We Are Resolutely Driving Sustainable Transformation

Dear Bayer stakeholders,

Time is running out. We have entered the decisive decade for achieving the Sustainable Development Goals (SDGs) of the United Nations by 2030. If 2021 has shown us one thing, it is the urgency of the transition toward a sustainable economy and society.

The economy grew again last year in many parts of the world. This is encouraging, and is creating the basis for sustainable development, particularly in low- and middle-income countries (LMICs). At the same time, global emissions have also increased once more, revealing the central dilemma in which we find ourselves. At Bayer, we experienced dynamic growth in 2021 and at the same time reduced emissions. That is an important signal.

The past year also again demonstrated the effects of the climate crisis: extreme heat waves in regions such as California and southern Europe, and destructive rainfall in China, Australia and Germany. The pressure to act has therefore further increased. This is confirmed by in-depth analyses undertaken last year, including a judgment by the Federal Constitutional Court of Germany. Against this backdrop, the climate summit in Glasgow delivered encouraging resolutions – but also showed that we still have a long way to go.

That is true for Bayer as well. We regard sustainability not as an additional activity, but rather as a core element of our strategic and normative alignment. We continued to resolutely push developments in this regard in 2021, and achieved significant progress:

// We set ourselves an internal carbon price of €100 per metric ton, which is taken into account in our capital expenditure projects.
// We have signed contracts for more than 600,000 MWh of electricity from renewable energies and thus increased their share of the electricity mix to about one quarter.
// We reduced our greenhouse gas emissions by 11.5% and are on track to become climate-neutral in our own operations by 2030.
// Across the divisions, we reached an additional 7.5 million people in the context of our sustainability targets.
// In 2022, the Supervisory Board established a committee to systematically assess our contribution to the SDGs.

We are also making progress as regards the sustainable development of our businesses: at Crop Science we are advancing carbon farming as a field of business in which farmers capture carbon in the soil, for which they are financially rewarded. We have entered into partnerships with Microsoft and others that are geared toward further developing the sustainable agriculture model. More and more smallholder farmers are benefiting from our programs in developing countries.

At Pharmaceuticals, we enable access to modern contraceptives for millions of women, as a crucial prerequisite for a self-determined life. We are also investing more than €400 million in the construction and expansion of facilities in Costa Rica and Finland for the production of long-acting contraceptives.

At Consumer Health, we are investing €100 million to make our products more sustainable. We will make the packaging for all of our customer products recyclable or reusable by 2030. And we are also advancing the goal of enabling more people to gain access to everyday health care, for example through our collaboration with the NGO Vitamin Angels.

Bayer CEO Werner Baumann

Partnerships generally play a key role in generating impact. A prime example of that is the LEAF Coalition, in which as a founding member together with governments, NGOs and other companies we were able to mobilize more than US$1 billion to protect rainforests in Asia, Africa and Latin America in 2021. In this way, we are helping to reach the goal resolved by the world community of stopping global deforestation.

Bayer is committed to transparency and reliability. And like almost no other company, we continuously invest in research, and thus in tomorrow's innovations. That has always been the secret of Bayer's success, and it is also the key to transitioning to a sustainable economy. We want to make an important contribution to the SDGs with our businesses – guided by the principles of the U.N. Global Compact and in keeping with our vision "Health for all, hunger for none."

And we want to be judged on that objective.

Sincerely,

Werner Baumann
CEO Bayer AG
Chief Sustainability Officer

For many years now, we have served on the Executive Board of the EAASM so as to educate patients about the dangers of purchasing drug products on the internet. We do this through information campaigns, research projects and publications that provide information on the risks and consequences.

We are also actively involved in the Pharmaceutical Security Institute, an alliance in which pharmaceutical companies provide mutual support in detecting and countering product-counterfeiting-related crimes. Through a joint COVID-19 initiative, we combated illegal offers and counterfeiting of Bayer products such as chloroquine.

3.6 Crop Science

Before crop protection products and technologies can be introduced to the market, it must be demonstrated that they can be used without exposing people or the environment to an unjustifiable risk. They therefore require official approval, which is governed by numerous international and national laws and regulations. We test products in compliance with the applicable official regulations and perform extensive risk assessments. We also observe the import regulations for the importing countries and acquire product approvals in countries in which the products are due to be marketed.

Bayer works continuously to improve its products and develop solutions for sustainable agricultural practices. The focus is on optimizing product benefits and safe use for our customers and applying the findings from product monitoring. For us, product stewardship begins at the research and development stage of a new product, continues through its production, marketing and safe use and ends with disposal, for example of product packaging.

We have specified our principles of responsible product management in our Group Regulation on Product Stewardship Commitment, Principles and Key Requirements. This is based on established and internationally recognized standards such as the International Code of Conduct on Pesticide Management issued by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), the guidelines of the crop protection association CropLife International, and the guidelines of the industry initiative Excellence Through Stewardship (ETS) for seeds and traits. This initiative promotes, for example, the introduction of product stewardship programs and quality management systems for seeds throughout the entire life cycle and entrusts independent outside experts with the performance of audits to verify that member companies are complying with its guidelines. Our plant biotechnology sites in the United States were recertified for the product stewardship programs in 2021.

Online transparency platform

Transparency is very important to Bayer, especially with respect to the safety of our products. Through transparency, too, we intend to strengthen our customers' and stakeholders' confidence in our products. Bayer was the first company in the agriculture industry to make safety-relevant data on crop protection products and genetically modified crops publicly available. Summaries of scientific studies assessed by the European Food Safety Authority (EFSA) in connection with the registration procedures for 32 of our crop protection active ingredients are available on our online transparency platform, including toxicological and ecotoxicological studies and investigations into degradability. We have also published summaries of scientific studies for 16 biotechnology traits within our seeds business that were previously evaluated by the responsible regulatory authorities in the United States.

Comprehensive reports on the registration studies for the approval of our crop protection products and genetically modified crops are available on specific request. The platform is continuously updated to provide the most recent status of safety-relevant information on crop protection products and genetically modified crops as well as information on plant breeding.

In addition, we are facilitating access to information – including official documents and data – on the procedure to grant emergency authorizations for crop protection products, including why this process is so important for European agriculture.

Furthermore, through the OpenLabs program initiated in 2020, we offer the public the opportunity to observe our scientists during a two-day event as they carry out a safety registration study. Here, the participants learn how we collect data on the safety of our crop protection products by complying with guidelines such as Good Laboratory Practice (GLP). As it currently is not possible to visit our Monheim site due to the COVID-19 pandemic, we have developed a virtual visitor platform that enables our scientists to engage with visitors online in live events, starting in 2022.

We present our principles for responsibly handling our products throughout their life cycle based on our Group Regulation on Product Stewardship Commitment, Principles and Key Requirements in the sections below.

Research and development

We use the latest knowledge and technologies to develop products and services so that we can continuously optimize their efficacy, productivity and safety for people and the environment.

As part of the testing process, chemical and biological crop protection products are examined early in the development phase with regard to their mode of action, their (eco)toxicological properties and the extent of potential residues in plants and the environment to ensure that we only continue to develop those products with the best safety profile. To determine risks more precisely, we perform extensive safety testing as defined by law.

The development of genetically modified seeds is also subject to extensive international guidelines and stringent national laws and regulations. We have specified internal processes in a Group regulation to ensure a responsible approach to biotech-based manufactured products throughout their life cycle. For more information on plant breeding and genetically modified seed, please see the Focus on: Agriculture chapter.

Production, packaging, storage and transport

Health, safety, environmental protection and quality are a top priority for Bayer at all its sites around the world, including the sites where crop protection products or seeds are produced. A health, safety and environmental protection (HSE) management system with uniform standards applies Group-wide. Product manufacture at our sites is performed according to the quality management standard ISO 9001. For more information, please see Chapter 8. Environmental Protection and Safety. As with our suppliers, we expect our third-party producers to conduct their business with Bayer in accordance with the requirements of our Supplier Code of Conduct. For more information, please see Chapter 4. Procurement. We ensure that our products are adequately packaged and are stored and transported according to the applicable legal and regulatory requirements. For more information, please see Chapter 8.9 Transportation and Storage Safety.

Marketing, sale and distribution

In its distribution of crop protection products and technologies, Bayer observes the International Code of Conduct on Pesticide Management of the Food and Agriculture Organization (FAO) of the United Nations and the World Health Organization (WHO). Our principles are defined in our Group Regulation on Product Stewardship Commitment, Principles and Key Requirements. In addition, since 2012, we have no longer sold WHO Class 1a or 1b agricultural crop protection products despite continued formal authorization to do so.

Not all our crop protection products are registered in Europe. There are various reasons for this, e.g. different customer needs and agricultural practices outside Europe. These crop protection products are registered in accordance with national regulations outside Europe. Bayer complies with international regulations, e.g. the U.N. Rotterdam Convention concerning the export of such products that could be produced in Europe but are not registered in Europe, and are registered in the importing country instead. In this context, Bayer committed itself to only selling crop protection products that are registered in at least one OECD (Organisation for Economic Cooperation and Development) country.

We regularly review the products we offer in emerging markets and developing countries with respect to the applicable specifications for ensuring the safety of our products and reducing the risks associated with their use. We voluntarily withdraw such products from the market if identified risks cannot be sufficiently limited. For more information on crop protection products and safety, please see our website.

To ensure the safe use of our crop protection products based on adequate research, we made an important voluntary commitment in 2016: we market only those crop protection products whose active ingredients are registered in at least one OECD country, or, in the case of new active ingredients, for which an OECD data package has been compiled. OECD data packages require the preparation of complete dossiers for crop protection products and their active ingredients in support of regulatory decisions in OECD countries. This includes the results of all test and study reports and other relevant information submitted by the company and other interested parties. The data needs to be made available to facilitate checking by regulatory authorities as a basis for decision-making with respect to the approval of individual active ingredients, the registration of crop protection products, the establishment of a maximum residue limit, or the determination of an import tolerance, as appropriate. The guidance contained in the OECD package can be used by regulatory authorities, where the evaluation of extensive data submissions is necessary. As part of our internal processes established to comply with this voluntary commitment, quarterly checks on all our crop protection sales are conducted.

Since 2021, we have shared our internal product safety standards on our website to shed light on how we determine how products can be used safely. These standards reflect the guidelines and standards of international organizations such as FAO, WHO and the OECD, as well as those of reference regulatory authorities around the world. They evolve continuously based on the latest scientific knowledge and help us to contribute to high safety standards also in less regulated markets.

For the marketing of genetically modified seeds, we have established internal processes and defined the requirements for the responsible use of biotechnology in our Group Regulation on Product Stewardship Commitment, Principles and Key Requirements.

We provide our customers with comprehensive, transparent and reliable information about our products and services in accordance with our Group Regulation on Responsible Marketing & Sales. Users of our products can contact us through a range of communication channels should they have complaints or inquiries or wish to report any incidents. These include both direct contact with our sales staff and hotline numbers printed on our product packaging. We follow up any incidents related to our crop protection and seed products reported through local authorities and we process the incidents with the aid of a dedicated management system. If necessary, we undertake measures ranging from labeling changes to product recalls in line with our key requirements.

Counterfeit products harbor substantial risks for users and the environment. For more information on our strategy for preventing product piracy, please see Chapter 3.5 Protection against Product Counterfeiting.

Integrated crop management for pest and resistance management

Bayer supports the implementation of integrated crop management measures that combine various strategies for controlling weeds, pests and plant diseases in farming. This overall concept is tailored to the special challenges facing farmers, and it enables them to unlock their full economic potential while at the same time minimizing the environmental impact of their farming activities. We offer a broad portfolio of innovative chemical and biological crop protection solutions, high-value seeds and data-driven application solutions and recommendations that help farmers protect their crops safely and responsibly in accordance with the particular requirements of the fields, crops and soils.

Bayer ForwardFarming initiative

Bayer promotes and supports ecological enhancement measures in agriculture and the recovery and protection of natural and semi-natural habitats. Together with farmers and scientific experts, we are working to find solutions to preserve biodiversity, e.g. through the Bayer ForwardFarming initiative. ForwardFarming promotes the implementation of sustainable agriculture in practice across a global network of independent agricultural operations.

On ForwardFarms, we show how sustainable agriculture involving integrated crop management and resistance management can be put into practice. In these representative operations, farmers demonstrate modern cultivation techniques, approaches to applying seeds and crop protection products, and the action they take to handle resources responsibly. The ForwardFarms promote dialogue with users and enable the worldwide exchange of ideas and findings among various stakeholder groups.

There are currently 26 Bayer ForwardFarms spread across Europe (20), Latin America (4) and Asia (2). During the COVID-19 pandemic, in-person visits have been limited, but outreach has continued via virtual events and, besides that, the ForwardFarm in Belgium offers a 360° tour for a virtual visit.

Responsible use of crop protection products

Through targeted training courses, we show farmers, seed treatment professionals, distributors and other users how to use our products both effectively and safely to maintain healthy plants and thereby increase the yield and quality of their harvested goods. Our objective is to continuously increase the outreach of our training activities, in part through more widespread use of digital media in the future.

The training courses convey contents such as safe handling of our products during use, transport, storage and disposal, the correct use of protective clothing, and first aid measures in the event of emergencies. The training topics can be adapted for a certain target group, a crop plant being used in cultivation or a particular product according to local requirements. Our training materials are available in various formats – from on-site presentations to brochures, videos, posters, manuals and live chats. In addition to special training measures for farmers and those who use crop protection products, we also combine training activities with events such as product launches or field days to reach a large number of farmers and distributors. Our training videos on the safe handling of crop protection products are also available online.

