Supplier Management

Our objective is to secure competitive advantages for BASF through professional procurement structures. Our suppliers are an important part of our value chain. Together with them, we aim to create value and minimize risks.

Strategy

- Sustainability-oriented supply chain management
- New goals for sustainability evaluations of relevant spend

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.1 We work together in an open and transparent way to generate long-term benefits for both sides. In doing so, we create value added that goes above and beyond procurement alone. For example, we develop solutions to target market-specific customer requirements together with our suppliers. Our sustainability-oriented supply chain management contributes to risk management by clarifying our expectations and standards for our suppliers, and by supporting them in carrying out our requirements. We count on reliable supply relationships and want to make our suppliers’ contribution to sustainable development transparent to us.

Due to the size and scale of our supplier portfolio, our suppliers are evaluated based on risk, including both country and industry-specific risks. 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. We will work towards having 80% of suppliers improve their sustainability performance upon re-evaluation. In 2019, 81% of the relevant spend had been evaluated. Of the suppliers re-evaluated in 2019, 52% had improved. The global targets are embedded in the personal goals of persons responsible for procurement.

2025 target
Share of relevant spend covered by sustainability evaluations
90%

2025 target
Percentage of suppliers with improved sustainability performance upon re-evaluation
80%

Worldwide procurement

Our more than 75,000 Tier 1 suppliers play a significant role in value creation at our company. We work in long-term partnership with companies from different industries around the world. They supply us with raw materials, chemicals, investment goods and consumables, perform a range of services and are innovation partners. We acquired raw materials, goods and services for our own production worth approximately €34.5 billion in 2019. There were no substantial changes to our supplier structure.

What we expect from our suppliers

- Global Supplier Code of Conduct

New suppliers are selected and existing suppliers are evaluated not only on the basis of economic criteria, but also environmental, social and corporate governance standards. Our 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. The Code of Conduct covers compliance with human rights, labor and social standards, and anticorruption and antitrust policies in addition to protecting the environment.

A registration portal incorporating our Supplier Code of Conduct was introduced in 2019 for all suppliers of technical goods, services and investment goods. In 2019, 1,596 new suppliers committed to our values via the portal. We specifically ask new raw materials suppliers to commit to the values of our Supplier Code of Conduct. Companies that do not accept our values are not taken on as new suppliers.

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1 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.

2 Suppliers can be natural persons, companies or legal persons under public law.

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 and our purchasers’ assessments. We also use further sources of information to identify relevant suppliers such as evaluations from Together for Sustainability (TfS), a joint initiative of chemical companies for sustainable supply chains.
Training and partnerships

In Brazil, we trained employees from 81 suppliers on topics such as how the United Nations’ Sustainable Development Goals (SDGs) can be implemented. We trained employees from 49 suppliers in 2019 as part of a local partnership with the East China University of Science and Technology in Shanghai.

BASF is one of 11 founding members of the econchain – German Business Initiative for Sustainable Value Chains initiative coordinated by the German sustainability network econsense. As part of this initiative, we help suppliers to improve their sustainability performance through training. Following successful pilot supplier training, which we started in 2018 in China and Mexico and completed in 2019, the concept was enhanced and refined to roll out the training further in 2020.

In addition, we instructed 229 BASF employees with procurement responsibility on sustainability-oriented supplier management and responsible procurement. This strengthens employee awareness to identify and minimize potential risks in the supply chain.  

Evaluating our suppliers

- **Together for Sustainability initiative aims to harmonize and standardize supplier assessments and audits**
- **Risk-based approach with clearly defined internal follow-up processes**

BASF is a founding member of the Together for Sustainability (TfS) initiative of leading chemical companies for the global standardization of supplier evaluations and auditing. With the help of TfS, we promote sustainability in the supply chain. The initiative aims to develop and implement a global program for the responsible supply of goods and services and improve suppliers’ environmental and social standards. The evaluation process is simplified for both suppliers and TfS member companies by a globally uniform questionnaire. The 22 members of the initiative conducted a total of 4,197 sustainability assessments – including both initial and follow-up assessments – and 309 audits in 2019. TfS has developed training for suppliers that already have a sustainability rating but have potential for improvement in environmental, social and corporate governance. In 2019, more than 200 participants attended training on this topic in China.

Using TfS evaluations, we pursue a risk-oriented approach with clearly defined, BASF-specific follow-up processes. A total of 81 raw material supplier sites were audited on sustainability standards on our behalf in 2019. We also received sustainability assessments for 537 suppliers from an external service provider. If we identify potential for improvement, we support suppliers in developing measures to fulfill our standards, such as providing training on environmental, social and corporate governance topics. We conduct another review according to a defined timeframe based on the sustainability risk measured. BASF reserves the right to discontinue any business relationship for non-adherence to international principles, failure to correct violations, or for displaying patterns of non-compliance with these standards. This did not occur in any case in 2019. We use this approach to evaluate suppliers with a potential sustainability risk at least every five years. The approach itself is regularly reviewed to identify possibilities for optimization.

Audit results

The audits conducted over the past few years have identified some deviations with respect to environmental, social and corporate governance standards, for example in waste and wastewater management, deviations in occupational safety measures and standards under labor law. Follow-up assessments in 2019 found, for example, that hazardous materials were stored correctly, wastewater was treated properly, there were sufficient emergency exits and trained emergency teams, and that labor laws were complied with. In 2019, none of our audits identified any instances of child labor or dangerous work and overtime performed by persons under 18. Further audits will be conducted at two suppliers due to lack of documentation.

BASF reviewed and assessed the issues raised at the platinum supplier Lonmin Plc, London, United Kingdom, in connection with the events in Marikana, South Africa. Lonmin was acquired by Sibanye-Stillwater on June 10, 2019. BASF initiated a dialog with Sibanye-Stillwater on June 10, 2019. BASF reviewed the issues raised at the platinum supplier Lonmin Plc, London, United Kingdom, in connection with the events in Marikana, South Africa. Lonmin was acquired by Sibanye-Stillwater on June 10, 2019. BASF initiated a dialog with Sibanye-Stillwater at an early stage on the results of the two audits...
of Lonmin in 2015 and 2017 and the measures arising from these. In January 2020, a full mining-specific re-audit was performed in accordance with the standards of the chemical industry’s “Together for Sustainability” (TfS) initiative to re-evaluate the situation and identify current need for action. Sibanye-Stillwater is a member and supporter of the International Platinum Group Metals Association (IPA) sustainability initiative that was co-founded by BASF. Under this initiative, the most important platinum mines and fabricators in South Africa and their customers – like BASF – are working to improve local living and working conditions. Measures include conducting comprehensive sustainability audits in the South African platinum group metals sector and exchanging factors for success. BASF continued its regular dialog with local stakeholder groups in 2019.

For more information on the supplier relationship with the Sibanye-Stillwater mine, see basf.com/en/marikana
**Raw Materials**

Responsible resource management is an integral part of our strategy. It is applied within the company through our Verbund concept, our innovative products and the use of renewable raw materials. In the search for alternative raw materials, we employ solutions that contribute to sustainability.

### Strategy

We strive to procure responsibly and use raw materials efficiently. That is why we take an interest in our suppliers, their products and the entire supply chain. The Verbund system is an important component of our resource efficiency concept: The by-products of one plant often serve as feedstock elsewhere, helping us to use raw materials more efficiently. We also contribute to the circular economy with our ChemCycling™ project (see box on the right).

In 2019, BASF purchased a total of around 30,000 different raw materials from more than 7,000 suppliers. Important raw materials (based on volume) include naphtha, liquid gas, natural gas, benzene and caustic soda. In addition to fossil resources, we also employ renewable raw materials. We use these to manufacture products that either cannot be made with fossil resources, or only at significantly greater effort, for example. In addition, our biomass balance approach enables us to allocate renewable raw materials to many of the products in our portfolio. Independent certification confirms that we have replaced the fossil feedstock needed for the sold biomass balance product with renewable resources. Products manufactured using this approach are indistinguishable from those produced solely from fossil raw materials. As for fossil raw materials, we also consider how renewable raw materials impact sustainability topics along the value chain. As well as 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. We aim to minimize these raw material-specific risks with measures, projects and targeted involvement in sustainability initiatives in the relevant value chains.

At a workshop in Ludwigshafen, Germany, we discussed with more than 90 recycling and standardization experts how the mass balance approach can be standardized to drive forward circular economy models. The starting point for discussions was a white paper from the CE100 (Circular Economy 100) initiative of the Ellen MacArthur Foundation, to which BASF sustainability experts had also contributed.

### The ChemCycling™ project

Recycling is becoming increasingly important due to the growing sustainability requirements in the markets and regulatory developments. The ChemCycling™ project launched by BASF in 2018 aims to manufacture products from chemically recycled plastic waste on an industrial scale.

To do this, our partners use thermochemical processes to transform plastic waste into secondary raw materials such as pyrolysis oil. We can feed these into our production Verbund at the beginning of the value chain, reducing the use of fossil raw materials. The percentage of recycled materials can be allocated to certain products manufactured in the Verbund using a mass balance approach and we can offer our customers certified products. These are indistinguishable from products manufactured from fossil feedstock.

In the pilot phase of the ChemCycling™ project, BASF presented – together with customers from various industries – prototypes made from chemically recycled materials, including mozzarella packaging, transparent refrigerator elements and insulation boxes.

