

# Welcome to your CDP Climate Change Questionnaire 2022

## C0. Introduction

### C0.1

#### **(C0.1) Give a general description and introduction to your organization.**

At BASF, we create chemistry for a sustainable future. About 111,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world.

BASF's activities are grouped into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. In 2021, BASF posted sales of €78.6 billion and income from operations before special items of approx. €7.8 billion. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the U.S. Further information on BASF is available at [www.basf.com](http://www.basf.com).

We carry out our corporate purpose, "We create chemistry for a sustainable future", by pursuing ambitious goals along our entire value chain. In this way, we aim to achieve profitable growth and take on social and environmental responsibility. Our products, solutions and technologies contribute to achieving the United Nations' Sustainable Development Goals (SDGs), for example, on sustainable consumption and production, climate action or fighting hunger. We are committed to contributing to the Paris climate agreement and support the recommendations of the Task Force on Climate-related Financial Disclosure (TCFD). We have defined sustainability focus areas in our corporate strategy to position ourselves in the market while meeting the growing challenges along the value chain: We source responsibly; We produce safely for people and environment; We produce efficiently; We value people and treat them with respect; We drive sustainable products and solutions.

Our leading position as an integrated global chemical company gives us the chance to make important contributions in the areas of resources, environment and climate, food and nutrition, and quality of life. Dealing with climate change is one of the major challenges to ensure a sustainable future. That's why we are committed to energy efficiency and global climate protection along the value chain.

Since 1990, we have been able to lower our overall greenhouse gas (GHG) emissions from chemical operations by 49.7% and reduce specific emissions by 75.4%. In March 2021, we set

new ambitious climate goals: We raised our medium-term 2030 target from CO2-neutral growth to reducing our global GHG emissions by 25 percent compared with 2018 – despite targeted growth and construction of a large Verbund site in South China. Further, we want to achieve net zero emissions by 2050. To achieve our ambitious climate protection goals, we have adopted comprehensive carbon management. This has five levers to reduce greenhouse gas emissions: Using renewable energies for both electricity and steam production (gray-to-green and power-to-steam levers), developing and applying new carbon-free and low-carbon production processes (new technologies lever), using alternative raw materials (bio-based feedstocks lever), and ongoing measures to further increase energy and resource efficiency in our production (continuous opex lever).

We also offer solutions that help our customers to avoid GHG emissions. They are classified as Accelerators “Climate Change and Energy” in our portfolio steering approach “Sustainable Solution Steering” and reflect our wide portfolio of climate protection products. For example, our expandable polystyrene granulates Styropor® and Neopor® are used to insulate buildings and help to save heating energy and reduce CO2. We invest more than 60% of our annual Research and Development (R&D) expenditures (€2.216 billion total R&D expenses in 2021) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection.

We use an in-house digital solution to calculate the carbon footprint of our products (PCF). These PCFs include all product-related greenhouse gas emissions generated until a BASF product leaves the factory gates (“cradle-to-gate”). The methodology follows general standards for life cycle analysis such as ISO 14044 and ISO 14067, as well as the Greenhouse Gas Protocol Product Standard, and has been certified by TÜV Rheinland. We used the method to calculate PCFs for around 45,000 sales products in 2021. The transparency this creates enables us to target our CO2 reduction measures to those areas where our customers can later achieve the greatest value added from lower carbon emissions in the value chain.

Forward-Looking Statements: This document may contain forward-looking statements. These statements are based on current estimates and projections and currently available information. Future statements are not guaranteeing future developments and results outlined therein. These are dependent on several factors; they involve various risks and uncertainties; and they are based on assumptions that may not prove to be accurate. We do not assume any obligation to update the forward-looking statements contained in this report.

## C0.2

### (C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1, 2021	December 31, 2021	Yes	1 year

## C0.3

**(C0.3) Select the countries/areas in which you operate.**

Argentina  
Australia  
Bahrain  
Belgium  
Brazil  
Canada  
Chile  
China  
Denmark  
Finland  
France  
Germany  
India  
Indonesia  
Ireland  
Italy  
Japan  
Malaysia  
Mexico  
Netherlands  
New Zealand  
Norway  
Poland  
Republic of Korea  
Russian Federation  
Singapore  
Slovakia  
South Africa  
Spain  
Switzerland  
Taiwan, China  
Thailand  
Turkey  
United Kingdom of Great Britain and Northern Ireland  
United States of America

## C0.4

**(C0.4) Select the currency used for all financial information disclosed throughout your response.**

EUR

## C0.5

**(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.**

Other, please specify

Worldwide production sites of BASF SE, its fully consolidated subsidiaries (emissions included in full), and proportionally consolidated joint operations (emissions disclosed pro rata according to BASF's interest)

## C-CH0.7

**(C-CH0.7) Which part of the chemicals value chain does your organization operate in?**

**Row 1**

### **Bulk organic chemicals**

Lower olefins (cracking)  
 Aromatics  
 Ethylene oxide & Ethylene glycol  
 Ethanol  
 Methanol  
 Polymers  
 Adipic acid

### **Bulk inorganic chemicals**

Ammonia  
 Fertilizers  
 Nitric acid  
 Chlorine and Sodium hydroxide  
 Carbon black  
 Soda ash  
 Titanium dioxide  
 Hydrogen  
 Oxygen  
 Other industrial gasses

### **Other chemicals**

Specialty chemicals  
 Specialty organic chemicals  
 Other, please specify  
 Approximately 45,000 sales products in total

## C0.8

**(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?**

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, an ISIN code	DE000BASF111

## C1. Governance

### C1.1

**(C1.1) Is there board-level oversight of climate-related issues within your organization?**

Yes

#### C1.1a

**(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.**

Position of individual(s)	Please explain
Chief Executive Officer (CEO)	<p><b>POSITION AND RELATION TO CLIMATE ISSUES</b></p> <p>The CEO of BASF has the overall responsibility for climate protection as part of the CEO’s wider responsibility for the Corporate Development Division of BASF, which develops and integrates sustainability in BASF’s strategies, and the Senior Project “Net Zero Accelerator”, which is bundling and accelerating cross-company activities to reduce GHG emissions. In this role, the CEO takes care of the development of climate protection targets, monitoring of target performance, advancing measures toward target achievement, and promoting/aligning climate-related issues in areas under the responsibility of other Board members (e.g. accounting for greenhouse gas emissions, supply chain activities, sustainable finance). The head of BASF’s Corporate Development Division, which has oversight for all climate protection topics in BASF, and the head of the Senior Project “Net Zero Accelerator”, which drives cross-company GHG emission reduction activities, report directly to the CEO.</p> <p><b>EXAMPLE OF CLIMATE-RELATED DECISION</b></p> <p>In 2021, the CEO initiated the establishment of the Senior Project “Net Zero Accelerator” to push the implementation of measures supporting BASF’s climate protection targets. The project kicked off in January 2022 with initially about 80 employees.</p>

#### C1.1b

**(C1.1b) Provide further details on the board’s oversight of climate-related issues.**

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<p><b>GOVERNANCE MECHANISMS</b></p> <p>Our Management Board reviews at least annually major climate-related topics like, for instance:</p> <ul style="list-style-type: none"> <li>- Climate-related risks and opportunities</li> <li>- Target performance</li> <li>- Budgets for functions and business units involved in climate-related topics</li> <li>- Carbon price forecasts</li> <li>- Progress on specific measures supporting BASF's sustainability strategy.</li> </ul> <p>In addition, depending on need, the following topics are addressed:</p> <ul style="list-style-type: none"> <li>- Investment decisions</li> <li>- Requests for approval of specific action plans, e.g. new R&amp;D initiatives.</li> </ul> <p><b>HOW SELECTED MECHANISMS CONTRIBUTE TO THE BOARD'S OVERSIGHT</b></p> <p>In the context of reviewing and guiding risk management policies, the Board receives twice a year a summary of the aggregated opportunity/risk exposure of BASF, including climate-related risks. The information is provided by Corporate Controlling and Finance and major points are discussed in Board meetings. This mechanism warrants that the Board can keep track of changes to the company risk profile (including climate change-related issues) and initiate corrective measures in case of significant changes.</p>

## C1.1d

**(C1.1d) Does your organization have at least one board member with competence on climate-related issues?**

Board member(s) have competence on climate-related issues	Criteria used to assess competence of board member(s) on climate-related issues

Row 1	Yes	<p>The Supervisory Board works hand in hand with the Board of Executive Directors in a holistic approach to determine suitable Board candidates. The competence profile of Board members requires many years of management experience in scientific, technical, and commercial fields.</p> <p>Further, the Board members improve their climate-related competencies via exchange with BASF's external Stakeholder Advisory Council which includes renowned experts on climate change.</p> <p>One Board member held a lecture about climate change and the chemical sector in the context of a Guest Professorship.</p> <p>Another BASF Board member is a member of the German Council for Sustainable Development, which published a position paper on climate neutrality.</p>
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## C1.2

**(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.**

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
President	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

## C1.2a

**(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).**

### **President of the Corporate Development Division**

#### **POSITION IN COMPANY**

The President of the Corporate Development Division represents the highest responsibility for overall governance for climate protection below the Board of Directors (= delegation of governance from Board). The President leads the Corporate Development Division and reports directly to the CEO who is the Board member with overall responsibility for climate-related topics within BASF. The three major units of the Corporate Development Division – strategic planning (including sustainability strategy), technology assessments, economic evaluations – provide core global functionalities for BASF's greenhouse gas (GHG) emission steering, e.g. governance for emission reduction and energy efficiency activities, consideration of GHG emissions in investment decisions, assessment of long-term scenarios, and preparation of top management decisions on climate protection, such as corporate environmental goal setting.

## RESPONSIBILITIES REGARDING CLIMATE-RELATED ISSUES

The President of the Corporate Development Division has oversight over the measures for GHG emission steering governed by the abovementioned three major units of the Corporate Development Division. Furthermore, the President is briefed regularly on current and emerging climate change-related issues highlighted by the Sustainability Manager heading the “Carbon Steering” unit within the Corporate Development Division, which covers these issues constantly as part of its core responsibilities. Finally, the President is a member of the Corporate Sustainability Board (CSB) led by a second Board member, which is BASF’s central steering committee for sustainable development. It is comprised of selected heads of business, corporate and functional units as well as of the regions. The CSB monitors the implementation of the sustainability strategy and cross-divisional initiatives, defines sustainability goals and approves corporate position papers on sustainability topics. Climate-related work under the head of BASF’s Corporate Development Division is discussed and aligned with the CSB in support of sustainable development and preparation of climate-related Board level discussions.

## RATIONALE OF ASSIGNMENT

Climate protection is a core element of BASF’s corporate strategy, which underpins BASF’s purpose “We create chemistry for a sustainable future”. The President of the Corporate Development Division has overall responsibility for the development and implementation of the BASF strategy and consequently, the responsibility for climate-related issues embedded in the strategy has been assigned to this role as well.

### **President of the Senior Project “Net Zero Accelerator”**

## POSITION IN COMPANY

The President of the Senior Project “Net Zero Accelerator” represents the highest responsibility for driving cross-company GHG emission reduction activities below the Board of Directors (= delegation of governance from Board). The President leads the Senior Project “Net Zero Accelerator” and reports directly to the CEO who is the Board member with overall responsibility for climate-related topics within BASF. The four major pillars of the Senior Project – Low Carbon Emission Technologies & Projects, Renewable Energy, Circularity & Renewable Raw Materials, and Transformation Opportunities – bundle major projects of BASF’s current levers for carbon management and provide core functionalities for the future development of the project portfolio of the Senior Project.

## RESPONSIBILITIES REGARDING CLIMATE-RELATED ISSUES

The President of the Senior Project has oversight over the measures for GHG emission reduction governed by the Senior Project organization associated with the four abovementioned pillars.

## RATIONALE OF ASSIGNMENT



The Senior Project “Net Zero Accelerator” has the explicit mission to bundle and accelerate BASF’s extensive activities to achieve climate neutrality in 2050, and the President is the head of this unit. Consequently, the responsibility has been assigned to this role.

## C1.3

**(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?**

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	

## C1.3a

**(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).**

Entitled to incentive	Type of incentive	Activity incentivized	Comment
Board/Executive board	Monetary reward	Efficiency target	Actual annual variable compensation of Board members is based on the achievement of set targets and the company’s success. This includes the achievement of BASF’s climate protection target.
Executive officer	Monetary reward	Efficiency target	Depending on the individual function of the officer, a wide range of actions, e.g. increase of process/energy efficiency, reduction of emissions, reduction of supply chain impacts or increase of sales of climate protection products, is incentivized.
Environment/Sustainability manager	Monetary reward	Efficiency target	Depending on the individual function of the manager, a wide range of actions, e.g. increase of process/energy efficiency, reduction of emissions, reduction of supply chain impacts or increase of sales of climate protection products, is incentivized.
Process operation manager	Monetary reward	Efficiency target	In the context of continuous improvement of operational excellence, process operation managers are incentivized to increase energy efficiency and reduce emissions in BASF plants.
Other, please specify	Monetary reward	Other (please specify)	Marketing manager’s performance is measured, amongst other KPIs, against

Marketing manager/account executive		Sales of climate protection products	sales targets, including sales of climate protection products.
Other, please specify Project leaders R&D	Monetary reward	Other (please specify) Developing climate protection products	R&D managers pursue projects based on individual targets related to progress on the development of new products, for example in our focus research areas derived from the three major areas in which chemistry-based innovations will play a key role in the future: resources, environment and climate; food and nutrition; and quality of life.
All employees	Monetary reward	Other (please specify) Emissions reduction project	BASF is constantly running suggestion scheme campaigns at different BASF sites. Each idea that is implemented earns a premium paid to the employee which is proportional to the amount of cost savings. Regularly special campaigns are launched that focus on energy savings and carbon emission reductions. If greenhouse gas emissions are avoided an additional CO2 bonus is paid. The ideas implemented in 2021 result in an annual greenhouse gas emission reduction of about 12,000 metric tons of CO2e.

## C2. Risks and opportunities

### C2.1

**(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?**

Yes

### C2.1a

**(C2.1a) How does your organization define short-, medium- and long-term time horizons?**

	From (years)	To (years)	Comment
Short-term	0	3	Timeframe aligned with wider enterprise risk management process.
Medium-term	3	10	Timeframe aligned with wider enterprise risk management process.

Long-term	10		Timeframe aligned with wider enterprise risk management process.
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## C2.1b

### (C2.1b) How does your organization define substantive financial or strategic impact on your business?

#### DEFINITION OF SUBSTANTIVE IMPACT

We understand risk to be any event that can negatively impact the achievement of our operational or strategic goals. We define opportunities as potential successes that exceed our defined goals. A specific risk or opportunity is considered as having a substantive impact if the resulting deviation from planned earnings exceeds €10 million. We have further defined the magnitude of impact to be linked to the following net financial implications for BASF's EBIT: High = more than €100 million, Medium = €10-100 million, Low = less than €10 million. If a new risk is identified that could have an impact on earnings of more than €10 million or bears reputational risks, it must be immediately reported to the Board of Executive Directors.

#### QUANTIFIABLE INDICATORS USED TO DEFINE SUBSTANTIVE IMPACT

(a) Potential financial implications for BASF: Depending on the nature of the risk or opportunity, different methods for quantification are considered. In case of a clear understanding about the direction of change driven by the risk/opportunity, the effects will be quantified based on expert assessments about the potential level of change and cause-effect-relationships. If the direction of change is unclear, i.e. the effect can be positive or negative and thus represents a volatility/uncertainty, a case-specific probability distribution over the impact range is estimated.

(b) Probability of occurrence: Financial impacts will only be considered where a risk or opportunity has a probability of occurrence of at least 1% or the potential to threaten BASF's license to operate. The method for estimation of probability depends on the nature of the risk or opportunity. In case that statistical data about the occurrence of the risk/opportunity are available (e.g. knowledge about return periods of weather events), such information will be the basis for the calculation of likelihoods. If no such statistical relationship can be relied on (e.g. when assessing the probability of implementation of certain policy measures), the likelihood will be subject to expert estimates. We classify probabilities as follows: low = less than 30%, medium = 30-70%, high = more than 70%.

## C2.2

### (C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

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#### Value chain stage(s) covered

Direct operations

Upstream  
Downstream

### **Risk management process**

Integrated into multi-disciplinary company-wide risk management process

### **Frequency of assessment**

More than once a year

### **Time horizon(s) covered**

Short-term  
Medium-term  
Long-term

### **Description of process**

Climate-related risks and opportunities are integrated into the company-wide risk identification, assessment, and management process that is based on the international risk management standard COSO II Enterprise Risk Management – Integrated Framework (2004). Climate-related risk reporting is systematically integrated into the aggregated opportunity/risk exposure of the BASF Group and is delivered twice a year by Corporate Controlling and Finance to BASF Group’s management

#### IDENTIFICATION

During the annual update of BASF’s catalog of opportunity and risk categories experts from various units such as corporate sustainability, advocacy, corporate technology, investor relations (IR), procurement, and supply chain identify topics that might have a material impact on BASF. Climate change is included as one major driver for risks but also opportunities. This catalog forms the basis for our risk assessment:

**Reputation:** Teams of Investor Relations, Corporate Strategy, Advocacy, and Corporate Communications monitor external stakeholders’ (e.g. investors, analysts, NGOs, media) expectations and brand perception and report major risks to the Board of Directors on a regular basis.

**Market development:** BASF’s economic intelligence and strategy teams are screening the market for possible future developments for BASF’s key customer industries. They discuss trends relevant at corporate level, e.g., regarding fit with the BASF strategy, and derive options for our businesses. Additionally, a disruption radar was developed to understand potential major strategic threats.

**Technology:** BASF’s corporate technology experts regularly review new technological developments regarding their potential for process optimization and improved environmental performance, including lower emissions. The findings are integrated into medium-term and long-term strategic analyses on the future of BASF’s production setup.

**Regulatory:** A global team of energy and climate policy experts analyses local and regional developments of regulation affecting BASF directly (e.g. carbon pricing systems) or indirectly via BASF-relevant value chains (e.g. regulation for products of key customers). In addition, the corporate Energy and Climate Policy group reviews

aggregated effects of global progress on climate protection (e.g. Paris Agreement). Experts from BUs and central functions evaluate effects on BASF business and decide on risk mitigation measures.

Climate/weather change: A climate risk dashboard provides information about potential physical risks from climate change for our production sites in Europe, Asia, North America and South America. This information is shared with site managers to enable a site-specific risk assessment to complement the site strategies and site developments. The assessment includes a view on interruption of supply chains and logistics for BASF products, i.e. upstream and downstream risks.

## ASSESSMENT

All risks and opportunities are evaluated based on (a) their potential financial implications for BASF and (b) their probability of occurrence, with the results of the assessment highlighting those risks and opportunities which can have a substantial impact (>€10 million deviation from planned earnings / >1% probability of occurrence or threat to license to operate).

The ERM framework, as laid out in a BASF Risk Management Policy and the Risk Management Process document, ensures that all risks and opportunities (including those related to climate as provided) are reported according to the same principles of quantification in a comparable manner.

Corporate Finance coordinates the integrity of the framework, guides reporting units and conducts an analysis of all reported risks with the goal to identify cross-divisional, cumulative risks and to assess the aggregated possible impact. Depending on the type of risk/opportunity, the time horizons considered vary. For instance, regulations regarding Emissions Trading Schemes (ETS) and risks connected to it, are already currently affecting our operations, while emerging regulation requires a medium- and long-term perspective.