In 2021, we continued to offer virtual training activities due to the COVID-19 pandemic, but also resumed on-site training wherever possible. The flexible approach and use of digital tools enabled us to reach more than 2.7 million external contacts (i.e. farmers, field workers, distributors, retailers and other stakeholders in the agriculture industry). We focused our training activities on countries where there are no statutory certification requirements for farmers concerning the safe handling of crop protection products. For this reason, training participation was highest in Asia, followed by African countries and Latin America. Our partnerships allow

us to increase the reach of the activities and conduct joint events, for example with universities, information centers or local, regional and international associations.

As part of Bayer's Safe Use Ambassador initiative launched in 2017, we enter into partnerships with universities and offer students annual training in the safe use of crop protection products, with a focus on safety for users and the environment. The goal is for the students to share their new knowledge with farmers during internships on farms. In 2021, Bayer organized four workshops related to the safe handling of crop protection products for more than 1,200 students, faculty members of universities and other relevant stakeholders in 14 countries, especially in Asia and Africa.

Bayer additionally trains farmers in various technical areas regarding the correct use of individual products. This includes training as mandated by the U.S. Environmental Protection Agency (EPA) as a condition of registration for products containing the herbicide dicamba for use in dicamba-tolerant soybean and cotton crops. This training course was developed in cooperation with other dicamba herbicide registrants and governmental certification authorities.

Successful completion of the training enables farmers to purchase and apply any dicamba products registered for use in dicamba-tolerant soybean and cotton crops. More than 46,000 users in the United States completed this certification in 2021, 50% of whom were trained by Bayer.

Product stewardship for glyphosate

The nonselective herbicide glyphosate is used in many countries for effective, simple and cost-effective weed control. The active ingredient was first introduced in 1974 and has since been marketed under a number of different tradenames in hundreds of crop protection products by several dozen different companies worldwide. In Europe, glyphosate-based herbicides are most frequently used according to the label to control weeds in various field crops. According to the label, applications include weed control in gardens and noncultivated areas, such as in industrial complexes and along railway tracks. Glyphosate works in plants by specifically inhibiting an enzyme that is essential to plant growth. This enzyme is not found in cells of humans or animals.

Combining glyphosate with crops that could withstand applications of this herbicide transformed agriculture. Farmers who cultivate glyphosate-tolerant crops tend to adopt conservation tillage, which brings its own benefits in terms of reduced soil erosion, improved water quality and lower carbon dioxide (CO_2) emissions. In agricultural systems where glyphosate-tolerant crops are not available, glyphosate provides benefits for farmers and the environment by simplifying weed management and reducing the need for mechanical tillage and enabling the adoption of cover crops. Outside of agriculture, glyphosate delivers benefits for noxious or invasive weed control.

Glyphosate has a proven track record of more than 40 years of safe use when used according to label directions. This is confirmed by science-based evaluations conducted by European regulatory bodies such as the European Food Safety Authority (EFSA), the European Chemicals Agency (ECHA) and the German Federal Institute for Risk Assessment (BfR) and other leading regulatory authorities such as the U.S. Environmental Protection Agency (EPA) and the Canadian governmental authority for pest control belonging to the Department of Health (Health Canada Pest Management Regulatory Agency [PMRA]). The most extensive agricultural epidemiological study ever with detailed information on glyphosate use, the Agricultural Health Study published in the Journal of the National Cancer Institute in 2018, also found no association between the use of glyphosate-based herbicides and the occurrence of non-Hodgkin lymphoma. The study followed more than 50,000 licensed applicators of crop protection products for more than 20 years.

Glyphosate's favorable environmental safety profile underlies its ability to be used in many diverse settings. Detailed reviews by the EFSA, PMRA and other regulatory authorities have concluded that approved uses of glyphosate-based herbicides are unlikely to cause adverse effects on the environment. In the United States, EPA scientists reached the same conclusion following their primary environmental review and have initiated a final step in the re-registration process to ensure current uses account for potential effects on endangered species.

This is a standard review for all pesticides in the United States and can take several years to complete. Bayer scientists reviewed the draft report on endangered species and engaged in the public comment period.

Extensive information on the public discussion surrounding the safety of glyphosate for users and the environment is available on our website. For information on the lawsuits against Bayer in the United States, please see 2021 Annual Report.

It is of central importance for Bayer to offer farmers a broad range of solutions to improve the sustainability and productivity of their operations.

Glyphosate will continue to play an important role in agriculture and in our product range. As one-size-fits-all solutions do not account for nature's needs, however, we plan to invest around €5 billion in the current decade to research additional weed control methods and thus provide farmers with more options in the future.

Glyphosate is currently going through the routine renewal process in the European Union. The designated Member States for the current glyphosate renewal process – known as the Assessment Group on Glyphosate (AGG) – are France, Hungary, the Netherlands and Sweden.

On June 15, 2021, the AGG published the main conclusions of their draft Renewal Assessment Report (dRAR) for glyphosate, concluding that glyphosate does meet the approval criteria. The AGG proposed that classification of glyphosate with regard to carcinogenicity, as for genotoxicity or toxicity for reproduction, is not justified. Furthermore, the AGG concluded that no chronic or acute consumer risk is expected from treatment of crops with glyphosate according to the representative uses for the current renewal process.

On September 23, 2021, the public consultation process on the draft Renewal Assessment Report opened. Sixty-day public consultations are well-established processes through which the European institutions increase the transparency of the evaluation for pesticides. Anyone could go to the EFSA and ECHA websites that hosted the public consultations to download either the full assessment report or only the sections of interest. This process ensured that all interested parties could actively participate in the science-based re-evaluation of glyphosate in the European Union.

A significant number of European Member State regulatory bodies, representatives of academia and scientists but also farmers around the world and interested private persons and NGOs submitted comments to the EFSA and the ECHA. All comments are made publicly available for maximum transparency on the EFSA and ECHA website.

On December 10, 2021, the Glyphosate Renewal Group, of which we are a member, submitted its response to the comments for consideration and reply to the EFSA. The AGG itself will then respond to the comments and our input and will afterwards forward all the information to the EFSA for evaluation. The next regulatory milestone is the so-called "stop the clock". This is the last opportunity for the applicant to feed additional data and information requested by the EFSA into the scientific evaluation.

Use of digital technologies

For Bayer, digital farming is an important tool for creating a better balance between productivity and environmental conservation. The goal of digital farming is to use resources such as water, fertilizer and crop protection products more efficiently and sustainably.

The utilization of these new technologies enables a reduction of the resources needed for plant production and also promotes the safe and responsible use of crop protection products. For example, the use of satellite and drone data already allows slight differences in the field to be accounted for and crop protection products to be individually and precisely applied in the required amount only where they are needed (zone/spot spraying plus Variable Rate Application).

In 2021, Bayer continued its strategic partnership with major drone-producing companies. Through our Leaps by Bayer unit, we also invest in two companies with their own drone

application development. The existing guidelines on the safe use of drones were refined further. We worked together with regional CropLife organizations, such as CropLife Asia, to frame guidance documents for the application of crop protection products through unmanned aircraft systems (UAS). In various countries, we carry out corresponding training courses for our employees and those of our research partners, often virtually. In order to raise awareness about safe-use methods in drone application, the latest drone technology and stewardship we shared insights on market development in Asia and Africa in a webinar with participants from 34 countries. Our participants were invited to present their own experiences in the field, such as optimal operating procedures and application times. This was followed by a discussion on the management of spray drift, regulatory standards and the functionality of drones.

Sensors on the latest tractors and harvesters can supply important information on soil conditions and plant health. This and further data is incorporated into the digital applications developed by the digital farming unit of Bayer – Climate LLC (formerly The Climate Corporation) – to help farmers achieve more efficient and sustainable agricultural operations.

Our digital farming platform Climate FieldView™ enables farmers to use data to optimize their agricultural inputs (costs) used on the field and to improve their output (yields). This takes place through the sensor-based collection and storage of large volumes of machine-generated agronomic data directly on the farmers' accounts. The application of this data not only helps farmers, but also creates substantial advantages for the environment. Thanks to precision agricultural machinery and digital tools, inputs such as seeds, water, fertilizer and crop protection products are only used when and where they are necessary. FieldView™ is currently available in North America, South America, Europe, Turkey, South Africa and Australia.

Water protection

Avoiding discharges of crop protection products into water bodies is an important aspect of sustainable agriculture. Alongside point source discharges into water bodies that can occur during the filling and cleaning of spraying devices, diffuse substance discharges from treated fields can also play a significant role. That is why many of our training measures for farmers also focus on protecting water bodies in the context of the correct use of our products.

To avoid point source discharges, Bayer recommends the use of biological remediation systems such as Phytobac™. This is designed to prevent water contamination with residues of crop protection chemicals generated during the filling and cleaning of spraying devices or the disposal of residual liquids. The system is already used in many EU countries and offered commercially by various third-party manufacturers. More than 5,000 Phytobac™ systems are currently in operation in Europe. Demonstration farms have also been implemented in Australia, Canada, China, Thailand, Argentina, Brazil and Colombia.

In collaboration with external partners, we have developed a digital geoinformation system (GIS) for agriculture in order to protect neighboring water bodies from diffuse substance discharges caused by runoff and erosion. Site-specific runoff risks are visualized by means of high-resolution maps supplemented with risk mitigation proposals. With this initiative, we are offering our agricultural customers a digital decision-making tool that facilitates both compliance with high environmental standards and optimal flexibility in productivity-oriented issues. Scale-up of the digital system is possible up to the country level, with the following countries already being mapped: Germany, the Netherlands and Belgium.

To meet increasing demands for environmental protection and occupational safety more effectively, we further engaged into the development of closed transfer systems. In a move consistent with the CropLife Europe commitment to making closed transfer systems universally available to European farmers and operators by 2030, Bayer has joined the cross-industry group developing the "easyconnect" closed transfer system. The system aims to provide a compelling solution that is fast, safe and convenient for farmers and operators across Europe. At the same time, Bayer will continue to support implementation of closed transfer systems via commercially available solutions such as the jointly developed "easyFlow" system from agrotop GmbH.

Protecting pollinators and other beneficial insects

Bees and other pollinators are hugely important for sustainable food production, and we also depend on healthy pollinators in our seeds business. Bayer shares the concerns about currently declining insect populations and has published a position on this issue. As the causes of this decline have not yet been fully clarified, we believe further scientific studies of the causes and the development of corresponding countermeasures are urgently needed. We have therefore established a dedicated working group to address the issue and are involved in researching the factors leading to this decline and developing measures to counter the trend.

Our research supports farmers in food production while at the same time contributing to the health, safety and biodiversity of pollinators. We promote dialogue with all stakeholder groups through our global network. In cooperation projects worldwide, we are looking into some of the major stress factors for pollinators and into new approaches for protecting them and for fostering the pollination of crops. At the same time, we are engaged in the development and implementation of approaches to protect insect biodiversity in the agricultural landscape where the current state of knowledge already allows for the definition of effective measures.

To minimize potential risks posed to pollinators by our crop protection products, initial tests – particularly to measure bee toxicity – are already carried out at an early development stage to ensure that only products with an environmental profile that allows pollinator-safe use are further developed. Crop protection products are stringently regulated and undergo thorough testing to make sure they can be used safely. We perform extensive safety testing and risk assessments, enabling us to recommend specific bee safety measures to farmers.

Meta-studies on plants featuring Bt technology (genetically modified plants that contain genes of the soil bacterium Bacillus thuringiensis (Bt)) have not identified any biologically relevant effects on honeybees. For more information, please see the Focus on: Agriculture chapter.

Bayer is one of the founding members of Growing Matters, an initiative that is committed to open and scientific discourse on stewardship, benefits and alternatives to neonicotinoid insecticides in North America. Together with its partners, Growing Matters launched the BeSure! campaign, designed to strengthen awareness and adoption of stewardship practices to protect bees and other wildlife during the handling, planting and disposal of treated seeds and other neonicotinoid applications used throughout the growing season.

Neonicotinoids

The introduction of the neonicotinoid class of insecticides in the 1990s brought new features to improve sustainability and to reduce the environmental impact of insecticides in agriculture. Neonicotinoids replaced older, frequently much more toxic insecticides, reinforced the concept of seed treatment minimizing environmental exposure to agrochemicals, and brought a broad spectrum of efficacy and new mode of action to assist integrated resistance and pest management on many crops.

Some years after introduction, there were some reports of incidents where the use of neonicotinoid products was associated with negative effects on nontarget insects, like bees. The most severe example was when dust from treated seeds was accidentally released during planting in Germany in 2008, which resulted in significant intoxication of bees nearby.

At Bayer, the incidents triggered internal reviews and research into risk mitigation measures or product replacements. It also changed the risk assessment and profiling of existing and new products in R&D. Several initiatives and processes were introduced to minimize further risk through the exposure of bees to neonicotinoid insecticides.

In 2021 we published details on our measures taken in recent years in a separate report. We have also published detailed information as an appendix to the report.