In 2019, BASF invested €20 million in Quantafuel AS, a start-up based in Oslo, Norway, that specializes in the pyrolysis of mixed plastic waste and the purification of the resulting oil. BASF is providing technical support in the startup of Quantafuel's commercial plant in Skive, Denmark. Together, the partners are also developing further the chemical recycling technology used by Quantafuel – an integrated pyrolysis and purification process. The aim is to optimize the products for use as raw materials in the chemical industry.

In the future, chemical recycling can help to reduce the amount of plastic waste that is disposed of in landfill or burned to produce energy. Chemical recycling complements mechanical recycling and is particularly suited to recycling mixed plastics or plastics with residues.

For more information, see basf.com/en/chemcycling

### Renewable resources

- Numerous projects and cooperative ventures to improve sustainability along the value chain

In 2019, around 5.3% of the raw materials we purchased worldwide were from renewable resources. To make the use of these materials more competitive, we work on product innovations based on renewable raw materials as well as on enhancing production processes. We also further established our biomass balance approach on the market in 2019. This approach aims to replace natural gas and naphtha at the beginning of the value chain with biogas and bio-naphtha from certified sustainable production. Should a customer select a biomass balanced product, the proportion of
renewable feedstock to be used is calculated based on the formula.

The calculation model is certified by an independent third party (TÜV Süd). In June 2019, BASF switched from TÜV Süd to the chemical industry's REDcert2 standard for the certification of its biomass balanced products.

Our Verbund production ensures that the characteristics and quality of all end products remain unchanged and that our customers can use them as usual. This method has already been applied to more than 80 BASF products – for example, for superabsorbents, dispersions, plastics such as polyamides and polyurethanes, and for intermediates available on the market as “drop-in products.” These can be used in place of previously employed products in the production process without having to change the process itself.

Palm oil, palm kernel oil, and their derivatives are some of our most important renewable raw materials. We aim to ensure that these raw materials come from certified sustainable sources, and actively support the Roundtable on Sustainable Palm Oil (RSPO). In 2019, we published our third progress report – the BASF Palm Progress Report – for greater transparency in the value chain. Based on our voluntary commitment to sustainably source palm oil products, we purchased 140,400 metric tons of certified palm kernel oil in 2019. This represents around 83.5% of our total volume of palm kernel oil.

Demand for certified products increased significantly again. As a result, in 2019 we increased sales volumes of certified palm oil and palm kernel oil-based products for the cosmetics and detergent and cleaning industries by more than 40% compared with the previous year. We are expanding our offering of certified sustainable products in accordance with the RSPO’s Mass Balance supply chain model. This helps our customers to meet their obligations to customers, consumers and stakeholders. BASF continues to drive forward the RSPO supply chain certification of our sites for cosmetic ingredients. In 2019, 24 production sites worldwide were RSPO certified. Our goal is to only source RSPO certified palm oil and palm kernel oil by 2020, provided it is available on the market. By 2025, this voluntary commitment will be expanded to include the most important intermediates products based on palm oil and palm kernel oil; these include fractions and primary oleochemical derivatives as well as edible oil esters.

In addition, our BASF Palm Sourcing Policy addresses the requirements for protecting and preserving forests and peatland, as well as the involvement of local communities. At the same time, we are stepping up our efforts to improve transparency and traceability in the supply chain. We were most recently able to trace 90% of our overall oil palm exposure.

BASF and Henkel have cooperated with the development organization Solidaridad since 2016 to more closely involve smallholder farmers in Indonesia and improve their living conditions. Smallholders complete farming and environmental training as part of the Farmer Field School initiative, with a focus on efficient and sustainable growing practices and health and safety standards. Between the start of the project in 2016 and June 2019, a total of more than 2,000 smallholders have completed a training program as part of the Farmer Field School initiative.

BASF and the Estée Lauder Companies and the RSPO have also partnered with Solidaridad to promote sustainable palm oil and palm derivatives production in the Indonesian province of Lampung. The project supports around 1,000 independent smallholders to improve their livelihoods and their sustainable production of palm oil and palm kernel oil. The project’s target is that a minimum of one-third of the supported smallholder farmers become certified according to the RSPO Smallholder Standard in three years.

BASF cooperates with Cargill, Procter & Gamble and the German governmental agency for international cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH) in a development partnership under the developPPP.de program commissioned by the German Federal Ministry for Economic Cooperation and Development to establish a certified coconut oil supply chain and improve the livelihood of coconut farmers in the Philippines and Indonesia. Thanks to the initiative, the first certified sustainable coconut oil was produced in the Philippines in 2018. Between November 2015 and October 2019, more than 4,100 coconut farmers were trained in Good Agricultural and Practices and farm management. About 1,600 farmers received additional training and were certified according to the Rainforest Alliance Sustainable Agriculture Standard. Farmers who were trained and certified earn 47% more on average than farmers who did not participate in the program.

There is a growing demand for sustainably produced castor oil, but there are no standards defined and adopted across the globe that can certify the same. Castor beans are mainly grown by Indian smallholders and there are few incentives for the producers to comply with the generally accepted quality standards. The Sustainable Castor Initiative – Pragati, a joint initiative established by BASF together with Arkema, Jayant Agro and Solidaridad, made further progress in 2019. With the initiative, the project members aim to improve the economic situation of castor oil farmers and their workers in India. Smallholders are trained and audited based on a sustainability code to optimize their yields, reduce the impact on the environment and be able to offer certified sustainable castor oil on the global market. BASF can start procuring sustainably produced, certified castor oil from 2020 onward. Based on the total volume required, we want to increase the share of sustainably produced castor oil over the long term. Since the project was initiated, more than 3,000 smallholders and over 5,000 hectares of land have been certified for sustainable castor cultivation. The smallholders certified under the program have been able to increase their yields by at least 50% compared with the 2016 baseline. The project has been extended for another three years, from 2019 to 2022.
Mineral raw materials

Sourcing mineral raw materials responsibly is important to BASF. We procure a number of mineral raw materials, such as precious metals, which we use to produce mobile and process emissions catalysts and battery materials. We support our customers by tracking the origins of minerals as defined in the Dodd-Frank Act – including tin, tantalum, tungsten, their ores and gold – to see if they come from mines in conflict regions in suspicious cases. We reserve the right to have suppliers audited and, if necessary, terminate our business relationship. Our suppliers have confirmed to us that they do not source minerals matching this definition of conflict minerals from the Democratic Republic of Congo or its neighboring countries. We intend to implement the E.U. Conflict Minerals Regulation published in 2017 by the 2021 deadline. The E.U. regulation defines supply chain due diligence for importers and processors of certain mineral raw materials originating from conflict regions and high-risk areas. In addition to responsible procurement of “conflict minerals,” BASF is committed to a responsible and sustainable global supply chain for cobalt and mica.

BASF does not purchase cobalt from artisanal mines in the Democratic Republic of Congo and aims to avoid this in the supply chain as well. In accordance with the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, we have analyzed our supply chains for cobalt for battery materials and conduct audits based on a specific risk assessment. BASF and Nornickel have signed a long-term supply agreement for nickel and cobalt from Nornickel's metal refinery in Finland. The agreement ensures locally sourced and secure supply of raw materials for battery production in Europe.

Automotive catalytic converters contain valuable precious metals like platinum, palladium and rhodium. They help to eliminate engine emissions such as carbon monoxide. The recycling of spent automotive catalysts is a complex process that enables the re-use of their precious metals. BASF recycles the platinum group metals (PGMs) contained in scrap automotive catalytic converters and chemical catalysts. All of the metal we recover is used to supply our mobile emissions catalysts and chemical and process catalysts businesses.
Environmental Protection, Health and Safety

Responsible Care Management System

The protection of people and the environment is our top priority. Our core business – the development, production, processing and transportation of chemicals – demands a responsible approach. We systematically address risks with a comprehensive Responsible Care Management System, which is continually being further developed. We expect our employees and contractors to know the risks of working with our products, substances and plants and handle these responsibly.

Responsible Care Management System

- Global directives and standards for safety, security, health and environmental protection
- Regular audits to monitor performance and progress

BASF’s Responsible Care Management System comprises the global directives, standards and procedures for safety, security, health and environmental protection for the various steps along our value chain. Our regulations cover the transportation of raw materials, activities at our sites and warehouses, and distribution of our products as well as our customers’ application of the products. Specifications for implementing these measures are laid out in binding directives that are introduced in consultation with employee representatives. These describe the relevant responsibilities, requirements and assessment methods. Our policies and requirements are constantly updated. We also maintain a dialog with government institutions, associations and other international organizations.

We set ourselves ambitious goals for safety and security, and health and environmental protection. We regularly conduct audits to monitor our performance and progress. We assess the potential risks and weaknesses of all our activities – from research and production to logistics – and the effects of these on the safety and security of our employees, the environment or our surroundings. In our databases, we 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.

For more information on Responsible Care®, see basf.com/en/responsible-care

Audits

- 152 safety, security, health and environmental protection audits performed

Regular audits help ensure that standards are met for safety, security, health and environmental protection. We conduct regular audits every three to six years at all BASF sites and at companies in which BASF is a majority shareholder. We use an audit database to ensure that all sites and plants worldwide are audited. Sites and companies acquired as part of acquisitions are audited in a timely manner to bring these into line with our standards and directives as necessary. After the integration phase is complete, they are generally audited within one to two years, depending on complexity and size. We have defined our regulations for Responsible Care audits in a global Group requirement. 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.