## RESPONSE

Following the principle of decentralized ERM, climate-related risks and opportunities are usually managed by the local, regional, and corporate business and functional units responsible for identifying and assessing them. These units take the first decision to mitigate, transfer, accept or control climate-related risks, to capitalize on opportunities, and to prioritize risks in line with the policies and requirements laid out in the general ERM policies and requirements. In view of risks/opportunities of higher potential impact, these units also decide to escalate findings and decisions to upper management levels. Additionally, BASF's Risk Committee reviews the BASF Group's risk portfolio at least twice a year to evaluate any adjustments to risk-management measures and informs the Board of Executive Directors of these.

## C2.2a

**(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?**

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	<p><b>RATIONALE FOR RELEVANCE</b></p> <p>BASF as an energy- and emissions-intensive company is directly affected by current and emerging regulations targeting energy use and efficiency as well as reduction of emissions. Such regulation can result in significant cost burdens for production.</p> <p><b>EXAMPLE</b></p> <p>A high number of power plants and chemical plants of BASF are regulated under the European ETS. Changes in prices for emission certificates can have a substantial impact on their cost of production. Hence, a team of experts from business units and central functions analyses emission certificate costs for all BASF plants included in the EU ETS based on the plants' emissions profiles as well as current and estimated future prices of certificates.</p>
Emerging regulation	Relevant, always included	<p><b>RATIONALE FOR RELEVANCE</b></p> <p>BASF as an energy- and emissions-intensive company is directly affected by current and emerging regulations targeting energy use and efficiency as well as reduction of emissions. Such regulation can result in significant cost burdens for production.</p> <p><b>EXAMPLE</b></p> <p>BASF has operations in China, which may be affected by the national ETS, potentially leading to higher operational costs for BASF based on the GHG emissions that fall under the scheme. A team of experts from business units and central functions conducts an impact assessment for the planned regulation.</p>
Technology	Relevant, sometimes included	<p><b>RATIONALE FOR RELEVANCE</b></p> <p>New technologies in GHG-intensive sectors in general and the chemical sector in particular (e.g. steam cracker with electric heating, carbon capture, and storage or use) may result in a step change of production processes. BASF with its wide range of assets often interlinked for process optimization (Verbund principle) needs to be aware of these changes to maintain a competitive production setup.</p> <p><b>EXAMPLE</b></p> <p>BASF's corporate technology experts regularly review new developments for power-to-x technologies, given that chemicals are</p>

		discussed to be a potential option for energy storage and sector coupling under the power-to-x concept. The findings are integrated into medium-term and long-term strategic analyses on the future of BASF's production setup.
Legal	Not relevant, included	<p>RATIONALE FOR RELEVANCE</p> <p>BASF monitors the development of litigation in all areas and geographies relevant to the company. While there is an overall increase in climate change-related litigations, the current main focus is not on the chemical industry. Based on BASF's ambitious climate targets, BASF's risk to become subject to lawsuits or other forms of legal disputes with a clear relation to climate change is seen as low in the medium-term. Given that there are no clear and substantive early warning signs of company-specific risk from the trend monitoring, legal risks from climate change are not considered relevant now. Please note that potential risks arising from current or future regulations are also categorized as legal risks within the BASF risk management and are monitored as described above under "current/emerging regulation".</p>
Market	Relevant, sometimes included	<p>RATIONALE FOR RELEVANCE</p> <p>BASF offers approximately 45,000 sales products for a wide range of value chains, e.g. automotive, construction, food. Megatrends in our customer industries may become a risk or opportunity for parts of our product portfolio, depending on the change in customer demand. Some of these changes may be driven by climate-related aspects (e.g. automotive: trend towards electric vehicles), while other parts of business are less affected by climate change (e.g. pigments). Hence, assessment of climate-related market risks only plays a more important role for the part of business considered to be more exposed to respective changes.</p> <p>EXAMPLE</p> <p>BASF delivers many solutions to the automotive industry. Recent trends to more climate-friendly products and technologies for transport (e.g. electric vehicles) pose a risk for our sales of products for the established customer solutions (e.g. catalysts for mobile combustion engines). Therefore, BASF experts from different business units, cooperating under the internal Global Automotive Steering Committee, conduct impact assessments of the trends. The findings are integrated into strategic considerations for business development.</p>
Reputation	Relevant, always included	<p>RATIONALE FOR RELEVANCE</p> <p>BASF has a significant corporate carbon footprint and is listed amongst the 166 focus companies that are cited by the investor-led initiative</p>

		<p>Climate Action 100+ as accounting for more than 80 percent of corporate industrial greenhouse gas (GHG) emissions. As a global industry leader, BASF is expected to act proactively on the challenges of climate change. If major investors (e.g. BlackRock, the largest single shareholder) or sustainability-oriented customers were to perceive BASF's business activities to be misaligned with the growing global momentum to act against climate change this could pose a reputational risk to the company that can ultimately lead to lower sales and a reduced market valuation.</p> <p>EXAMPLE</p> <p>BASF is in the focus of various investor-led initiatives like Climate Action 100+ which aims to engage with the world's largest corporate GHG emitters and ensure that they curb their GHG emissions. BASF's Investor Relations (IR) unit is closely monitoring the activities of such initiatives and engaging with the stakeholders.</p>
<p>Acute physical</p>	<p>Relevant, always included</p>	<p>RATIONALE FOR RELEVANCE</p> <p>BASF operates in around 250 production sites in diverse environments in around 90 countries all over the world (e.g. Ludwigshafen/Germany, Antwerp/Belgium, Geismar/USA, Guaratinguetá/Brazil, Kuantan/Malaysia, Nanjing/China). Given the global setup of the production base, acute physical risks from climate change cannot be excluded as an intrinsic risk factor with potentially significant impacts on individual sites and therefore need to be assessed for relevance.</p> <p>EXAMPLE</p> <p>BASF operates production sites in regions potentially vulnerable to the increased frequency of cyclones due to climate change. Respective changes in physical climate parameters can lead to more extreme weather conditions, which represent an inherent risk for our production capacity. Such kind of risks from climate change for our sites in Europe, Asia, North America, and South America are assessed by BASF-internal experts in close cooperation with renowned research institutions using their own observations and public information. The information is shared with site managers to complement the standard procedures for long-term maintenance of the sites.</p>
<p>Chronic physical</p>	<p>Relevant, always included</p>	<p>RATIONALE FOR RELEVANCE</p> <p>BASF operates in around 250 production sites in diverse environments in around 90 countries all over the world (e.g. Ludwigshafen/Germany, Antwerp/Belgium, Geismar/USA, Guaratinguetá/Brazil, Kuantan/Malaysia, Nanjing/China). Given the global setup of the production base, chronic physical risks from climate change cannot be</p>



		<p>excluded as intrinsic risk factor with potential significant impact on individual sites and therefore need to be assessed for relevance.</p> <p>EXAMPLE</p> <p>Most BASF sites require water for their production processes and cooling, and many sites use nearby waterways for logistics. Climate change is projected to have a long-term effect on regional precipitation patterns for many of the regions where our sites are located, including a reduction of the amount of precipitation in some regions (e.g. Gulf of Mexico, and the Mediterranean). Lower precipitation levels may ultimately limit availability of water at affected production sites and thus represent a risk that BASF must decrease production capacity and/or change mode of transport due to limited navigability of waterways. Such kind of risks from climate change for our sites in Europe, Asia, North America and South America are assessed by BASF-internal experts in close cooperation with renowned research institutions using own observations and public information. The information is shared with site managers to complement the standard procedures for long-term maintenance of the sites.</p>
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## C2.3

**(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?**

Yes

## C2.3a

**(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.**

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**Identifier**

Risk 1

**Where in the value chain does the risk driver occur?**

Direct operations

**Risk type & Primary climate-related risk driver**

Emerging regulation  
Carbon pricing mechanisms

**Primary potential financial impact**

Increased direct costs

**Company-specific description**

BASF's main regulatory risk derives from additional cost burdens from the EU emissions trading system (ETS) compared to global competitors which have no comparable additional costs. In fact, approx. 52% of our Scope 1 and Scope 2 emissions are covered by the EU ETS and have to be backed by the appropriate allowances. The tightening of the EU 2030 climate target from -40% to -55% GHG emission reduction will bring additional costs for BASF: It requires a lower 2030 ETS cap while existing Carbon Leakage protection instruments (e.g. free emission allowances) may be reduced and new instruments suggested by the EU Commission like Carbon Border Adjustments are not able to provide an adequate level of protection. This may result in competitive disadvantages even for the best performers, combined with increasing prices for the certificates which we will have to buy, and substantial administrative costs. Even though the efficiency of BASF's plants is above average, and BASF is leading the transition to GHG-free technologies, a lack of free allowances leads to a loss of competitiveness compared to non-European competitors. In addition to the direct effects in the context of the ETS, we also face indirect effects through higher electricity prices for our power purchase because of increasing costs for emission allowances being passed on from the power sector, while compensation for these costs decreased. We estimate the energy volume of BASF affected by the limitation of compensation to be in the order of 2.3 TWh.

**Time horizon**

Medium-term

**Likelihood**

Likely

**Magnitude of impact**

High

**Are you able to provide a potential financial impact figure?**

Yes, an estimated range

**Potential financial impact figure (currency)**

**Potential financial impact figure – minimum (currency)**

150,000,000

**Potential financial impact figure – maximum (currency)**

350,000,000

**Explanation of financial impact figure**

The quantification of the risk is based on the following assumptions: under the revised EU ETS Directive (based on the suggestion by the EU Commission in 2021) with a disproportionate burden between the ETS and non-ETS sectors, the free allocation of allowances may decrease by the order of about 3 million allowances for BASF in consideration of a medium-term time horizon. At the same time, ETS certificate prices may rise significantly during the 4th trading period. Calculating with an estimated new

range of carbon prices of 55-125 €, this results in a risk of about €150-350 million per year (conservative estimation approach).

### Cost of response to risk

1,000,000,000

### Description of response and explanation of cost calculation

#### RESPONSE

We mitigate cost impacts by reducing GHG emissions intensity through numerous measures:

- (1) Development and deployment of new CO<sub>2</sub>-free processes to produce chemicals, with a focus on technologies replacing fossil fuels with electricity from renewable sources, e.g. electrically heated steam crackers for basic chemicals. In Antwerp, BASF is engaged in one of the largest carbon capture and storage projects under the North Sea.
- (2) Systematic implementation of improvement processes at existing production plants: at the end of 2021, 35 sites in Europe had certified energy management systems (ISO 50001), representing 90% of our primary energy demand in Europe. Each year multiple energy saving projects are assessed, kicked off, and implemented (>150 measures in EU implemented in 2021).
- (3) Increasing the share of renewable energy in our power supply: In 2021 we purchased a share of Vattenfall's wind farm Hollandse Kust Zuid. In addition, we have signed long-term purchase agreements for renewable energy with suppliers such as Ørsted and Engie. 31 BASF sites in Europe were entirely or partially powered by emission-free electricity in 2021.
- (4) Active engagement with decision-makers and governments at the regional, federal, and EU level on climate and energy-related issues.

#### CASE STUDY

**Situation:** We expect increasing ETS certificate prices to lead to higher costs for electricity production in our own power plants.

**Task:** Improve efficiency in our own power plants to reduce emissions and consequently cost burden from ETS.

**Action:** In 2019, we started the modernization of our combined heat and power plant in Schwarzheide, Germany, with investments of €73 million, which is still ongoing.

**Result:** Once it is started up in 2022, it will produce 10% more electricity at a 10% lower CO<sub>2</sub> emissions factor of the power generated thanks to higher fuel efficiency.

#### EXPLANATION OF COST

Efficiency projects result in no net additional costs (savings justify initial investment according to BASF's profitability criteria; calculations include a carbon price). Projected capital expenditures for new technologies amount to < €1 billion in 2021-2025. Costs of engagement with stakeholders over this time are estimated at €7.5 million (~10 FTEs dedicated to this task, cost of ~€150,000 each p.a. over 5 years). Considering also

additional costs for expanding renewable energy supply, we estimate that total costs sum up to about €1 billion in 2021-2025.

## Comment

### Identifier

Risk 2

### Where in the value chain does the risk driver occur?

Direct operations

### Risk type & Primary climate-related risk driver

Acute physical

Drought

### Primary potential financial impact

Decreased revenues due to reduced production capacity

### Company-specific description

Production at BASF's largest site Ludwigshafen depends on the adjacent river Rhine in two ways: (a) withdrawal of water mainly for cooling purposes, (b) transportation of raw materials and final products via barges (about 40% of all goods that are transported to or from the site are transported on the river). Based on extreme weather / Rhine water level conditions experienced at the site over the last decades, like the drought and heatwave of 2003 and the flood in 2013, the robustness of site operations for such events was increased constantly by various measures (e.g. pump systems for low water level, adapted management plans, options to switch mode of transport, rebalance production across the global portfolio of assets). Additionally, BASF assessed physical risks from climate change for the site in 2015 and concluded that significant risks of extreme weather events will materialize beyond 2050 and that the existing mitigation measures are therefore still appropriate. However, in 2018, the site experienced an exceptional drought and heat, which caused an extremely long and intense phase of low river water levels and very high water temperatures during the peak of the heatwave. As a consequence, the high water temperature was limiting cooling capacity and low water levels were limiting transport by barge. The existing measures were insufficient to mitigate all impacts, which ultimately led to decreased production capacity and a negative earnings impact of around €250 million mainly due to missing transport capacities for raw materials. The event raised the question of whether global warming has already changed the likelihood of occurrence and/or intensity of extremely low water level and/or high water temperature events at the site. In 2021 BASF performed a dedicated scenario analysis for low water events and associated risks based on climate projections for the river Rhine provided by the German federal climate adaptation service "DAS-Basisdienst". This analysis showed a) the 2018 event was a rare extreme event and b) the risk for comparable events with the previously described impacts is increasing in the coming decades depending on the climate change scenario.

**Time horizon**

Short-term

**Likelihood**

Very unlikely

**Magnitude of impact**

High

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

250,000,000

**Potential financial impact figure – minimum (currency)****Potential financial impact figure – maximum (currency)****Explanation of financial impact figure**

The quantification of the risk is based on the following assumptions: the figure represents the negative earnings impact due to limited production capacity (i.e. the delta between planned and realized production; further details regarding the figures are subject to confidentiality) at the Ludwigshafen site in 2018, which was triggered by extreme weather in the respective year (high water temperature limiting cooling capacity, low water level limiting transport) and is considered as an estimate for impacts of similar future events (without any further adaptation).

**Cost of response to risk**

23,000,000

**Description of response and explanation of cost calculation**

RESPONSE

In 2019, we included Climate Resilience in the central strategic goals of the Ludwigshafen site (Zukunftsbild Werk Ludwigshafen) to challenge major projects if they contribute to climate resilience. Under this umbrella, we initiated several targeted measures to increase the resilience of the Ludwigshafen site against potentially more frequent and prolonged phases of very high water temperature and very low water levels. Progress and status of these projects are reported biannually directly to site management, which reports directly to the board. In addition, BASF is a co-signatory to the Federal Ministry of Transport's 'Low Water Rhine' action plan presented in 2019. The navigability of the Rhine must be improved in the coming years with various measures.

CASE STUDY

Situation: Low water level of the river Rhine limits its navigability for standard shipping

vessels and high water temperature during heatwaves limits cooling capacity.

Task: Work out measures to make the Ludwigshafen site more resilient against long-lasting low-water and high-temperature events of the river Rhine.

Action: To master the logistical challenges, we have developed an early warning system for low river Rhine water levels together with the Federal Institute of Hydrology, which enables accurate long-term forecasts for our supply chains. We expanded logistics infrastructure and capabilities to be able to shift to alternative modes of transportation. Since 2019 BASF has chartered various ships suitable for low river Rhine water situations. Additionally, BASF initiated and developed together with external partners an innovative barge which is suitable for extremely low water. Concerning high water temperatures, we have increased the cooling capacity for our production in 2019 and 2020 by optimizing and expanding re-cooling systems. In 2021/22 further measures improved the control of our cooling water network.

Result: Longer usability of waterway as mode of transport during low water levels and increasing flexibility to switch between different modes of transport. The measures already taken in 2019 enable us on the cooling water side to master a weather scenario like in 2018.

#### EXPLANATION OF COST

The figure of €23,000,000 represents the total costs of immediate measures from 2019 until 2022, initiated to increase the resilience of the Ludwigshafen site and can be attributed 50% each, to measures regarding logistics and the expansion of cooling capacity mentioned above.

#### Comment

## C2.4

**(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?**

Yes

## C2.4a

**(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.**

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#### Identifier

Opp1

#### Where in the value chain does the opportunity occur?

Downstream

#### Opportunity type

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Primary potential financial impact**

Increased revenues resulting from increased demand for products and services

**Company-specific description**

BASF is the world's largest chemical supplier to the automotive industry. The global light vehicle production is projected to increase to more than 80 million units in 2022. BASF expects the share of chemicals in average vehicles to increase, due to the trend towards energy efficiency and clean energy. It is driven by emissions performance regulations around the world, like e.g. in Europe where the EU-wide fleet targets have been tightened to a reduction of 55.5% of CO<sub>2</sub> emissions from 2030 on and 100% from 2035 on, compared to 2021. BASF drives new technologies and helps customers meeting their sustainability commitments, for example:

(1) We offer advanced cathode active materials (CAM) for lithium-ion (Li-ion) batteries, which play a key role for battery performance, energy density, service life and safety. We further aim to be at the forefront of sustainable action. For example, BASF aims to provide CAM products in its newly constructed European plants with a leading CO<sub>2</sub> footprint thanks to the use of renewable energy, local and energy-efficient processes, and a closed loop setup.

(2) The growing demand for electromobility is increasing the need for lithium-ion battery recycling. As a leading producer of battery materials with future local production capacities in the three main markets – Asia, Europe, and North America – BASF has in-depth expertise in battery chemistry and process technology. We are utilizing these competencies to address battery recycling as an additional growth market in cooperation with partners along the value chain. Currently, BASF is constructing a prototype plant for battery recycling in Schwarzheide, Germany. The prototype recycling plant will allow for the development of operational procedures and optimization of technology to deliver superior returns of lithium, nickel, cobalt, and manganese from end-of-life lithium-ion batteries as well as off-spec material from cell producers and battery material producers. The recovered metals shall be used to produce new cathode active materials and enable a circular economy for the battery value chain.

(3) ChemCycling™ recycles plastic waste, which is currently landfilled or incinerated, into primary materials, which causes less CO<sub>2</sub> emissions than the production of plastics from primary fossil resources (naphtha). Growing implementation of said technologies will likely increase the share of added value from chemical products within the automotive segment, leading to higher overall sales.

**Time horizon**

Medium-term

**Likelihood**

Very likely

**Magnitude of impact**

High

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

7,000,000,000

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**

The market for cathode active materials is expected to grow at about 21% per year until 2030 (considering applications in e-mobility, energy storage systems, consumer electronics as well as all cathode chemistries). This corresponds to a total size of ~4200 kt and a value reaching €100 billion in 2030. Electromobility is a major driver of this growth. For 2030, we anticipate annual sales of more than 30 million electric vehicles, compared to 6.6 million vehicles in 2021 [1]. We target a market share in our relevant market segments of >10% for our battery materials business in 2030, corresponding to >€7 billion in sales in 2030 [2]. This estimate for 2030 was entered as the financial impact figure.