Mitigating measures taken include:

// Ongoing label revisions and use reductions – systematic and explicit exclusion of flowering application of imidacloprid products onto bee-attractive crops or close to beehives
// Tests in Research & Development to characterize the toxicity of novel development compounds to bees at a much earlier stage of the screening process in order to identify and remove unfavorable chemistry from the research phase
// Bayer's invention of BayStep technology, which enhances the quality of the treated seeds by avoiding abrasion; BayStep is available license-free to advance technology adoption
// Our development and commercialization, in Sivanto™, of an insecticide that can replace various applications of neonicotinoids

In 18 EU Member States, emergency approvals of neonicotinoid seed treatments have been granted since 2016. In November 2021, the EFSA confirmed that 17 emergency uses for sugar beet, granted in 11 Member States in 2020 and 2021, were all justified due to lack of alternatives and for effective resistance management. This demonstrates that, in specific cases, continued access to these neonicotinoids is beneficial to farmers in the European Union and endorsed by their governments. Bayer only supplies products in cases where local growers identify the agronomic need; the justification is consistent with the terms of the regulation and seed treatment occurs at ESTA-certified sites.

We believe that continuing to manufacture and market neonicotinoids under the conditions authorized by regulatory authorities around the world, including the emergency provisions in Europe, is responsible, beneficial and consistent with the U.N. Global Compact environmental principles.

Monarch butterfly

Populations of the migratory monarch butterfly, which are common in North America, have declined in recent decades due to the loss of milkweed in the United States, habitat loss in the Mexican forests, weather and climate changes, natural enemies, and disease pathogens and parasites. To enhance the habitat for the monarch butterfly and other pollinators, Bayer is collaborating with conservation groups, academic experts, farmers and government agencies to find meaningful and proactive ways to help these important pollinators thrive. We are working to ensure that the growth of the wild plants (milkweed/Asclepias) that constitute the monarch butterfly's main source of food is supported along its migration routes outside of cultivated areas. This benefits not only monarchs, but also many other insects, birds and mammals.

Through an app called HabiTally, which we developed together with Iowa State University in 2019, farmers and landowners can document the habitats they have created for monarch butterflies and track the gains made in milkweed (Asclepias) stems/acres across the United States. The app allows for better estimates of how much current habitat exists and where, while also better facilitating analysis of gaps and opportunities for further habitat development. The United States Fish and Wildlife Service uses the data to better assess and monitor the population dynamics of the monarch butterfly. For more information, please see our website.

Disposal of containers and old inventories, discontinuation policy

Processes are in place at Bayer to ensure the safe sell-off of products, including the disposal of obsolete inventories or waste. The crop protection product industry has set up voluntary initiatives in various countries for the proper disposal of obsolete stocks. As part of its activities in the international CropLife association, Crop Science is additionally working with the Food and Agriculture Organization (FAO) of the United Nations and the World Bank to support the proper collection and disposal of obsolete crop protection products in Africa.

Empty crop protection product containers must be safely disposed of to ensure that the product residues that possibly remain are not released into the environment and that empty containers are not improperly reused. As the proper disposal of crop protection product containers is handled differently in many countries, the crop protection industry works together with authorities, distributors and farmers to establish or maintain suitable disposal systems.

Bayer supports programs worldwide to ensure the safe recycling and disposal of empty packaging and containers. Users can learn about how to safely dispose of our products through information on their labels.

We support the safe disposal of empty crop protection product containers in many countries together with our CropLife International industry association, enabling the collection of 800,000 metric tons of plastic since 2005. This partnership has also facilitated the development of environmentally friendly packaging design programs, the implementation of training courses for distributors and farmers in the proper handling of crop protection product containers, and the testing of plastic recycling options. Particularly successful disposal programs have been established in Brazil, Canada, France, Germany and Australia. In Brazil, more than 450,000 metric tons of empty crop protection product containers have been disposed of since 2002 through the InpEV (National Institute for Processing Empty Packages) program.

In Germany, the crop protection industry partnered with agricultural wholesalers to develop the voluntary PAMIRA system for disposing of agrochemical packaging materials. Crop protection producers cover the costs for collection, logistics and utilization of packaging, while wholesalers provide the collection points. In 2020, around 3,000 metric tons of crop protection product and liquid fertilizer packaging in Germany were returned free of charge and disposed of in an environmentally friendly manner through the PAMIRA system.

3.7 Biodiversity

According to the latest report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) on biodiversity and ecosystem services, more than one million species of animal and plant face extinction, driven by human activity. The number one threat to biodiversity is the loss, deterioration and fragmentation of habitats. This is why attention is centered on raw material production in the primary sector, and particularly agriculture.

Biodiversity is an interdisciplinary topic that affects several areas of Bayer as well as our entire value chain. Therefore activities at Bayer focus on the responsible use of natural resources to conserve and protect ecosystems, species and genetic biodiversity. Active ingredients for pharmaceutical development and the agriculture sector benefit especially from biodiversity conservation and enhancement. We have spelled out this stance in our Position on Conservation and Restoration of Biodiversity in Agriculture and Forestry.

Bayer is committed to the objectives of the United Nations' Convention on Biological Diversity (CBD), including the fair and equitable sharing of benefits arising from the utilization of genetic resources, as well as the International Treaty on Plant Genetic Resources for Food and Agriculture of the FAO, which prescribes the balanced and fair division of use of genetic resources. Our Group Regulation on the Access and Use of Genetic Resources defines the principles of how to manage access to and the use and transfer of genetic resources and/or traditional knowledge throughout the company.

When planning new production sites, Bayer takes into account that they must not be set up in areas that are statutorily protected with regard to their natural characteristics, biodiversity or other factors. Using the international Integrated Biodiversity Assessment Tool (IBAT), we conducted a comparison of the geographical coordinates of our 553 production sites, breeding stations and research sites in 2020 with those of internationally recognized protected areas (such as ASEAN Heritage Parks, Wetlands of International Importance according to the Ramsar Convention, Specially Protected Areas of Mediterranean Importance according to the Barcelona Convention, UNESCO-MAB Biosphere Reserves and World Heritage Sites). The comparison showed that 30 of our sites are located within six kilometers of such protected areas.

Forest habitats are of central importance for biodiversity and forests play a key role in protecting the climate. With our Position on Deforestation and Forest Degradation, we aim to address the causes of these within our sphere of influence, as well as in cooperation with our customers in the agriculture and forestry sector and within our supply chains. In our current Report to CDP Forest, we have included a detailed statement on this.

In 2021, biodiversity presented many diverse opportunities despite continued challenges impacting multiple areas of our portfolio, our activities, farmers and our value chain. Bayer has made significant efforts to develop science-based knowledge-sharing projects expanding resilience in cropping systems demonstrated through effective metrics. Coinciding with the United Nations Food Systems summit, we also embraced and promoted the concept of regenerative agriculture.

Agriculture

In agriculture, the most important drivers for the loss of biodiversity are land use change, climate change, crop management practices and pollution. This is of utmost importance, as agriculture relies on biodiversity: many species create and maintain important ecosystem services such as healthy soils, pollination or natural pest control and are thus essential for food, feed and fiber production. Maintaining a diverse range of species allows agricultural systems to be more resilient to stresses, including those caused by climate change. At the same time, the very purpose of agriculture is to provide a safe and secure food supply for humans, which entails the sensible use of measures to protect those crops from organisms that could compromise the harvest. Obtaining the optimal balance is our goal.

We acknowledge that farming, like many other activities, has an impact on biodiversity. To meet the social, environmental and economic needs of a population that is growing in numbers and wealth, we need to further optimize agricultural production systems. We can build on existing technologies and solutions, which have already significantly reduced the impact on the environment, mainly through increases in productivity and efficiency. We believe that only through diversity in farming systems can we equally conserve biodiversity and meet other important needs.

It is our priority to facilitate the adoption of biodiversity conservation measures by farmers and landowners as an integral part of good agricultural practices. Therefore, we invest in the development of innovative tools and services that improve farming and land management practices while balancing production and conservation objectives. Acknowledging the global diversity of cropping systems, regulatory requirements and societal expectation, we collaborate with local experts and associations to develop tailored tools that can address the challenges of each field.

For Bayer, digital farming is another important tool for creating a better balance between productivity and conservation. The goal of digital farming is to use resources such as water, fertilizer and crop protection products more efficiently and sustainably. This also indirectly helps protect biodiversity. For more information, please see Chapter 3.6 Crop Science.

Developing measures for farmers

The IPBES report names land use change as the number one root cause of biodiversity decline. In a collaboration with the International Food Policy Research Institute (IFPRI) and ETH Zurich (ETH), we work together with farmers in Brazil, Germany, France and the United States. The collaboration will leverage a scientific and farmer network and tap into comprehensive research, insights and experiences in the field of biodiversity and agriculture.

In the first phase, we are working together with our partners to identify measures and management options that benefit local/regional biodiversity and also create value for farmers. Among other possible measures that can be taken by farmers are the improvement of soil health to protect it against erosion, the creation of beneficial (micro-)climatic conditions and the provision of habitats for beneficial insects and pollinators. These beneficial ecosystem services also contribute to a higher resilience of the cropping system.

In the second phase, we will identify ways of helping farmers with the implementation of those measures, e.g. by providing customized advice or by assisting farmers to get access to incentives that compensate for additional costs and efforts.

Reduced impact from crop protection products

We understand that crop protection products are often perceived as one of many root causes of biodiversity decline. Potential impacts of pesticides on the environment are diligently assessed, particularly during their development and by approval authorities. Moreover, our researchers successfully work on the discovery of new molecules aimed at minimizing such potential unintended and detrimental environmental effects. For detailed information on our stewardship activities in the development of new crop protection products and our training measures for farmers using our products, please see Chapter 3.6 Crop Science.

We are continuing our efforts to further reduce the environmental impact of our crop protection portfolio. Therefore, we have targeted a reduction in the environmental impact of our crop protection products of 30% by 2030. For more information, please see the Focus on: Agriculture chapter.

Risk mitigation for pollinators

Pollination plays a key role in all terrestrial ecosystems. Pollinators therefore represent a significant part of worldwide biodiversity. Pollination plays an important role in global crop production and in safeguarding nutrition. To minimize risks posed to bees and other pollinators by our crop protection products, we perform extensive safety testing and risk assessments and implement product stewardship measures.

We continuously invest in research activities to better understand the root causes of pollinator and insect decline and we support activities to counteract these trends – such as our engagements around the milkweed habitat creation for monarch butterflies, and our activities with German farmers and conservation institutes to implement ecological enhancement measures in intensive agricultural areas.

For more information on protecting pollinators and on the effects of our products, please see Chapter 3.6 Crop Science. For more information on our measures taken with regard to neonicotinoids, please see our separate report.

Commitment

We support the conservation and sustainable use of genetic resources as well as food security and ecological sustainability – not just through financial contributions and donations, but also through material donations to establish new collections aimed at conserving the genetic diversity of crops. We engage in various projects worldwide in this respect, including especially the building up of capacities particularly in farming communities, and also participate in numerous public–private partnerships.

7. Climate Protection

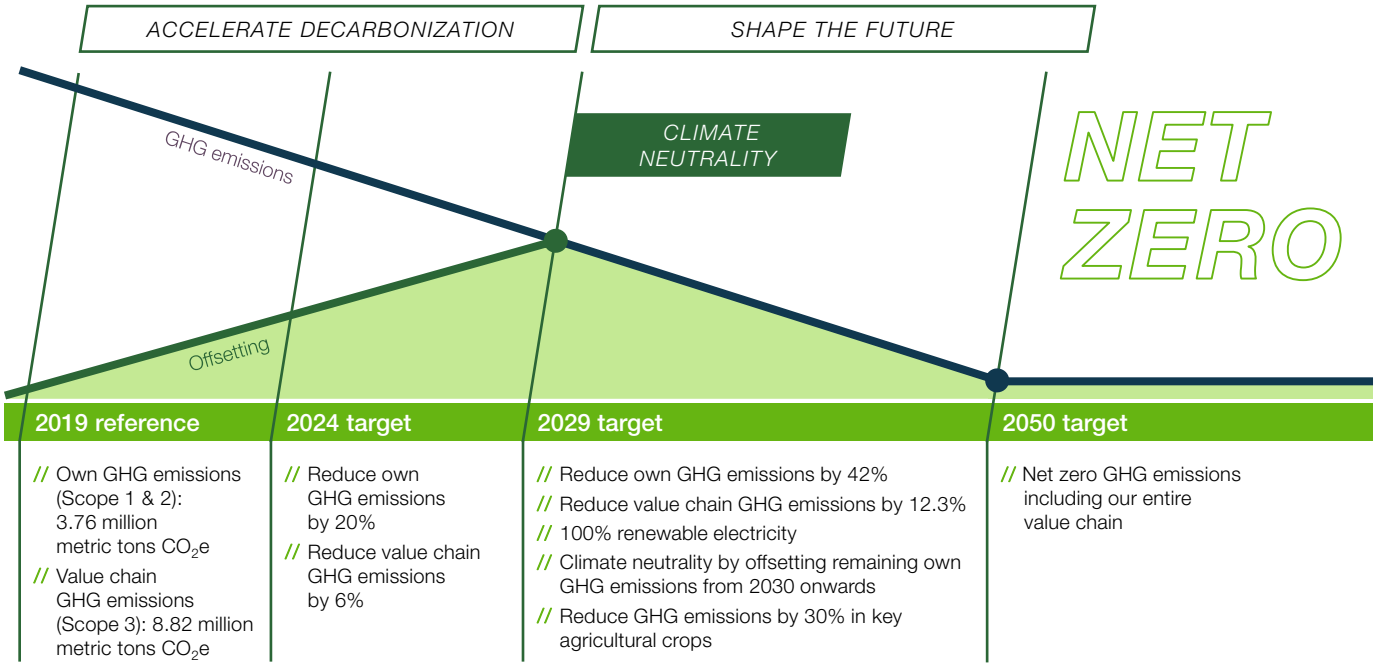
Climate change affects us all and is one of the greatest challenges that humankind will face in the future. Bayer considers climate protection and the related reduction of greenhouse gas emissions to be a top priority. We support the Paris Agreement and the objective of limiting global warming to 1.5°C relative to the pre-industrial level. The Science Based Targets initiative (SBTi) has validated our target and confirms our contribution to fulfilling the Paris Agreement. We anticipate that our business areas of healthcare and agriculture will on the one hand be impacted by climate change, but on the other will also be part of the solution.