For more information on occupational safety and health protection, see page 109 onward

Costs and provisions for environmental protection in the BASF Group

<table>
<thead>
<tr>
<th>Million €</th>
<th>2019</th>
<th>2018</th>
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</thead>
<tbody>
<tr>
<td>Operating costs for environmental protection</td>
<td>1,035</td>
<td>1,077</td>
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<tr>
<td>Investments in new and improved environmental protection plants and facilities</td>
<td>328</td>
<td>277</td>
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<tr>
<td>Provisions for environmental protection measures and remediation</td>
<td>654</td>
<td>639</td>
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</table>

*Values shown refer to December 31 of the respective year.

For more information, see the Notes to the Consolidated Financial Statements on pages 230 and 260
Safety in production

For occupational and process safety as well as health and environmental protection and corporate security, we rely on comprehensive preventive measures and expect the cooperation of all employees and contractors. Our global 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.

Strategy

- Global safety standards
- Strengthening risk awareness
- Comprehensive incident analyses and global experience and information exchange

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 safety, security, and environmental and health protection. A worldwide network of experts ensures these are implemented. As part of our continuous improvement process, we regularly monitor progress toward our goals.

We promote risk awareness for every individual with measures such as systematic hazard assessments, specific and ongoing qualification measures and global safety initiatives.

We analyze accidents, incidents and their causes in detail at a global level to learn from these. Hazard analyses 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.

By 2022, we will introduce digital solutions and applications at more than 350 of our plants to further increase the safety, security, planning capability and availability of our plants. For example, augmented reality solutions will support daily operations by providing direct, fast access to the required information with mobile end devices and apps. Other digital solutions will enable us to perform predictive maintenance or efficiently simulate maintenance and production processes in digital plant models.

Based on our corporate values, leaders serve as safety role models for our employees. 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.

Global safety initiative

- Focus of Global Safety Days: “Safe choices become safe habits”

Our global safety initiative was established in 2008 and plays a key role in the ongoing development of our safety culture. With around 1,000 events at 325 sites, the focus of our Global Safety Days in 2019 was “Safe choices become safe habits.” Around the globe, 80,000 participants took the opportunity to learn about practical examples and gain valuable insights around risk-aware behavior and conscious decision-making. Around 7,500 employees and contractors registered to participate at the Ludwigshafen site alone. The events offered centrally were therefore 90% booked out. This involvement and lively discussion make a major contribution to the safety culture.

For more information on the global safety initiative, see basf.com/global-safety-initiative

Occupational safety

- New tools to prevent work-related accidents
- Employees and contractors worldwide instructed on safe behavior

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

In addition to the legally required briefings, we also held training courses on safe procedures in 2019 to strengthen risk awareness among our employees and contractors and prevent work-related accidents.

Furthermore, our training center at the Ludwigshafen site in Germany has offered continual further education on diverse safety and security topics for employees and contractors since 2010. Some 11,800 participants received training there in 2019.
Improving health and safety with digitalization

Digitalization and the associated innovative technologies open up numerous new opportunities for us to improve occupational safety, make safety training more realistic and effective, and better link medical care around the world. In 2019, we therefore held workshops to enable internal safety experts from various disciplines to brainstorm ideas together and develop solutions. The remarkable number of suggestions – around 300 – shows the enormous potential of digitalization for health and safety. Many of the ideas are feasible and we are working on their implementation. Examples include projects to detect whether a person is wearing personal protective equipment, to locate missing persons in an emergency, virtual reality training for the fire department or telemedicine applications. Since 2018, Digital Lunch@EHS events have been held several times a year to keep experts and employees from the business units up to date with the latest developments, present progress made, inspire new applications and strengthen dialog.

In 2019, 0.3 work-related accidents per 200,000 working hours occurred at BASF sites worldwide (2018: 0.3). The proportion of chemical-related accidents rose slightly to 7% (2018: 6%). Unfortunately, there was one fatal work-related accident in 2019 (2018: 3). In October, an employee of BASF Polska Sp. z o.o. succumbed to injuries sustained from falling down the stairs during a business event outside of company premises. BASF is supporting the relevant authorities in their investigation 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 information and awareness campaigns.

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

Process safety

- Regular review of plant safety concepts and performance of implementation checks and safety-related measures
- Global initiatives to reduce process safety incidents
- Network of experts and global training methods foster dialog

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 process safety standards 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 plant safety concept and implementation check for every plant that considers the key aspects of safety, health and environmental protection – from conception to startup – and stipulates specific protection measures.

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 in line with changing technologies and as necessary.

2025 target
Reduction of worldwide process safety incidents per 200,000 working hours

≤0.1

We use the number of process safety incidents (PSI) per 200,000 working hours as a reporting indicator. We have set ourselves the goal of reducing process safety incidents to a rate of no more than 0.1 per 200,000 working hours by 2025. In 2019, we recorded 0.3 process safety incidents per 200,000 working hours worldwide (2018: 0.3). We pursue continual improvement by investigating every incident in detail, analyzing causes and using the findings to derive suitable measures. In addition, training methods are continually refined and enhanced to increase risk awareness.

We are constantly working to increase the availability of our plants and determine the right point in time for maintenance measures and revamping/refurbishment. The aim is to further reduce unscheduled shutdowns. To achieve this, we launched a digitalization project in 2017, which was first implemented in 2018 at a number of plants in Ludwigshafen, Germany, and then extended in 2019 to further plants in Ludwigshafen as well as in Schwarzeheide, Germany, and Antwerp, Belgium. We want to roll the project out worldwide in 2020.
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 potential safety risks. At the Ludwigshafen site in Germany, the PSI reduction initiative was held for the fifth time in 2019. In the past, this initiative mainly focused on the implementation of technical measures, such as introducing a tool to visualize safety measures during maintenance work and startup processes for production plants, for example. In 2019, discussions centered for the first time on specific events and their behavior-based causes. Another topic was the competencies needed to prevent such events from happening again. This new approach involves targeted training and is initially being tested by three plants. Further plants will adopt the proven concept on a step-by-step basis. Bolstered by a cultural shift in risk awareness, North America again made avoiding and detecting all leaks a key priority in 2019.

We play an active role in improving process safety around the world in a global network of experts, through our involvement in organizations such as the International Council of Chemical Associations (ICCA), and by fostering dialog with government institutions.

**Health protection**

- **Global standards for corporate health management**
- **2019 Global Health Campaign “moment_to_moment” focuses on mindfulness**

Our global corporate health management serves to promote and maintain the health and productivity of our employees. Our worldwide standards for occupational health are specified in a directive that is implemented by a global network of experts. This was once again supported by numerous emergency drills and health promotion measures in 2019.

We measure our performance in health protection using the Health Performance Index (HPI). The HPI comprises five components: recognized occupational diseases, medical emergency preparedness, 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 0.97, we once again reached this ambitious goal in 2019 (2018: 0.96).

<table>
<thead>
<tr>
<th>Year</th>
<th>Target Score</th>
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<tr>
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</tbody>
</table>

Our 2019 Global Health Campaign “moment_to_moment” focused on mindfulness. The aim was to sensitize our employees to conscious and safe behavior in their everyday working and personal lives. Over 500 sites worldwide took part in the health campaign with activities such as mindfulness workshops, courses, talks and exercises.

**Emergency response, corporate security and cybersecurity**

- **Regular review of emergency systems and crisis management structures**
- **Comprehensive protection measures against third-party interference**

We are well prepared for crisis situations thanks to our global crisis management system. In the event of a crisis, our global, regional or local emergency response plans and crisis management structures are engaged, depending on the impact scope. We involve situation-related partners and suppliers as well as cities, communities and neighboring companies. A new IT system to support emergency response was introduced in 2018/2019 to speed up communication between the relevant actors in the event of a crisis and maintain the best possible overview of the situation. The crisis management team can now record and process events around the world better and in more detail.

We regularly check our emergency systems, crisis management structures and drill procedures with employees, contractors, local authorities and emergency rescue workers. For example, in 2019 we conducted 277 drills and simulations in Ludwigshafen, Germany, to instruct participants on our emergency response measures.

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 protect our employees, sites, plants and company know-how against third-party interference. This includes, for example, analyzing potential security risks in the communities surrounding our production sites and addressing in depth the issue of cybersecurity. BASF has a comprehensive program in place to continually improve its...
ability to prevent, detect and react to cybersecurity incidents. By establishing a global Cyber Security Defense Center, BASF significantly expanded the availability of its cybersecurity experts to ensure around-the-clock protection. We cooperate closely with a global network of experts and partners to ensure that we can protect ourselves against cyberattacks as far as possible. Our IT security system is certified according to ISO 27001.

Around the world, we work to sensitize employees about protecting information and know-how. For example, we further strengthened our employees’ awareness of risks in 2019 with mandatory online training for all employees and other offerings such as seminars, case studies and interactive training. We have defined mandatory information protection requirements to ensure compliance with our processes for protecting sensitive information and perform audits to monitor this.

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. We provided information protection instruction to more than 96,000 participants in 2019. 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.

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

Aspects of human rights related to site security, such as the right to liberty and security of person, are a component of the global qualification requirements of our security personnel. Respect for human rights is a mandatory element of any contract with service providers of the BASF Group who are active in this area.

For more information on emergency response, see basf.com/emergency_response
**Product stewardship**

We review the safety of our products from research and development through production and all the way to our customers’ application. We continuously work to ensure that our products pose no risk to people or the environment when they are used responsibly and in the manner intended.