Citation:

[1] IEA (2022): Global EV Outlook 2022

[2] BASF Investor Update, September 2021

**Cost to realize opportunity**

4,000,000,000

**Strategy to realize opportunity and explanation of cost calculation**

STRATEGY

(1) We expand production capacities and introduce new products i.a. around battery materials. In Europe two new CAM plants in Harjavalta (FI) and Schwarzheide (DE) are under construction and their start-up will be around the end of 2022. Moreover, through its modular design and infrastructure, manufacturing capacities can quickly be scaled up at Schwarzheide, enabling BASF to meet increasing customer demand. In 2021 BASF also formed Shanshan Battery Materials Co., Ltd. in China. With production facilities in all key regions and a global capacity of 160 metric kilotons of CAM from 2022 onward, we can serve cell manufacturers and OEM customers in all key markets.

(2) We invest in R&D of low-carbon solutions for the automotive sector, e.g. high-energy density battery materials. By 2025, our battery materials aim to double the real driving range of midsize cars from 300 to 600 km on a single charge and reduce the charging time to 15 min.

(3) We engage in partnerships fostering low-carbon mobility (e.g. Global Battery Alliance). Further, we entered several cooperative agreements in 2021, to jointly drive forward the development of innovative CAM and recycling solutions (i.a. with battery cell manufacturers CATL and SVOLT and automotive OEM Porsche).



## CASE STUDY

**Situation:** The growing demand for e-mobility is increasing the need for Li-ion battery recycling, which is currently not yet available at scale. We want to expand into this growth market which requires to scale up efficient recycling process technology.

**Task:** Development of operational procedures and optimization of technology to deliver superior returns of lithium, nickel, cobalt, and manganese from end-of-life Li-ion batteries as well as off spec material from cell producers and battery material producers.

**Action:** In 2021, BASF started to build up a battery recycling prototype plant in Schwarzheide. The investment is part of the EU Commission's approved "Important Project of Common European Interest" and received financial support from the Federal Ministry of Economics and Energy of Germany.

**Result:** The prototype plant will ensure start-up success for future commercial plants to enable a circular economy for the battery value chain.

## EXPLANATION OF COST

CAPEX of €3.5-4.5 billion is planned between 2022 and 2030 to build up and expand our capacities for producing and recycling battery materials globally. The average value of €4 billion represents estimated costs to realize the opportunity.

## Comment

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### Identifier

Opp2

### Where in the value chain does the opportunity occur?

Downstream

### Opportunity type

Products and services

### Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

### Primary potential financial impact

Increased revenues resulting from increased demand for products and services

### Company-specific description

BASF's product portfolio contains innovative solutions for the thermal insulation of buildings. These materials can help save energy and therefore emissions. For example, we offer Neopor®, Styrodur®, and Elastopor® for insulation up to a nearly zero energy home standard. We are continuously working to improve the energy efficiency and performance of our offerings, for example by converting customers from HFC- to more climate-friendly HFO-based PU systems especially in the North American region in line

with climate control regulations. The last publicly available analysis shows that the volumes of Styropor®, Neopor®, and Styrodur® sold in 2019 help our customers to save 62 million metric tons of CO<sub>2</sub> emissions over the entire lifecycles of these products when used to insulate existing buildings. We expect the global market of these thermal insulation products to grow due to tightening product efficiency regulations and standards as well as higher energy prices. For example, as often cited by the European Commission „buildings are responsible for 40% of total energy consumption and 36% of energy-related greenhouse gas emissions in the EU“. Therefore, the decarbonization of buildings is key for achieving 2030 and 2050 climate targets. The revised European EPBD (Energy Performance of Buildings Directive) has requested the Member States to strengthen renovation strategies. In the context of the EU Green Deal, in October 2020 the EU Commission published a new strategy to boost renovation called "A Renovation Wave for Europe – Greening our buildings, creating jobs, improving lives" (COM(2020)662). It aims to double annual energy renovation rates in the next ten years. This will lead to increasing demand for innovative BASF insulation products for the building and construction sector.

**Time horizon**

Medium-term

**Likelihood**

Very likely

**Magnitude of impact**

High

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

150,000,000

**Potential financial impact figure – minimum (currency)**
**Potential financial impact figure – maximum (currency)**
**Explanation of financial impact figure**

The quantification of the opportunity is based on the following assumptions: According to a roadmap, published by the European Commission in the context of an initiative about the status of renovation of public and private buildings, currently, about 1% of buildings in Europe are renovated per year [1]. We assume that policy measures to increase energy efficiency in buildings (e.g. the European Green Deal) can drive global renovation rates into the order of 1-2% per year (for reference: GlobalABC, IEA and UNEP propose a global target of 3% per year in 2030 to decarbonize buildings in line with the Paris Agreement [2]). The increased renovation rate will lead to a respective growth of the market for insulation materials. We assume growth rates are in line with the market growth of about 2% p.a. This translates into additional annual net sales of

>€150 million per year, based on the year 2019 sales in the insulation segment.

Citations:

- [1] European Commission Roadmap: A Renovation Wave initiative for public and private buildings <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12376-Commission-Communication-Renovation-wave-initiative-for-the-building-sector>
- [2] GlobalABC/IEA/UNEP (Global Alliance for Buildings and Construction, International Energy Agency, and the United Nations Environment Programme) (2020): GlobalABC Roadmap for Buildings and Construction: Towards a zero-emission, efficient and resilient buildings and construction sector, IEA, Paris.

### **Cost to realize opportunity**

100,000,000

### **Strategy to realize opportunity and explanation of cost calculation**

STRATEGY

- (1) We expand production capacities and introduce new products into the market, like the Cavipor® FTX 1 insulation material or biomass balance (BMB) versions of Styropor®, Neopor® and Styrodur®.
- (2) We engage in several associations and standardization bodies on standards for energy-efficient construction (e.g. CEFIC, PlasticsEurope, PU Europe.).
- (3) BASF promotes the benefits of insulation materials in demonstration projects. For example, in 2020 we became a primary industry partner in the NEST modular innovation building project operated by two Swiss research institutes, Empa and Eawag, in Dübendorf (Switzerland).
- (4) We invest in R&D of new low carbon insulation solutions. Central sustainability tools (e.g. Eco-Efficiency Analysis) support this work.

CASE STUDY

**Situation:** In context of the European Green Deal, the Italian government is making great efforts to reduce energy consumption in the country and is offering homeowners strong financial incentives to improve the energy efficiency of their homes (e.g. through thermal insulation). The prerequisite for the highest subsidy, the Superbonus 110%, is the use of insulation products that contain a minimum quantity of recycled material (e.g. 10% for expandable polystyrenes / EPS) and have been audited and certified by an independent institute.

**Task:** To benefit from the governmental subsidies, BASF seeks to offer suitable products in the Italian market that fulfill the requirement of the initiative.

**Action:** BASF approached the Italian authorities to convince them of the benefits of its solutions and to get Neopor® BMB accepted under the Superbonus 110% requirements. The BMB insulation boards can save 42% in CO<sub>2</sub> emissions compared to conventional Neopor®.

**Result:** Neopor® BMB has been successfully accepted as compliant, making it equivalent to consisting of 100% recycled material. It is now marketed in Italy under the brand name Neopor® BMBcert™. Italy is so far the only country in Europe where a

product following the BMB approach has been classified as equivalent to a fully recycled product.

#### EXPLANATION OF COST

In 2021 BASF invested about €100 million in research in the segment “Chemicals”, which includes styrenic foams. Regarding engagement in associations and standardization bodies, we estimate that a low single-digit number of FTEs (cost of ~€150,000 per FTE and year) represent our interests, so the contribution to the overall estimate of costs is marginal and not visible in the total value.

#### Comment

#### Identifier

Opp3

#### Where in the value chain does the opportunity occur?

Downstream

#### Opportunity type

Products and services

#### Primary climate-related opportunity driver

Development and/or expansion of low emission goods and services

#### Primary potential financial impact

Increased revenues resulting from increased demand for products and services

#### Company-specific description

BASF is the market leader in the production of certified compostable and soil-biodegradable plastics with products like ecoflex® and ecovio®. These products are used for their environmental performance in the agriculture, consumer, and packaging industry, where they promote organic recycling, and healthier soils and tackle the global problem of plastic pollution and persistent microplastic in the environment. Moreover, they promote resource efficiency, which supports climate protection. Recent regulatory initiatives and legislative frameworks represent significant market opportunities for BASF:

- 1) Separating organic waste becomes mandatory in EU Member states by 2024. Certified compostable ecovio® bags make organics waste collection easier while fully biodegrading in compost and do not leave any persistent microplastics behind.
- 2) New laws in several EU countries (France, Italy, Spain, and Austria) ban single-use fruit & vegetable and/or lightweight carrier bags while exempting certified compostable (either industrial or home compostable) alternatives. BASF offers several certified compostable ecovio® grades with various bio-based contents that can meet these market requirements.
- 3) China will ban a list of single use and take away applications (e.g. bags, food delivery

service ware, and food containers) made of non-compostable materials nationwide by 2025. Additionally, waste management is to be set up by 2025. We offer a range of ecovio® packaging grades that could serve this market.

4) The EU extends the producer's financial and/or operational responsibility for a product to include the management of the post-consumer stage through Extended Producer Responsibility (EPR). EPR policies generally shift the waste management cost or physical collection partially or fully from local governments to producers. Our certified soil-biodegradable alternatives are out of the scope of the EPR as they fully biodegrade after usage and do not require collection and recycling. Moreover, there has been a recent announcement about the promotion of soil-biodegradable mulch film by the Ministry of Agriculture and Rural Affairs, China. With ecovio®M, a specific grade for mulch film application, our expertise in agronomy and know-how in film processing and laying out the mulch film is BASF is able to support the initiatives.

Market studies show that BASF currently has a market share of about 10% in these markets, which are estimated to grow by €300 million in the next years.

### **Time horizon**

Short-term

### **Likelihood**

Very likely

### **Magnitude of impact**

Medium-high

### **Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

### **Potential financial impact figure (currency)**

30,000,000

### **Potential financial impact figure – minimum (currency)**

### **Potential financial impact figure – maximum (currency)**

### **Explanation of financial impact figure**

Market studies show that BASF currently has a market share of about 10% in the markets mentioned above. The figure of €30 million describes the assumed additional revenue of BASF if the overall market of the described products grows with the mentioned legislative-driven opportunities 1) to 4), while BASF's market share remains at 10% (=10% of the total market potential of €300 million; using the lower estimates for the respective market sizes).

Underlying data: Market projections of several national and cross-national associations (e.g. The French Association for Plastic Packaging, The Italian Association for Biodegradable Plastics, Degradable Plastics Committee of the Chinese Standardization Office, The Agriculture Plastics Environment Europe) estimate an additional market

potential of these biodegradable plastics of €300 million in the next years. Due to the new legislation in China, we see additional potentials for a change in market size and market players, but those developments can only be estimated more precisely in the years to come.

### **Cost to realize opportunity**

300,000

### **Strategy to realize opportunity and explanation of cost calculation**

#### STRATEGY

With global biodegradability research lab capabilities, expertise in polymer compounding, and a dedicated compounding line, BASF is well positioned and can offer suitable products to capture the opportunities mentioned above. In addition, cooperation with Red Avenue (a Chinese PBAT producer) will allow BASF to cater to the increasing demand from a local source within the Asian region. In 2021, BASF also announced to cooperate with WPO Polymers to distribute biopolymer ecovio® for certified compostable bags in Spain and Portugal. Further, BASF actively lobbies for the benefits of compostable and biodegradable products through associations (e.g. Bioplastics in Europe) and direct contact with stakeholders (e.g. legislators). BASF also highlights the benefits of its products through externally reviewed life cycle assessments (LCA).

#### CASE STUDY

**Situation:** China has adopted legislation that mandates that specific single-use plastics (e.g. light bags, bowls, and cups for takeaway food, carrier envelopes) become biodegradable by law.

**Task:** Demonstrate that certified compostable ecovio® can be handled in organic waste treatment infrastructure in China, show that suggested standards for compostable plastics work “in practice”, and that BASF is a credible stakeholder for discussing solutions in this area.

**Action:** We have identified Chinese partners and co-developed detailed plans with them to demonstrate the processability of our materials in Chinese organic waste treatment plants and started the implementation in 2021.

**Result:** BASF is among the experts that are heard in the specification of the standards defining biodegradability in China. Through this and field testing we ensure that we can provide the right products for the Chinese market. Demonstration projects are ongoing, and results will be available in 2023.

#### EXPLANATION OF COST

We estimate a total of €300,000 to do these projects in Chinese waste treatment plants: material costs of compostable ecovio to be tested (€30,000), costs for producing products in specific applications and for distribution (€50,000), personnel costs of BASF experts supporting the project implementation and communication (€150,000) and consultancy of academics reviewing and summarizing the study results (€70,000). No significant additional costs are linked to our further lobbying actions as they are mainly

covered by our standard budgets (e.g. personnel expenses in corporate communication, and general marketing budgets).

### **Comment**

The project has started and the first experiments at our collaboration partner, the Tongji University, Shanghai are ongoing. Due to Corona Pandemic the set-up of new organics recycling facilities in Hainan as well as the testing connected to that is delayed. Results will be available in Q1 2023. Due to legislative changes in China, we do see a potential impact on the markets coming up in future. Currently, the full effect is not estimable. This uncertainty is also visible in strong differences in market size estimations (e.g. Asiachem, Greenpeace, Degradable Plastics Committee of the Chinese Standardization Office). Therefore, we kept our current estimations from 2020 but very closely monitor the Chinese and global markets to react quickly to new market potentials.

### **Identifier**

Opp4

### **Where in the value chain does the opportunity occur?**

Direct operations

### **Opportunity type**

Resource efficiency

### **Primary climate-related opportunity driver**

Use of more efficient production and distribution processes

### **Primary potential financial impact**

Reduced indirect (operating) costs

### **Company-specific description**

BASF's primary energy use amounted to about 58.8 million MWh in 2021, highlighting the relevance of energy for our operations. Consequently, energy saving as a measure to increase resource efficiency can make a key contribution to reducing our operating costs. At the same time, the growing awareness and readiness among policymakers to mitigate climate change, which is driven by the Paris Climate Agreement, are leading to new/extended incentives for energy efficiency (e.g. tax cuts, levy exemptions). One example are funding opportunities under the German legislation for combined heat and power plants ("Kraft-Wärme-Kopplungsgesetz"), e.g. funding of energy efficiency increase by modernization of such plants, which BASF has already applied for successfully in 2018. Subsequently, in 2019 we started the modernization of our combined heat and power plant in Schwarzheide, Germany with investments of €73 million. Once it is started up in 2022, it will produce 10% more electricity and the CO<sub>2</sub> emissions factor of the power generated will be around 10% lower thanks to higher fuel efficiency. For BASF, besides our company-intrinsic strive for operational excellence, these incentives can strengthen the business case for energy efficiency measures, make them more economically viable, and speed up implementation – leading to additional cost savings for BASF in the short- to medium-term.

**Time horizon**

Short-term

**Likelihood**

Virtually certain

**Magnitude of impact**

Medium-high

**Are you able to provide a potential financial impact figure?**

Yes, a single figure estimate

**Potential financial impact figure (currency)**

24,700,000

**Potential financial impact figure – minimum (currency)****Potential financial impact figure – maximum (currency)****Explanation of financial impact figure**

The financial impact represents the annual monetary savings resulting from almost 290 energy efficiency measures implemented globally in 2021 under the governance of our Energy Management Team. Operational excellence projects included a wide range of energy conservation measures resulting in savings of fuel, electricity, steam, cooling water, etc., for example, chemical process modifications, process heat integration, advanced process control systems implementation, lighting, and steam traps, incinerator fuel reductions, new combined heat and power plants, boiler efficiency upgrades, tower packing replacement, HVAC upgrades, etc. Each project reported annual savings as “MWh saved”, which were converted to financial savings by multiplying with local cost per MWh, also provided within each project. The sum of all annual savings results in the given financial impact figure of €24.7 million.

**Cost to realize opportunity**

38,900,000

**Strategy to realize opportunity and explanation of cost calculation**

## STRATEGY

We promote energy efficiency by implementing energy management systems at all relevant sites. By the end of 2021, 76 production sites representing 90.2% of our primary energy demand were covered by certified energy management systems according to DIN EN ISO 50001. Further, we run a continuous operational excellence (opex) program triggering annual energy efficiency measures as an important contribution under the opex lever for achieving our climate protection goals.

## CASE STUDY

Situation: BASF strives to increase energy efficiency to achieve cost savings and



contribute to the corporate climate protection goals.

Task: Identifying, collecting, prioritizing, selecting, and implementing efficiency measures in BASF production, engineering, maintenance, logistics, procurement, and administration.

Action: BASF sites and plants continuously propose opex measures within a central project database where opportunities are tracked. The measures are evaluated within a specific opex project approval process, which leads to a selection of projects to be implemented. In 2021, 205 additional energy efficiency measures were initiated, 287 measures were implemented, and another 99 entered implementation. The global Energy Management team monitored their progress in the different plants all over the world.

Result: From the measures implemented in 2021, BASF will save around €24.7 million per year in energy cost, contributing about 174,000 t of annual CO<sub>2</sub>e savings. The database allows to track measures as best practice examples for other sites.

#### EXPLANATION OF COST

Costs of €38.9 million relate to the investment required in the reporting year to implement the energy efficiency measures proposed and approved within the operational excellence program. Projects which have only entered implementation are not included in the costs. Due to the high number of individual measures, a more detailed breakdown seems not sensible.

#### Comment

## C3. Business Strategy

### C3.1

**(C3.1) Does your organization's strategy include a transition plan that aligns with a 1.5°C world?**

#### Row 1

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##### Transition plan

Yes, we have a transition plan which aligns with a 1.5°C world

##### Publicly available transition plan

Yes

##### Mechanism by which feedback is collected from shareholders on your transition plan

We have a different feedback mechanism in place

##### Description of feedback mechanism


We are continuously collecting feedback via our bilateral exchanges with individual investors and investor groups. Please note that the statutory provisions of the German Stock Corporation Act (AktG) do not provide for the adoption of resolutions concerning management measures by the Annual Shareholders' Meeting.