7.1 Management Approach

The Chairman of the Board of Management holds direct responsibility for climate protection in his role as Chief Sustainability Officer. In keeping with their level of importance, climate-change-related topics and Bayer's climate strategy were discussed at a total of two meetings of the Board of Management and two meetings of the Supervisory Board in 2021. The attainment of our Group target to reduce greenhouse gases through 2030 is factored into the long-term compensation of the Board of Management and Bayer's managerial staff. The compensation-relevant target is based on Bayer's necessary contribution to an SBTi-validated 1.5°C scenario. Climate protection is also an integral element of annual variable compensation.

In addition, the Sustainability Council established in 2020 advises the Board of Management in all matters related to sustainable development – including climate protection. In 2021, climate change and the related impacts and opportunities for Bayer were discussed at two meetings of the Sustainability Council.

Roadmap to Net Zero



GHG = greenhouse gas

The Chairman of the Board of Management is supported in this by the Public Affairs, Science, Sustainability & HSE Enabling Function and the sustainability departments within the divisions. The divisions handle the operational implementation of the climate protection measures at their sites with the support of the enabling functions. We formed Group-wide working groups for the strategic and operational implementation of climate-change-related measures and a special working group to analyze various climate scenarios and their impacts on our business.

7.2 Climate Strategy

Net zero target

Bayer has undertaken to achieve a net zero target for greenhouse gas emissions throughout the entire value chain by 2050 or earlier. As an external expression of commitment to net zero greenhouse gas emissions, the company also signed the Business Ambition for 1.5°C, a campaign of the SBTi in partnership with the U.N. Global Compact and the We Mean Business Coalition.

Medium-term climate targets by 2030

Bayer aims to achieve climate neutrality at all its own sites by 2030. To attain that target, we intend to reduce by the end of 2029 our own emissions – the so-called Scope 1 and Scope 2 emissions – by 42% relative to the reference year 2019. This target on the pathway to a 1.5°C scenario was reviewed and acknowledged by the SBTi.

We have set a reduction target for Scope 3 emissions of 12.3% by 2029 (relative to 2019) for our value chain. This target was also reviewed and acknowledged by the SBTi.

Interim targets by 2024

By 2024, we aim to reduce our own (Scope 1 and Scope 2) emissions by 20% and our emissions in the value chain (Scope 3) by 6% (relative to 2019) in line with the reduction pathway of our Science Based Target (SBT).

Measures

We have developed a net zero roadmap to achieve our ambitious climate targets. This roadmap comprises various measures in the areas of energy & efficiency, governance and offsetting. To implement our long-term climate strategy, our focus lies on reducing the greenhouse gas emissions associated with our operations and on the resilience of our business fields.

Energies & efficiencies

// Electricity from renewable energies: by 2029, we intend for 100% of the electricity we purchase to be derived from renewable sources. In 2021, therefore, we pressed ahead with the conversion of our Group-wide electricity procurement, and renewable energies now account for 24.7% of our total purchased electricity volume. We have defined specific criteria for the procurement of green electricity and published this information on our website. These criteria include the geographical proximity between power generation locations and Bayer's sites, the use of new production sources and a focus on wind and solar energy. The criteria are based on the next-generation green power guidelines of the WWF (World Wide Fund for Nature).

// Investment in efficiency measures and renewable energies: to achieve an absolute reduction in our remaining emissions, we intend to invest €500 million through 2030 in renewable energies and in increasing the energy efficiency of our facilities and buildings. We are investing in process innovations, more efficient facilities and building technology, as well as in the implementation and optimization of energy management systems, particularly at our production sites. Capital expenditure projects are under way at various sites to advance the use of climate-neutral technologies such as geothermal energy or emissions-free steam production.

Governance

// Capital investment and an internal CO_2 price: we are aligning our capital expenditures to our goal of achieving net zero greenhouse gas emissions by 2050. This is in line with the international goal of limiting global warming to 1.5°C. To drive this transition, we have established an internal CO_2 price of €100 per metric ton of CO_2 for the calculation of our capital expenditure projects.

// Investment decisions: we perform a voluntary ecological assessment for capital expenditure projects exceeding €10 million. Emissions reduction and efficiency measures are integral to these evaluations.

Offsetting

// We will offset our own emissions (Scope 1 and 2) that still remain following reduction through technological measures and cannot be avoided (such as greenhouse gas emissions generated by chemical processes) by purchasing certificates from climate protection projects that meet recognized quality standards. These projects need to have a connection to our own business. Here as well, we have established specific criteria for our own procurement of certificates from climate protection projects. In this process, we focus on nature-based climate solutions, preferably concerning forestry and agriculture projects. We will also invest in innovative projects to promote the development of voluntary carbon markets. We report on our website on our strategy and the projects we support.

// We offset 300,000 metric tons of our greenhouse gas emissions in 2021 by financing reforestation and forest conservation projects, for example in Brazil, Indonesia, Nicaragua and Uganda.

LEAF Coalition

The destruction of forests is a pressing global challenge, especially considering that forest conservation is one of the most important measures to protect biodiversity and the climate.

Within the framework of its activities to protect the forests, Bayer is a participant in the LEAF (Lowering Emissions by Accelerating Forest finance) Coalition. LEAF mobilized more than US$1 billion in 2021 to initiate the biggest public–private effort to protect the rainforests.

We clearly advocate enforcement of the corresponding laws to protect the Amazon rainforest. That also includes driving forward the sustainable intensification of agriculture in Brazil to prevent further deforestation.

Certificates from activities undertaken in connection with LEAF are expected to be part of our offsetting portfolio beginning in 2023.

Value chain (Scope 3)

By 2029, we aim to reduce greenhouse gas emissions along the upstream and downstream value chain (Scope 3) by at least 12.3% (reference year 2019) through cooperation with suppliers and customers. This target was validated and acknowledged by the Science Based Targets initiative (SBTi). As the ability of one company on its own to reduce greenhouse gas emissions along the value chain is only limited, Bayer has joined together with other companies within various initiatives. Together, we aim to ascertain the level of greenhouse gas emissions and climate risks and develop reduction targets and strategies within the scope of programs such as the Together for Sustainability (TfS) initiative of the chemical industry.

Bayer heads up the working group to reduce greenhouse gas emissions in the supply chain. The goal is to standardize the calculation of a product-related carbon footprint (PCF) for the chemical industry. At the same time, an approach is being developed to pass on the PCF within the value chain. The plan is to share results from the TfS working group with the Carbon Transparency Partnership (CTP) of the World Business Council for Sustainable Development (WBCSD). The CTP develops climate approaches across industries. As a member of the WBCSD, we are working on suitable measures there as well.

Through the Supply Chain Initiative of CDP (formerly the Carbon Disclosure Project), we ask our strategically important suppliers and those who account for a significantly high proportion of our emissions in the value chain to provide us with more exact greenhouse gas emissions data. Using the methods of the Supply Chain Initiative, we aim to learn more about the greenhouse gas emissions of our suppliers and the share of these emissions attributable to products and services sourced by us. We also ascertain reduction targets and the use of renewable energies. The goal is to better integrate data collected by our suppliers into the calculation of our emissions for the value chain. By applying the Supply Chain Initiative methods, furthermore, we aim to identify potential for reducing greenhouse gas emissions among our suppliers and incorporate this potential into our supplier development efforts (please see also Chapter 4.2 Sustainability in the Supply Chain).

In 2021, we – like our biggest transport and logistics partners and various industrial companies – began to implement the IT solution "EcoTransIT World" for automatic calculation of transport-related greenhouse gas emissions. EcoTransIT World is geared toward continuously evolving and harmonizing the methods for determining emissions in the transport sector worldwide and thus creating a globally acknowledged methodology. Bayer is also a member of the EcoTransIT World Initiative.

Furthermore, we take advantage of the Pharmaceutical Supply Chain Initiative (PSCI) working group to engage in dialogue within the pharmaceutical industry about measures to reduce Scope 3 emissions.

For more information on our target of reducing greenhouse gas emissions in agriculture by 30%, please see also the Focus on: Agriculture chapter.

Climate policy engagement and management

Externally, we advocate for a climate position in line with our ambitious targets and demand that our partners also undertake decarbonization measures in accordance with the Paris Agreement. We critically scrutinize our memberships in relevant industry associations and their positions as regards climate policy measures. To ensure transparency in this connection, we published an Industry Association Climate Review for the first time in 2021.

This report compares the climate policy positions of our industry associations with our own climate goals. As our industry associations represent us in the public debate, we disclose where we agree with these positions and where they diverge from ours. It is of paramount importance to us that we maintain a dialogue with our associations to achieve an amicable solution. Where differences exist, dialogue enables us to take measures to close these gaps.

The analysis of 2021 represents a first step and forms the basis for Bayer's further efforts to advocate through its member associations for scientifically founded policies to combat climate change. In producing this analysis, we worked together with Climate Action 100+, an investor initiative that cooperates with the world's biggest industrial companies on the issue of climate change.

Climate reporting

We are committed to transparently communicating our climate targets and progress, as well as the impact that climate change has on Bayer.

Through our longstanding and continuous participation in CDP, we disclose our climate-related activities and progress with a high degree of detail.

Bayer supports the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) with respect to reporting on this topic. In our report, we implement the 11 recommendations of the TCFD in the four categories of Governance, Strategy, Risk Management and Metrics & Targets. For more information, please see our separate TCFD report.

7.3 Risk and Opportunity Analysis

In 2021, we looked at the risks and opportunities stemming from the effects of climate change from various perspectives to better evaluate them as regards our company and integrate them into our strategy and measures. Climate-related risks are already accounted for in our Group-wide Enterprise Risk Management (ERM) system.

Climate scenarios

We analyze the possible effects of climate change across two different scenarios. We use these scenarios to understand the impact of this factor on our business and to identify measures for mitigating risks and exploiting opportunities. With a cross-functional and -divisional team we have identified relevant opportunities and risks for our business in both scenarios.

Building on Assessment Report 6 of the Intergovernmental Panel on Climate Change (IPCC) and supplemented with further sources relevant to our business areas, we have drafted our scenario description. The basis comprises an optimistic scenario concerning climate change with warming of below 2°C – the “Green Road” SSP1-2.6 (temperature increase of 1.8°C by 2100 compared with the preindustrial age) – and one that is aligned to current global behavior – the “Rocky Road” SSP3-7.0 (temperature increase of 3.6°C).

Green Road (SSP1-2.6)

// The Green Road scenario assumes the average global temperature will rise by 1.7°C between 2041 and 2060 compared with the preindustrial age. Between 2081 and 2100, the temperature is likely to rise by 1.8°C compared with the preindustrial age.
// This scenario is characterized by the rapid implementation of ambitious and globally coordinated climate-related laws and provisions, which could include short-term, intensified and transitory changes such as new regulations for enterprises. The rapid reduction in greenhouse gas emissions leads to less severe weather- and climate-related effects.

Rocky Road (SSP3-7.0)

// The Rocky Road scenario assumes an average global temperature rise of around 2.1°C between 2041 and 2060, and a likely rise of 3.6°C between 2081 and 2100 compared with the preindustrial age.
// In this scenario, we expect less ambitious laws and provisions that vary widely from one region to another. That leads to a slower pace of emissions reduction and thus more intensive weather- and climate-related changes in all regions of the world. The varying levels of ambition also lead to additional trade barriers that can be manifested in measures such as a Carbon Border Adjustment Mechanism (CBAM).

In our analysis of the effects of climate change, we go beyond the customary Enterprise Risk Management time horizons and instead apply the following time horizons:

// Short term (2021–2025)
// Mid term (2026–2035)
// Long term (2036–2050)

Climate impact drivers

Based on the overarching description, we have identified nine climate impact drivers of materiality for Bayer so as to analyze in more detail the effects that the regulatory and physical changes will have on our business. The goal of the analysis is to identify the relevance and change potential as pertains to Bayer and our fields of business and to determine further activities.

We separately gauge the respective opportunities and risks associated with the nine climate impact drivers shown in the graphic – in each case based on the various time horizons and on the Green Road and Rocky Road scenarios.

Climate Impact Drivers		Short term (2021–2025)		Mid term (2026–2035)		Long term (2036–2050)	
		Risk	Opportunity	Risk	Opportunity	Risk	Opportunity
Transitional impact drivers							
Laws, regulations, policies							
Carbon taxation/pricing, carbon border adjustment & offsetting							
Commodity prices							
End customer/customer/market							
Food security							
Acute physical impact drivers							
Extreme weather events							
Chronic physical impact drivers							
Permanent water cycle							
Diseases							
Temperature							

The Green Road (SSP1-2.6) = The Rocky Road (SSP3-7.0) = Relevance = low high

Below we provide insight into the assessments of the individual climate impact drivers.

Transitional impact drivers

Based on the Paris Agreement, the most important countries and regions in which Bayer operates have committed to limit global warming by reducing their greenhouse gas emissions.