**Strategy**

- Global directives with uniformly high standards for product stewardship

We are committed to continuously minimizing the negative effects of our products on the environment, health and safety along the value chain – from development to disposal. This commitment to product stewardship is enshrined in our Responsible Care® charter and the initiatives of the International Council of Chemical Associations (ICCA). We also ensure uniformly high standards for product stewardship worldwide. In some cases, we have committed to voluntary initiatives that go beyond the local legal requirements.

We maintain and evaluate environmental, health and safety data for our substances and products in a global database. This information is updated continuously. The database forms the basis for our safety data sheets, which we make available to our customers in around 40 languages. Our global emergency hotline network enables us to provide information around the clock. We train and support our customers in fulfilling their industry or application-specific product requirements. In associations and together with other manufacturers, BASF is pushing for the establishment of voluntary global commitments to prevent the misuse of chemicals.

BASF supports the implementation of initiatives such as the Global Product Strategy (GPS) of the ICCA. GPS is establishing worldwide standards and best practices to improve the safety management of chemical substances and to support governments in the introduction of local chemical regulations. We are also involved in initiatives such as workshops and training seminars in developing countries and emerging markets. In 2019, these included the ASEAN (Association of Southeast Asian Nations) workshop on regulatory cooperation in Vietnam and a Responsible Care workshop in Argentina.

For more information on GPS, see basf.com/en/gps

**Environmental and toxicological testing**

**Use of alternative methods for animal studies**

Before launching products on the market, we subject them to a variety of environmental and toxicological testing. We apply state-of-the-art knowledge in the research and development phase of our products. For instance, we only conduct animal studies when they are required by law and approved by respective authorities. Animal studies are at times stipulated by REACH and other national legislation outside the European Union in order to obtain more information on the properties and effects of chemical products.

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 are continually developing and optimizing alternative methods, and we use them wherever it is possible and accepted by the authorities. We use alternative methods in more than a third of our toxicological tests. Currently, 33 alternative methods are being used in our labs and another 22 are in the development stage. BASF spent €3.5 million toward this purpose in 2019. The development of alternative methods for testing the potential of substances to induce developmental toxicity has been a focus area of our research since 2017.

Since 2016, BASF SE's Experimental Toxicology and Ecotoxicology department has been working together with a total of 39 partners on one of the largest European collaborative projects for alternative methods. The project, planned to run for six years, aims to develop alternative methods to the point that chemical risk assessments can be efficiently conducted largely without animal testing.

For more information on alternative methods, see basf.com/alternative_methods

For more information on GPS, see basf.com/en/gps

For more information on alternative methods, see basf.com/alternative_methods
Management of new technologies

Continual safety research on nano- and biotechnology

Nanotechnology and biotechnology offer solutions for key societal challenges – for example, in the areas of climate protection or health and nutrition.

Safe handling of nanomaterials is stipulated in our Nanotechnology Code of Conduct. In recent years, we have conducted over 250 scientific studies and participated in numerous Verbund projects related to the safety of nanomaterials in Germany and around the world. The results were published in more than 130 scientific articles.

In 2018, we concluded laboratory and evaluation work on the Nano-in-Vivo research project. The project was conducted in cooperation with German governmental bodies over a period of more than five years and examined the toxicological effects of long-term exposure to nanoparticles. We communicated the first findings at industry conferences in 2019. We will publish further data and results together with the German governmental bodies in the final report and in scientific papers. The insights delivered by the research project complement our previous findings that toxicity is determined not by the size of the particles but by the intrinsic properties of the substance.

OECD testing and implementation guidelines must be developed for the new requirements for nanomaterials under REACH, the European chemicals regulation. We support this process by contributing our expertise in various working groups of the European Chemicals Agency (ECHA) and the OECD’s Business and Industry Advisory Group (BIAC).

Together with partners from academia and government authorities, we are working on E.U.-funded projects to validate alternative testing methods for evaluating and grouping nanomaterials with a view to regulatory acceptance. Many of the methods developed for nanoparticles could, in our view, also be used to evaluate solid particles in the future, an approach we bring up in regulatory discussions.

BASF makes successful use of biotechnology. We produce a range of established products with the help of biotechnological methods. This provides us with extensive experience in the safe use of biotechnological methods in research and development as well as in production. When employing biotechnology, we adhere to all local standards and legal regulations governing production and marketing. We are also guided by the code of conduct set out by EuropaBio, the European biotechnology association.

For more information on nanotechnology and the Nanotechnology Code of Conduct, see basf.com/nanotechnology
Our regulations and measures for transportation and warehouse safety cover the delivery of raw materials, the storage and distribution of chemical products among BASF sites and customers, and the transportation of waste from our sites to the disposal facilities.

**Strategy**

- **Risk minimization along the entire transportation chain**

  We want our products to be safely loaded, transported, handled and stored. This is why we depend on reliable logistics partners, global standards and an effective organization. Our goal is to minimize risks along the entire transportation chain – from loading and transportation to unloading. Some of our guidelines for the transportation of dangerous goods go above and beyond national and international dangerous goods requirements. We have defined global guidelines and requirements for the storage of our products and regularly monitor compliance with these.

- **Accident prevention and emergency response**

  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.

  **Transportation incidents**

  We are systematically implementing our measures to improve transportation safety. We report in particular on goods spillages that could lead to significant environmental impacts such as 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 2019 with spillage of more than 200 kilograms of dangerous goods (2018: 3). None of these transportation incidents had a significant impact on the environment (2018: 0).

  **Securing raw materials supply via the Rhine River**

  At the Verbund site in Ludwigshafen, Germany, around 40% of incoming volumes are transported to the site by ship under normal conditions. In 2018, logistics were impacted by the low water levels on the Rhine River caused by the hot and dry summer. We are implementing various measures to make the site more resilient to extended low water events. For instance, we are involved in creating an early warning system for low water, have chartered ships that can navigate low water levels, are investing in making loading stations more flexible, and are additionally developing our own type of ship together with partners. BASF is also a co-signatory of the German Federal Ministry of Transport’s “Low water on the Rhine” action plan, which aims to improve shipping conditions on the Rhine over the coming years with various measures. We recorded no extended low water events in 2019.

  **Activities in external networks**

  We are actively involved in external networks, which quickly provide information and assistance in emergencies. These include the International Chemical Environmental (ICE) initiative and the German Transport Accident Information and Emergency Response System (TUIS), in which BASF plays a coordinating role. In 2019, we provided assistance to other companies in 165 cases worldwide (2018: 145). We apply the experience we have gathered to set up similar systems in other countries. Since 2019, external experts such as the public fire services or other emergency responders can consult our systems for information on the detection of chemical substances in the human body. This “human biomonitoring” can be used to determine and evaluate whether and what amount of chemical substances have been absorbed by the human body during a rescue operation. It can be used to test and verify the efficacy of safety measures taken and of safety equipment, which is of particular importance for the health protection of emergency responders. Our experts provide assistance in evaluating whether human biomonitoring is feasible in a specific case, and in selecting the target substances to be tested, as well as appropriate sampling methods including transport and storage of samples.

1 Hazardous goods are classified in accordance with national and international hazardous goods regulations.
**Energy and climate protection**

As an energy-intensive company, we are committed to energy efficiency and global climate protection. We want to reduce emissions along the value chain. To achieve this, we rely on efficient technologies for generating steam and electricity, increased use of renewable energies, energy-efficient production processes and comprehensive energy management, among other things. Our climate protection products make an important contribution toward helping our customers avoid emissions.

**Strategy**

- **New climate protection target: CO₂-neutral growth until 2030**
- **Carbon management bundles measures to reduce greenhouse gas emissions**

Climate protection is very important to us. As a leading chemical company, we want to achieve CO₂-neutral⁠¹ growth until 2030: We aim to keep total greenhouse gas emissions from our production sites and our energy purchases stable at the 2018 level while growing production volumes. Sharp increases due to the startup of large-scale plants will be progressively offset. When deciding on investments and acquisitions, we systematically consider the effects on greenhouse gas emissions.

We want to reach our climate protection target and enable further reductions with plant optimization measures, by purchasing low-carbon energy, and with a research and development program to reduce our greenhouse gas emissions over the long term. We have bundled these measures in our carbon management program (see page 121). In addition, we will also consider temporarily taking external offsetting measures such as purchasing certificates if the technical or economic environment does not permit a stabilization of emissions at the 2018 level using the above approaches.

Most of BASF’s greenhouse gas emissions are attributable to the consumption of energy. At sites with internal supply capabilities, we primarily rely on highly efficient combined heat and power plants with gas and steam turbines, and on the use of heat released by production processes. Furthermore, we are committed to energy management that helps us analyze and further improve the energy efficiency of our plants on an ongoing basis. 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 offer our customers solutions that help prevent greenhouse gas emissions and improve energy and resource efficiency. Around half² of our annual research and development spending goes toward developing these products and optimizing our processes.

Our climate protection activities are based on a comprehensive analysis of our emissions. We report on greenhouse gas emissions in accordance with the Greenhouse Gas Protocol as well as the sector-specific standard for the chemical industry. As part of the implementation of BASF’s strategy, we have made changes to how greenhouse gas emissions and energy are reported from 2019 onward. For ease of comparison, the 2018 figures have been adjusted according to the new method and target.

- The emissions of BASF SE subsidiaries that are fully consolidated in the Group financial statements in which BASF holds an interest of less than 100% are included in full in emissions reporting (previously: emissions included on a pro rata basis). The emissions of proportionally consolidated joint operations continue to be disclosed pro rata according to our interest.