**Frequency of feedback collection**

More frequently than annually

**Attach any relevant documents which detail your transition plan (optional)**

 BASF\_Investor-Update-2022\_Keynote\_Presentation.pdf

 BASF\_CMD-2021\_Keynote-Speech.pdf

**C3.2**

**(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?**

Use of climate-related scenario analysis to inform strategy	
Row 1	Yes, qualitative and quantitative

**C3.2a**

**(C3.2a) Provide details of your organization's use of climate-related scenario analysis.**

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios Bespoke transition scenario	Company-wide	1.6°C – 2°C	<p><b>OBJECTIVE</b></p> <p>Ambition and implementation of global climate politics are decisive for the growth of chemical industry and its customers. To assess impact of different approaches on global climate politics, four scenarios were defined and quantified. Scenario narratives are rooted in different societal mindsets. One scenario aims at a significant global reduction of CO2 emissions, while other scenarios allow for further increasing emissions and higher global warming trajectories.</p> <p><b>METHODOLOGY</b></p> <p>Narratives were developed by a team of economists, energy market experts, chemists and technology experts from BASF. Scenarios were quantified in cooperation with Cambridge Econometrics, using their E3ME model. The scenarios cover a temperature range from well below 2°C up to 4°C of global warming. The</p>

		<p>lower end was selected as representative of temperature alignment here. BASF-specific outcomes were derived from variation of customer industry growth rates within said scenarios, using additional inhouse calculation tools. Results were be discussed with BASF Operating Divisions (OD).                  Examples for assumptions: i.a. relative impact of regulation vs. CO2 price driven changes in energy markets or development of regional share of electric vehicles.</p> <p><b>COVERAGE AND TIME HORIZONS</b></p> <p>Analyses cover all major regions, countries, and customer industries of BASF.                  Projections were made up to 2050, as climate policy targets and strategic planning horizons for carbon abatement projects often refer to this time frame.</p> <p><b>RESULTS</b></p> <p>Without taking behavioral changes into account, growth rates of major macroeconomic aggregates are quite resilient. Typical outcomes of simulations with high climate protection ambitions and significant behavioral changes are stable GDP growth rates with structural changes in industrial output and demand for chemicals. Scenarios are discussed internally in division-specific workshops. Feedback is fed into the further refinement of scenario results. Scenario-specific datasets are provided for testing the economic viability of investments and strategies in sensitivity analyses.</p>
<p>Physical climate scenarios RCP 8.5</p>	<p>Company-wide</p>	<p><b>OBJECTIVE</b></p> <p>Assessment of the impact of potential environmental conditions at major BASF production sites to complement site strategies and site developments including interruption of supply chains and logistics for BASF products.</p> <p><b>METHODOLOGY</b></p> <p>A Climate Risk Dashboard was established to provide climate data for all production sites under an RCP2.6, RCP4.5 &amp; RCP8.5 scenario. The data is delivered by</p>

			<p>an external service provider using the IPCC scenarios focusing on all major climate perils (heat, drought, wind, heavy precipitation, cold, flood, wildfire, hail). The dashboard is shared with site managers to enable a site-specific risk assessment to complement the site strategies and site developments. Examples for assumptions: Level of GHG emissions driving global warming and subsequent impacts.</p> <p><b>COVERAGE AND TIME HORIZONS</b></p> <p>Analyses cover all major regions and countries. We focused on our biggest locations; however, the analysis is available to all locations globally. Climate data are available until 2100, however, the focus of the risk assessment is on the 30-years-change being in line with the transition perspective</p> <p><b>RESULTS</b></p> <p>Scenario data indicate changes in environmental impact factors depending on the level of global warming, time horizon, and geolocation (e.g. increased drought risk in Ludwigshafen). Sites are often better prepared for known risks (e.g. hurricanes in the Gulf of Mexico area), vs. potentially emerging risks. Results are used to drive internal discussions on resilience towards climate change (e.g. increase in cooling water capacity to ensure production during drought periods).</p>
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### C3.2b

**(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.**

**Row 1**

**Focal questions**

**RATIONALE FOR SELECTION OF SCENARIOS**

For both, transition and physical risks, scenarios were chosen that cover different levels of temperature increase. To stress-test BASF’s ability to mitigate and adapt to climate-related risks, the set of scenarios includes a pathway with very ambitious climate action leading to global warming below 2°C in line with the Paris Agreement, as well as a

pathway leading to very high global warming (RCP 8.5).

## FOCAL QUESTIONS

Transition scenario:

- How do scenarios with different climate protection ambition impact demand for BASF products? Where are risks, where are opportunities?
- What are perspectives for final consumer demand, e.g. in mobility, nutrition, and housing in alternative scenarios?
- How can BASF products support the decarbonization of the energy sector, improve the energy efficiency in the building sector, and the transition toward a circular economy?
- What are relative growth expectations for countries and industries in different scenarios?
- What is the level of fossil fuel, energy, power, and CO<sub>2</sub> prices in different scenarios? What is the relative role of regulation vs. prices in emission reduction?

Physical scenario:

- Are our assets resilient against the increased severity of natural disasters or changing weather patterns?
- Does BASF have an increased risk of business interruptions due to climate change?

## Results of the climate-related scenario analysis with respect to the focal questions

Transition:

### RESULTS

There are multiple opportunities but also risks for BASFs product portfolio. While overall material consumption might grow weaker due to more circularity and a rising service share in private consumption in scenarios with high climate protection ambitions, the chemical industry is also an important enabler in this transition process.

This can be seen e.g., in the energy sector (with products for renewable energy production) or in the mobility sector (with products supporting the electrification of the global car fleet such as battery materials, coolants, and lightweight polymers). Building insulation and smart homes play an important role for increasing the energy efficiency in the building sector, triggering demands for specific chemical products.

Overall, the green scenario illustrates the increasing demand for products with a low carbon footprint (achieved via the use of chemically recycled inputs, renewable bio-feedstock, renewable energy, or new electrified production processes) and the need for transparency on the Product Carbon Footprint – which is a lighthouse project of BASF for the Chemical Industry.

### HOW RESULTS INFORMED DECISION MAKING

Scenarios are used as an input for long-term feedstock, energy, and CO<sub>2</sub> price forecasting, showing the interval of potential price developments and allowing for

sensitivity analysis in investment projects. In a regional perspective, different developments of energy and CO2 prices, and different speeds of energy transition must be considered, which is simulated in a regional diversity scenario. These results can also be used as an input for analyzing the relative competitiveness of different investment locations.

Physical:

**RESULTS**

Most BASF sites require water for their production processes and cooling, and many sites use nearby waterways for logistics. Our scenario analysis shows that climate change is having long-term effects on regional precipitation patterns for many of the regions where our sites are located resulting in higher risks of business interruptions in the future. Therefore, this analysis enables our sites to continuously monitor the changing climatic/environmental conditions and to implement mitigations measures where necessary.

**HOW RESULTS INFORMED DECISION MAKING**

For our location in Ludwigshafen, specific measures were taken to mitigate the effects of future physical risks and increase resilience. We have developed an early warning system for low River Rhine water levels together with the Federal Institute of Hydrology, which enables accurate long-term forecasts for our supply chains. We expanded logistics infrastructure and capabilities to be able to shift to alternative modes of transportation. Moreover, BASF initiated and developed together with external partners an innovative barge that is suitable for extremely low water levels. Concerning high water temperatures, we have increased the cooling capacity by optimizing and expanding re-cooling systems.

**C3.3**

**(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.**

	<b>Have climate-related risks and opportunities influenced your strategy in this area?</b>	<b>Description of influence</b>
Products and services	Yes	<p><b>INFLUENCE ON STRATEGY</b></p> <p>The global transition to a low-carbon economy has impacted BASF's portfolio steering process by being factored into the strategic portfolio analyses conducted by business units together with corporate strategy to understand if products</p>

		<p>are (a) benefiting from change (e.g. materials for low-carbon construction or transport); (b) at risk (e.g. catalysts for mobile combustion engines); (c) remaining unaffected (e.g. pigments) and to take appropriate management steps. Taking an aggregate perspective on sales, we conclude that management steps successfully led to tapping first opportunities for products benefiting from the change, following the growth of renewables (e.g. products for wind, solar power), more sustainable construction (e.g. materials for buildings insulation, see C2.4a Opp 2) and transport (e.g. materials for electric vehicles, see C2.4a Opp 1).</p> <p>TIME-HORIZONS CONSIDERED</p> <p>Analyses and steering consider short-, medium and long-term impacts on our business objectives.</p>
<p>Supply chain and/or value chain</p>	<p>Yes</p>	<p>INFLUENCE ON STRATEGY</p> <p>Purchase of energy, as part of our supply chain activities, accounts for about 12% of BASF's total Scope 1+2 emissions. Thus, it constitutes a significant strategic lever in our Carbon Management for reducing our emissions exposure in view of climate-related transition risks (e.g. higher costs through carbon regulation; see C2.3a Risk 1). We initiated measures to increase the share of renewables in the electricity purchased for our production sites, in support of our climate protection target. Another strategic measure in our supply chain activities refers to the purchase of raw materials. In our Supplier CO2 Management Program, we aim to achieve transparency on the product-related CO2 emissions of our purchased raw materials. We offer our support and share our knowledge on Product Carbon Footprint (PCF) valuation methodologies and tools with our suppliers. In the improvement phase, we will jointly identify levers and targets with our suppliers to reduce these GHG emissions. Also, as part of managing transition risks across the value chain, we have initiated strategic measures to speed up the transition to a circular economy. We develop more "close the loop" solutions (i.e., turn waste into resources) via external partnerships and pilot projects. Further, we have started to increase the resilience of up-/downstream transport against climate-related physical risks at our largest production site in Ludwigshafen (e.g. through alternative transport options, see C2.3a Risk 2).</p> <p>TIME-HORIZONS CONSIDERED</p>

		<p>Strategic levers bundled under Carbon Management cover short-, medium and long-term activities. Measures focusing on supplier carbon footprints, circular economy and resilience are expected to be effective short- to medium-term.</p>
Investment in R&D	Yes	<p><b>INFLUENCE ON STRATEGY</b></p> <p>In order to contribute to the company's purpose "We create chemistry for a sustainable future", BASF has derived three major areas in which chemistry-based innovations will play a key role in the future: (1) resources, environment &amp; climate; (2) food &amp; nutrition; (3) quality of life. The focus area (1) highlights directly that climate-related risks and opportunities have impacted the area of R&amp;D investments, showing that BASF has focused and intensified this topic to come up with proper solutions (C2.4a Opp 1, 2 &amp; 3). We invest more than 60% of our annual R&amp;D expenditures (2021: €2.216 billion total R&amp;D expenses) on product and process innovations where the R&amp;D target is related to energy/resource efficiency and climate protection. The R&amp;D component is also firmly embedded in our Carbon Management to reach our climate protection target and reduce our GHG emissions over the long term.</p> <p><b>TIME-HORIZONS CONSIDERED</b></p> <p>The strategic levers bundled under Carbon Management as well as our wider R&amp;D approaches cover short-, medium- as well as long-term activities.</p>
Operations	Yes	<p><b>INFLUENCE ON STRATEGY</b></p> <p>BASF operates plants that are liable to Emission Trading Schemes, indicating that carbon pricing as a regulatory risk has already materialized to some extent and can be expected to become even more relevant in future (e.g. implementation of the Chinese national ETS or more stringent EU ETS, see C2.3a Risk 1). Such climate-related transition risks contributed to leveraging climate action within our corporate strategy. We defined a climate protection target and set out various measures in our operations to mitigate transition risks through reducing emissions exposure, especially (1) improve process / energy efficiency (as part of our wider Carbon Management); (2) integrate a carbon price in the assessment of new capital expenditure projects. Further, we</p>



		<p>have started to increase the resilience of operations against climate-related physical risks at our largest production site in Ludwigshafen by initiating a range of adaptation measures (e.g. higher cooling capacity, see C2.3a Risk 2).</p> <p>TIME-HORIZONS CONSIDERED</p> <p>The strategic levers bundled under Carbon Management cover short-, medium- as well as long-term activities. Investment projects have a medium- to long-term view. Measures focusing on resilience are expected to be effective short- to medium-term.</p>
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### C3.4

**(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.**

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Indirect costs Capital expenditures Capital allocation Acquisitions and divestments Access to capital Assets	<p>REVENUES</p> <p>Financial planning regarding revenues needs to consider future contributions from innovations as well as from existing products. Climate-related risks and opportunities are reflected in both aspects: R&amp;D activities at BASF are directed to contribute to the company’s purpose “We create chemistry for a sustainable future”, and one focus area of R&amp;D are “resources, environment and climate”. We invest more than 60% of our annual R&amp;D expenditures (€2.216 billion total R&amp;D expenses in 2021) on product and process innovations where the R&amp;D target is related to energy/resource efficiency and climate protection. This underlines that we expect to generate a significant share of future revenues from solutions in this area. Moreover, our active portfolio steering towards solutions in line with our purpose and the societal needs during the transition to a low-carbon economy is also expected to contribute positively to our sales. In 2021, about 22% of total BASF sales can be attributed to products and solutions that make a particular contribution to climate protection and energy efficiency (Accelerators "Climate Change and Energy" within our portfolio steering approach "Sustainable Solution Steering"). We already reached our 2025 sales target (€22 billion in total Accelerator sales by 2025) for Accelerator products in 2021. Consequently, we will update our product portfolio steering target over the course of 2022.</p> <p>Time horizon covered: Revenue streams are primarily assessed for the short- to a medium-term timeframe.</p>

		<p><b>DIRECT / INDIRECT COSTS</b></p> <p>BASF plants in Europe, Korea and China are subject to carbon regulations (i.e. CO2 pricing mechanisms) that increase operating costs. Our financial planning integrates these variable costs in the forecasts of plant performance. We estimate a total burden in the range of €150-350 million per year (global aggregate view), i.e. a high financial impact considering BASF's system for classification of financial implications. Time horizon covered: Cost implications are assessed for short-, medium- and long-term time periods.</p> <p>Case study direct/indirect costs (STAR-approach):                  Situation: About 52% of our global Scope 1+2 emissions are covered by the EU ETS and have to be backed by the appropriate allowances. The risk of additional costs for these BASF installations results from a lack of free allowances even for the best performers and increasing prices for the certificates during the fourth trading period of the EU ETS.                  Task: Determine potential future cost burdens for BASF installations regulated under the EU ETS fourth trading period as input to financial planning for these assets.                  Action: A corporate team evaluates the impact of current and future regulations on the level of free allowances of the installations and estimates the demand for the purchase of certificates, based on future production plans. In combination with projections for the price of EU ETS certificates (resulting from the respective internal scenario analysis), estimates for total cost burdens can be derived: under the revised EU ETS Directive (based on COM suggestion 2021) with a disproportionate burden between the ETS and non-ETS sector, free allocation of allowances may decrease in the order of about 3 million allowances for BASF. At the same time, ETS certificate prices may rise significantly during the 4th trading period. Calculating with an estimated range of carbon prices of €55-125, this results in a risk of about €150-350 million per year (conservative estimation approach).                  Result: The estimated future costs of compliance with the EU ETS (fourth trading period) complement the financial planning for each installation.</p> <p><b>CAPEX / CAPITAL ALLOCATION/ACQUISITIONS</b></p> <p>By 2025, we plan to invest up to €1 billion to achieve our climate protection targets. Additional investments of up to €3 billion are to follow by 2030. BASF has set up a structured process to evaluate investment projects (e.g. capital expenditures, acquisitions), including impacts on the environment (e.g. climate) and respective costs. The process considers a project base case (integrating different technology approaches, if applicable) as well as the option to assess alternative risk scenario cases.</p>
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		<p>Climate-related aspects can be attributed to any case depending on strategic goals as well as the expected likelihood and magnitude of impacts. In this way, climate-related aspects directly become a complementary component of the evaluation and decision scheme for business cases of investment projects. For example, business cases for capital expenditures and acquisitions in Europe will include potential costs of European carbon regulation. Different technology options/acquisition models (e.g. varying levels of control) within the business case will show varying GHG emission levels and respective carbon costs, which directly impacts the assessment of economic viability for the various options. The process is valid for all major investment projects. The financial impact varies strongly, depending on the nature of the project (e.g. physical conditions at the location of plant(s), level of emissions, regulatory context). The consideration of climate-related aspects can lead to significant additional costs in specific cases.</p> <p>Time horizon covered: Investment projects are typically relevant under medium- to long-term considerations.</p> <p><b>ACCESS TO CAPITAL</b></p> <p>BASF has identified risks primarily in the areas of existing and emerging regulation, change of markets, and reputational impacts due to changing investor or customer perspectives. We actively manage these risks (e.g. holding an open dialogue to prevent reputational damage) and we currently foresee no substantial impacts by the described risks regarding investor valuation of BASF and our performance in relation to climate change on our access to capital. This is underlined by our good credit ratings, e.g. “A3/P-2/outlook stable” by Moody’s and “A/A-1/outlook stable” by Standard and Poor’s.</p> <p>Time horizon covered: The impact assessments have a focus on short- to medium-term time periods.</p> <p><b>ASSETS / LIABILITIES</b></p> <p>BASF has identified risks and opportunities primarily in the areas of existing and emerging regulation, change of markets, and reputational impacts due to changing investor or customer perspectives. None of the assessments of the different risks and opportunities have pointed to impacts triggering the need to factor them into financial planning related to our assets or our liabilities. Rated “A3/P-2/outlook stable” by Moody’s and “A/A-1/outlook stable” by Standard and Poor’s, BASF enjoys good credit ratings.</p> <p>Time horizon covered: The impact assessments have a focus on short- to medium-term time periods.</p>
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## C3.5

**(C3.5) In your organization’s financial accounting, do you identify spending/revenue that is aligned with your organization’s transition to a 1.5°C world?**

No, but we plan to in the next two years

## C4. Targets and performance

### C4.1

**(C4.1) Did you have an emissions target that was active in the reporting year?**

Absolute target

### C4.1a

**(C4.1a) Provide details of your absolute emissions target(s) and progress made against those targets.**

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**Target reference number**

Abs 1

**Year target was set**

2018

**Target coverage**

Company-wide

**Scope(s)**

Scope 1

Scope 2

**Scope 2 accounting method**

Market-based

**Scope 3 category(ies)**

**Base year**

2018

**Base year Scope 1 emissions covered by target (metric tons CO<sub>2</sub>e)**

17,820,000

**Base year Scope 2 emissions covered by target (metric tons CO<sub>2</sub>e)**

4,067,000

**Base year Scope 3 emissions covered by target (metric tons CO<sub>2</sub>e)**

**Total base year emissions covered by target in all selected Scopes (metric tons CO<sub>2</sub>e)**

21,887,000

**Base year Scope 1 emissions covered by target as % of total base year emissions in Scope 1**

96

**Base year Scope 2 emissions covered by target as % of total base year emissions in Scope 2**

100

**Base year Scope 3 emissions covered by target as % of total base year emissions in Scope 3 (in all Scope 3 categories)**

**Base year emissions covered by target in all selected Scopes as % of total base year emissions in all selected Scopes**

97

**Target year**

2030

**Targeted reduction from base year (%)**

25

**Total emissions in target year covered by target in all selected Scopes (metric tons CO<sub>2</sub>e) [auto-calculated]**

16,415,250

**Scope 1 emissions in reporting year covered by target (metric tons CO<sub>2</sub>e)**

17,721,000

**Scope 2 emissions in reporting year covered by target (metric tons CO<sub>2</sub>e)**

2,464,000

**Scope 3 emissions in reporting year covered by target (metric tons CO<sub>2</sub>e)**

**Total emissions in reporting year covered by target in all selected scopes (metric tons CO<sub>2</sub>e)**

20,185,000

**% of target achieved relative to base year [auto-calculated]**

31.1052222781

**Target status in reporting year**

Revised

**Is this a science-based target?**

No, and we do not anticipate setting one in the next 2 years

**Target ambition**

**Please explain target coverage and identify any exclusions**

Compared with the baseline 2018, we want to reduce greenhouse gas emissions from our production sites (excluding emissions from the sale of energy to third parties) and our energy purchases by 25% by 2030. The target applies to our main business as a chemical company, accounting for 97% of total emissions in the base year. We excluded a small share of emissions related to the generation of steam and electricity for sale to third parties (3% of total emissions in the base year), which are not part of our core business activities and partly even driven by external factors (e.g. supply regulations in the power sector). +++ Note that this target has been revised in the reporting year: Based on the most recent progress in developing low-emission and CO2-free technologies, we decided to increase the ambition level from carbon-neutral growth until 2030 to reducing our greenhouse gas emissions worldwide by 25% until 2030 compared with 2018. Moreover, we want to achieve net zero emissions by 2050.

**Plan for achieving target, and progress made to the end of the reporting year**

We were able to reduce emissions by 7.8% in the reporting year compared to baseline. To achieve our ambitious climate protection goals, we have adopted comprehensive carbon management. This has five levers to reduce greenhouse gas emissions: Using renewable energies for both electricity and steam production (gray-to-green and power-to-steam levers), developing and applying new carbon-free and low-carbon production processes (new technologies lever), using alternative raw materials (bio-based feedstocks lever), and ongoing measures to further increase energy and resource efficiency in our production (continuous opex lever).

