



TCFD Report

2020

1. Governance

Management's Role

The Chairman of the Board of Management holds direct responsibility for climate protection in his role as Chief Sustainability Officer. He is supported in this by the Public Affairs, Science & Sustainability 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.

The Sustainability Council was established in 2020 to advise the Board of Management in the future in all matters related to sustainable development – including climate protection. The ever-present global relevance of climate change also explains the increasing importance of this topic at Bayer. For example, climate change and Bayer's climate strategy were discussed at a total of three meetings of the Board of Management and one Supervisory Board meeting in 2020.

The Board of Management of Bayer AG holds overall responsibility for an effective risk management system. The Audit Committee of the Supervisory Board examines the appropriateness and effectiveness of the risk management system at least once a year and reports thereafter to the full Supervisory Board.

For more information:

- // Bayer Sustainability Report 2020 – Chapter 2.1 Corporate Governance Practices and Principles
- // Bayer Sustainability Report 2020 – Chapter 7 Climate Protection
- // Bayer Annual Report 2020 – Chapter 2.7 Risk Management

Board's Oversight

Bayer AG is subject to German stock corporation law and therefore has a dual governance system consisting of the Board of Management and the Supervisory Board. The Board of Management manages the company based on a transparent strategy that is geared toward its long-term success and complies with applicable laws and ethical standards. The Supervisory Board oversees and monitors the Board of Management.

The organization and oversight obligations of the Board of Management and the Supervisory Board are mainly ensured by compliance management and risk management systems.

In our 2020 Annual Report, we report in detail on the main elements of the Bayer Group's corporate governance structures and conformity with the recommendations of the German Corporate Governance Code, relevant corporate governance practices, the composition and procedures of the Board of Management, the Supervisory Board and their committees, and the Compensation Report along with the objectives to be defined and the underlying concepts.

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For more information:

- // Bayer Sustainability Report 2020 – Chapter 2.1 Corporate Governance Practices and Principles
- // Bayer Annual Report 2020 – Chapter 2.7 Risk Management
- // Bayer Sustainability Report 2020 – Chapter 7.3 Climate Protection – Risk and Opportunity Analysis

2. Strategy

Identification and Impacts

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 anticipate that our business areas of health care and agriculture will be impacted by climate change but will also be part of the solution.

In 2020, we looked at the risks and 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); we plan to further intensify this aspect in the future, in doing so addressing the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

Short-term (extreme) weather events and long-term climate changes present a challenge particularly for the agriculture industry whose intensity can vary according to region. There are increasing risks of harvest losses and thus for the agricultural value chain as a whole. The Bayer Crop Science Division therefore takes weather and climate aspects into account when evaluating the risks for its business and aligning its business strategy.

The natural-physical effects of climate change are particularly relevant for our agricultural products. In addition, health risks such as cardiovascular disease will also intensify in many cases due to hotter summer months or more frequent heatwaves. This could create increased demand for cardiovascular or nutrient supply products.

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 one of the world's biggest CO₂ emitters, for example, the agriculture industry can help to protect the climate – for example by capturing CO₂ in farmland.

All climate models anticipate an increase in extreme weather conditions that present an elevated risk of crop losses and thus risks for the agricultural value chain as a whole. As a seed producer, we therefore want to develop plants with increased resistance against such extreme weather conditions. That includes short-stature corn that is less susceptible to storms (for more information, please see our Sustainability Report 2020 – Chapter Focus on: Agriculture). We also enable farmers to better and more quickly react to extreme weather conditions with our FieldView™ digital farming platform.

Further information about opportunities and risks can be found within the Bayer CDP Climate Report 2020.

For more information:

- // Bayer Sustainability Report 2020 – Chapter 7 Climate Protection
- // Bayer Sustainability Report 2020 – Chapter 7.2 Climate Protection – Climate Strategy
- // Bayer Sustainability Report 2020 – Chapter 7.3 Climate Protection – Risk and Opportunity Analysis
- // Bayer CDP Climate Report 2020 – www.bayer.com/cdp-climate

Resilience of Bayer's Strategy

With our strategy for achieving climate neutrality and reducing greenhouse gas emissions along a path of 1.5 degrees Celsius, we are reducing the risk of possible higher costs as a result of new or more expensive emissions certificates.