// One example is the European Union's Green Deal, the goal of which is to accelerate the transition to an emissions-free future and achieve climate neutrality by 2050. The EU is consequently expected to further increase costs for the emission of greenhouse gases (e.g. through CO_2 regulations such as the EU emissions trading system (EU-ETS) or a CO_2 tax), adjust financing incentives (e.g. through the EU taxonomy) and drive forward technological changes (e.g. through the promotion of renewable energies and hydrogen technologies).
// China has committed to attain net zero emissions by 2060 and is therefore expected to introduce further regulations in this connection.

Through our strategy for achieving climate neutrality and reducing greenhouse gas emissions on the pathway to a 1.5°C scenario, we are reducing the risk of additional costs caused by the expected regulations.

We continuously analyze the further effects of regulatory changes on our business. National and international CO_2 reduction targets could lead to the abandonment of fossil fuels and impact the demand for fuels from biomass (biofuels), for example. Depending on the regulators' decision, this could lead to either increased or reduced demand for biofuels. This decision could impact our sales markets, as some of our customers grow corn for the production of biofuels.

As one of the world's biggest CO_2 emitters, the agriculture industry can also play a key part in protecting the climate and thus mitigating climate risks – for example by capturing CO_2 in farmland. For more information on our target of reducing greenhouse gas emissions in agriculture by 30%, please see the Focus on: Agriculture chapter.

Physical impact drivers

Weather and climate effects are of particular significance for the Crop Science Division and are accounted for in both strategic planning and the seasonal business risk. These effects are intensifying as a result of climate change, and both short-term (extreme) weather events and long-term climate changes will further increase.

Acute physical impact drivers

All climate models anticipate an increase in extreme weather conditions (such as drought, heavy rains and storms) that present an elevated risk of crop losses and thus risks for the agricultural value chain as a whole. Despite all precautions, operations at our sites or those of our customers may be disrupted and crop failures may occur in connection with extreme weather events such as natural disasters. In the IPCC forecasts, the intensity of such events varies widely from one region to the next. In the IPCC's regional fact sheets for the Central North America region (CNA), for example, extreme precipitation is predicted to increase; the South American Monsoon region (SAM) is expected to experience both a delay in the monsoon season and intensified droughts.

In addition to risks, however, climate change can also create opportunities for our business. Bayer's product range and innovation capability – particularly in the agricultural value chain – will create a foundation for leveraging new options and sales opportunities in the future against the background of climate change. As a seed producer, we already offer plants with increased resistance to extreme weather conditions. That includes short-stature corn that is less susceptible to storms (for more information, please see the Focus on: Agriculture chapter).

We also enable farmers to react better and more quickly to extreme weather conditions with our FieldView™ digital farming platform. For more information, please see Chapter 3.6 Crop Science.

Chronic physical impact drivers

The long-term natural and physical effects of climate change will impact particularly the permanent water cycle (for example through a transition to a wetter or a drier climate or a delay in the monsoon season), the spread of diseases or insect pests, and further coupling effects of temperature changes. These effects will become particularly relevant for our agricultural business.

We develop strategies to help farmers increase their resilience against the effects of climate change. At the same time, we want to help farmers reduce their own greenhouse gas emissions and cultivate healthy and sustainable crops. As there are no uniform solutions in agriculture, farmers need numerous options from which they can select the most suitable for their fields and the locally prevailing conditions.

In addition, health risks such as cardiovascular disease can also intensify due to hotter summer months or more frequent heatwaves. This could create increased demand for products for cardiovascular disease or nutritional supplements.

Next steps

As data models and insights into climate change are constantly evolving, we will continue to expand and refine our scenario description and analysis in 2022 and beyond. By doing this, we want to be in a position to describe future challenges and opportunities as accurately as possible to derive short-, medium- and long-term mitigation measures. Findings from these analyses will play a bigger role in our strategic, portfolio and operational processes.

We also participate in the Value Chain Risk to Resilience working group of the international Business for Social Responsibility network. Through dialogue in this forum, we improve our own analyses and want to help improve the identification of regulatory and physical climate risks and climate resilience measures throughout companies' supply chains.

7.4 Greenhouse Gas Emissions

At Bayer, air emissions are primarily caused by the combustion of primary energy sources such as gas and oil. These are used to generate electricity, steam and auxiliary energy (such as for heating and cooling) for the manufacture of our products. Further emissions derive from chemical processes in which coal and other energy sources are required to produce chemical reactions. Emissions are also generated by our vehicle fleet and in the extraction and processing of raw materials.

In reporting greenhouse gas emissions, we take into account the recommendations of the Greenhouse Gas Protocol (GHG Protocol). Direct emissions from our own power plants, vehicles, waste incineration plants and production facilities (Scope 1) and indirect emissions from the procurement of electricity, steam and cooling energy (Scope 2) are determined at all environmentally relevant sites whose annual consumption exceeds 1.5 terajoules. In this connection, we have drafted Group regulations for the Group-wide recording of greenhouse gas emissions.

In line with the GHG Protocol, we report indirect emissions (Scope 2) according to both the location-based and market-based methods.

Bayer's greenhouse gas emissions fell further in 2021 compared to 2020. We succeeded in reducing our own Scope 1 and Scope 2 emissions by 11.5%, or around 410,000 metric tons, particularly by increasing the share of our electricity derived from renewable energies. Overall, we have already reduced our own emissions (Scope 1 and Scope 2) by 15.7% compared with the reference year 2019.

We address our climate protection activities in detail in our latest Report to CDP (formerly the Carbon Disclosure Project).

Greenhouse Gas Emissions (Scope 1 and 2)

Million metric tons of CO_2 equivalents	2020	2021
Scope 1: Direct emissions[1]	2.01	1.93
of which carbon dioxide (CO_2)	1.96	1.90
of which ozone-depleting substances	0.012	0.011
of which partially fluorinated hydrocarbons (HFCs)	0.022	0.014
of which nitrous oxide (N_2O)	0.008	0.007
of which methane (CH_4)	0.003	0.003
Scope 2: Indirect emissions[2] according to the location-based method	1.75	1.56
Scope 2: Indirect emissions[2] according to the market-based method[3]	1.57	1.24
Total greenhouse gas emissions (Scope 1 and 2) according to the market-based method[3]	**3.58**	**3.17**
of which offset greenhouse gas emissions	0.2	0.3
Specific greenhouse gas emissions (kg CO_2e/€ thousand external sales) according to the market-based method[3, 4]	86.55	71.95

2020 figures restated

[1] In line with the GHG Protocol, we also report the direct emissions resulting from the generation of energy for other companies which is sold as a site service. In 2021, these emissions corresponded to 0.14 million metric tons of CO_2 equivalents.

[2] Typically, CO_2 accounts for 98% of all energy-related greenhouse gas emissions. When determining indirect emissions, our calculations are therefore limited to these greenhouse gases and we indicate all emissions in CO_2 equivalents.

[3] For Bayer, the market-based method of the GHG Protocol most reliably reflects the values for Scope 2 emissions and the success of emissions reduction measures, so we apply emissions volumes calculated using this method when calculating the total and specific greenhouse gas emissions.

[4] Specific Bayer Group emissions are calculated by adding together direct emissions and indirect emissions calculated using the market-based method of the GHG Protocol (Scope 2) then dividing the total volume by the external sales volume.

In 2021, Bayer was involved in European emissions trading with five plants in total. The CO_2 emissions of these plants amounted to almost 315,000 metric tons.

Due to the varying depth of value creation, direct and indirect greenhouse gas emissions (Scope 1 and Scope 2) are unequally distributed among our divisions. Our raw material extraction activities, including treatment and downstream processing, for the manufacture of the crop protection intermediates of Crop Science are especially energy-intensive – this division therefore accounts for the greatest share of our greenhouse gas emissions.

Greenhouse Gas Emissions by Division (Scope 1 and 2)

Million metric tons of CO_2 equivalents	2020	2021
Scope 1: Direct emissions[1]	2.01	1.93
of which Crop Science	1.65	1.61
of which Pharmaceuticals	0.19	0.18
of which Consumer Health	0.02	0.02
of which other[2]	0.16	0.13
Scope 2: Indirect emissions[3] according to the market-based method[4]	1.57	1.24
of which Crop Science	1.38	1.06
of which Pharmaceuticals	0.13	0.12
of which Consumer Health	0.06	0.05
of which other[2]	0.004	0.003

[1] In line with the GHG Protocol, we also report the direct emissions resulting from the generation of energy for other companies which is sold as a site service.

[2] These include greenhouse gas emissions from the vehicle fleet and emissions caused by the enabling functions.

[3] Typically, CO_2 accounts for 98% of all energy-related greenhouse gas emissions. When determining indirect emissions, our calculations are therefore limited to these greenhouse gases and we indicate all emissions in CO_2 equivalents.

[4] For Bayer, the market-based method of the GHG Protocol most reliably reflects the values for Scope 2 emissions and the success of emissions reduction measures, so we apply emissions volumes calculated using this method when calculating the total and specific greenhouse gas emissions.

Value chain (Scope 3)

The GHG Protocol Corporate Value Chain (Scope 3) Accounting & Reporting Standard bindingly regulates the reporting of all indirect emissions from the value chain and separates these emissions into 15 categories. Emissions from eight Scope 3 categories are of material importance to Bayer and together account for our total Scope 3 emissions. We describe these in detail in the Report to CDP.

The category "Purchased goods and services" accounts for the most significant share of our Scope 3 emissions, at 71%.

Greenhouse Gas Emissions in the Value Chain (Scope 3)

Million metric tons of CO_2 equivalents	2020	2021
Scope 3: Indirect emissions from our upstream and downstream value chain (by materiality)[1]	9.20	8.94
of which indirect emissions from our upstream and downstream value chain to attain the SBT[2, 3]	8.22	8.16
Progress in the reduction of Scope 3 emissions[4, 5]	–	–7%

2020 figures restated

[1] Emissions from eight Scope 3 categories are of material importance to Bayer and together represent our total Scope 3 emissions: (1) purchased goods and services, (2) capital goods, (3) fuel- and energy-related activities, (4) (upstream) transportation and distribution, (5) waste generated from operations, (6) business travel, (7) employee commuting and (12) end-of-life treatment of sold products.

[2] Science Based Target

[3] For the calculation of our reduction target for Scope 3 emissions in line with SBTi, 91% of total materially important Scope 3 emissions are considered. The following Scope 3 categories are covered: (1) purchased goods and services, (2) capital goods, (3) fuel- and energy-related activities, (4) (upstream) transportation and distribution and (6) business travel.

[4] 2029 target: 12.3% reduction

[5] All greenhouse gas emissions from air travel in 2021 were offset.

In accordance with the guidelines of the Science Based Targets initiative (SBTi), the calculation of our reduction target for Scope 3 emissions utilizes only the five major categories that make up the biggest portion of our Scope 3 emissions (91%). We also separately report the sum of these Scope 3 emissions in the following table. For more information on initiatives to reduce Scope 3 emissions, please see Chapter 7.2 Climate Strategy.

Compared with 2020, we achieved a slight reduction in emissions in our value chain of 0.6% or around 50,000 metric tons. This already accounts for 7% of our reduction target for 2029 compared to the reference year.

7.5 Energy

Our energy needs have the greatest direct impact on our greenhouse gas emissions. Production accounts for the most significant share of our energy requirement, which depends on the production operations at the sites and the depth of our value chain (please see also Chapter 7.4 Greenhouse Gas Emissions).

Energy consumption

When calculating total energy consumption, we differentiate between primary and secondary energy consumption. The main source of primary energy consumed comprises fossil fuels that we use to generate electricity, steam and cooling energy for our own use and to a small extent for sale to other companies. Secondary energy consumption reflects the purchase of electricity, steam and cooling energy at our sites worldwide.

One of the targets we have set within the context of our climate strategy is to cover 100% of purchased electricity needs with renewable energies by 2030. To achieve this objective, we have produced a catalogue of criteria such as physical proximity to the production plant and additionality. For more information, please see Chapter 7.2 Climate Strategy.

In 2021, around 24.7% of our purchased electricity was sourced from renewable energies. We concluded additional supply agreements for electricity from renewable energies in the United States, Brazil and Germany in 2021. We are thus on track to achieve our target of 100% in 2029.

Compared with 2020 (35.9 petajoules), Bayer's total energy consumption fell by 2.9% to 34.8 petajoules in 2021. This includes both primary energy consumption, mainly of fossil fuels, and secondary energy consumption. This decline compared to 2020 is primarily due to interruptions in production as a result of Hurricane Ida at the sites in Soda Springs, Idaho, and Luling, Louisiana, in the United States. A reduction in the number of vehicles in the company fleet also contributed.

Energy Consumption

TJ	2020	2021
Primary energy consumption	17,836	18,071
Natural gas	10,911	10,682
Coal	566	608
Liquid fuels	2,901	2,653
of which for vehicle fleet/transport	2,480	2,194
Waste	416	499
Other[1]	932	1,068
Primary energy consumption for third-party companies	2,111	2,561
Secondary energy consumption	18,022	16,764
Electricity[2]	12,166	11,059
of which electricity from power grid	11,451	8,325
of which electricity from renewable energies	715	2,734
Steam	4,485	4,381
of which steam from renewable energies	25	82
Steam from waste heat (process heat)	550	574
Cooling energy	691	632
Secondary energy consumption for third-party companies	131	118
Total energy consumption	**35,858**	**34,835**

2020 figures restated

[1] For example biomass

[2] The proportion of primary energy sources used in generating the electricity consumed depends on the respective electricity mix of our energy suppliers.