**List the emissions reduction initiatives which contributed most to achieving this target**

## C4.2

**(C4.2) Did you have any other climate-related targets that were active in the reporting year?**

Net-zero target(s)

## C4.2c

**(C4.2c) Provide details of your net-zero target(s).**

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**Target reference number**

NZ1

**Target coverage**

Company-wide

**Absolute/intensity emission target(s) linked to this net-zero target**

Abs1

**Target year for achieving net zero**

2050

**Is this a science-based target?**

No, and we do not anticipate setting one in the next 2 years

**Please explain target coverage and identify any exclusions**

The target applies to Scope 1 and Scope 2 (market-based) and our main business as a chemical company, accounting for 97% of total emissions under Scope 1+2 in the base year 2018. We excluded a small share of emissions related to the generation of steam and electricity for sale to third parties (3% of total emissions in the base year), which are not part of our core business activities and partly even driven by external factors (e.g. supply regulations in the power sector).

**Do you intend to neutralize any unabated emissions with permanent carbon removals at the target year?**

Yes

**Planned milestones and/or near-term investments for neutralization at target year**

We have not planned near-term investments or milestones related to neutralization at target year.

**Planned actions to mitigate emissions beyond your value chain (optional)**

We have not planned specific actions to mitigate emissions beyond our value chains in relation to our net zero target.

**C4.3**

**(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.**

Yes

**C4.3a**

**(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.**

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	56	
To be implemented*	398	264,000

Implementation commenced*	191	116,000
Implemented*	523	1,457,000
Not to be implemented	68	

## C4.3b

**(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.**

### Initiative category & Initiative type

Energy efficiency in production processes  
Process optimization

### Estimated annual CO<sub>2</sub>e savings (metric tonnes CO<sub>2</sub>e)

174,000

### Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1  
Scope 2 (location-based)  
Scope 2 (market-based)

### Voluntary/Mandatory

Voluntary

### Annual monetary savings (unit currency – as specified in C0.4)

24,723,000

### Investment required (unit currency – as specified in C0.4)

38,913,000

### Payback period

1-3 years

### Estimated lifetime of the initiative

Ongoing

### Comment

In 2021, our production sites have implemented 287 measures worldwide that result in savings of fuel, electricity, steam, cooling water etc. Projects included numerous energy conservation measures, e.g. chemical process modifications, additional process heat integration, advanced process control systems implementation, fuel switches to lower carbon footprint fuels, boiler efficiency upgrades, and optimization in steam systems. At the Ludwigshafen site, e.g., a multi-stage evaporation system set up at one plant saves over 60,000 metric tons of steam per year. Moreover, additional heat integration made it possible to supply other users with higher-pressure steam, reducing fuel consumption on the power plant side. At the Shanghai-Caojing site, a modernized



control concept reduced the fuel demand of a heat recovery unit, and at another plant, steam demand was reduced by additional heat integration using a cooler. At the Geismar Verbund site in Louisiana, steam demand was reduced by the use of optimized condensate separators. In total, these exemplary measures save more than 23,000 metric tons of CO<sub>2</sub> annually.

Monetary savings reported here stem from reduced energy consumption and relate only to those measures implemented in 2021. Since many projects benefit from a combination of different activities highlighted by CDP (e.g. heat recovery, cooling technology) and belong to the same overarching internal program, we decided to represent them jointly under "Process optimization".

**Initiative category & Initiative type**

Low-carbon energy consumption

Other, please specify

Green energy procurement based on mix of wind, hydro and solar power

**Estimated annual CO<sub>2</sub>e savings (metric tonnes CO<sub>2</sub>e)**

1,062,000

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

0

**Investment required (unit currency – as specified in C0.4)**

0

**Payback period**

No payback

**Estimated lifetime of the initiative**

Ongoing

**Comment**

The CO<sub>2</sub> savings resulted from new green contracts in 2021 for the Italian sites as well as for a great number of German sites and one site in Poland and the US as well as due to green certificates procurement in the US, China, and Europe.

**Initiative category & Initiative type**

Waste reduction and material circularity

Waste reduction

**Estimated annual CO<sub>2</sub>e savings (metric tonnes CO<sub>2</sub>e)**

185,000

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 1

Scope 3: Other (downstream)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

14,338,000

**Investment required (unit currency – as specified in C0.4)**

12,462,000

**Payback period**

&lt;1 year

**Estimated lifetime of the initiative**

Ongoing

**Comment**

In 2021 we were able to implement 97 measures with a focus on waste reduction at sites worldwide. Along with a process automation project at the Nitric Acid plant in LU the decomposition of nitrous oxide could be considerably increased thus resulting in about 154,000 metric tons of CO<sub>2</sub> equivalent emissions reduction.

**Initiative category & Initiative type**

Other, please specify

Other, please specify

Material consumption reduction in terms of a reduction of raw material demand by increasing material efficiency of processes

**Estimated annual CO<sub>2</sub>e savings (metric tonnes CO<sub>2</sub>e)**

36,000

**Scope(s) or Scope 3 category(ies) where emissions savings occur**

Scope 3 category 1: Purchased goods &amp; services

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

36,620,000

**Investment required (unit currency – as specified in C0.4)**

9,986,000

**Payback period**

&lt;1 year

### Estimated lifetime of the initiative

Ongoing

### Comment

In 2021 we were able to implement 138 measures in order to reduce raw material consumption. For example, at our Freeport site, the process efficiency was improved by new high-efficiency packing and a new distributor in a column resulting in avoiding almost 4,000 metric tons of CO<sub>2</sub> emissions. At a plant at the Antwerp site, we were able to reduce the raw material demand and thus avoid about 2,000 metric tons of CO<sub>2</sub> emissions by the installation of an online GC analyzer at a reactor and a newly implemented advanced process control (APC) system.

## C4.3c

### (C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Dedicated budget for low-carbon product R&D	We invest more than 60% of our annual R&D expenditures (€2.216 billion total R&D expenses in 2021) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection. For example, in a research project on an alternative production method for sodium acrylate, we are investigating the use of CO <sub>2</sub> as a chemical feedstock.
Partnering with governments on technology development	BASF is involved in several government-sponsored R&D initiatives on new technology development. For example, we are developing an innovative, climate-friendly production process for hydrogen (methane pyrolysis) together with partners from academia and industry in a joint project sponsored by the German Federal Ministry of Education and Research.
Internal price on carbon	Carbon pricing plays a role in internal assessments of capital investments and operational costs of our production facilities, the rationale being that costs originating from respective pricing schemes have an impact on the return on investment and cost-benefit ratio of operations. The price of carbon considered depends on various factors driven by the specific assessment, e.g. geography and timeframe of an investment. Sometimes, several pricing scenarios are used to evaluate uncertainties in future regulatory environments
Internal incentives/recognition programs	Employees with core responsibilities concerning energy and climate protection sign individual target agreements relating to emission reduction activities. The BASF compensation system links their bonus to the achievement of these individual targets. Every employee can engage in the employee suggestion scheme and bring forward ideas on emission reductions and will be rewarded financially if the idea is implemented.

Employee engagement	To enhance the awareness of employees and to realize emission reductions that are mainly based on behavioral changes, employee engagement programs are conducted, e.g. through brochures on how to increase the energy efficiency at the office, specific employee events or a specific employee suggestion scheme targeted at climate protection.
Compliance with regulatory requirements/standards	BASF complies with the regulatory requirements resulting from emission trading systems, e.g. in the EU, China, and South Korea. Moreover, compliance with air quality regulations can have an impact on the emission of GHGs. Our plants comply with these regulatory requirements. Additionally, regulations in many countries require a certain standard for the energy efficiency of new buildings. This is the minimum standard that is met if a new building is planned by BASF.
Dedicated budget for other emissions reduction activities	We have set up a dedicated budget for operational excellence measures, which covers measures to increase energy and resource efficiency as well as certain other emission reductions (e.g. abatement technology) in operations.
Other Setting of corporate goals	By setting ambitious corporate goals a process is initiated that ensures that measures relying on respective investments are implemented to reach these goals.

## C4.5

**(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?**

Yes

## C4.5a

**(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.**

**Level of aggregation**

Group of products or services

**Taxonomy used to classify product(s) or service(s) as low-carbon**

Other, please specify

BASF Sustainable Solution Steering in line with the WBCSD Chemical Industry Methodology for Portfolio Sustainability Assessment (PSA)

**Type of product(s) or service(s)**

Other

Other, please specify

BASF portfolio of climate protection products (Accelerators “Climate Change and Energy” in Sustainable Solution Steering)

### Description of product(s) or service(s)

We have segmented our portfolio regarding the contribution of our more than 45,000 products to sustainability, using the externally validated Sustainable Solution Steering method. Products with a substantial sustainability contribution in the value chain are classified as Accelerators. The products that help to reduce GHG emissions or increase energy efficiency in this context are dubbed Accelerators “Climate Change and Energy” and reflect our wide portfolio of climate protection products. Data on revenue generated in this table refer to revenues with this group of products. We offer many climate protection technologies in a variety of sectors, such as in the construction industry, the automotive industry, or industrial processes. For selected climate protection products, we assess the contribution to avoiding GHG emissions in dedicated case studies. It is not possible to summarize the various cases in the context of this disclosure. Therefore, we only showcase our methodology of calculating avoided GHG emissions based on lifecycle analysis in the following columns by using BASF's expandable polystyrene granulates (EPS) Styropor® and Neopor® as representative examples of our climate protection portfolio. EPS are used to insulate buildings and help to save heating energy and reduce carbon emissions. Neopor® contains particles of graphite. This enables the production of insulation boards with up to 20% better insulation performance than conventional EPS.

### Have you estimated the avoided emissions of this low-carbon product(s) or service(s)

Yes

### Methodology used to calculate avoided emissions

Addressing the Avoided Emissions Challenge- Chemicals sector

### Life cycle stage(s) covered for the low-carbon product(s) or services(s)

Cradle-to-grave

### Functional unit used

Heating a newly insulated existing single-family detached house in Germany at an average room temperature of 19°C for 40 years (net energy demand 10,018 kWh/a)

### Reference product/service or baseline scenario used

Heating an existing single-family detached house in Germany at an average room temperature of 19°C for 40 years (net energy demand 20,875 kWh/a)

### Life cycle stage(s) covered for the reference product/service or baseline scenario

Cradle-to-grave

### Estimated avoided emissions (metric tons CO<sub>2</sub>e per functional unit) compared to reference product/service or baseline scenario

141

### Explain your calculation of avoided emissions, including any assumptions

We conducted an attributional LCA study based on ISO 14040:2006 and ISO 14044:2006 that includes all material and energy inputs and outputs from raw materials

acquisition through production, use, and disposal (cradle-to-grave analysis). The study focuses on the wall insulation of an existing house by using an External Thermal Insulation Composite System (ETICS) based on expanded polystyrene (EPS). The study compares two alternatives for an existing detached house in Germany: one in which the house is left as representing the weighted average of non-refurbished and already refurbished houses, and one in which the façade is refurbished to current German standards using an External Thermal Insulation Composite System based on expanded polystyrene. The dimensions and geometry of the house including the number and size of windows were chosen to represent a typical single-family detached house in Germany built in the 1960s. The thickness of the insulation board and the heating demand of the house were calculated based on monthly energy balances by energy experts using software to simulate the thermal behavior of the representative house.

The applied reference flows are:

- (1) The newly insulated house with 198 m<sup>2</sup> of an External Thermal Insulation Composite System with an EPS Board (WLG 035 ( $\lambda = 0.035 \text{ W/(m}^2\text{K)}$ ), density 20 kg/m<sup>3</sup>) with a thickness of 14 cm achieving a U-value (wall) of 0.2 W/(m<sup>2</sup>\*K) and a net heating energy demand of 10,018 kWh/a
- (2) The house left as is with a net heating energy demand of 20,875 kWh/a.

In this study, the simplified calculation method was used. This means that the production and disposal phases of the study do not consider the entire house, but only the differences between the two alternatives. These are the production and the installation of the ETIC System and the disposal of the insulation system at the end of its defined service life. GWP factors from the IPCC 5th AR were used. No allocation was needed in the documented input data.

Results: The results of the study demonstrate the environmental benefits of wall insulation in particular with regard to the reduction of GHG emissions. The newly insulated house has a significantly lower carbon footprint as the house left as is, with about 141 tons of avoided greenhouse gas emissions. The GHG emissions are dominated by the use phase, i.e., the heating energy demand of the house and the service life.

**Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year**

22

## C5. Emissions methodology

### C5.1

**(C5.1) Is this your first year of reporting emissions data to CDP?**

No

## C5.1a

**(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?**

### Row 1

#### Has there been a structural change?

Yes, a divestment

Yes, a merger

#### Name of organization(s) acquired, divested from, or merged with

Divestment BCE: BASF's pigment business (BASF Colors and Effects) was sold to DIC (as negotiated in August 2019). About 2500 employees were affected.

Divestment Solenis: BASF and Clayton, Dubilier and Rice sold Solenis to Platinum Equity.

Divestment: BASF completed the sale of its production site in Kankakee, Illinois, to a subsidiary of One Rock Capital Partners, LLC.

Merger: BASF and Shanshan founded a battery material enterprise in China of which BASF holds 51% and Shanshan 49%.

#### Details of structural change(s), including completion dates

BCE: The transaction was completed on June 30th, 2021. The turnover of the divested business was about €1 billion, BCE was sold for €1.15 billion and contributed about 92,000 t of Scope 1 and Scope 2 emissions in the first 6 months. Thus, we assume that the effect of the divestiture is about 92,000 t of CO<sub>2</sub>e.

Solenis: BASF held 49% of Solenis. BASF-share of sales revenues was €1.1 billion. The transaction was completed on November 9, 2021. Solenis turnover was \$3 billion in the business year ending on September 30, 2021. Effect on emissions is estimated at less than 5,000 t.

Kankakee: The purchase price was €177 million. The sale was completed on May 31, 2021. Effect on emissions is estimated at 28,000 t (for 7 months; based on the first five months of 2021).

Some other sites were shut down and are no longer part of the 2021 balance, affecting 2021 emissions with a minus of 36,000 t (based on their 2020 data).

BASF Shanshan Battery Materials: Turnover September to December 2021: €354 million; sales price €616 million, transaction completed on August 31, 2021. Effect on emissions is estimated at about 70,000 t.

Other new sites added another 50,000 t of CO<sub>2</sub>.

## C5.1b

**(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?**

Change(s) in methodology, boundary, and/or reporting year definition?	
Row 1	No

## C5.1c

**(C5.1c) Have your organization’s base year emissions been recalculated as result of the changes or errors reported in C5.1a and C5.1b?**

	<b>Base year recalculation</b>	<b>Base year emissions recalculation policy, including significance threshold</b>
Row 1	No, because the impact does not meet our significance threshold	<p>A pre-condition for a recalculation is a thorough impact assessment. If the impact assessment indicates a change of the baseline by <math>\geq 5\%</math> due to significant structural changes of BASF (e.g. mergers, acquisitions, divestments), major changes to the calculation methodology / accounting approach (e.g. revision of the GHG Protocol, switches in datasets for emission factors), or identification of existing but not yet assessed emissions, the Board of Directors shall be requested for approval of the recalculation of the baseline.</p> <p>The changes reported in C5.1a didn't meet the threshold:</p> <p>a) total annual emissions associated with the acquisitions and divestitures were minor (BCE with largest footprint: Scope 1+2 emissions of 161,000 t of CO<sub>2</sub> in 2020, equivalent to 0.8% of total BASF emissions of that year)</p> <p>b) the changes occurred mid-year and thus did not even affect the whole year (e.g., effect of BCE considering only relevant share of the year: around 0.37% of total emissions).</p>

## C5.2

**(C5.2) Provide your base year and base year emissions.**

### Scope 1

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

18,593,000

**Comment**

### Scope 2 (location-based)

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018



**Base year emissions (metric tons CO<sub>2</sub>e)**

3,747,000

**Comment**

**Scope 2 (market-based)**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

4,067,000

**Comment**

**Scope 3 category 1: Purchased goods and services**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

48,550,000

**Comment**

**Scope 3 category 2: Capital goods**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

1,900,000

**Comment**

**Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

2,906,000

**Comment**

**Scope 3 category 4: Upstream transportation and distribution**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

1,937,000

**Comment**

**Scope 3 category 5: Waste generated in operations**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

717,000

**Comment**

**Scope 3 category 6: Business travel**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

211,000

**Comment**

### Scope 3 category 7: Employee commuting

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO2e)**

236,000

**Comment**

### Scope 3 category 8: Upstream leased assets

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO2e)**

270,000

**Comment**

### Scope 3 category 9: Downstream transportation and distribution

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO2e)**

1,817,000

**Comment**

### Scope 3 category 10: Processing of sold products

---

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

BASF does not calculate and report GHG emissions from processing of sold products, as these emissions were identified as not being relevant to BASF. This is the result of a thorough analysis and balancing of the different relevance criteria for Scope 3 emissions sources and the five accounting and reporting principles of the GHG Protocol standards by WRI and WBCSD. BASF produces a large variety of intermediate goods. This application diversity cannot be tracked reasonably, and reliable figures on a yearly basis are virtually impossible to obtain. These circumstances strongly compromise the reporting principles completeness, consistency and accuracy (and feasibility), thereby not serving our business goal of reducing GHG emissions along the value chain. In addition, the WBCSD Chemical Sector Standard “Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain” emphasizes that “chemical companies are not required to report Scope 3, category 10 emissions, since reliable figures are difficult to obtain, due to the diverse application and customer structure”.

**Scope 3 category 11: Use of sold products**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

41,509,000

**Comment****Scope 3 category 12: End of life treatment of sold products**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO<sub>2</sub>e)**

15,954,000

**Comment****Scope 3 category 13: Downstream leased assets**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO2e)**

100,000

**Comment**

**Scope 3 category 14: Franchises**

---

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

Not relevant as BASF does not own or operate franchises.

**Scope 3 category 15: Investments**

---

**Base year start**

January 1, 2018

**Base year end**

December 31, 2018

**Base year emissions (metric tons CO2e)**

1,858,000

**Comment**

**Scope 3: Other (upstream)**

---

**Base year start**

**Base year end**

**Base year emissions (metric tons CO2e)**

**Comment**

**Scope 3: Other (downstream)**

---

**Base year start**

**Base year end**

**Base year emissions (metric tons CO<sub>2</sub>e)**

**Comment**

## C5.3

**(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.**

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

## C6. Emissions data

### C6.1

**(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO<sub>2</sub>e?**

**Reporting year**

---

**Gross global Scope 1 emissions (metric tons CO<sub>2</sub>e)**

18,668,000

**Start date**

January 1, 2021

**End date**

December 31, 2021

**Comment**

Emissions of N<sub>2</sub>O, CH<sub>4</sub> and HFC have been translated into CO<sub>2</sub> emissions using the Global Warming Potential, or GWP, factor. GWP factors are based on the Intergovernmental Panel on Climate Change (IPCC) 2007, errata table 2012 for the 2018 and 2020 reporting years, and IPCC 2014 for the 2021 reporting year. HFC (hydrofluorocarbons) are calculated using the GWP factors of the individual components. Gross Scope 1 emissions decreased by 1.5 % compared to 2020.

**Past year 1**

---

**Gross global Scope 1 emissions (metric tons CO<sub>2</sub>e)**

18,395,000

**Start date**

January 1, 2020

**End date**

December 31, 2020

**Comment**

## C6.2

**(C6.2) Describe your organization’s approach to reporting Scope 2 emissions.**

**Row 1**

---

**Scope 2, location-based**

We are reporting a Scope 2, location-based figure

**Scope 2, market-based**

We are reporting a Scope 2, market-based figure

**Comment**

No changes in reporting method compared to previous years.