- We report on emissions and energy for BASF operations including the businesses acquired from Bayer in 2018 and excluding the deconsolidated oil and gas business. The businesses acquired from Bayer are accounted for from January 1, 2018.

- We use the market-based approach (previously: location-based approach) to report on greenhouse gas emissions from purchased energy (Scope 2) for the purpose of our climate protection target. Both approaches continue to be presented in the overview of greenhouse gas emissions in accordance with the Greenhouse Gas Protocol.

Since 2004, we have participated in the international non-profit organization CDP’s program for reporting on data relevant to climate protection. BASF achieved a score of A− in CDP’s rating for 2019, thus attaining Leadership status again. 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 emissions reduction strategies to achieve company-wide goals.

Climate protection is a shared global task. We advocate climate protection by supporting initiatives to this end. For instance, BASF spearheaded the World Economic Forum’s initiative on Collaborative Innovation for Low-Carbon Emitting Technologies in the Chemical Industry. In July 2019, BASF and the World Economic Forum invited representatives from 20 international chemical companies to a kick-off workshop in Ludwigsafen, Germany. Representatives also participate in the Task Force on Climate-related Financial Disclosures (TCFD). In 2019, we shared learnings and best practices on the implementation of the TCFD recommendations with four industry peers at a TCFD Preparers Forum for Chemicals. For the first time, this report includes an
For more information on climate protection, see basf.com/climate_protection
For more information on carbon management, see basf.com/en/carbon-management

Global goals and measures

We want to achieve CO₂-neutral growth until 2030. In other words, we aim to maintain total greenhouse gas emissions from our production sites (excluding emissions from sale of energy to third parties) and our energy purchases at the 2018 level (21.9 million metric tons of CO₂ equivalents) while increasing production.

In 2019, the emissions reported under this target amounted to 20.1 million metric tons of CO₂ equivalents, a decrease of 8.2% compared with the previous year (2018: 21.9 million metric tons of CO₂ equivalents). This is primarily attributable to shutdowns of large-scale plants for maintenance work, among other reasons. In addition, energy supply agreements were updated and measures to increase energy efficiency and optimize processes were implemented. We expect emissions for 2020 to increase to the 2018 level, due among other factors to fewer scheduled major shutdowns and the acquisition of Solvay’s polyamide business.
Greenhouse gas emissions from BASF operations (excluding sale of energy to third parties) compared with baseline 2018

Specific greenhouse gas emissions in 2019 amounted to 0.574 metric tons of CO₂ equivalents per metric ton of sales product,¹ 0.5% lower than in the previous year. Since 1990, we have been able to lower our overall greenhouse gas emissions from BASF operations by 49.9% and even reduce specific emissions by 75.0%.

**Specific greenhouse gas emissions from BASF operations²**

<table>
<thead>
<tr>
<th>Year</th>
<th>Metric tons of CO₂ equivalents per metric ton of sales product</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>0.577</td>
</tr>
<tr>
<td>2019</td>
<td>0.574</td>
</tr>
</tbody>
</table>

Energy supply of the BASF Group 2019

**Electricity supply**
- Purchased: 32%
- Internally generated: 68%

**Steam supply**
- Purchased: 6%

**Waste heat**
- 46%

Internally generated: 48%

By 2020, we want to have introduced certified energy management systems (DIN EN ISO 50001) at all relevant production sites.³ Together, these represent 90% of BASF's primary energy demand.

This is how we intend to identify and carry out improvements in energy efficiency, reducing not only greenhouse gas emissions and saving valuable energy resources, but also increasing our competitiveness.

The introduction and implementation of certified energy management systems is steered by a global working group. All energy efficiency measures are recorded and analyzed in a global database and made available to BASF sites as best practices. We are currently pursuing more than 200 measures to reduce energy consumption and increase competitiveness. Further sites across all regions were certified in accordance with ISO 50001 in 2019. These include the Verbund site in Kuantan, Malaysia, as well as another 18 sites in the United States, Brazil, Chile, China, India, Germany, France, the Netherlands, Belgium, Poland and Spain, among other countries. At the end of 2019, 82 sites were certified worldwide, representing 85% of our primary energy demand.

**Certified energy management systems (ISO 50001) at BASF Group sites worldwide, in terms of primary energy demand³**

<table>
<thead>
<tr>
<th>Year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>39.5</td>
</tr>
<tr>
<td>2016</td>
<td>42.3</td>
</tr>
<tr>
<td>2017</td>
<td>54.3</td>
</tr>
<tr>
<td>2018</td>
<td>69.9</td>
</tr>
<tr>
<td>2019</td>
<td>85.1</td>
</tr>
</tbody>
</table>

¹ Sales product volumes include sales between BASF Group companies; merchandise is not taken into account.
² We have changed the method used to calculate the relevant environmental indicators compared with the previous year. Further information can be found on page 116. The figures for 2018 have been adjusted according to the new method.
³ The selection of relevant sites is determined by the amount of primary energy used and local energy prices.
Energy supply and efficiency

- Internal supply and Verbund system as important components of our energy efficiency strategy

Gas and steam turbines in combined heat and power plants enable us to fulfill more than 70% of the electricity demand of the BASF Group. Compared with separate methods of generating steam and electricity, we saved 12.4 million MWh of fossil fuels and prevented 2.5 million metric tons of carbon emissions in 2019. In 2019, internally generated power in the BASF Group had a carbon footprint of around 0.26 metric tons of CO₂ per MWh of electricity and was below the national grid factor at most BASF Group locations. The figure for purchased electricity in 2019 was around 0.46 metric tons of CO₂ per MWh (market-based approach). As part of our carbon management (see page 121), we therefore aim to reduce the carbon footprint of purchased electricity.

The Verbund system is an important component of our energy efficiency strategy: Waste heat from one plant’s production process is used as energy in other plants. In this way, the Verbund saved us around 19.2 million MWh in 2019, which translates to 3.9 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 prevent a total of 6.4 million metric tons of carbon emissions in 2019.

We further improved the resource and energy consumption of our production in numerous projects around the world in 2019. At the Verbund site in Ludwigshafen, Germany, for example, we were able to save considerable amounts of steam and therefore primary energy with predictive, model-based process control systems at two production plants. Process improvements at many other sites have also led to savings in steam, electricity and fuel.

We also rely on locally available sources to supply our sites with energy. We are increasingly incorporating the use of renewable energies, especially purchasing electricity. Our research also contributes to increasing the efficiency of technologies for the use of renewable energy sources.

### Additional key indicators for energy and climate protection in BASF operations*

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2019</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific greenhouse gas emissions (metric tons of CO₂ equivalents per metric ton of sales product)</td>
<td>0.574</td>
<td>0.577</td>
</tr>
<tr>
<td>Primary energy demand (million MWh)</td>
<td>58.520</td>
<td>60.586</td>
</tr>
<tr>
<td>Energy efficiency (kilograms of sales product per MWh)</td>
<td>598</td>
<td>626</td>
</tr>
</tbody>
</table>

*We have changed the method used to calculate the relevant environmental indicators compared with the previous year. Further information can be found on page 116. The figures for 2019 have been adjusted according to the new method.

**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.

Carbon footprint and climate protection products

- Reporting on greenhouse gas emissions along the entire value chain
- Customers’ use of BASF climate protection products avoids greenhouse gas emissions

BASF has published a comprehensive corporate carbon footprint since 2008. This report on all greenhouse gas emissions along the value chain. It also shows, on the basis of selected climate protection products, the emissions avoided through the use of these products.

The greenhouse gas emissions arising before and after BASF’s activities in the value chain (Scope 3 in accordance with the Greenhouse Gas Protocol) amounted to around 100 million metric tons of CO₂ equivalents in 2019 (2018: 118 million metric tons of CO₂ equivalents). The significant decrease compared with the previous year is attributable to the deconsolidated oil and gas business, which is no longer included in the carbon footprint as of 2019. However, this decrease is partly offset by a new methodological approach to calculate the emissions from the disposal of our products. These emissions are estimated based on a closed carbon cycle, taking into account regional disposal methods.

Our climate protection products offer our customers solutions to avoid greenhouse gas emissions over their entire lifecycle as compared with reference products. The systematic analysis we conduct on our portfolio – Sustainable Solution Steering (see page 38) – rates the use of these Accelerator solutions as particularly good with respect to climate protection and energy.

Examples of Accelerator solutions are our expandable polystyrene granulates (EPS) Styropor® and Neopor®. Both products are used to insulate buildings and help to save heating energy and reduce carbon emissions. Neopor® contains particles of graphite. This
enables the production of insulation boards with up to 20% better insulation performance than conventional EPS. Another polystyrene-based climate protection product is Styrodur®, an extruded rigid foam panel, which likewise offers optimum insulation performance and a wide range of potential applications, especially under high pressure.

An analysis shows that the volumes of Styropor®, Neopor® and Styrodur® sold in 2019 help our customers to save 62 million metric tons of CO₂ emissions over the entire lifecycles of these products when used to insulate existing buildings. This calculation is based on a lifecycle analysis that takes into account the production and disposal of the insulation materials and compares the energy consumption of a renovated building with that of an unrenovated building over a period of 50 years. The calculation of avoided greenhouse gas emissions took into account the chemical industry standards of the International Council of Chemical Associations (ICCA) and the World Business Council for Sustainable Development (WBCSD). All three products also help to reduce carbon emissions in new buildings, where they have been used as standard for decades.