Primary and secondary energy consumption is usually dependent on the production volume: the more that is produced, the greater the energy consumption and also the associated greenhouse gas emissions. Energy management systems such as ISO 50001 help to identify potential energy savings both in production processes and when developing new production processes or converting existing ones. This not only conserves valuable energy resources, but also takes into account economic factors associated with long-term savings. In our Report to CDP, we also describe the projects to save energy that were implemented at various sites.

Energy efficiency

Bayer reports energy efficiency as the ratio of energy used to external sales. Energy efficiency improved compared with 2020.

Energy Efficiency

kWh/€ thousand external sales	2020	2021
Energy efficiency	241	220

2020 figures restated

For more information on our energy efficiency measures, please see Chapter 7.2 Climate Strategy.

8. Environmental Protection and Safety

Protecting the environment and ensuring the safety of our employees and the people who live near our sites are among our highest priorities. We work continuously to reduce the environmental impact of our business activities and develop product solutions that benefit the environment. Bayer focuses on taking consistent precautions – to ensure safety in day-to-day work, in the operation of production facilities, and on work-related travel and transportation routes.

8.1 Management Approach

Responsibility for steering and monitoring health, safety and environmental protection (HSE) aspects across the Group lies with the Public Affairs, Science, Sustainability & HSE Enabling Function. As of February 2022, HSE has been assigned to the Chairman of the Board of Management, who also serves as Chief Sustainability Officer at Bayer. The Public Affairs, Science, Sustainability & HSE Enabling Function establishes responsibilities, targets, key performance indicators and framework conditions for the entire Group. These include the Group Regulation on HSE Management and HSE Key Requirements, which forms an integral part of the global HSE management system. This Group regulation describes the basic approach for monitoring HSE processes at Bayer and defines core HSE requirements that need to be implemented worldwide. Detailed requirements for individual environmental protection and safety aspects are established in further-reaching Group regulations that are also binding (see graphic).

The continuous review and revision of Group regulations by the Public Affairs, Science, Sustainability & HSE Enabling Function, regular mandatory internal audits and external certification processes ensure that the systems at all sites meet the relevant requirements.

Management systems for environmental protection and safety issues are in place that are integrated into the business processes throughout the Group. Operational responsibility for health, safety and environmental protection lies with the individual divisions, which steer HSE via management systems, committees and working groups at our sites.

Environmental management at the sites also involves the development and implementation of site-related targets and programs to reduce our environmental impact. The following priorities apply:

// Avoiding waste/emissions
// Recycling in all cases where it is practicable to do so by reasonable means
// Minimizing waste/emissions that cannot be avoided or recycled

We report all relevant HSE data of the Group, including all fully consolidated companies in which we have a share of more than 50%, collect data on occupational injuries and environmental incidents at all sites worldwide, and record environmental indicators at 217 environmentally relevant production, research and administration sites, compiling this in the Group-wide information system. We consider all sites to be environmentally relevant whose annual energy consumption is greater than 1.5 terajoules.

Ecological assessment for capital expenditures

Our HSE commitment extends beyond the scope of legal requirements. We perform a voluntary ecological assessment for capital expenditure projects exceeding €10 million. This includes an evaluation of direct and indirect greenhouse gas emissions. The goal is to involve stakeholders at an early stage and adequately assess environmental impact and other sustainability dimensions.

This ecological assessment ensures uniform environmental and sustainability standards worldwide, taking into account Bayer's internal standards and the best available technologies. One example of this approach in 2021 was the planning of a new production site in Costa Rica, where Bayer aims to reduce greenhouse gas emissions to such an extent that this positively supports our pathway toward climate neutrality. We will also succeed in reducing greenhouse gas emissions in Leverkusen on the basis of an ecological assessment.

In the case of acquisitions, we examine compliance with the applicable environmental and occupational safety regulations as well as fundamental employee rights at the production sites in question. Through our HSE management systems we also avoid damage and disruptions to work and production.

HSE management systems

Based on the Group Regulation on HSE Management and HSE Key Requirements, all environmentally relevant Bayer sites must have in place an HSE management system that complies with recognized international standards (e.g. ISO 14001 or ISO 45001).

By the end of 2025, furthermore, 80% of our business activity should have coverage with external certification to the above standards.

Binding Group Regulations

Standards and Certifications

% of business activities based on energy consumption of environmentally relevant sites	2020	2021
Certification to external standards		
ISO 14001 certification/EMAS validation	56	61
ISO 45001 certification/OHSAS 18001	45	50
ISO 50001 certification	22	31
Degree of coverage with certification to at least one of the above standards	60	65

HSE audits

Audits are an integral component of our global HSE management system. They help to ensure compliance with applicable regulations and to improve our performance worldwide through the management and mitigation of possible HSE risks. Bayer's global HSE audit program comprises both general HSE audits and process and plant safety audits. The Group Regulation on Health, Safety and Environmental Audits defines the basic principles and methodology for selection, planning, implementation and post-processing using a risk-based decision-making process. Bayer's audit approach is based on the international standard ISO 19011 "Guidelines for Auditing Management Systems" and provides the framework for carrying out audits.

Through the overarching HSE audit approach, we include all units and apply the same concepts worldwide. When selecting sites for audit, the focus is particularly on production sites, relevant Bayer warehouses, sites with research and development units, and relevant seed treatment and processing units.

The frequency of audits is determined taking into account the risk category (based partly on the size of the site or the type of production activity), the performance evaluation (based partly on past audit results, for example) and risk-mitigating measures (e.g. existing ISO certifications), and

ranges from two to five years. Incident-based audits can be carried out in addition to this. The audit criteria comprise all applicable environmental protection and safety regulations and standards for the area being audited, including Bayer regulations, local HSE management system regulations, legally applicable standards, permit requirements and international standards (e.g. ISO 14001 or ISO 45001). If deficiencies in compliance with legal regulations are identified, additional compliance audits can be planned. Within the scope of these audits, action plans and responsibilities are established to fix the issues identified.

The respective site management, the division and the head of the Public Affairs, Science, Sustainability & HSE Enabling Function are notified of the audit findings. Supplementary to the global HSE and process and plant safety audits, sites and country organizations carry out their own internal HSE audits or self-inspections according to a specific risk-based approach. Since 2020, all global audit reports have been stored in a database.

8.2 Air Emissions

Air emissions are monitored and targets for their reduction pursued as part of our environmental management system at the sites. These emissions are also partly considered in the calculation of greenhouse gas emissions such as of ozone-depleting substances or nitrous oxide (laughing gas). Our approach to the issue of air emissions is also described in the Group Regulation on HSE Management and HSE Key Requirements. For more information on our greenhouse gas emissions and our energy consumption, please see Chapter 7. Climate Protection.

Emissions of ozone-depleting substances in 2021 fell from 4.3 to 3.9 metric tons owing to emissions reduction measures at the Vapi site in India. Emissions from the incineration of biomass such as VOCs, NO_x and SO_x were calculated using updated factors, leading to a reduction in emissions from incineration processes. Carbon monoxide emissions from a furnace in Soda Springs, Idaho, United States, had to be calculated using a higher emissions factor owing to local regulatory requirements.

Other Direct Air Emissions

1,000 metric tons	2020	2021
ODS[1]	0.0043	0.0039
VOCs[2]	0.69	0.43
CO (carbon monoxide)	1.16	2.66
NO_x (nitrogen oxides)	4.16	3.57
SO_x (sulfur oxides)	1.32	1.28
Particulates	2.29	2.05

[1] Ozone-depleting substances (ODS) according to the Montreal Protocol, in CFC-11 equivalents

[2] Volatile organic compounds (VOCs) excluding methane

8.3 Water and Wastewater

Responsible water usage is a cornerstone of our commitment to sustainable development and is described in the Group Regulation on HSE Management and HSE Key Requirements. Clean water in sufficient quantities is essential for the health of people, animals and plants. That is why it is crucial that industrial water usage will continue not to lead to local problems such as water shortages for the people living in the catchment areas of our production sites. In our Water Position, we undertake to comply with international, national and local legislation to protect water resources, use them as sparingly as possible and further reduce emissions into water.

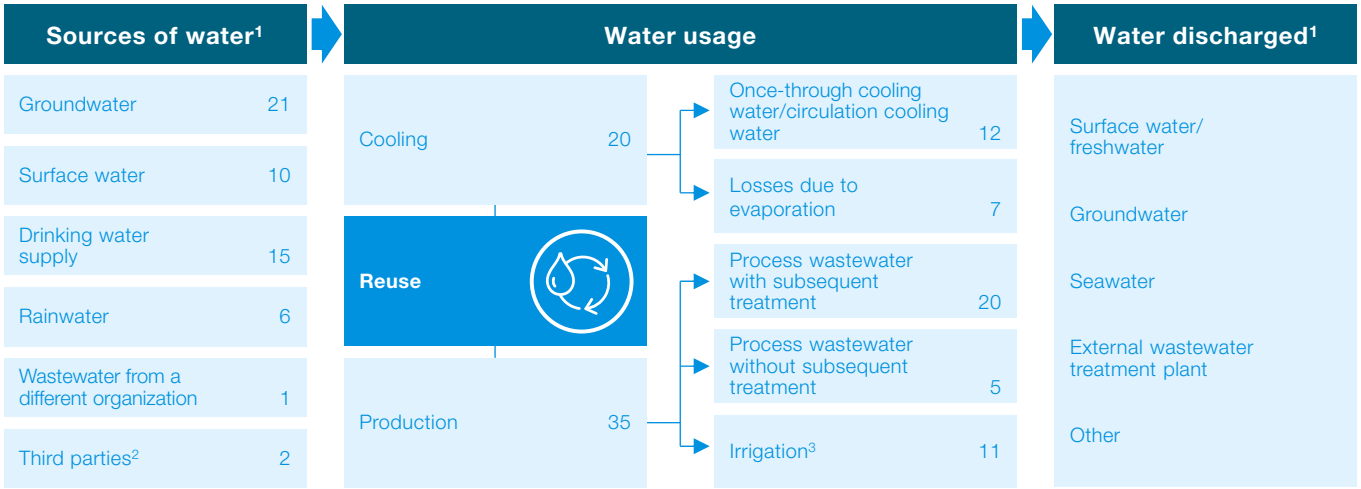
In our water stewardship strategy, we address a variety of factors connected with water, from operational water use and innovative products, such as drought-resistant crops with a reduced water requirement, to our commitment in the value chain and cooperation with partners. We support the CEO Water Mandate of the U.N. Global Compact with the goal of working with key stakeholders to develop sustainable strategies for water usage. Since 2021, furthermore, we have been a member of the Water Resilience Coalition (WRC), the goals of which substantiate and supplement the ambitions of the CEO Water Mandate at the private-sector level. We also participate in the Water and Climate Leaders group of the World Meteorological Organization (WMO) to improve the global political framework and enhance the perceived relevance of this issue among the public. We are currently further developing our water strategy to better address the opportunities and risks associated with water stewardship in the future, especially in view of changing climatic conditions.

In our annual response to the CDP Water Disclosure, we report in detail on our handling of water and the company-specific water footprint. This equates to a progress report for the CEO Water Mandate. We received an A- rating in 2021.

Sites in water-scarce regions

We aim to identify potential for improvement particularly at sites located in water-scarce areas or in areas identified as being threatened by water scarcity, and use as little water there as possible. The regions in which water consumption exceeds the available renewable surface and groundwater resources were identified using the Aqueduct Water Risk Atlas of the World Resources Institute (WRI).

Water Use in the Bayer Group 2021 (million m³)



[1] The differences between volumes of water consumed and water discharged can be explained, for example, by quantities of water used as raw materials in products, unquantified losses due to evaporation, leaks and volumes of condensate generated through the use of steam as a source of energy. Detailed data on water discharged is shown in the corresponding table below.
[2] E.g. process water, water contained in raw materials used
[3] Mainly agricultural irrigation

By the end of 2020, we had already established water management systems at all relevant sites in regions threatened by water scarcity. The relevant Bayer sites in this context are all locations with energy consumption of at least 1.5 terajoules per year that at the same time account for at least 0.1% of the Group's global water consumption.

The key characteristics of a sustainable water management policy are a balance between water consumption and availability, as well as the optimal conservation of water resources. Due to widely varying local situations, each water management system is designed individually on the basis of a detailed risk analysis that takes into account local circumstances and the main parameters of our water supply and disposal. The identified risks necessitate locally adapted countermeasures such as the establishment of alternative supply sources, the improvement of wastewater quality or wastewater recirculation. These activities are accompanied by management measures such as regular employee training in water management or participation in round tables with regulatory authorities and residents.

We are aware that climate change will further exacerbate the problem of water scarcity in the future. To avert future risks for our production capacities and the local communities, we will establish by 2023 suitable water management systems at all relevant sites that will be threatened by water scarcity by 2030. We identify such sites using the base scenario of the WRI.

For more information on water sources in water-scarce areas or in areas identified as being threatened by water scarcity, please see the table "Water Sourced in Water-Scarce Areas or Areas Threatened by Water Scarcity."

Water use

In 2021, total water use in the Bayer Group was 55 million cubic meters (2020: 57 million cubic meters). Some 5.8% of our total water use (55 million cubic meters) comes from water sources in water-scarce areas or in areas identified as being threatened by water scarcity (as defined by the World Resources Institute).

Water Sourced by Division

Million m³	2020	2021
Total water sourced	57	55
of which Crop Science	45	45
of which Pharmaceuticals	11	8
of which Consumer Health	2	2
of which other[1]	0.05	0.05

[1] This includes water use attributable to the enabling functions and administration sites of the regions.