## C6.3

**(C6.3) What were your organization’s gross global Scope 2 emissions in metric tons CO2e?**

**Reporting year**

---

**Scope 2, location-based**

3,670,000

**Scope 2, market-based (if applicable)**

2,464,000

**Start date**

January 1, 2021

**End date**

December 31, 2021

**Comment**

25% decrease in Scope 2 emissions e.g., due to increase in share of green electricity (market based).

**Past year 1**

---

**Scope 2, location-based**

3,362,000

**Scope 2, market-based (if applicable)**

3,279,000

**Start date**

January 1, 2020

**End date**

December 31, 2020

**Comment**

**C6.4**

**(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?**

Yes

**C6.4a**

**(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.**

**Source**

GHG emissions from mobile combustion

**Relevance of Scope 1 emissions from this source**

Emissions are not relevant

**Relevance of location-based Scope 2 emissions from this source**

No emissions from this source

**Relevance of market-based Scope 2 emissions from this source (if applicable)**

No emissions from this source

**Explain why this source is excluded**

We do not report CO2 emissions from mobile combustion since their contribution to BASF's total GHG emissions is not significant (less than 0.1 % of BASF's total GHG emissions). This is far less than our 5% materiality threshold.

**Estimated percentage of total Scope 1+2 emissions this excluded source represents**

0

**Explain how you estimated the percentage of emissions this excluded source represents**

Emissions from mobile combustion comprise emissions from our own assets (as opposed to vehicles we lease, accounted in scope 3). We estimate that we own 2000 cars, on average running 10000 km per year and emitting 150 g of CO2 per km. We estimate that we own 100 trucks / tractors, on average running 1000 km per year and



emitting 500 g of CO<sub>2</sub> per km. This results in a total of 350 tCO<sub>2</sub>, which represents 0.0017% of our combined Scope 1 and 2 emissions.

**Source**

CO<sub>2</sub> emissions from administrative sites/offices (e.g. sales offices)

**Relevance of Scope 1 emissions from this source**

Emissions are not relevant

**Relevance of location-based Scope 2 emissions from this source**

Emissions are not relevant

**Relevance of market-based Scope 2 emissions from this source (if applicable)**

Emissions are not relevant

**Explain why this source is excluded**

BASF reports GHG emissions only for its production facilities. GHG emission data from other facilities such as sales offices are not collected since their contribution to BASF's total GHG emissions was calculated to be less than 1%, which is under our materiality threshold of 5%. We periodically reassess the contribution from our administrative sites. GHG emissions from assets leased by BASF are accounted for as Scope 3 emissions.

**Estimated percentage of total Scope 1+2 emissions this excluded source represents**

0

**Explain how you estimated the percentage of emissions this excluded source represents**

We estimate the carbon intensity of office buildings we own at 0.08 tCO<sub>2</sub> per m<sup>2</sup> per year (from electricity and heating). The total area occupied by these buildings is 0.5 million m<sup>2</sup>. This results in a total of 0.04 million tCO<sub>2</sub> per year which represents ~0.2% of our Scope 1 and 2 emissions combined.

## C6.5

**(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.**

**Purchased goods and services**

**Evaluation status**

Relevant, calculated

**Emissions in reporting year (metric tons CO<sub>2</sub>e)**

55,195,000

**Emissions calculation methodology**

Average data method

Spend-based method

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

(i) Activity data: Quantity and monetary purchasing volume of the goods and services purchased in the reporting year were obtained from BASF internal business data management systems. (ii) Emissions factors: Cradle-to-gate emissions factors were obtained from commercially and publicly available data sources such as GaBi (sphera), ecoinvent and PlasticsEurope as well as from BASF's own LCA database, which is based mainly on primary data. Supply chain emission factors for technical goods and services were obtained from the 2012 Guidelines to DEFRA/DECC's GHG Conversion Factors for Company Reporting, Annex 13. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: We analyzed the GHG emissions of our procured raw materials and precursor manufacturing at BASF's suppliers' facilities (including merchandise) by calculating the cradle-to-gate emissions, including all direct GHG emissions from raw material extraction, precursor manufacturing and transport, as well as indirect emissions from energy use. To do so, we determined the quantity of each single product purchased, and then applied emission factors for about 80 percent of the purchased products (by weight). If country-specific emission factors were available, a weighted product carbon footprint was calculated to reflect the percentage of the regional distribution of the purchased material. We multiplied the CO<sub>2</sub>e emissions per kilogram of each product by the respective quantity of the product purchased to determine cradle-to-gate emissions. Finally, the resulting Scope 3 emissions were extrapolated to 100% of the total purchasing volume to account for all procured raw materials and precursors. For calculating the emissions from packaging, we first determined the material compositions of the different packaging groups such as HDPE or steel drums. Then, we calculated GHG emissions by multiplying the number of purchased items of packaging by their respective cradle-to-gate emission factors. The GHG emissions from technical goods and services were assessed based on the monetary purchasing volume in the reporting year by multiplying the amount of spending (with inflation adjustment and considering VAT) by the GHG conversion factors from the Defra 2012 Guidelines.

**Capital goods**

---

**Evaluation status**

Relevant, calculated

**Emissions in reporting year (metric tons CO<sub>2</sub>e)**

1,701,000

**Emissions calculation methodology**

Average spend-based method

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

(i) Activity data: Monetary purchasing volumes of capital goods purchased in the reporting year were obtained from BASF internal business data management systems. (ii) Emissions factors: Supply chain emission factors for spending on capital goods were obtained from the 2012 Guidelines to DEFRA/DECC's GHG Conversion Factors for Company Reporting, Annex 13 (Indirect emissions from supply chain). (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: The GHG emissions that are associated with BASF's capital goods purchased in the reporting year were estimated based on the following approach: All sub-segments of BASF's global Technical Procurement related to the sourcing of capital equipment such as machinery and fabricated equipment were analyzed based on their monetary purchasing volume in the reporting year. Each sub-segment was assigned a corresponding SIC code because the DEFRA conversion factors for greenhouse gas emissions are based on the standard classification system (SIC 2003). The amount of spending (with inflation adjustment and considering VAT) was then multiplied by the respective GHG conversion factor and subsequently added up to the total GHG emissions from capital goods.

**Fuel-and-energy-related activities (not included in Scope 1 or 2)****Evaluation status**

Relevant, calculated

**Emissions in reporting year (metric tons CO<sub>2</sub>e)**

2,904,000

**Emissions calculation methodology**

Average data method

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

(i) Activity data: The quantities of fuel and energy, i.e., electricity and steam purchased in the reporting year were obtained from BASF internal business data management systems. (ii) Emissions factors: The cradle-to-gate emissions factors were obtained from the GaBi database. The grid-related loss factor was taken from IEA, Electricity Statistics (most recent year available). (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: The GHG emissions from the extraction, production and transportation of fossil fuels used for power and steam generation in our own (power) plants were determined by multiplying the amount of purchased fuels by their respective, region-specific cradle-to-gate CO<sub>2</sub>e emission factors. The GHG emissions from the extraction, production and transportation of fuels consumed in the generation of electricity and steam purchased by BASF in the reporting year were calculated as follows: The amount of primary energy was determined based on the amount of purchased electricity and steam and the respective

fuel efficiencies (83% for steam generation; 37% for electricity generation). The share of the different fuel types of the total amount of primary energy was then calculated for each region based on the fuel shares of electricity generation (IEA, Electricity Statistics; most recent year available). The fuel shares were then multiplied by the respective region-specific CO<sub>2</sub>e emission factors to result in the overall CO<sub>2</sub>e emissions. Generation of electricity, steam, heating and cooling that is consumed in a T&D system: GHG emissions associated with losses of purchased electricity and steam were estimated based on our location-based Scope 2 emissions in the reporting year and a grid-related loss factor. Losses associated with our own T&D system due to our own generation of electricity and steam are already accounted for in our Scope 1 emissions which are based on fuel input. Generation of electricity and steam that is purchased by the reporting company and sold to end users is not applicable to BASF.

## Upstream transportation and distribution

---

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO<sub>2</sub>e)

2,252,000

### Emissions calculation methodology

Distance-based method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

(i) Activity data: Quantities, types of goods and regional split of purchase in the reporting year as well as origin and destination points, mode of transport and load factors were obtained from BASF internal business data management systems. (ii) Emissions factors: The CO<sub>2</sub> emission factors used were taken from the GLEC Framework. For quantification of the GHG emissions from BASF's internal transports the emission factors incorporated in the IT solution EcoTransIT World were used ([www.ecotransit.org/](http://www.ecotransit.org/)). (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: GHG emissions associated with the transport of raw materials purchased by BASF in the reporting year were calculated by multiplying the quantities of products procured by a transportation distance and by an emissions factor for the mode of transport. For large-volume raw materials (make up more than 50% of the purchasing volume), the mode of transport and the transport distance were determined substance specifically. For the remaining raw materials transportation distances for each region were estimated by logistics experts. For procured products in Europe, the modal split from a Cefic survey for chemical transports was used; for all other regions only truck transport was assumed. The GHG emissions from BASF internal transports were calculated based on detailed transportation data using the IT solution EcoTransIT World. GHG emissions associated with the transportation of technical & capital goods purchased by BASF were calculated based on an estimated weight for capital and technical goods derived from

the monetary purchasing volume and an assumed material content. Weight of purchased packaging was calculated based on material composition. Only truck transportation and an average transportation distance of 500 km (1,000 km in USA) were assumed for the transport of technical goods.

## Waste generated in operations

---

### Evaluation status

Relevant, calculated

### Emissions in reporting year (metric tons CO<sub>2</sub>e)

1,742,000

### Emissions calculation methodology

Average data method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

(i) Activity data: The quantities of solid waste and wastewater generated during production at all BASF production sites were obtained from BASF's in-house Reporting EHS Application database. The data collection method differentiates between on-site and off-site disposal as well as between different disposal methods (waste incineration with and without energy recovery, landfill, wastewater treatment and others). (ii) Emissions factors: The emissions factors were obtained from the GaBi database. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: The GHG emissions from on-site waste incineration, landfill and physical recovery are accounted for in our Scope 1 emissions. The off-site physical recovery (recycling) of waste is assigned zero emissions, following the cut-off approach in life cycle assessment. The GHG emissions from off-site waste incineration with energy recovery were calculated by multiplying the amount of waste in this category by a suitable emission factor. The GHG emissions from off-site waste incineration without energy recovery as well as from landfill disposal were calculated based on a carbon balance. It was assumed that all carbon contained in the waste is eventually converted to CO<sub>2</sub> during incineration or landfilling. From a survey of a variety of different chemical products, the average carbon content of a chemical product was determined. Multiplying the amount of waste by this factor yields the waste's total carbon content which is then converted to the amount of emitted CO<sub>2</sub>. The GHG emissions of BASF operated wastewater plants are accounted for in our Scope 1 or Scope 2 emissions, respectively. The CO<sub>2</sub>e emissions from non-BASF operated wastewater treatment plants were calculated as follows based on a TOC (Total Organic Carbon) material balance. It is assumed that 30% of the influent organic carbon load is insoluble and inert, as well as the nonbiodegradable TOC in the effluent. It is also assumed that 25% of the remaining biotreatable TOC is converted into biosludge during biotreatment. The residual TOC, which is about 50% of the total influent TOC, is

converted into CO<sub>2</sub>. The CO<sub>2</sub> emissions were calculated from the residual TOC with a conversion factor of CO<sub>2</sub>/TOC=3.67.

## Business travel

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### Evaluation status

Not relevant, calculated

### Emissions in reporting year (metric tons CO<sub>2</sub>e)

27,000

### Emissions calculation methodology

Distance-based method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

5

### Please explain

(i) Activity data: Miles and kilometers per means of transportation, travelled by BASF employees in the reporting year were collected by external partners such as travel agencies and provided to BASF's Travel Management. For some travel activities the travel providers directly reported the amount of emitted greenhouse gases for the reporting year (applies to rail travel in Germany and trips by rental car). (ii) Emissions factors: CO<sub>2</sub>e emissions factors for short-haul, medium-haul and long-haul flights were taken from DEFRA's GHG Conversion Factors for Company Reporting (2021). CO<sub>2</sub>e emissions factors for travel with train per country were taken from: SNCF, 2020 for France; Thalys Network, 2017 for Belgium; Ferrovie dello stato italiane, 2019 for Italy; ÖBB, 2018/2019 for Austria; DEFRA, 2021 for UK; EPA, 2021 for the US; Via Rail, 2019 for Canada; IEA Railway Handbook, 2017 and the India GHG Program, 2015 for Asia Pacific. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: The GHG emissions associated with the transportation of all BASF Group employees for business-related activities were calculated as follows: a) GHG emissions from business travel by air: Miles were converted to CO<sub>2</sub> equivalents using conversion factors for the average passenger in shorthaul, medium-haul and long-haul flights. b) GHG emissions from business travel by train: Rail miles were converted into CO<sub>2</sub>e emissions using country-specific and/or railway-specific CO<sub>2</sub>e conversion factor for travel by train; for rail travel in Germany the external partner Deutsche Bahn directly reports the resulting GHG emissions zero emissions due to 100% green power). (c) GHG emissions from business travel by car: External partners (i.e., car rental companies) provided a summary of kilometers driven and the resulting GHG emissions for the reporting year.

## Employee commuting

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### Evaluation status

Not relevant, calculated

### Emissions in reporting year (metric tons CO<sub>2</sub>e)

163,000

**Emissions calculation methodology**

Average data method

Distance-based method

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

**Please explain**

(i) Activity data: Number of employees per region as well as distance and mode of transportation for a selected group of employees in Germany, who participated in a poll in 2017. (ii) Emissions factors: The CO<sub>2</sub>e emissions factors used for car, motorbike, and public transportation were taken from DEFRA's GHG Conversion Factors for Company Reporting (2021) for employee commuting in Europe and Asia and from EPA's mission Factors for Greenhouse Gas Inventories (2021) for North and South America. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: CO<sub>2</sub>e emissions from employee commuting in Europe were calculated based on the results of a representative poll conducted among BASF SE employees in 2017. Employees were asked about the distance travelled between their homes and workplaces and their means of transportation. GHG emissions were calculated by multiplying the travelled distance (220 days per year, back and forth) by the respective CO<sub>2</sub>e emissions factor accounting for the different means of transportation. The resulting GHG emissions were subsequently extrapolated to all BASF Group employees in Europe. For North America, the calculations were based on Bureau of Transportation Statistics on principal means of transportation to work. It was assumed that employees travel 236 days per year and 30 kilometers one-way. For Asia and South America, it was assumed that all employees travel a distance of 30 km by car (one-way) and 230 or 222 days per year, respectively. The corresponding emissions were calculated by multiplying the distance by the number of employees, number of working days and an average emission factor for cars per km. Due to the corona pandemic, working from home was established in all BASF regions. For 2021 it was estimated that about 30% of all employees worked from home for a period of 9 months and hence did not commute to work. This fact was considered in the calculations of GHG emissions from employee commuting.

**Upstream leased assets****Evaluation status**

Not relevant, calculated

**Emissions in reporting year (metric tons CO<sub>2</sub>e)**

147,000

**Emissions calculation methodology**

Average data method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

#### Please explain

(i) Activity data: Leased cars: Vehicle miles as defined in the leasing contracts for BASF SE employees in the reporting year. Leased office and storage space: Data for the reporting year was obtained from BASF internal business data management systems. Leased equipment: Monetary purchasing volume for leased equipment in the reporting year was derived from BASF internal business data management systems. (ii) Emissions factors: CO<sub>2</sub> emissions factors for leased cars were provided by the car manufacturers. They differentiate between fuel type (diesel/gasoline) as well as cubic capacity. For electric cars the electricity consumption of the models was taken from the manufacturer's specification. Energy consumption (electricity and heat energy) per square meter of office space and warehouses in Europe was taken from a study of BMWi, 2015. For North and South America, it was taken from the Commercial Buildings Energy Consumption Survey (EIA, 2012). For Asia, it was taken from a study by Ding et al., 2017. Region-specific CO<sub>2</sub> emissions factors per MWh were obtained from IEA, 2021. Emission factors for leased equipment were taken from the 2012 Guidelines to DEFRA/DECC's GHG Conversion Factors for Company Reporting, Annex 13 (Indirect emissions from supply chain). (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: GHG emissions from leased assets were calculated for three different categories. 1) GHG emissions from cars leased by BASF SE were calculated by multiplying the vehicle miles travelled, which were derived from the respective leasing contracts, by the relevant CO<sub>2</sub> emissions factors. Since only the leasing contracts of BASF SE were evaluated, the resulting GHG emissions were subsequently extrapolated based on the number of employees to account for the entire BASF Group. 2) The GHG emissions from leased offices and storage space were assessed based on leased space and the annual energy consumption per square meter of office and storage space, respectively. 3) The GHG emissions from leased equipment such as hardware (i.e. computers or printers) were assessed based on the monetary purchasing volume in the reporting year (with inflation adjustment and considering VAT) and the corresponding GHG conversion factors.

### Downstream transportation and distribution

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#### Evaluation status

Relevant, calculated

#### Emissions in reporting year (metric tons CO<sub>2</sub>e)

1,702,000

#### Emissions calculation methodology

Distance-based method

### Percentage of emissions calculated using data obtained from suppliers or value chain partners



0

**Please explain**

(i) Activity data: Quantities of product, origin and destination points, mode of transport and load factors were obtained from BASF internal business data management systems. (ii) Emissions factors: The emission factors incorporated in the IT solution EcoTransIT World were used ([www.ecotransit.org/](http://www.ecotransit.org/)). (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: For the calculation of the GHG emissions associated with the transport of BASF products sold in the reporting year, the respective shipments from BASF sites to BASF customers were evaluated using the IT solution EcoTransIT World.

**Processing of sold products****Evaluation status**

Not relevant, explanation provided

**Please explain**

BASF does not calculate and report GHG emissions from processing of sold products, as these emissions were identified as not being relevant to BASF. This is the result of a thorough analysis and balancing of the different relevance criteria for Scope 3 emissions sources and the five accounting and reporting principles of the GHG Protocol standards by WRI and WBCSD. BASF produces a large variety of intermediate goods. This application diversity cannot be tracked reasonably, and reliable figures on a yearly basis are virtually impossible to obtain. These circumstances strongly compromise the reporting principles completeness, consistency and accuracy (and feasibility), thereby not serving our business goal of reducing GHG emissions along the value chain. In addition, the WBCSD Chemical Sector Standard "Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain" emphasizes that "chemical companies are not required to report Scope 3, category 10 emissions, since reliable figures are difficult to obtain, due to the diverse application and customer structure".