We continuously analyze the further effects of regulatory requirements on our business, such as through the EU Green Deal. National or international CO₂ reduction targets could lead to the abandonment of fossil fuels, for example; at the same time regulatory authorities have been critical of the generation of fuels from

biomass (biofuels). Depending on the regulators' decision, this could lead to either increased or reduced demand for biofuels. This decision can impact our sales markets, as some of our customers grow corn for the production of biofuels.

For more information:

- // Bayer Sustainability Report 2020 – Chapter 7.3 Climate Protection – Risk and Opportunity Analysis
- // Further information about Bayer's resilience can be found below, or on our website www.bayer.com

3. Risk Management

As a global life science enterprise, we are exposed to a wide range of internal and external developments and events that could significantly impact the achievement of our financial and nonfinancial objectives. Opportunity and risk management is therefore an integral part of corporate management at Bayer.

We have implemented a holistic and integrated risk management system designed to ensure the continued existence and future target attainment of the Group through the early identification, assessment and treatment of risks. Our risk management system is aligned to internationally recognized standards and principles such as the ISO 31000 standard.

Responsibility for the identification, assessment, treatment and reporting of risks lies with the operational business units in the divisions and enabling functions.

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In 2020, we looked at the risks and 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); we plan to further intensify this aspect in the future, in doing so addressing the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

We will conduct a scenario analysis in 2021 based on the internationally acknowledged scenarios SSPs (Shared Socioeconomic Pathways) and RCPs (Representative Concentration Pathways) of the Intergovernmental Panel on Climate Change (IPCC). This analysis is designed to help us assess the impact of climate change on our business strategy through 2030 and 2050 and to derive relevant decisions. To better prepare for tomorrow's challenges, we are analyzing scenarios both for the achievement of the Paris objectives and for global warming of 3.5 degrees Celsius. Here we distinguish between physical and transition risks and opportunities.

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 one of the world's biggest CO₂ emitters, for example, the agriculture industry can help to protect the climate – for example by capturing CO₂ in farmland.

For more information:

- // Bayer Annual Report 2020 – Chapter 3.2 Opportunity and Risk Report
- // Bayer Sustainability Report 2020 – Chapter 2.7 Corporate Governance
- // Bayer Sustainability Report 2020 – Chapter 7.3 Climate Protection – Risk and Opportunity Analysis

4. Metrics and Targets

Targets

We support the Paris Agreement and the objective of limiting global warming to 1.5 degrees Celsius relative to the pre-industrial level. In 2019, therefore, we made climate neutrality at our sites a Group target for 2030 within our climate program. We plan to attain this target partly by reducing our emissions (Scope 1 and 2) by 42% (base year: 2019) in absolute terms and partly by offsetting the remaining emissions (Scope 1 and 2). We also strive to reduce the relevant emissions in our value chain (Scope 3) by 12.3% in absolute terms. These reduction goals were confirmed by the Science Based Targets initiative (SBTi). The attainment of these targets is accounted for in the compensation of the Board of Management and upper managerial employees.

As a signatory to the Business Ambition for 1.5 degrees Celsius, we have committed to reaching net zero emissions in our entire value chain by 2050.

With our strategy for achieving climate neutrality and reducing greenhouse gas emissions along a path of 1.5 degrees Celsius, we are reducing the risk of possible higher costs as a result of new or more expensive emissions certificates.

To achieve both the Group target of climate neutrality and the Science Based Targets, we will implement various measures in the future in the areas of energy efficiency, energy sources, compensation and value chain:

CO₂ reduction / Decarbonization

- // We will spend €500 million through 2030 to attain an absolute reduction in our emissions through energy efficiency measures. We are investing in process innovations, more efficient facilities and building technology, as well as the implementation and optimization of energy management systems, particularly at our production sites. We also use an internal CO₂ price of €100 per metric ton when calculating our capital expenditure projects.
- // Worldwide, we will source 100% of our procured electricity from renewable energies by 2030. As this electricity is generated without emitting greenhouse gases, its exclusive use enables an absolute reduction of our own greenhouse gas emissions (Scope 2). We are focusing here above all on establishing long-term electricity purchase agreements with renewable energy producers that operate close to our sites wherever possible. Whenever a power supply agreement is not possible, we purchase high-quality green electricity certificates. We are also examining options for producing our own electricity from regenerative energy at our sites.
We will not be able to make all our production processes CO₂ neutral and will still have to use fossil fuels in chemical processes or special manufacturing methods. In this connection, greenhouse gas emissions do not only result from combustion, but through chemical reactions in processes required for engineering reasons.
- // For capital expenditure projects exceeding €10 million we perform a voluntary ecological assessment. This includes an evaluation of direct and indirect emissions.
- // To enable a future reduction in the emissions of our upstream value chain (supply chain, Scope 3), we undertook a Scope 3 analysis in 2020 to identify relevant reduction potentials. Possible implementation measures include giving suppliers incentives to use electricity from renewable energies, further improving our logistics and reducing packaging. Within the scope of the Together for Sustainability (TfS) industry initiative, Bayer heads up the working group on emissions reduction in the supply chain, which aims to identify possible levers and develop improvement measures. In accordance with the guidelines of the Science Based Targets initiative (SBTi), the calculation of our reduction target for Scope 3 emissions takes into account five categories that make up the biggest portion of our Scope 3 emissions (88%).

CO₂ neutralization

// We will fully offset these unavoidable emissions (Scope 1 and 2) by 2030 through certificates from compensation projects, especially in reforestation, forest conservation and agriculture. In selecting projects, we pay particular attention to ensuring that they enable long-term CO₂ capture (permanence) and that this would not take place without the sale of certificates (additionality). In addition, we have established further internal quality requirements such as the certification of projects according to internationally acknowledged standards. We also prefer projects that not only achieve CO₂ capture, but also provide social benefit for the disadvantaged population. Yet it is also especially important to us to promote biodiversity and water conservation and to prevent the development and spread of deserts. We already offset 200,000 metric tons of CO₂ in 2020, for example by financing reforestation projects in Uruguay, Brazil and China.

Climate resilience

- // Crop Science works continuously to improve its products and develop solutions for achieving sustainable agricultural practices. Our innovations in the areas of plant breeding and crop protection are designed to further improve both the quality and the quantity of harvests and enhance plants' resilience against insect pests, diseases and a changing climate.
- // One example of the possibilities offered by new breeding techniques is our short stature corn, which we will commercialize in the coming years: Through breeding, plant biotechnology and genome editing, we have succeeded in developing seed varieties that enable the growth of shorter corn plants that have the potential to not bend or break as easily as corn plants of regular height in the presence of strong winds or heavy rain. Losses in the United States due to bent plants amount to between 5 and 25% a year depending on the severity of weather events. Short stature corn also has the potential to enable a more optimized uptake of water and nutrients such as nitrogen through the less pronounced development of the other plant parts.
- // We launched the Bayer Carbon Initiative in 2020 to attain our target of a 30% reduction in greenhouse gas emissions from farming by 2030. This underscores the central role that farmers and their fields can play in having a positive long-term environmental impact. Encouraging farmers to forgo plowing, precisely determine their nitrogen requirement or utilize cover crops enables greenhouse gas emissions to be lowered and CO₂ to be better captured in the soil. Some 700 farmers in Brazil and the United States are participating in the program during the 2020/2021 growing season. In both countries, they will receive support from us in implementing climate-friendly farming processes.

For more information:

- // Bayer Annual Report 2020 – Chapter 1.2 Strategy and Management – Sustainability
- // Bayer Sustainability Report 2020 – Chapter Sustainability Strategy
- // Bayer Sustainability Report 2020 – Chapter 3.6 Product Stewardship – Crop Science
- // Bayer Sustainability Report 2020 – Chapter 7.2 Climate Protection – Climate Strategy
- // Bayer Sustainability Report 2020 – Chapter 7.3 Climate Protection – Risk and Opportunity Analysis
- // Bayer Sustainability Report 2020 – Chapter 8.1 Environmental Protection and Safety – Management Approach
- // [https://www.cropscience.bayer.com/people-planet/climate-change/a/carbon-zero-future-for-agriculture](https://www.cropsscience.bayer.com/people-planet/climate-change/a/carbon-zero-future-for-agriculture)

Metrics

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 production of our products. Some of our emissions derive from chemical processes in which coal and other energy sources are required to produce chemical reactions. Emissions are also generated through 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 line with the GHG Protocol, we report indirect emissions (Scope 2) according to both the location-based and the market-based methods.