Water consumption by the Pharmaceuticals Division could be reduced through water-saving measures at the Orizaba Proquina site in Mexico.

Around 35.7% of all water used by Bayer is cooling water that is only heated in this process and does not come into contact with products. It can be returned to the water cycle without further treatment in line with the relevant official permits.

At our production facilities, we endeavor to use water several times and to recycle it. Water is currently recycled by various means at 42 sites, these being responsible for 46.3% of the total water used. These means include closed cooling cycles, reuse of treated wastewater, including to water fields, and recirculation of steam condensates as process water. The total volume of water recycled comes to more than 376 million cubic meters, meaning that the 55 million cubic meters of water originally sourced is used more than six times on average.

Water Sourced in Water-Scarce Areas or Areas Threatened by Water Scarcity[1]

Million m³	2020	2021
Total water sourced	57	55
of which in water-scarce areas or areas threatened by water scarcity[1]	3	3

[1] As defined by the World Resources Institute, Aqueduct Water Risk Atlas

Wastewater

We aim to minimize our emissions into water. Compliance with the relevant wastewater thresholds at our production sites worldwide is monitored by supervisory authorities and external assessors and is also reviewed at regular intervals during on-site audits by internal experts.

To further reduce or completely exclude the release of active ingredient traces into the environment, we implement additional wastewater treatment measures at the production sites that are established in a Group regulation. These measures include a hazard evaluation and HSE risk assessment of the wastewater to determine whether active ingredient concentrations need to be further reduced. In such cases, internal wastewater thresholds can be derived that offer sufficient risk mitigation and go beyond legally established limits.

The total volume of industrial and mixed wastewater was 25 million cubic meters in 2021, which is comparable to the previous year.

Volume of Treated Production Wastewater by Discharge Destination

Million m³	2020	2021
Surface water	16.0	16.5
Groundwater	0.004	0.006
Seawater	0.1	0.3
Other (evaporation, irrigation, seepage)	2.7	2.3
External wastewater treatment plant	5.8	5.5
Total wastewater	25	25
of which in water-scarce areas or areas threatened by water scarcity	0.8	0.8

All wastewater is subject to strict monitoring before it is discharged into the various disposal channels. In 2021, 79.6% of our industrial and mixed wastewater worldwide was purified in wastewater treatment plants (Bayer or third-party facilities). In 2021, we again applied alternative means of disposing of product-containing wastewater such as incineration, distillation or chemical treatment and subsequent processing in a biological wastewater treatment facility. Following careful analysis according to official provisions, the remaining volume was categorized as not environmentally hazardous and returned to the natural water cycle.

Discharges of phosphorus into wastewater have risen by 34.0% owing to higher production utilization at the site in Camacari, Brazil. The shutdown of a facility at the site in Dormagen, Germany, led to a reduction in nitrogen discharges of 24.5%. Improved wastewater analytics at the site in Camacari, Brazil, reduced emissions of total organic carbon (TOC) by 17.0%.

Emissions into Water

1,000 metric tons	2020	2021
Phosphorus	0.38	0.51
Nitrogen	0.48	0.36
TOC[1]	1.54	1.28
Heavy metals	0.0026	0.0032
Inorganic salts	151	172
COD[2]	4.61	3.83

[1] Total organic carbon (TOC)
[2] Chemical oxygen demand; calculated value based on TOC figures (TOC x 3 = COD)

Remediation and safeguarding of soil and groundwater contamination

In line with the Group Regulation on HSE Management and HSE Key Requirements, Bayer ensures the implementation of measures to prevent the contamination of soil and groundwater. This includes inspecting facilities for leaks, implementing effective secondary retention measures for storage tanks, and maintenance and inspection programs. The measures also encompass applying suitable leak identification devices for tanks, containers and pipes containing hazardous materials as well as the installation of sealed surfaces with a sufficient retention volume, for example in tank loading and unloading areas.

Bayer also actively performs remediation activities to mitigate environmental damage resulting from noncompliant waste management or accidents in the past. Dedicated processes have been established for this purpose that stipulate comprehensive investigation of sites and, where necessary, one or several of the following measures: remediation activities to clean up the impacted environment, safeguarding of contaminated sites so that they do not constitute a danger, and monitoring of the conducted remediation and safeguarding activities.

These are implemented based on statutory requirements and the latest technological standards. Such activities are also designed to avert possible financial or reputational damage to the company.

To manage contamination, we have established uniform standards in our Group regulation for the investigation and remediation of such sites. Our specialized teams work systematically together with external experts to support all affected sites in the planning, implementation and monitoring of remediation processes and measures, measure their progress, and execute and conclude these cases with a positive effect for people and nature.

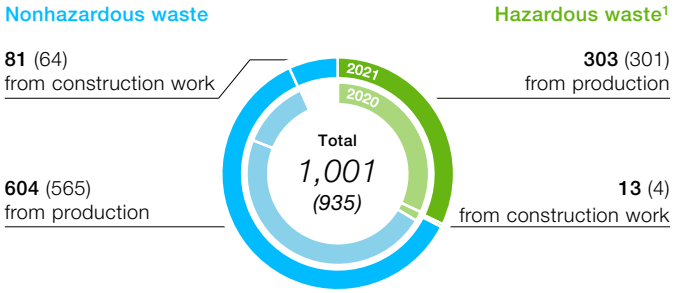
To enable the implementation of environmental protection measures and the mitigation of contamination, provisions are established for the expected costs of the remediation of contaminated sites, the recultivation of landfills, the clean-up of environmental pollution at existing production or storage sites and similar measures. For more information on provisions, please see the 2021 Annual Report.

8.4 Waste and Recycling

We want to minimize material consumption and disposal volumes through systematic waste management. Waste separation, safe disposal channels and economically expedient recycling processes serve this purpose. In accordance with our Group regulations, all production sites are obliged to prevent, recycle and reduce waste and to dispose of it safely and in line with good environmental practices. Each of our sites must have an up-to-date waste register that includes the following details for each waste stream: the name and description of the waste, its source and volume and sufficient information on its composition, hazard classification and final treatment and disposal.

Waste volumes and recycling paths are impacted not just by production fluctuations, but also by building refurbishment and land remediation work.

Waste Generated 2021 (2020)
1,000 metric tons



2020 figures restated
[1] Definition of hazardous waste in accordance with the local laws in each instance

Waste volume generated

Bayer ensures that waste is properly disposed of at its sites. We also carry out regular audits of external disposal facilities for this purpose.

The total volume of waste generated rose by 7.1% in 2021 compared to 2020. This was mainly attributable to seed production being increased at several sites in Latin America and larger volumes of plant byproducts then being disposed of. The volume of hazardous waste rose to 316,000 metric tons (2020: 305,000) owing to construction and remediation work at the site in Berlin, Germany. Hazardous waste from production, including hazardous waste from wastewater treatment plants, remained at the same level as last year, at 303,000 metric tons.

The volume of waste disposed of increased by 6.1%. Some 48.4% of this waste was successfully reused or recycled. The proportion of hazardous waste that was recycled was 15.7%.

Waste by Means of Disposal

1,000 metric tons	2020	2021
Total volume of waste disposed of[1]	**940**	**998**
Nonhazardous waste disposed of	635	685
of which volume removed to landfill	123	78
of which volume incinerated	52	53
of which volume recycled[2]	365	434
of which other[3]	96	120
Hazardous waste disposed of	305	313
of which volume removed to landfill	16	12
of which volume incinerated	226	224
of which volume recycled	38	49
of which other[3]	25	28

2020 figures restated
[1] Waste can also be stored at sites as an intermediate step. For this reason, the volume of waste disposed of can differ slightly from the volume of waste generated by Bayer.
[2] Recycling refers to processes through which waste is reused or treated for reutilization.
[3] For example passed on to third parties (e.g. providers/waste disposal companies) for disposal or utilization for energy generation or composting

The volume of hazardous waste sent to landfill fell owing to the greater use of waste incineration at the Vapi site in India.

Due to the varying depth of value creation, waste volumes are unequally distributed among our divisions. Crop Science accounts for a greater proportion due partly to its more significant product volume.

Waste by Division

1,000 metric tons	2020	2021
Total volume of waste disposed of[1]	**940**	**998**
of which Crop Science	771	811
of which Pharmaceuticals	145	170
of which Consumer Health	21	16
of which other[2]	3	1

2020 figures restated

[1] Waste can also be stored at sites as an intermediate step. For this reason, the volume of waste disposed of can differ slightly from the volume of waste generated by Bayer.

[2] This includes waste attributable to the enabling functions and administration sites of the regions.

Disposal, recycling and processing

Legislation prohibits the recycling and processing/treatment of a large proportion of our materials, especially pharmaceuticals and crop protection products. In our divisions, we make use of the opportunities for recycling within the framework of legal regulations. Production-specific and substance-specific recycling is carried out in compliance with the individual requirements of a given production site. Packaging materials are recycled in line with national regulations as part of the country-specific infrastructure for waste disposal. In many countries with no legal regulation, the industry has set up a returns system in collaboration with other providers (please see Chapter 3.6 Crop Science, Disposal of containers and old inventories, discontinuation policy).

Material-based recycling plays an important role in Crop Science's manufacturing of active ingredients and intermediates, and is handled in line with the specific requirements at the respective production site. Solvents, catalysts and intermediates are processed and returned to the production process. Material recycling is taken into account as an important development criterion in the global process development for active ingredients and intermediates.

In the Pharmaceuticals and Consumer Health divisions, production-specific recycling is carried out in compliance with the specific requirements at a given production site. The disposal of pharmaceutical products is subject to strict safety criteria, which means that recycling is not possible for the portfolios of the Pharmaceuticals and Consumer Health divisions. Material-based recycling takes place at the Pharmaceuticals site in Bergkamen, Germany, in the form of the recovery of solvents used in production. A returns program for an iodinated X-ray contrast agent makes it possible to reprocess the iodine contained therein and introduce it to an industrial cycle (for more information, please see Chapter 3.8 Pharmaceuticals and Consumer Health).

8.5 Environmental Incidents

There were three environmental incidents that resulted in the release of substances into the environment in 2021 (2020: three). A sulfuric acid tank leaked at a site in the United States, resulting in small amounts of the acid penetrating the diked containment. At the Muscatine site in Iowa, United States, natural gas entered the environment when a combustion flare did not properly ignite to burn the gas. And at the Dormagen site in Germany, sodium hydroxide solution was mistakenly used for high-pressure cleaning instead of water and entered the environment. An external contractor employee was fatally injured. Most of the sodium hydroxide solution was collected and disposed of properly.

Factors that determine whether there is a reporting obligation for a particular environmental incident include, in particular, the nature and quantity of the substance, the amount of damages caused and any consequences for nearby residents. In line with our internal voluntary commitment, we report any leakage of substances with a high hazard potential from a quantity of 100 kilograms upward. For details of the environmental and transport incidents in 2021, please see Chapter 8.9 Transportation and Storage Safety.

8.6 Occupational Health and Safety

Safeguarding the occupational health and safety of our own employees, and that of the employees of contractors (commissioned outside companies) who are under the direct supervision of Bayer, entails preventing occupational accidents and occupational illnesses, assessing potential hazards, ensuring comprehensive risk management and creating a healthy working environment. Occupational safety management systems are implemented at our sites throughout the Group. In this connection, the same requirements, rules and training measures apply for employees of contractors as for Bayer employees (see regulation graphic for more information).

Within the context of our occupational health and safety management, Bayer employees and those of contractors receive extensive training in the prevention of accidents and safety incidents and promotion and maintenance of employee health. The measures range from safety briefings and special training courses on the safe handling of chemical substances to web-based training that highlights the advantages and possibilities of a work environment that promotes health. Overall, more than 83,481 employees completed health and safety training measures in 2021.

A significant proportion of the accidents and injuries suffered by our employees have behavior-linked causes. For example, accidents can occur when employees use smartphones while walking. Alongside technical and organizational measures, therefore, promoting safety-conscious behavior is an important starting point for preventing accidents and injuries. The measures we take and initiatives we introduce take into account globally recognized occupational health and safety principles. We also promote safety-conscious behavior among all our employees through the global Behavioral Safety initiative.

Occupational health and safety measures also include the monthly HSE Newsletter, which enables managerial staff to regularly incorporate HSE topics into the dialogue with the employees, as well as our global Health and Safety Day with its various activities and training measures.

In 2021, the digital transformation and the second year of the COVID pandemic provided new stimuli for the further development of our processes and available occupational health and safety measures. These included the new central intranet platform “House of Health,” which gives all employees access to health-related topics.

The central data collection platform we launched in 2021 for integrated accident management enables the sites to exchange accident analysis information with one another digitally and thus more quickly derive corrective measures. The platform also makes it easier for our occupational health and safety experts to exchange information on work-related illnesses and injuries experienced by our employees. We aim to anticipate and avoid accidents at our sites through corrective and preventive measures.

Risk assessment and preventive measures

The workplaces of our employees and those of contractors under the direct supervision of Bayer are regularly subjected to a comprehensive health-related risk assessment and hazard analysis by Bayer experts that also covers possible exposure of employees to chemicals. Details of these measures are set out in a Group regulation.

Measures derived from this analysis to protect the health of our employees follow the STOP hierarchy: 1) **s**ubstitution, 2) **t**echnical protective measures, 3) **o**rganizational protective measures and 4) **p**ersonal protective measures. These measures and targeted studies are designed to prevent occupational illnesses.