**Use of sold products****Evaluation status**

Relevant, calculated

**Emissions in reporting year (metric tons CO<sub>2</sub>e)**

4,050,000

**Emissions calculation methodology**

Methodology for direct use phase emissions, please specify

Direct use-phase emissions from greenhouse gases and products that contain or form greenhouse gases that are emitted during use

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

0

### Please explain

(i) Activity data: Quantities and types of products sold in the reporting year were obtained from BASF internal business data management systems. (ii) Emissions factors: not applicable. (iii) GWP values: GWPs were taken from the 5th Assessment Report, IPCC, 2013. In the case of some fluorinated hydrocarbons, GWPs are based on manufacturers' information. (iv) Methodology & assumptions: For calculation of the GHG emissions associated with the use of BASF products we only considered the direct use-phase emissions of sold products over their expected lifetime, i.e. the GHGs and products that contain or form GHGs that are emitted during use. 1) GHG emissions from products sold in the reporting year that form greenhouse gases: Nitrogenous fertilizers release nitrous oxide to the atmosphere because of microbial action in the soil. Associated GHG emissions were calculated based on amount of N-containing fertilizers sold in the reporting year, nitrogen content and on the fact that about 1% (in presence of a nitrification inhibitor only 0.5%) of nitrogen contained in the fertilizer is converted into N<sub>2</sub>O-N. CO<sub>2</sub> from the use of urea (as fertilizer and diesel exhaust liquid) and from the use of carbonates (as leavening agent) was calculated based on sold product quantity and contained CO<sub>2</sub> amount. 2) GHG emissions from products sold in the reporting year that contain greenhouse gases such as dry ice, CO<sub>2</sub> as gas for the beverage industry and HFCs as foaming agents to produce polyurethane foams: GHG emissions from dry ice and CO<sub>2</sub> sold to the beverage industry were considered based on the sold quantity. GHG emissions from HFCs were calculated based on the procured HFC-quantities and loss rate of HFCs in the polyurethane foams during their use phase (100% over the entire life cycle).

### End of life treatment of sold products

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#### Evaluation status

Relevant, calculated

#### Emissions in reporting year (metric tons CO<sub>2</sub>e)

28,340,000

#### Emissions calculation methodology

Average data method

#### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

(i) Activity data: Quantity of products (raw materials, pre-products and packaging) purchased in the reporting year and percentage of BASF's sales in Europe and in other regions were obtained from BASF internal business data management systems. The ratio of the different waste disposal methods (incineration, landfill, recycling) in each country/region was derived from data on municipal waste treatment provided by Eurostat (2020), OECD Statistics (2017, 2018) and the Chinese National Bureau of Statistics. (ii) Emissions factors: not applicable. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology &

assumptions: GHG emissions from the disposal of all BASF products (except products that are already disposed of during their use phase and accounted for in the respective category) manufactured in the reporting year were calculated presuming that all BASF products at the end of their lives are either disposed of by landfilling or incineration, or recycled. It was assumed that the products would be used and disposed of in the countries to which BASF sold them. The amount of GHG emissions was calculated separately for each region and end-of-life method. Recycling was assigned zero emissions following the cut-off approach in life cycle assessment. The emissions from landfilling and incineration were calculated based on a carbon balance. It was assumed that all carbon contained in the products is eventually converted to CO<sub>2</sub> after disposal. For this calculation the same range of chemicals as in Category 3.1 was considered since their amounts and C-contents are known. Incineration with energy recovery was considered proportionately in Europe, North America and Asia. In accordance with the Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain, total emissions from incineration with energy recovery were allocated to the waste treatment and the energy generation with a zero emission factor by using an economic allocation approach based on proportions of total costs of waste treatment and total revenues from sale of generated steam and electricity.

### Downstream leased assets

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#### Evaluation status

Not relevant, calculated

#### Emissions in reporting year (metric tons CO<sub>2</sub>e)

100,000

#### Emissions calculation methodology

Average data method

#### Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

#### Please explain

BASF owns only a few downstream leased assets. GHG emissions of this category are estimated to account for about 5% of the category Upstream Leased Assets, which corresponds to <0.1 million tons of CO<sub>2</sub>e.

### Franchises

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#### Evaluation status

Not relevant, explanation provided

#### Please explain

Not relevant as BASF does not own or operate franchises.

### Investments

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#### Evaluation status

Relevant, calculated

**Emissions in reporting year (metric tons CO<sub>2</sub>e)**

3,073,000

**Emissions calculation methodology**

Investment-specific method

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100

**Please explain**

(i) Activity data: Scope 1 and Scope 2 emissions of BASF's equity-accounted joint ventures and associated companies were obtained from the respective companies upon inquiry. (ii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iii) Methodology & assumptions: GHG emissions from equity-accounted joint ventures and equity-accounted associated companies are not included in BASF's Scope 1 or Scope 2 emissions. The GHG emissions from these companies are evaluated on a regular basis by inquiring these data from the respective companies, but only from non-consolidated companies of which BASF holds a minimum interest of 20%.

**Other (upstream)**

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**Evaluation status**

**Please explain**

**Other (downstream)**

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**Evaluation status**

**Please explain**

## C6.5a

**(C6.5a) Disclose or restate your Scope 3 emissions data for previous years.**

**Past year 1**

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**Start date**

January 1, 2020

**End date**

December 31, 2020

**Scope 3: Purchased goods and services (metric tons CO2e)**

47,753,000

**Scope 3: Capital goods (metric tons CO2e)**

1,722,000

**Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)  
(metric tons CO2e)**

3,119,000

**Scope 3: Upstream transportation and distribution (metric tons CO2e)**

2,462,000

**Scope 3: Waste generated in operations (metric tons CO2e)**

1,343,000

**Scope 3: Business travel (metric tons CO2e)**

34,000

**Scope 3: Employee commuting (metric tons CO2e)**

147,000

**Scope 3: Upstream leased assets (metric tons CO2e)**

169,000

**Scope 3: Downstream transportation and distribution (metric tons CO2e)**

1,237,000

**Scope 3: Processing of sold products (metric tons CO2e)**

**Scope 3: Use of sold products (metric tons CO2e)**

5,951,000

**Scope 3: End of life treatment of sold products (metric tons CO2e)**

23,911,000

**Scope 3: Downstream leased assets (metric tons CO2e)**

100,000

**Scope 3: Franchises (metric tons CO2e)**

**Scope 3: Investments (metric tons CO2e)**

3,438,000

**Scope 3: Other (upstream) (metric tons CO2e)**

**Scope 3: Other (downstream) (metric tons CO2e)**

**Comment**

Data from 2020 (no restatement)

**C6.7**

**(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?**

Yes

**C6.7a**

**(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.**

	<b>CO2 emissions from biogenic carbon (metric tons CO2)</b>	<b>Comment</b>
Row 1	91,000	These emissions comprise biogenic CO2 from fermentations at Ludwigshafen, Germany and Gunsan, Korea, biogenic emissions from burning nutshells in Mangalore, India to generate steam as well as biogenic emissions from the Ludwigshafen sludge incinerator.

**C6.10**

**(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.**

**Intensity figure**

0.000269

**Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)**

21,132,000

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

78,598,000,000

**Scope 2 figure used**

Market-based

**% change from previous year**

26.5

**Direction of change**

Decreased

### Reason for change

BASF's total GHG emissions per unit total revenue decreased by 26.5% in 2021 compared to 2020. The absolute gross Scope 1 and Scope 2 emissions decreased by 2.5% while revenues increased by 32.9% (+€19.5 billion). The increase in revenues is attributable to higher volumes and prices (partially due to business taking up again after the Covid-19-pandemic). All segments recorded higher sales volumes, with chemicals, materials and surface technologies being particularly successful.

A large increase in the share of green electricity (88 sites worldwide were already partially or fully powered by emission-free electricity at the end of 2021, vs. 19 sites in 2020) led to a 25% decrease in Scope 2 market-based emissions. Despite significantly higher production volumes, there was a 1.5% reduction in Scope 1 emissions compared to 2020 mainly driven by:

- GHG emission reductions due to energy efficiency and process optimization (see C4.3a: 287 measures in 2021, accounting for -174,000 t of Scope 1+2 emissions),
- GHG emission reductions due to waste reduction measures (see C4.3a: 97 measures in 2021, accounting for -185,000 t of Scope 1+2 emissions),
- savings from employee suggestion measures (-12,000 t).

### Intensity figure

193.8

### Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO<sub>2</sub>e)

21,132,000

### Metric denominator

full time equivalent (FTE) employee

### Metric denominator: Unit total

109,042

### Scope 2 figure used

Market-based

### % change from previous year

3.1

### Direction of change

Decreased

### Reason for change

BASF decreased its GHG emissions per FTE employee in 2021 compared to 2020 by 3.1%. The number of FTE employees increased by 0.7% while absolute Scope 1 and Scope 2 emissions decreased by 2.5%, resulting in a significant decrease of the indicator value. After a decrease in the number of employees in 2020 due to the sale of the construction chemicals business, the number of people working for BASF was rather

stable in 2021 with acquisitions and divestitures neutralizing each other.

A large increase in the share of green electricity (88 sites worldwide were already partially or fully powered by emission-free electricity at the end of 2021, vs. 19 sites in 2020) led to a 25% decrease in Scope 2 market-based emissions. Despite significantly higher production volumes, there was a 1.5% reduction in Scope 1 emissions compared to 2020 mainly driven by:

- GHG emission reductions due to energy efficiency and process optimization (see C4.3a: 287 measures in 2021, accounting for -174,000 t of Scope 1+2 emissions),
- GHG emission reductions due to waste reduction measures (see C4.3a: 97 measures in 2021, accounting for -185,000 t of Scope 1+2 emissions),
- savings from employee suggestion measures (-12,000 t).

### Intensity figure

0.564

### Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO<sub>2</sub>e)

20,185,000

### Metric denominator

Other, please specify  
Metric ton of sales product

### Metric denominator: Unit total

35,793,303

### Scope 2 figure used

Market-based

### % change from previous year

11.7

### Direction of change

Decreased

### Reason for change

This intensity figure refers to GHG emissions and volume of sales products for BASF EXCLUDING emissions related to the generation of steam and electricity for sale to third parties; this matches the scope of our corporate climate protection target. BASF decreased its GHG emissions per metric ton of sales products in 2021 compared to 2020 by 11.7% (2020: 0.639 tCO<sub>2</sub>e per ton of sales product vs. 2021: 0.564 tCO<sub>2</sub>e per ton of sales product). The volume of sales products from businesses within the reporting boundary increased by 9.9%. The relevant Scope 1 and 2 emissions (i.e. excluding emissions related to the generation of steam and electricity for sale to third parties) decreased by 3% in 2021.

A large increase in the share of green electricity (88 sites worldwide were already partially or fully powered by emission-free electricity at the end of 2021, vs. 19 sites in 2020) led to a 25% decrease in Scope 2 market-based emissions. Despite significantly



higher production volumes, there was a 1.5% reduction in Scope 1 emissions compared to 2020 mainly driven by:

- GHG emission reductions due to energy efficiency and process optimization (see C4.3a: 287 measures in 2021, accounting for -174,000 t of Scope 1+2 emissions),
- GHG emission reductions due to waste reduction measures (see C4.3a: 97 measures in 2021, accounting for -185,000 t of Scope 1+2 emissions),
- savings from employee suggestion measures (-12,000 t).

## C7. Emissions breakdowns

### C7.1

**(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?**

Yes

#### C7.1a

**(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).**

Greenhouse gas	Scope 1 emissions (metric tons of CO <sub>2</sub> e)	GWP Reference
CO <sub>2</sub>	18,181,000	IPCC Fifth Assessment Report (AR5 – 100 year)
CH <sub>4</sub>	34,000	IPCC Fifth Assessment Report (AR5 – 100 year)
N <sub>2</sub> O	418,000	IPCC Fifth Assessment Report (AR5 – 100 year)
HFCs	34,000	IPCC Fifth Assessment Report (AR5 – 100 year)
SF <sub>6</sub>	1,000	IPCC Fifth Assessment Report (AR5 – 100 year)

### C7.2

**(C7.2) Break down your total gross global Scope 1 emissions by country/region.**

Country/Region	Scope 1 emissions (metric tons CO <sub>2</sub> e)
Belgium	3,486,000
Brazil	151,000
China	503,000
France	44,000
Germany	8,082,000

India	23,000
Italy	55,000
Japan	4,000
Republic of Korea	352,000
Spain	20,000
United States of America	4,886,000
Other, please specify Rest of world	1,062,000

### C7.3

**(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.**

By facility

### C7.3b

**(C7.3b) Break down your total gross global Scope 1 emissions by business facility.**

Facility	Scope 1 emissions (metric tons CO <sub>2</sub> e)	Latitude	Longitude
Ludwigshafen, Germany	7,534,000	49.49594	8.431191
Antwerp, Belgium	3,370,000	51.32405	4.285598
Kuantan, Malaysia	479,000	3.967425	103.4237
Freeport, USA	792,000	29.00441	-95.3933
Geismar, USA	933,000	30.21022	-91.0345
Rest of world	5,560,000	0	0

### C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

**(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO<sub>2</sub>e.**

	Gross Scope 1 emissions, metric tons CO <sub>2</sub> e	Comment
Chemicals production activities	17,721,000	

### C7.5

**(C7.5) Break down your total gross global Scope 2 emissions by country/region.**

Country/Region	Scope 2, location-based (metric tons CO <sub>2</sub> e)	Scope 2, market-based (metric tons CO <sub>2</sub> e)
Belgium	239,000	163,000

Brazil	41,000	41,000
China	865,000	582,000
France	10,000	9,000
Germany	388,000	318,000
India	44,000	44,000
Italy	7,000	0
Japan	56,000	48,000
Republic of Korea	252,000	252,000
Spain	19,000	23,000
United States of America	910,000	294,000
Other, please specify Rest of world	838,774	690,000

## C7.6

**(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.**

By facility

### C7.6b

**(C7.6b) Break down your total gross global Scope 2 emissions by business facility.**

Facility	Scope 2, location-based (metric tons CO <sub>2</sub> e)	Scope 2, market-based (metric tons CO <sub>2</sub> e)
Ludwigshafen, Germany	11,000	10,000
Antwerp, Belgium	245,000	166,000
Kuantan, Malaysia	201,000	89,000
Freeport, USA	102,000	35,000
Geismar, USA	106,000	66,000
Rest of world	3,004,774	2,098,000

## C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

**(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO<sub>2</sub>e.**

	Scope 2, location-based, metric tons CO <sub>2</sub> e	Scope 2, market-based (if applicable), metric tons CO <sub>2</sub> e	Comment
Chemicals production activities	3,670,000	2,464,000	

## C-CH7.8

**(C-CH7.8) Disclose the percentage of your organization's Scope 3, Category 1 emissions by purchased chemical feedstock.**

Purchased feedstock	Percentage of Scope 3, Category 1 tCO <sub>2</sub> e from purchased feedstock	Explain calculation methodology
High Value Chemicals (Steam cracking)	18	<p>Activity data: Quantities of high-value chemicals (HVCs) purchased in the reporting year were obtained from BASF internal business data management systems. Note that we are not able to separate HVCs from steam cracking from other HVC sources and therefore report the share of total HVCs-related emissions here.</p> <p>(i) Emissions factors: Cradle-to-gate emissions factors were obtained from commercially and publicly available data sources such as GaBi (sphaera), ecoinvent and PlasticsEurope as well as from BASF's own LCA database, which is based mainly on primary data.</p> <p>(ii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv)</p> <p>Methodology and assumptions: We analyzed the GHG emissions of the procured HVCs and precursor manufacturing at BASF's suppliers' facilities (including merchandise) by calculating the cradle-to-gate emissions, including all direct GHG emissions from raw material extraction, precursor manufacturing and transport, as well as indirect emissions from energy use. To do so, we determined the quantity of each single product purchased, and then applied emission factors. We multiplied the CO<sub>2</sub>e emissions per kilogram of each product by the respective quantity of the product purchased to determine cradle-to-gate emissions.</p>

## C-CH7.8a

**(C-CH7.8a) Disclose sales of products that are greenhouse gases.**

	Sales, metric tons	Comment
Carbon dioxide (CO <sub>2</sub> )	185,000	BASF is selling carbon dioxide, e.g. to the beverage industry.

Methane (CH4)	0	Sales of natural gas (with the main component being methane) through the discontinued oil and gas business falls outside the reporting boundary.
Nitrous oxide (N2O)	0	BASF is not selling this product
Hydrofluorocarbons (HFC)	0	BASF is not selling this product
Perfluorocarbons (PFC)	0	BASF is not selling this product
Sulphur hexafluoride (SF6)	0	BASF is not selling this product
Nitrogen trifluoride (NF3)	0	BASF is not selling this product

## C7.9

**(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?**

Decreased

### C7.9a

**(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.**

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption	1,062,000	Decreased	4.9	BASF's Scope 1 and Scope 2 emissions decreased by 1,062,000 metric tons (t) of CO2e in 2021 compared to 2020 due to additional purchases of renewable energy in 2021. 88 sites (out of about 250) are fully or partially supplied with renewable imported electricity now. If these sites' electricity supply would have had the same characteristics as in 2020 our emissions would have been more than 1 million t higher. Our total Scope 1 and Scope 2 emissions in 2020 were 21,674,000 t CO2e, therefore we arrived at -4.9% $((1,062,000/21,674,000)*100 = 4.9\%)$ . The CO2 savings resulted from new green contracts and the purchase of RECs.

Other emissions reduction activities	371,000	Decreased	1.7	<p>BASF's Scope 1 and Scope 2 emissions decreased by 371,000 metric tons (t) of CO<sub>2</sub>e in 2021 compared to 2020 due to emissions reduction activities implemented in 2021. Our total Scope 1 and Scope 2 emissions in 2020 were 21,674,000 t CO<sub>2</sub>e, therefore we arrived at 1.7% through <math>(371,000/21,674,000)*100 = 1.7\%</math>. The emission reduction activities in 2021 can be broken down as follows:</p> <ul style="list-style-type: none"> <li>- GHG emission reductions due to energy efficiency and process optimization (see C4.3a: 287 measures in 2021, accounting for -174,000 t of Scope 1+2 emissions),</li> <li>- GHG emission reductions due to waste reduction measures (see C4.3a: 97 measures in 2021, accounting for -185,000 t of Scope 1+2 emissions),</li> <li>- savings from employee suggestion measures (-12,000 t).</li> </ul>
Divestment	161,000	Decreased	0.7	<p>The emissions from our operations decreased by 0.7% (corresponding to 161,000 metric tons of CO<sub>2</sub>e) in 2021 compared to 2020 due to the divestment of our Color Solutions and BASF Colors and Effects (BCE) business as well as some minor other divestitures (Kankakee, Solenis) Our total Scope 1 and Scope 2 emissions in 2020 were 21,674,000 t CO<sub>2</sub>e, therefore we arrived at 0.7% through <math>(161,000/21,674,000)*100 = 0.7\%</math>. All divestitures were effective mid-year. Only the effects of the months where the divestment was effective were taken into account. E.g. for BCE, which left the BASF Group on June 30, 2021, it was assumed that the same emission would have occurred in the second half of the year. The first six months' emissions were reported, and the assumed emissions from July to December were counted under divestiture effects.</p>
Acquisitions	124,000	Increased	0.6	<p>The emissions from our operations increased by 0.6% (corresponding to 124,000 metric tons of CO<sub>2</sub>e) in 2021 compared to 2020 mainly due to the</p>

				acquisition of Shanshan Battery materials in 2021. The new sites started reporting emissions in 2021 which led to an increase compared to 2020. Our total Scope 1 and Scope 2 emissions in 2020 were 21,674,000 t CO <sub>2</sub> e, therefore we arrived at 0.6% through $(124,000/21,674,000)*100 = 0.6\%$ .
Mergers	0	No change	0	Category not relevant in the actual year-on-year comparison.
Change in output	2,570,000	Increased	11.9	In 2021 the volume of production from the operations within the reporting boundary increased in comparison to 2020. Assuming that the GHG intensity of our various businesses in 2020 had continued to apply in 2021, the higher production would have resulted in an increase in Scope 1 and Scope 2 GHG emissions of 11.9% (corresponding to 2,570,000 metric tons of CO <sub>2</sub> e) in 2021 in comparison to 2020. Our total Scope 1 and Scope 2 emissions in 2020 were 21,674,000 t CO <sub>2</sub> e, therefore we arrived at 11.9% through $(2,570,000/21,674,000)*100 = 11.9\%$ . Obviously, however, we managed to overcompensate this effect of the change in output by renewable energy and efficiency.
Change in methodology	0	No change	0	No changes in 2021.
Change in boundary	0	No change	0	Category not relevant in the actual year-on-year comparison.
Change in physical operating conditions	0	No change	0	Category not relevant in the actual year-on-year comparison.
Unidentified	0	No change	0	Category not relevant in the actual year-on-year comparison.
Other	1,642,000	Decreased	7.6	BASF is accounting for GHG emissions from about 250 production sites globally. Changes in local operating conditions of