For more information:

- // Bayer Sustainability Report 2020 – Chapter 7.4 Climate Protection – Greenhouse Gas Emissions

Scope 1, Scope 2 and Scope 3 Emissions

Greenhouse Gas Emissions (Scope 1 and 2)		
Million metric tons of CO ₂ equivalents	2019	2020
Scope 1: Direct emissions ¹	2.08	2.01
of which carbon dioxide (CO ₂)	2.01	1.96
of which ozone-depleting substances	0.031	0.012
of which partially fluorinated hydrocarbons	0.020	0.022
of which nitrous oxide (N ₂ O)	0.008	0.008
of which methane (CH ₄)	0.004	0.003
Scope 2: Indirect emissions ² according to the location-based method	1.77	1.75
Scope 2: Indirect emissions ² according to the market-based method ³	1.68	1.57
Total greenhouse gas emissions according to the market-based method³	3.76	3.58
of which offset greenhouse gas emissions	–	0.2
Specific greenhouse gas emissions (kg CO ₂ e/€ thousand external sales) according to the market-based method ^{3,4}	86.38	86.55

2019 figures restated

¹ In line with the GHG Protocol, we also report the direct emissions resulting from the generation of energy for other companies and sold as a site service. In 2020, resulting emissions corresponded to 0.11 million metric tons of CO₂ equivalents.

² Typically, CO₂ 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 CO₂ 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 from the total volume of direct emissions and indirect emissions calculated using the market-based method of the GHG Protocol (Scope 2), divided by the external sales volume.

In 2020, the Bayer Group was involved in European emissions trading with five plants in total. The CO₂ emissions of these plants amounted to almost 313,000 metric tons.

Due to the varying depth of value creation, direct and indirect greenhouse gas emissions (Scope 1 and 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 According to Division (Scope 1 and 2)

Million metric tons of CO ₂ equivalents	2020
Scope 1: Direct emissions ¹	2.01
of which at Crop Science	1.65
of which at Pharmaceuticals	0.19
of which at Consumer Health	0.02
of which other ²	0.16
Scope 2: Indirect emissions ³ according to the market-based method ⁴	1.57
of which at Crop Science	1.38
of which at Pharmaceuticals	0.13
of which at Consumer Health	0.06
of which other ²	0.004

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

² These comprise greenhouse gas emissions from the vehicle fleet and emissions caused by the enabling functions.

³ Typically, CO₂ 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 CO₂ 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.

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.

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 relevant categories that make up the biggest portion of our Scope 3 emissions (88%). We also separately report the sum of these Scope 3 emissions in the following table.

Greenhouse Gas Emissions in the Value Chain (Scope 3)

Million metric tons of CO ₂ equivalents	2019	2020
Scope 3: Indirect emissions from our upstream and downstream value chain (by materiality) ¹	10.05	8.86
of which indirect emissions from our upstream and downstream value chain to attain the SBT ^{2,3}	8.87	7.88
Progress in the reduction of Scope 3 emissions ^{4,5}	–	– 11.2%

2019 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, (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, 88% 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 2030 target: 12.3% reduction

⁵ All greenhouse gas emissions from air travel in 2020 were offset.

For more information:

// Bayer Sustainability Report 2020 – Chapter 7.4 Climate Protection – Greenhouse Gas Emissions

// We address our climate protection activities in our latest report to CDP (formerly the Carbon Disclosure Project): www.bayer.com/cdp-climate

Masthead

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Editor

Jörg Schäfer, phone +49 214 30 39136

Email: joerg.schaefer@bayer.com

Public Affairs & Sustainability

Ute Menke, phone +49 214 30 36520

Email: ute.menke@bayer.com

Sebastian Leins, phone +49 214 30 25782

Email: sebastian.leins@bayer.com

Bayer on the internet: www.bayer.com

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