BASF also offers biomass balance (BMB) versions of Styropor®, Neopor® and Styrodur®. In accordance with an externally certified mass balancing method, 100% of the fossil raw materials used in the production of these BMB products are replaced by renewable raw materials such as bio-naphtha or biogas. This saves carbon emissions and fossil resources during the manufacturing process. Together with the German EPS insulation material manufacturer Bachl, we calculated in a lifecycle analysis that the use of renewable raw materials reduces carbon emissions from the production of Neopor® BMB insulation boards by 66% compared with conventionally produced Neopor® boards (based on one cubic meter of insulation board).

Other innovative climate protection products for thermal insulation applications include BASF’s new high-performance polyurethane-based and mineral-based insulation materials, SLENTITE® and SLENTEX®, which offer even more efficient insulation at lower thicknesses compared with conventional materials.

For more information on the sustainability analysis of our product portfolio, see pages 38 to 39
For more information on our emissions reporting, see basf.com/corporate_carbon_footprint

Greenhouse gas emissions along the BASF value chain in 2019*

Million metric tons of CO₂ equivalents

<table>
<thead>
<tr>
<th>21 BASF</th>
<th>10 Customers</th>
<th>26 Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (including generation of steam and electricity)</td>
<td>Emissions from the use of end products (C 11)</td>
<td>Incineration with energy recovery, landfilling (C 12)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>54 Suppliers</th>
<th>4 Transport</th>
<th>6 Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchased products, services and capital goods (C 1, 2, 3a)</td>
<td>Transport of products, employees’ commuting and business travel (C 4, 6, 7, 9)</td>
<td>(C 3b, 3c, 5, 8, 13, 15)</td>
</tr>
</tbody>
</table>

* According to Greenhouse Gas Protocol; Scope 1, 2 and 3; categories within Scope 3 are shown in parentheses. For more information on Scope 3 emissions reporting, see basf.com/corporate_carbon_footprint
Climate protection is firmly embedded in our corporate purpose, “We create chemistry for a sustainable future,” and is a cornerstone of our strategy. We are committed to the Paris Climate Agreement and its goal of limiting global warming to below 2 degrees Celsius. Our innovative climate protection products, such as insulation materials for buildings or battery materials for electromobility play a role here. We are also continually working to reduce our own carbon emissions. We have already almost halved our carbon emissions since 1990 through improvements to processes and methods – while simultaneously doubling sales product volumes.

Reconciling climate protection and growth

Until 2030, we want to continue to grow our production without adding further CO₂ emissions. Global activities to reach this climate protection target and reduce our greenhouse gas emissions over the long term are bundled in our carbon management. We have adopted a three-pronged approach: We aim to increase production and process efficiency, purchase electricity from renewable sources, and develop completely new low-emission technologies and processes. We want to use these to significantly reduce CO₂ emissions from 2030 onward.

Further improving process and energy efficiency

We aim to make our plants even more efficient and further optimize resource use in our processes. That is why we have increased our budget for operational excellence from €250 million to €400 million annually, among other measures. Part of this goes toward initiatives to reduce our greenhouse gas emissions. When constructing new plants or developing new sites, we draw on our expertise and innovative technologies to optimize the use of raw materials and in this way, reduce CO₂ emissions. For example, our new acetylene plant in Ludwigshafen, Germany (annual capacity: 90,000 metric tons) uses around 10% less natural gas per metric ton of end product compared with the old plant (see page 64).

BASF’s Verbund concept also plays a key role in increasing efficiency. It helps us to realize synergies across all segments and to efficiently steer value chains. Intelligently linking production and energy demand enables us to use fewer resources and reduce our emissions. Together, combined power and steam generation and our continuously enhanced Energy Verbund prevented a total of 6.4 million metric tons of carbon emissions in 2019 (see page 119). 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.

1 The goal includes other greenhouse gas emissions according to the Greenhouse Gas Protocol, which are converted into CO₂ equivalents.
Increasing use of renewable energy

As part of carbon management, we aim to increase the proportion of renewable energy in the electricity purchased for our production sites. Twenty-three sites in Europe, North America and Asia already source emission-free electricity from suppliers.

Number of sites partially or fully powered by emission-free electricity in 2019

| Number of sites | 23 |

Together with our partners, we are also conducting a feasibility study to evaluate a pioneering supply concept for our planned chemical complex in Mundra, India. The aim is for the new site (scheduled production startup: 2024) to be entirely supplied with renewable energy, primarily from an attached wind and solar park. If realized, it would, to our knowledge, be the world’s first petrochemical site with carbon-neutral energy supply (see page 65).

Pioneering research and development program

Most of our production processes and methods are already highly optimized, making further improvements to existing plants an increasingly difficult task. As a result, completely new technologies are needed to avoid greenhouse gas emissions over the long term and on a large scale. This is where our Carbon Management R&D Program comes in. The focus here is on the production of basic chemicals, which are used in many products and innovations and account for around 70% of the chemical industry’s greenhouse gas emissions.

As part of this R&D program, we are developing an innovative, climate-friendly production process for hydrogen (methane pyrolysis) together with partners from academia and industry in a joint project sponsored by the German Federal Ministry of Education and Research, to name one example. Hydrogen is used as a reactant in many chemical processes, such as ammonia synthesis. However, the processes currently used to produce hydrogen from natural gas, such as steam reforming, are extremely CO₂ emission-intensive. In methane pyrolysis, by contrast, natural gas is split directly into its components hydrogen and carbon. The resulting ultra-pure solid carbon could be used to produce aluminum, for example. Methane pyrolysis requires less electricity than the alternative method of producing hydrogen using water electrolysis. If this energy comes from renewable sources, this could make the hydrogen production process carbon-free.

Methanol could also be produced without CO₂ emissions in the future. Methanol is a starting material for the production of products such as formaldehyde or acetic acid and also serves as a source of energy. In 2019, an international patent (PCT) was filed for a climate-friendly production process for methanol that BASF developed as part of the Carbon Management R&D Program. In this new process, the waste gas streams from methanol synthesis are incinerated and the resulting CO₂ isolated and fed back into the process as feedstock. The syngas needed is also produced CO₂-free, for example through partial oxidation, and thus all of the carbon from the raw material ends up in the methanol. Unlike in conventional methods, this process does not produce any greenhouse gas emissions.

Other examples from our Carbon Management R&D Program include dry reforming methane to produce syngas as the basis for the production of olefins with a significantly lower carbon footprint (see page 33), the development of an electrical heating concept for our steam crackers, or using CO₂ to produce sodium acrylate (see page 34). We are optimistic that these climate-friendly production processes can be implemented from 2030 onward.

Creating the framework for the transformation

The transition toward a climate-friendly society remains a fundamental challenge of the 21st century. There are many ways in which the chemical industry can be part of the solution. The political and regulatory environment is also crucial to the development and successful application of completely new production processes on an industrial scale. Demand for electricity from renewable sources will increase sharply with innovative, more climate-friendly technologies. At the Ludwigshafen site in Germany alone, we would need to roughly triple or quadruple our current electricity use (2019: 6.2 TWh) to fully implement new, low-carbon electricity-based production processes like the ones being developed in our Carbon Management R&D Program. As well as its availability, the price of green power is also a critical success factor. Sectors like the chemical industry, which compete in an international market, cannot pass on the additional costs caused by low-carbon technologies to their customers until a comparable carbon pricing mechanism exists globally – or at least at G20 level. Until then, governments must implement measures to ensure the competitiveness of climate-friendly processes.
Air and soil

We want to further reduce emissions to air from production, prevent waste and protect the soil. We have set ourselves standards for doing so in global directives. If no recovery options are available for waste, we dispose of it in a proper and environmentally responsible manner.

Strategy

- Regular monitoring of emissions to air
- Professional disposal of hazardous waste

Regular monitoring of our emissions to air is a part of our environmental management. Aside from greenhouse gases, we also measure emissions of other pollutants into the atmosphere. Our climate protection activities are based on a comprehensive analysis of our emissions.

Our Raw Material Verbund helps us prevent or reduce waste. We regularly carry out audits to inspect external waste disposal companies to ensure that waste is properly disposed of. 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 BASF sites, proper remediation measures are reviewed based on prevailing legal and current technical standards, and undertaken as necessary.

Emissions to air

- Emissions to air slightly lower

Absolute emissions of air pollutants from our chemical plants amounted to 25,130 metric tons in 2019. Emissions of heavy metals in 2019 amounted to 2 metric tons (2018: 2 metric tons).

Our product portfolio contains a variety of catalysts used in the automotive sector and in industry to reduce the emission of air pollutants.

Emissions to air

<table>
<thead>
<tr>
<th>Metric tons</th>
<th>2019</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO (carbon monoxide)</td>
<td>3,530</td>
<td>3,778</td>
</tr>
<tr>
<td>NOx (total nitrogen oxides)</td>
<td>10,534</td>
<td>11,130</td>
</tr>
<tr>
<td>NMVOC (nonmethane volatile organic compounds)</td>
<td>4,496</td>
<td>5,391</td>
</tr>
<tr>
<td>SOx (total sulfur oxides)</td>
<td>1,982</td>
<td>1,926</td>
</tr>
<tr>
<td>Dust</td>
<td>2,410</td>
<td>2,377</td>
</tr>
<tr>
<td>NH3 (ammonia) and other inorganic substances</td>
<td>2,178</td>
<td>2,264</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25,130</strong></td>
<td><strong>26,866</strong></td>
</tr>
</tbody>
</table>

Management of waste and contaminated sites

- Total waste volume slightly higher
- Systematic management of contaminated sites

We aim to avoid waste as far as possible. If waste is unavoidable, we review the options for recycling or energy recovery in terms of a circular economy. BASF’s Verbund structures are used for efficient waste management. As of 2019, the BASF Group’s waste footprint also includes all materials from construction activities, which are usually recycled. Until 2018, only hazardous waste from construction activities was reported. Accordingly, the total waste reported in 2019 is higher than in 2018.