In addition to the appraisals by experts, both our employees and those of contractors are urged to immediately report work-related hazards or dangerous situations to their supervisors or via the compliance hotline.

On top of country-specific regulations regarding mandatory examinations, we offer our employees regular medical examinations – in some cases on a mandatory basis – in all countries in which this is legally permissible.

Occupational health and safety in the second year of the COVID-19 pandemic

Occupational health and safety at Bayer was once again heavily impacted by the progression and development of the COVID-19 pandemic in 2021. As the health and safety of our employees are our top priority, the Corporate Crisis Team headed by the Chairman of the Board of Management adapted the existing rules and regulations to the changing risk situations.

All rules, instructions, FAQs and further information for employees are being continuously updated and made available on a central intranet platform for the duration of the pandemic. Our employees are notified at all times of the current status of applicable local measures. That has enabled us to reduce COVID-19-related risks for our employees at the workplace. We had registered only a very low infection rate by the end of 2021, even compared with the local areas surrounding our sites. We have also observed relatively high vaccination acceptance among our employees.

The globally implemented protection concepts and measures take into account the varying occupational tasks at the respective sites. We were able to maintain or quickly restart production at the sites and thus ensure the supply of products to our patients and customers. The following measures played a role in this regard:

// Working from home wherever possible
// “STOP entry”: no access for employees showing symptoms of illness, safeguarded by a self-check questionnaire and body temperature checks at the site gates and entrances
// Two-meter distancing rule; in areas where it was not possible to observe this distance, plastic dividers were installed and the use of facemasks during working hours was made mandatory
// Hygiene rules for hand-washing and disinfection, and the general use of a facemask; we provided our employees with masks at an early stage in all countries where it was possible to do so according to national law
// Vaccination offers at numerous sites for our employees, their family members and employees of contractors under the direct supervision of Bayer, as well as family members of such contractors

Mental health

As the COVID-19 pandemic has placed an additional burden on many people worldwide, including our own employees and their families, we paid special attention to the mental health of our employees in 2021.

Through target-group-appropriate information and programs, we are endeavoring to break down taboos surrounding the issue of mental health and are looking to counteract the development of mental illness more proactively in the future:

// Development of the central intranet platform "House of Health," with wide-ranging information and training offerings to address issues such as emotional health and resilience, as well as physical health and ergonomics
// More than 600 different training courses, lectures and podcasts on maintaining good mental health, aimed at various target groups
// Workshops for managerial staff on mental health and well-being

Occupational injuries and occupational illnesses

The basis of our reporting on occupational injuries is the Recordable Incident Rate (RIR), which covers all occupational injuries and illnesses suffered by Bayer employees and employees of contractors under the direct supervision of Bayer leading to medical treatment that goes beyond basic first aid. As a result, the RIR covers injuries and occupational illnesses both with and without lost workdays. In 2021, it rose to 0.37 cases per 200,000 hours worked, which is equivalent to 441 occupational injuries worldwide (2020: 390). The RIR thus came in below the defined target for 2021 of 0.39. In statistical terms, this means that one recordable incident occurred for more than every 534,000 hours worked. Recordable injuries with lost workdays constituted 249 of the total of 441 occupational injuries, meaning that the corresponding parameter, the Lost Time Recordable Incident Rate (LTRIR), rose slightly from 0.20 in 2020 to 0.21 in 2021. The continued low number of occupational injuries was due in part to increased working from home, which was considerably expanded as a protective measure in connection with the COVID-19 pandemic.

Regrettably, two employees lost their lives in work-related accidents in 2021. An employee died in a road accident in Isando, South Africa. In Kansas City, Missouri, United States, an employee died after contracting COVID-19 – in this case it could not be ruled out that he became infected during worktime.

Recordable Occupational Injuries[1]

	2020	2021
Number of occupational injuries	390	441
of which Bayer employees	335	375
of which employees of contractors under direct Bayer supervision	55	66
Overall rate of occupational injuries (RIR[2])	0.32	0.37
Rate of occupational injuries with lost workdays (LTRIR[3])	0.20	0.21
Fatal occupational injuries	6	6
of which Bayer employees	2	2
of which employees of contractors under direct Bayer supervision	4	4

2020 figures restated
[1] The figures include Bayer employees and employees of contractors whose accidents occurred under direct Bayer supervision.
[2] RIR = Recordable Incident Rate
[3] LTRIR = Lost Time Recordable Incident Rate

Rate of Occupational Injuries (RIR) by Region[1]

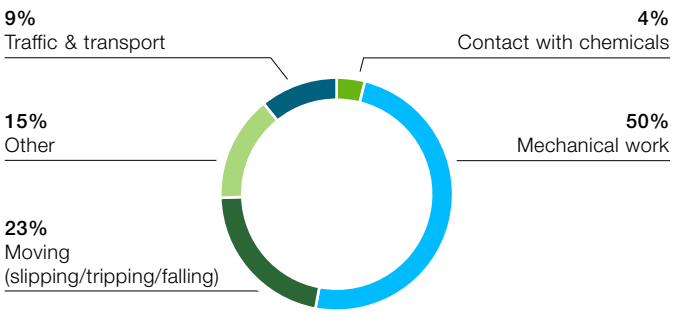
	2020	2021
Europe/Middle East/Africa	0.40	0.43
North America	0.47	0.69
Asia/Pacific	0.15	0.17
Latin America	0.23	0.18
Total	**0.32**	**0.37**

2020 figures restated
[1] The rate also includes employees of contracted outside companies whose injuries occurred on our company premises and under the supervision of Bayer.

To better assess the importance of a recordable accident in terms of specific injuries, an internal Bayer indicator was introduced in 2021 to determine the severity of an injury. We use a numeric value for this severity that results from a combination of categories. It represents an additional dimension to describe the extent of the injury and, on that basis, improve occupational safety.

In 2021, as in previous years, the number of injuries involving contact with chemicals was small (4%) in relation to the total number of occupational injuries.

Notification of Accidents and Injuries 2021



Occupational illnesses are also included in the RIR and LTRIR figures, regardless of whether they are listed in national registers of occupational diseases. As lists of occupational diseases are not globally standardized – and in many countries do not exist at all – we document all occupational illnesses, provided they have been diagnosed and recognized by a physician. In 2021, 46 new cases of occupational illnesses were reported throughout the Bayer Group, 33 of them with lost workdays. These were related to COVID-19 and the musculoskeletal system, among other disorders, without a clear pattern of risk areas identifiable. The number of incidents corresponds to 0.2 occupational illnesses per one million hours worked.

8.7 Biosafety

In accordance with the guidelines of the World Health Organization (WHO) on biorisk management, we consider biosafety to comprise the principles, technologies and processes implemented to prevent unintended exposure to biological materials that could pose a risk to people or the environment. Misuse or theft of biological materials is also prevented by corresponding measures.

Biological material must be handled with suitable care to ensure that employees, residents and the environment are protected. This includes microorganisms, invertebrates, vertebrates, plants, cell cultures, genetically modified organisms, toxins and allergens. An assessment of the biosafety risk is necessary before biological materials can be used, particularly in R&D and production. These analyses are conducted by the employee responsible for biosafety in each case and verified together with an expert. All employees tasked with biosafety must undergo regular training.

Processes for carrying out assessments and other necessary measures are established in a Group Regulation on Biosafety that is oriented to the specifications of the WHO, among others. Wherever local laws and regulations are more stringent than the standards laid out by the Group regulation, the more stringent variant takes precedence.

A group of biosafety experts from all divisions and regions cooperates within the Bayer Biosafety Panel. Under the auspices of the Public Affairs, Science, Sustainability & HSE Enabling Function, the panel is responsible for developing, reviewing and implementing Bayer's biosafety rules and regulations throughout the Group. It also advises and supports the biosafety community with which it maintains regular communication to ensure a uniform and high standard of biosafety throughout the company.

The same rules on biosafety apply in amended form for the new cell and gene therapy technology platform as for the rest of the Bayer Group (please see Chapter 2.4 Bioethics). The platform's partners have accepted the HSE Key Requirements and thus the issue of biosafety, and have undertaken to compile risk assessments on this issue. The biosafety
experts maintain a steady dialogue with one another.

The implementation of legal and Bayer Group guidelines on biosafety is also overseen by the HSE audit program.

8.8 Plant Safety

We aim to design and operate our processes and production facilities in such a way that they do not pose any inappropriate risks to our employees, the environment or neighboring communities. This is conditional on an effective system to ensure plant safety being in place that enables operational risks to be identified, remedied and reduced and their effects mitigated. We are continuously working to further develop the safety culture, the expertise of employees and the globally applicable Group regulations on process and plant safety, which also cover topics such as machine and laboratory safety and prescribe uniform processes and standards for evaluating risks and establishing suitable safety measures. We also implement training measures in this connection.

In this way we ensure that a uniform safety level is in place at the 40 Bayer sites at which volumes of hazardous substances significant for plant safety are stored or processed, while going beyond the legal requirements in most countries.

Processes and plants at Bayer are operated with a robust concept based on our Group regulations. This concept comprises instructions for safe operations, including startup and shutdown, maintenance, retrofitting procedures and response to malfunctions. Site emergency response plans define the measures to be undertaken in cases of urgency. These encompass procedural instructions for internal and external communication and reporting, including notification of responsible authorities and surrounding municipalities. The sites regularly conduct emergency exercises to assess the effectiveness of the deployments and introduce improvements if necessary. Joint exercises are conducted in cases where external personnel are crucial for emergency preparedness. The frequency of these exercises is determined based on the existing risk.

Responsibilities and verification

To ensure a high safety level at our facilities, we have defined clear responsibilities in our company that are assumed internally by various organizational units. Responsibility for the safe operation of production facilities lies with plant management. Experts from the Engineering & Technology Enabling Function are responsible together with the plant operators for conducting risk analyses and drawing up

safety concepts. Using systematic analytical methods, the process risks of our facilities are identified in interdisciplinary teams supervised by these experts. On this basis, the team develops robust protective concepts that take into account health, safety and environmental protection aspects. Everyone involved in this process completes a Group-wide plant safety training program. In addition, the safety experts must undergo a globally valid internal training and certification program that qualifies them to carry out risk analyses in the teams. The certification program ensures globally uniform quality standards in the development of safety concepts at our production facilities.

Ultimately, the Public Affairs, Science, Sustainability & HSE Enabling Function performs the necessary governance for process and plant safety in the Bayer Group. This function further develops the Group's safety management system and establishes the internal safety requirements, verifying their observance through special process and plant safety audits.

To maintain the high safety level of our facilities, the related safety concepts for each facility are examined every five years. Technical modifications are subject to a stringent change management process. Furthermore, maintenance and inspection programs are established for the safety facilities to ensure the necessary availability and functionality in case of need. Furthermore, all facilities and technical apparatus are serviced according to maintenance and inspection plans.

Plant safety is an integral component of the planning stages for capital expenditure projects. We carry out risk analyses during the various phases of a capital expenditure project. At very early stages in the development of new production processes, we examine the applicability of the principles of inherently safer design and the feasibility of a sound safety concept. Finally, before a new production facility is brought on stream, our safety experts verify all defined safety measures and confirm their proper implementation by carrying out plant and equipment inspections.

Further development of plant safety

To maintain and strengthen safety awareness, we continuously update and improve the globally binding training program TOPPS (Top Performance in Process and Plant Safety). Participation is compulsory for all Bayer employees who are able to influence process and plant safety at production and auxiliary facilities and is documented in the training system. TOPPS training documentation is available in 15 languages.

We are further developing plant safety through our active participation in internal global and regional networks of experts and as a member of associations such as the European Process Safety Centre (EPSC), the Center for Chemical Process Safety (CCPS), Dechema ProcessNet and the German Chemical Industry Association (VCI). We also drive progress in this regard worldwide within the framework of standards.

Since 2019, we have used the globally standardized key performance indicator (KPI) Process Safety Incident Rate (PSI-R) as an indicator for plant safety. This is integrated into the Group-wide reporting system. Reporting of this indicator is based on the requirements of the International Council of Chemical Associations (ICCA). Process safety incidents (PSIs) refer to incidents during which amounts of chemical substances or energy that exceed defined thresholds leak from their primary containment, such as pipelines, pumps, tanks or drums. The PSI-R indicates the number of process safety incidents per 200,000 hours worked. In 2021, the PSI-R was 0.08 (2020: 0.08). A total of 96 process safety incidents occurred in 2021 (Process Safety Incident Count, PSI-C).

In addition, we also indicate the Process Safety Incident Severity Rate (PSI-SR). We report this according to the grading system of the International Council of Chemical Associations (ICCA).

Process Safety Incidents[1]

	2020	2021
Process Safety Incident Count (PSI-C)[1]	92	96
Process Safety Incident Rate (PSI-R)[1,2]	0.08	0.08
Process Safety Incident Severity Rate (PSI-SR)[1,3]	0.21	0.14

[1] According to ICCA (International Council of Chemical Associations)
[2] Number of PSI incidents per 200,000 hours worked
[3] Degree of severity for all PSI incidents per 200,000 hours worked

To prevent substance and energy releases, the causes of PSIs are analyzed and relevant findings are communicated to potentially affected sites throughout the Bayer Group. The reporting thresholds are intentionally set at such a low level that even material and energy leaks that have no impact on employees, the local community or the environment are systematically recorded and reported. We pursue this preventive approach so that weaknesses can be identified and corrected before a more serious incident can occur.