Waste generation in the BASF Group

<table>
<thead>
<tr>
<th>Million metric tons</th>
<th>2019</th>
<th>2018 a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total waste generation</td>
<td>2.34</td>
<td>2.19</td>
</tr>
<tr>
<td>Waste recovered</td>
<td>0.99</td>
<td>0.80</td>
</tr>
<tr>
<td>Thermally recovered</td>
<td>0.54</td>
<td>0.52</td>
</tr>
<tr>
<td>Waste disposed of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In underground landfills</td>
<td>0.19</td>
<td>0.17</td>
</tr>
<tr>
<td>In surface landfills</td>
<td>0.36</td>
<td>0.46</td>
</tr>
<tr>
<td>Through incineration</td>
<td>0.78</td>
<td>0.76</td>
</tr>
<tr>
<td>Classification of waste for disposal a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonhazardous waste</td>
<td>0.43</td>
<td>0.45</td>
</tr>
<tr>
<td>Hazardous waste</td>
<td>0.92</td>
<td>0.94</td>
</tr>
<tr>
<td>Transported hazardous waste</td>
<td>0.28</td>
<td>0.28</td>
</tr>
</tbody>
</table>

a The classification of waste into hazardous and nonhazardous waste is performed according to local regulations.

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

For more information on provisions for environmental protection, see the Notes to the Consolidated Financial Statements on pages 230 and 260
Water is of fundamental importance in chemical production. It is used as a coolant, solvent and cleaning agent, as well as to make our products. We are committed to its responsible use along the entire value chain and especially in our production sites' water catchment areas. We have set ourselves a global goal for sustainable water management.

**Strategy**

- Sustainable water management

We aim to use water as sparingly as possible and further reduce emissions to water. To do so, we have set out a Group directive with globally applicable standards.

We are introducing sustainable water management at all relevant production sites. These include our major Verbund sites as well as the sites in water stress areas. We have expanded our definition of water stress areas to all areas in which more than 40% of available water is used by industry, household and agriculture (previous definition: more than 60% of available water). Sustainable water management considers the quantitative, qualitative and social aspects of water use. We want to identify where we can improve at our sites, and use as little water as possible, especially in water stress areas. We offer our customers solutions that help purify water and use it more efficiently while minimizing pollution.

In order to ensure transparency in our reporting on water, we once again took part in CDP reporting in 2019. BASF achieved the top grade of A and thus Leadership status for sustainable water management. CDP’s evaluation of sustainable water management includes how transparently companies report on their water management activities and what they do to reduce risks, such as water scarcity. CDP also assesses the extent to which product developments – even at the customers of the companies under evaluation – can contribute to sustainable water management.

Global goal and measures

Our goal is to introduce sustainable water management at all production sites in water stress areas¹ and at our major Verbund sites by 2030, covering 93% of BASF’s total water abstraction.² We achieved 35.8% of this target in 2019 (2018: 50.0%). In 2019, BASF introduced sustainable water management at eight sites.

2030 target

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

Water stress areas around the world

1 From 2019 onward, we have expanded our definition of water stress areas to regions in which more than 40% of available water is used by industry, household and agriculture. The definition is based on Aqueduct 3.0. In addition, our water target continues to take into account the sites that we identified as water stress areas in accordance with Pfister et al. (2009) prior to 2019, as well as the Verbund sites. This significantly increases the number of sites included in the water target and reduces the previous implementation level of BASF’s water target accordingly.

2 As part of the implementation of BASF’s strategy, we have made changes to how environmental indicators are reported. For ease of comparison, the 2018 figures have been adjusted according to the new requirements (see page 8).
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 are also a member of the global organization Alliance for Water Stewardship.

**Water balance**

- **Using water responsibly**

  Our water usage totaled 1,717 million cubic meters in 2019 (2018: 1,743). This demand was covered for the most part by surface water, such as rivers and lakes. At some sites, we use alternative sources such as treated municipal wastewater, brackish water or seawater.

  We predominantly use water for cooling purposes (86%), after which we reirculating it back to our supply sources. We reduce our water use by recirculating as much water as possible. To do this, we use recooling plants that allow water to be reused several times.

  The water consumption of the BASF Group describes the amount of water that is no longer available to other users. Consumption is mainly attributable to the evaporation of water during closed-circuit cooling. Water consumption in 2019 amounted to around 61 million cubic meters (2018: 70).

  In 2019, around 28% of our production sites were located in water stress areas. These accounted for 1% of BASF’s total water abstraction. Water consumption in water stress areas (as defined by Aqueduct 3.0) accounted for around 14% of our total water consumption and was primarily attributable to evaporation in cooling processes.

  The supply, treatment, 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**

- **Emissions at prior-year level**

  A total of 1,509 million cubic meters of water were discharged from BASF production sites in 2019, including 173 million cubic meters of treated wastewater from production. Emissions of nitrogen to water amounted to 3,000 metric tons (2018: 3,100). Around 12,100 metric tons of organic substances were emitted in wastewater (2018: 12,600). Our wastewater contained 25 metric tons of heavy metals (2018: 23). Phosphorus emissions amounted to 260 metric tons (2018: 220 metric tons). Our wastewater is treated through different methods depending on the type and degree of contamination – including biological processes, oxidation, membrane technologies, precipitation or adsorption.

  In order to avoid unanticipated emissions and the pollution of surface or groundwater, we create water protection strategies for our production sites. This is mandatory for all production plants as part of the Responsible Care® initiative. 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

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1 As part of the implementation of BASF’s strategy, we have made changes to how environmental indicators are reported. For ease of comparison, the 2018 figures have been adjusted according to the new requirements (see page 6).

2 To determine the percentage figure for water abstraction and water consumption, sites in water stress areas are identified using Aqueduct 3.0.
Employees

Our employees make a significant contribution to BASF’s long-term 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.

117,628 employees around the world

Employee engagement and leadership impact
on center stage

Strategy

- We are committed to valuing and treating people with respect, and fostering an inspiring working environment

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 new corporate strategy promotes a working atmosphere based on mutual trust, in which employees are given the space to optimally develop their individual talents and potential.

Number of employees

As of December 31, 2019, the number of employees decreased to 117,628 employees compared with 122,404 employees as of December 31, 2018. That includes 6,964 employees in the disposal group for the construction chemicals business as of December 31, 2019 (December 31, 2018: 2,017 employees in the disposal group for the oil and gas business). We employed 3,161 apprentices\(^1\) (2018: 3,174). 2,606 employees were on temporary contracts (of which 44.0% were women).

Of material significance to the decrease in the number of employees were the merger of the oil and gas businesses of Wintershall and

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\(^1\) At BASF, the apprenticeship program trains students for technical, scientific and business vocations as well as for trade and craft professions.
DEA in the joint venture Wintershall Dea, as well as the sale of the paper and water chemicals business. As a result, the number of employees decreased by more than 3,000 employees.

**Employee engagement**

- Global employee survey conducted in 2019
- Engagement index of 79%

BASF can rely on the engagement of its employees. Employee engagement is shown by, for example, a passion for the job, a dedication to top performance and a commitment to BASF. Global employee surveys and pulse checks are an established feedback tool 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 and the Supervisory Board. We have performed regular global employee surveys since 2008. We aim to keep the employee engagement determined by these surveys at a high level 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 employee engagement level as an index score based on five questions on set topics in our employee surveys. Overall, more than 71,000 employees participated in this year’s survey, representing 66% of survey recipients.1

Our 2019 employee survey showed an engagement index of 79%. Despite significant challenges associated with restructuring measures, this score is already close to the target we set ourselves. We continue to aim to increase this score to over 80%.

We support our leaders with a range of follow-up measures to decentrally address the individual action areas and in this way, help further strengthen employee engagement together with their employees.

**What we expect from our leaders**

- Leaders as role models

Our leaders and their teams should make a sustainable contribution to BASF’s success and to safeguarding its future. This is why we want to strengthen the impact of our leadership. 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 candidates. Our leadership culture is founded on a global Competency Model, which sets out specific behavioral standards based on our corporate values. 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 trainers. 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. Regular feedback plays an important role in the development of leaders. That is why in 2019, we developed and implemented FEEDback&forward, a comprehensive feedback program for all senior executives.2 This will be rolled out Group-wide from 2020 as an annual tool for leaders to reflect on their own leadership skills (see box on the right).

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1 Scope of employees surveyed goes beyond the scope of consolidation presented on page 6. However, there are exceptions for companies that represent joint ventures and joint operations, as well as companies held for sale.

2 The term “senior executives” refers to leadership levels 1 to 4, whereby level 1 denotes the Board of Executive Directors. In addition, individual employees can attain senior executive status by virtue of special expertise.
Inclusion of diversity

- Fostering diversity is part of our company culture
- Target for proportion of women in leadership positions increased

The global character of our markets translates into different customer requirements – and we want to reflect this diversity among our employees, too. 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. This diversity is important to us because it enables our employees to better meet our customers’ needs. By valuing and promoting employee diversity, we boost our teams’ performance and power of innovation, and increase creativity, motivation and each and every individual’s 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. This is enshrined in our global Competency Model, which provides a framework for our employees and leaders. The inclusion of diversity is anchored in this model as one of the behaviors expected of employees and leaders.

Our leaders play an important role in its implementation. We support them by integrating topics such as inclusive leadership into our leadership development courses. Special seminars and training events are held to sensitize leaders to issues such as unconscious bias. This enables them to remain as objective as possible when making personnel decisions, for example, to avoid unconscious biases in favor of or against candidates with certain characteristics or views.

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. The U.N. recommendations show the many opportunities companies have to contribute to positive social change. As part of pride month, employees promoted openness, acceptance and tolerance with campaigns at various sites around the world.

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. Mixed-age teams also benefit from the combination of different skills and perspectives, for example, by bringing together knowledge of digital technologies with many years of experience and process expertise.

2030 target
Proportion of women in leadership positions with disciplinary responsibility

For instance, BASF has a wide range of initiatives to support couples with equal career potential. As part of overseas delegation, for example, we provide comprehensive coaching and, since 2019, a platform with offers for the partners of delegated employees. This bundles offerings from several companies and makes it easier to find a suitable position abroad. In addition, BASF supports future leaders with individual mentoring and training programs tailored to the needs of different phases of life.

BASF has been a member of the Chefsache initiative since 2016, a network of leaders from industry, academia, the public sector and media. The initiative aims to initiate social change such as increasing the percentage of women in leadership positions in Germany.

Leaders and professionals in the BASF Group

<table>
<thead>
<tr>
<th>Category</th>
<th>December 31, 2019</th>
<th>Of which women (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Senior) executives a</td>
<td>9,522</td>
<td>23.0</td>
</tr>
<tr>
<td>Professionals b</td>
<td>40,290</td>
<td>30.7</td>
</tr>
</tbody>
</table>

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

For more information on health protection, see page 111
Positioning as an attractive employer

Addressing specific target groups through social media and online marketing

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 appeal in the global labor markets. Target group-specific campaigns focus on sustainability, digital ways of working and innovation for the future – reflecting our strategic action areas and key labor market trends.

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 address specific target groups. In 2019, we expanded our social media presence with a global career channel on Instagram to give younger audiences in particular insights into employee stories and offer another communication platform.

One focus is on the recruitment of digital talents. We have a dedicated global career website for digital talents to strengthen our position among this group. In addition, we launched a chatbot in 2019 to provide support on our career website and answer questions about the application process at any time of day or night. BASF introduced a digital talent network to help its employees actively participate in the digital transformation. This online platform aims to foster dialogue around digital projects and ideas across the company and improve cross-team and cross-unit cooperation. Another focus of our activities is attracting talented female recruits. In 2019, we held the first X-Days event in Germany, for instance. We invited female students and PhD candidates in the natural sciences to find out more about BASF and digital career opportunities, and network with female leaders.

We once again achieved high scores in a number of employer rankings in 2019. For example, in a study conducted by Universum, BASF was again selected by engineering and IT students as one of the 50 most attractive employers in the world. In North America, DiversityInc named BASF as one of the top 50 companies for diversity in recruiting for the seventh consecutive year. In Asia, Top Employer recognized BASF China as one of the best employers for the tenth time in succession. In South America, BASF was recognized as one of the top employers in the Brazilian chemical industry by local human resources magazine Você S/A.

The BASF Group hired 8,026 new employees in 2019. The percentage of employees who resigned during their first three years of employment — the early turnover rate — was 1.4% worldwide in 2019. This turnover rate was 0.7% in Europe, 2.1% in North America, 2.8% in Asia Pacific and 2.0% in South America, Africa, Middle East. Our early turnover rate is therefore at a desirable low level.

BASF Group new hires in 2019

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>December 31, 2019</th>
<th>Of which women (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>4,418</td>
<td>26.5</td>
</tr>
<tr>
<td>North America</td>
<td>1,665</td>
<td>29.5</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>1,376</td>
<td>32.3</td>
</tr>
<tr>
<td>South America, Africa, Middle East</td>
<td>567</td>
<td>38.3</td>
</tr>
<tr>
<td>Total</td>
<td>8,026</td>
<td>28.9</td>
</tr>
</tbody>
</table>

As of December 31, 2019, the BASF Group was training 3,161 people in 15 countries and around 50 occupations. We spent a total of around €113 million on vocational training in 2019.

Learning and development

Life-long learning concept

Focus on virtual learning and digitalization

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 lifelong, self-directed learning. 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 are playing an ever-increasing role in our development offerings. In 2019, we expanded our global digital learning platform with the addition of an independent learning module. This gives employees a wide range of personalized learning recommendations and special learning paths on diverse topics. In addition, all employees have access to a continuously growing online library with professional resources on leadership, personal development and business. These digital offerings enable employees to take responsibility for their own professional development and
promote knowledge transfer across BASF as a whole. We launched the #liveitleadit initiative in 2019 to harness the opportunities of digital transformation for BASF. Ten modules on different aspects of leadership in the digital age give leaders inspiration for their work, including on agility or leading in a data-driven world.

In addition, more and more academies in the divisions and service units, which teach specific professional content, offer virtual training. We have offered virtual presence training since 2018, which gives all employees the opportunity to attend professional development courses via digital communication channels such as virtual meetings.

**Compensation and benefits**

- Compensation based on employee’s position and individual performance as well as company’s success
- ROCE determines variable compensation

We want to attract engaged and qualified employees, retain them and motivate them to achieve top performance with an attractive package including 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 local and regional 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. 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 2019, for example, around 25,400 employees worldwide (2018: 25,600) participated in the “plus” share program: BASF offers senior executives the opportunity to participate in a share price-based compensation program, the long-term incentive (LTI) program. In 2019, 90% of the approximately 1,100 people eligible to participate in the LTI program worldwide did so, investing up to 30% of their variable compensation in BASF shares. From 2020 onward, the previous LTI program for senior executives will be replaced by a new program. The new program will incentivize the development of the total shareholder return, as well as the achievement of strategic growth, profitability and sustainability targets.

For more information, see the Notes to the Consolidated Financial Statements from page 284 onward.

### BASF Group personnel expenses

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2018</th>
<th>+/-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages and salaries</td>
<td>8,825</td>
<td>8,470</td>
<td>4.2%</td>
</tr>
<tr>
<td>Social security contributions and assistance expenses</td>
<td>1,545</td>
<td>1,459</td>
<td>5.9%</td>
</tr>
<tr>
<td>Pension expenses</td>
<td>554</td>
<td>730</td>
<td>(24.1%)</td>
</tr>
<tr>
<td><strong>Total personnel expenses</strong></td>
<td><strong>10,924</strong></td>
<td><strong>10,659</strong></td>
<td><strong>2.5%</strong></td>
</tr>
</tbody>
</table>

1 In calculating ROCE, adjustments are made for negative and positive special items resulting from acquisitions and divestitures (e.g., integration costs in connection with acquisitions and gains or losses from the divestiture of businesses) when these exceed a corridor of plus or minus 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.
Balancing personal and professional life

- Wide range of offerings for different phases of 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. BASF helps employees to adapt working hours and location to their personal circumstances with a wide range of options, including flexible working hours, part-time employment and mobile working.

Regional initiatives specifically address the needs of our employees at a local level. For example, we are expanding the number of flexible co-working spaces in the Rhine-Neckar region in Germany. Our Work-Life Management employee center in Ludwigshafen (LuMit) offers a number of services under one roof: childcare, fitness and health, social counseling and coaching. We provide employee assistance programs at sites in Germany and around the world to help employees overcome difficult life situations and restore and maintain their employability.

- Dialog with employee representatives

Trust-based cooperation with employee representatives is an important component of our corporate culture. Our open and ongoing 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, we involve employee representatives to develop socially responsible implementation measures at an early stage. Our actions are aligned with the respective legal regulations and the agreements reached, as well as operational considerations. In 2019, this happened in connection with the agreed sale of the pigments business and the construction chemicals business, subject to the approval of the relevant competition authorities. The early, detailed presentation and explanation of the organizational changes in connection with the implementation of the new corporate strategy in 2019 was also a reflection of our trust-based cooperation.

By focusing our discussions on the local and regional situations, we aim to find tailored solutions to the different challenges and legal considerations 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.

For more information, see basf.com/employeerepresentation

- International labor and social standards

- Alignment with U.N. Guiding Principles on Business and Human Rights

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 external 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 what the human rights issues and international labor standards in our global Code of Conduct mean as these relate to our employees.

It forms the basis for our global management process: We monitor and evaluate whether the national law of all the countries in which BASF operates complies with international labor and social standards. If the national law contains no or lower requirements, actions 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 our central due diligence system. Based on our guideline, our management process has been able to improve maternity leave at BASF companies with no statutory requirements or lower requirements.
than in the BASF guideline, for example. Our voluntary commitment to respect international labor and social standards has been integrated into the existing corporate audit process since 2019. For this purpose, preparatory training was held for the auditors. As before, individual elements of the guideline are also reviewed as part of internal control processes such as Responsible Care audits in BASF Group companies.

For more information on global standards, see page 29
For more information on our sustainability-related risk management, see page 36 onward
For more information on compliance, see page 157 onward
For more information on labor and social standards, see basf.com/labor_social_standards