			<p>these sites (e.g. technical variation of process parameters, dynamic production planning and control, maintenance work during operations, environmental conditions) affect the GHG emissions of these sites. However, the individual factors of influence usually cannot be quantified separately due to the complexity of the sites, hence only their cumulative effect is subsumed under "Other". In 2021, changes in local operating conditions resulted in a net decrease of emissions of 7.6% (corresponding to 1,642,000 metric tons of CO<sub>2</sub>e) compared to 2020. Our total Scope 1 and Scope 2 emissions in 2020 were 21,674,000 t CO<sub>2</sub>e, therefore we arrived at 7.6% through <math>(1,642,000/21,674,000) \times 100 = 7.6\%</math>. A major share of the strong change can very likely be attributed to business taking up again after the Covid-19-crisis. With many processes running more efficiently with more output this effect also leads to an overall decreasing GHG emissions intensity, emission factors for numerous plants/products/processes could be reduced significantly due to higher output and efficiency. This effect alone is estimated at -900,000 t. In addition, changes in emission factors of purchased energy, which don't fall under "change of methodology", have impacted the result. For example, we estimate this effect for Kuantan, a rather large site in Malaysia, to be at about -120,000 t of CO<sub>2</sub>.</p>
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### C7.9b

**(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?**

Market-based



## C8. Energy

### C8.1

**(C8.1) What percentage of your total operational spend in the reporting year was on energy?**

More than 0% but less than or equal to 5%

### C8.2

**(C8.2) Select which energy-related activities your organization has undertaken.**

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

### C8.2a

**(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.**

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	16,000	51,372,000	51,388,000
Consumption of purchased or acquired electricity		2,377,000	1,462,000	3,839,000
Consumption of purchased or acquired steam		0	5,610,000	5,610,000

Consumption of self-generated non-fuel renewable energy		3,000		3,000
Total energy consumption		2,396,000	58,444,000	60,840,000

## C-CH8.2a

**(C-CH8.2a) Report your organization's energy consumption totals (excluding feedstocks) for chemical production activities in MWh.**

### Consumption of fuel (excluding feedstocks)

#### Heating value

LHV (lower heating value)

#### MWh consumed from renewable sources inside chemical sector boundary

16,000

#### MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)

44,653,000

#### MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary

6,719,000

#### Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary

51,388,000

### Consumption of purchased or acquired electricity

#### MWh consumed from renewable sources inside chemical sector boundary

2,377,000

#### MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)

1,462,000

#### MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary

0

#### Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary

3,839,000

### Consumption of purchased or acquired steam

**MWh consumed from renewable sources inside chemical sector boundary**

0

**MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)**

3,644,000

**MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary**

1,966,000

**Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary**

5,610,000

#### Consumption of self-generated non-fuel renewable energy

---

**MWh consumed from renewable sources inside chemical sector boundary**

3,000

**MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)**

0

**MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary**

0

**Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary**

3,000

#### Total energy consumption

---

**MWh consumed from renewable sources inside chemical sector boundary**

2,396,000

**MWh consumed from non-renewable sources inside chemical sector boundary (excluding recovered waste heat/gases)**

49,759,000

**MWh consumed from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary**

8,685,000

**Total MWh (renewable + non-renewable + MWh from recovered waste heat/gases) consumed inside chemical sector boundary**

60,840,000

## C8.2b

**(C8.2b) Select the applications of your organization’s consumption of fuel.**

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	Yes
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	Yes

## C8.2c

**(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.**

### Sustainable biomass

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

16,000

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

16,000

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

### Other biomass

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

0

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

0

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

Not applicable

**Other renewable fuels (e.g. renewable hydrogen)**

---

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

0

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

0

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

Not applicable

**Coal**

---

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

1,106,000

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

263,000

**MWh fuel consumed for self-generation of steam**

843,000

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

**Oil**

---

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

107,000

**MWh fuel consumed for self-generation of electricity**

5,000

**MWh fuel consumed for self-generation of heat**

34,000

**MWh fuel consumed for self-generation of steam**

68,000

**MWh fuel consumed for self- cogeneration or self-trigeneration**

0

**Comment**

**Gas**

---

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

43,440,000

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

12,583,000

**MWh fuel consumed for self-generation of steam**

3,311,000

**MWh fuel consumed for self- cogeneration or self-trigeneration**

27,546,000

**Comment**

**Other non-renewable fuels (e.g. non-renewable hydrogen)**

---

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

6,719,000

**MWh fuel consumed for self-generation of electricity**

0

**MWh fuel consumed for self-generation of heat**

0

**MWh fuel consumed for self-generation of steam**

1,204,000

**MWh fuel consumed for self- cogeneration or self-trigeneration**

5,515,000

**Comment**

**Total fuel**

---

**Heating value**

LHV

**Total fuel MWh consumed by the organization**

51,388,000

**MWh fuel consumed for self-generation of electricity**

5,000

**MWh fuel consumed for self-generation of heat**

12,880,000

**MWh fuel consumed for self-generation of steam**

5,442,000

**MWh fuel consumed for self- cogeneration or self-trigeneration**

33,061,000

**Comment**

## C8.2d

**(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.**

	<b>Total Gross generation (MWh)</b>	<b>Generation that is consumed by the organization (MWh)</b>	<b>Gross generation from renewable sources (MWh)</b>	<b>Generation from renewable sources that is consumed by the organization (MWh)</b>
Electricity	11,150,000	8,912,000	3,000	3,000
Heat	12,879,000	12,879,000	0	0
Steam	42,550,000	39,350,000	14,000	14,000
Cooling	0	0	0	0

## C-CH8.2d

**(C-CH8.2d) Provide details on electricity, heat, steam, and cooling your organization has generated and consumed for chemical production activities.**

### Electricity

**Total gross generation inside chemicals sector boundary (MWh)**

11,150,000

**Generation that is consumed inside chemicals sector boundary (MWh)**

8,912,000

**Generation from renewable sources inside chemical sector boundary (MWh)**

3,000

**Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)**

0

### Heat

**Total gross generation inside chemicals sector boundary (MWh)**

12,879,000

**Generation that is consumed inside chemicals sector boundary (MWh)**

12,879,000

**Generation from renewable sources inside chemical sector boundary (MWh)**

0

**Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)**

0



## Steam

---

**Total gross generation inside chemicals sector boundary (MWh)**

42,550,000

**Generation that is consumed inside chemicals sector boundary (MWh)**

39,350,000

**Generation from renewable sources inside chemical sector boundary (MWh)**

14,000

**Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)**

20,555,000

## Cooling

---

**Total gross generation inside chemicals sector boundary (MWh)**

0

**Generation that is consumed inside chemicals sector boundary (MWh)**

0

**Generation from renewable sources inside chemical sector boundary (MWh)**

0

**Generation from waste heat/gases recovered from processes using fuel feedstocks inside chemical sector boundary (MWh)**

0

## C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero or near-zero emission factor in the market-based Scope 2 figure reported in C6.3.

---

**Sourcing method**

Direct procurement from an off-site grid- connected generator e.g. Power purchase agreement (PPA)

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify  
Wind, Solar

**Country/area of low-carbon energy consumption**

United States of America

**Tracking instrument used**

US-REC

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

73,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

United States of America

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Unbundled energy attribute certificates (EACs) purchase

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify

Wind

**Country/area of low-carbon energy consumption**

United States of America

**Tracking instrument used**

US-REC

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

1,300,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

United States of America

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Green electricity products from an energy supplier (e.g. green tariffs)

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify

Solar, Wind

**Country/area of low-carbon energy consumption**

Canada

**Tracking instrument used**

GEC

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

7,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Canada

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Unbundled energy attribute certificates (EACs) purchase

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify

Wind

**Country/area of low-carbon energy consumption**

China

**Tracking instrument used**

I-REC

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

414,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

China

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Unbundled energy attribute certificates (EACs) purchase

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify

Wind, Solar

**Country/area of low-carbon energy consumption**

Belgium

**Tracking instrument used**

GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

250,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Belgium

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify

Wind, Solar

**Country/area of low-carbon energy consumption**

Germany

**Tracking instrument used**

GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

216,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Germany

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify

Wind, Solar

**Country/area of low-carbon energy consumption**

Netherlands

**Tracking instrument used**

GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

46,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Netherlands

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

**Energy carrier**

Electricity

**Low-carbon technology type**

Wind

**Country/area of low-carbon energy consumption**

Poland

**Tracking instrument used**

GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

26,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Poland

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify

Wind, Solar

**Country/area of low-carbon energy consumption**

Italy

**Tracking instrument used**

GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

25,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Italy

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify

Wind, Solar, Biomass

**Country/area of low-carbon energy consumption**

United Kingdom of Great Britain and Northern Ireland

**Tracking instrument used**

GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

8,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

United Kingdom of Great Britain and Northern Ireland

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**

---

**Sourcing method**

Default delivered electricity from the grid (e.g. standard product offering by an energy supplier), supported by energy attribute certificates

**Energy carrier**

Electricity

**Low-carbon technology type**

Renewable energy mix, please specify  
Wind, Solar, Biomass

**Country/area of low-carbon energy consumption**

Ireland

**Tracking instrument used**

GO

**Low-carbon energy consumed via selected sourcing method in the reporting year (MWh)**

10,000

**Country/area of origin (generation) of the low-carbon energy or energy attribute**

Ireland

**Commissioning year of the energy generation facility (e.g. date of first commercial operation or repowering)**

2,021

**Comment**



## C8.2g

**(C8.2g) Provide a breakdown of your non-fuel energy consumption by country.**

---

**Country/area**

Belgium

**Consumption of electricity (MWh)**

1,769,000

**Consumption of heat, steam, and cooling (MWh)**

5,008,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

6,777,000

---

**Country/area**

Brazil

**Consumption of electricity (MWh)**

296,000

**Consumption of heat, steam, and cooling (MWh)**

397,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

693,000

---

**Country/area**

China

**Consumption of electricity (MWh)**

957,000

**Consumption of heat, steam, and cooling (MWh)**

3,060,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

4,017,000

---

**Country/area**

France

**Consumption of electricity (MWh)**

338,000

**Consumption of heat, steam, and cooling (MWh)**

1,921,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

2,259,000

---

**Country/area**

Germany

**Consumption of electricity (MWh)**

6,671,000

**Consumption of heat, steam, and cooling (MWh)**

16,535,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

23,206,000

---

**Country/area**

India

**Consumption of electricity (MWh)**

66,000

**Consumption of heat, steam, and cooling (MWh)**

68,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

134,000

---

**Country/area**

Italy

**Consumption of electricity (MWh)**

66,000

**Consumption of heat, steam, and cooling (MWh)**

161,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

227,000

---

**Country/area**

Japan

**Consumption of electricity (MWh)**

111,000

**Consumption of heat, steam, and cooling (MWh)**

20,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

131,000

---

**Country/area**

Republic of Korea

**Consumption of electricity (MWh)**

626,000

**Consumption of heat, steam, and cooling (MWh)**

1,828,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

2,454,000

---

**Country/area**

Spain

**Consumption of electricity (MWh)**

77,000

**Consumption of heat, steam, and cooling (MWh)**

98,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

175,000

---

**Country/area**

United States of America

**Consumption of electricity (MWh)**

3,404,000

**Consumption of heat, steam, and cooling (MWh)**

12,838,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

16,242,000

**Country/area**

Other, please specify

Rest of world

**Consumption of electricity (MWh)**

897,000

**Consumption of heat, steam, and cooling (MWh)**

3,024,000

**Total non-fuel energy consumption (MWh) [Auto-calculated]**

3,921,000

**C-CH8.3**

**(C-CH8.3) Does your organization consume fuels as feedstocks for chemical production activities?**

Yes

**C-CH8.3a**

**(C-CH8.3a) Disclose details on your organization's consumption of fuels as feedstocks for chemical production activities.**

**Fuels used as feedstocks**

Other, please specify

Total fuel feedstock. This excludes non-fuel chemical feedstocks

**Total consumption**

11,155,000

**Total consumption unit**

metric tons

**Inherent carbon dioxide emission factor of feedstock, metric tons CO2 per consumption unit**

3

**Heating value of feedstock, MWh per consumption unit**

12.7

**Heating value**

LHV

**Comment**

The breakdown of our feedstock mix is considered confidential business information. Therefore, we present the sum of fuel feedstocks that are listed by name in the selection menu of the feedstocks column as well as a weighted average emission factor and heating value. Note that all carbon feedstocks are not combusted to result in CO2 emissions but used as raw materials as C-source for other higher-value chemicals. The oxidation level in the final product will be most likely +IV.

### C-CH8.3b

**(C-CH8.3b) State the percentage, by mass, of primary resource from which your chemical feedstocks derive.**

	Percentage of total chemical feedstock (%)
Oil	74
Natural Gas	18
Coal	2
Biomass	6
Waste (non-biomass)	0
Fossil fuel (where coal, gas, oil cannot be distinguished)	0
Unknown source or unable to disaggregate	0

## C9. Additional metrics

### C9.1

**(C9.1) Provide any additional climate-related metrics relevant to your business.**

### C-CH9.3a

**(C-CH9.3a) Provide details on your organization’s chemical products.**

**Output product**

High Value Chemicals (Steam cracking)

**Production (metric tons)**

**Capacity (metric tons)**

3,480,000

**Direct emissions intensity (metric tons CO<sub>2</sub>e per metric ton of product)**

**Electricity intensity (MWh per metric ton of product)**

**Steam intensity (MWh per metric ton of product)**

**Steam/ heat recovered (MWh per metric ton of product)**

**Comment**

Capacity refers to ethylene production and considers 100% capacity of the operations. BASF's share might be lower.

---

**Output product**

Ammonia

**Production (metric tons)**

**Capacity (metric tons)**

1,765,000

**Direct emissions intensity (metric tons CO<sub>2</sub>e per metric ton of product)**

**Electricity intensity (MWh per metric ton of product)**

**Steam intensity (MWh per metric ton of product)**

**Steam/ heat recovered (MWh per metric ton of product)**

**Comment**

Capacity considers 100% capacity of the operations. BASF's share might be lower.

---

**Output product**

Aromatics extraction

**Production (metric tons)**

**Capacity (metric tons)**

1,765,000

**Direct emissions intensity (metric tons CO<sub>2</sub>e per metric ton of product)**

**Electricity intensity (MWh per metric ton of product)**

**Steam intensity (MWh per metric ton of product)**

**Steam/ heat recovered (MWh per metric ton of product)**

**Comment**

Capacity considers 100% capacity of the operations. BASF's share might be lower.

---

**Output product**

Butadiene (C4 sep.)

**Production (metric tons)**

**Capacity (metric tons)**

680,000

**Direct emissions intensity (metric tons CO<sub>2</sub>e per metric ton of product)**

**Electricity intensity (MWh per metric ton of product)**

**Steam intensity (MWh per metric ton of product)**

**Steam/ heat recovered (MWh per metric ton of product)**

**Comment**

Capacity considers 100% capacity of the operations. BASF's share might be lower.

## C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	

### C-CH9.6a

(C-CH9.6a) Provide details of your organization’s investments in low-carbon R&D for chemical production activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Other, please specify Product and process innovations where the R&D target is related to energy/resource efficiency and climate protection	Applied research and development	41 - 60%		R&D activities at BASF are directed to contribute to the company’s purpose “We create chemistry for a sustainable future”, expressing our understanding of the need to address the demands of a growing world population while the planet’s resources (including the atmosphere’s capacity to take up GHGs) are finite. In this context, BASF has derived three major areas in which chemistry-based innovations will play a key role in the future: resources, environment, and climate; food and nutrition; and quality of life. Annual R&D investment in the focus area “resources, environment, and climate” has ranged from more than 40% to more than 60% of the total annual R&D



				spend over the past years and targets product and process innovations related to energy/resource efficiency and climate protection. To reflect this range, we have selected 41-60% in column "Average % of total R&D investment over the last 3 years".
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## C10. Verification

### C10.1

**(C10.1) Indicate the verification/assurance status that applies to your reported emissions.**

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

### C10.1a

**(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.**

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Reasonable assurance

**Attach the statement**

 BASF21\_CDP Letter.pdf

**Page/ section reference**

1-9

**Relevant standard**

ISAE3000

**Proportion of reported emissions verified (%)**

100

## C10.1b

**(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.**

---

**Scope 2 approach**

Scope 2 location-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Reasonable assurance

**Attach the statement**

 BASF21\_CDP Letter.pdf

**Page/ section reference**

1-9

**Relevant standard**

ISAE3000

**Proportion of reported emissions verified (%)**

100

---

**Scope 2 approach**

Scope 2 market-based

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Reasonable assurance

**Attach the statement**

 BASF21\_CDP Letter.pdf

**Page/ section reference**

1-9

**Relevant standard**

ISAE3000

**Proportion of reported emissions verified (%)**

100

## C10.1c

**(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.**

---

**Scope 3 category**

Scope 3: Purchased goods and services

Scope 3: Capital goods

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)

Scope 3: Upstream transportation and distribution

Scope 3: Waste generated in operations

Scope 3: Business travel

Scope 3: Employee commuting

Scope 3: Upstream leased assets

Scope 3: Investments

Scope 3: Downstream transportation and distribution

Scope 3: Use of sold products

Scope 3: End-of-life treatment of sold products

Scope 3: Downstream leased assets

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 BASF21\_CDP Letter.pdf

**Page/section reference**

1-9

**Relevant standard**

ISAE3000

**Proportion of reported emissions verified (%)**

100

---

**Scope 3 category**

- Scope 3: Purchased goods and services
- Scope 3: Capital goods
- Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2)
- Scope 3: Upstream transportation and distribution
- Scope 3: Waste generated in operations
- Scope 3: Business travel
- Scope 3: Employee commuting
- Scope 3: Upstream leased assets
- Scope 3: Investments
- Scope 3: Downstream transportation and distribution
- Scope 3: Use of sold products
- Scope 3: End-of-life treatment of sold products
- Scope 3: Downstream leased assets

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Type of verification or assurance**

Limited assurance

**Attach the statement**

 BASF21\_CDP Letter.pdf

**Page/section reference**

1-9

**Relevant standard**

ISAE 3410

**Proportion of reported emissions verified (%)**

100

**C10.2**

**(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?**

Yes

## C10.2a

**(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?**

Disclosure module verification relates to	Data verified	Verification standard	Please explain
C4. Targets and performance	Progress against emissions reduction target	ISAE3000	The data point is given within our integrated annual report. All sustainability-related performance information according to GRI Standards ("Comprehensive" application option) in the "BASF Report 2021", published under <a href="https://report.basf.com/2021/en/">https://report.basf.com/2021/en/</a> , were subject to the assurance engagement. +++ Reference to CDP question number: C4.1a +++ Type of verification and frequency: reasonable assurance, annual process
C6. Emissions data	Year on year emissions intensity figure	ISAE3000, ISAE3410	The data point is given within our integrated annual report. All sustainability-related performance information according to GRI Standards ("Comprehensive" application option) in the "BASF Report 2021", published under <a href="https://report.basf.com/2021/en/">https://report.basf.com/2021/en/</a> , were subject to the assurance engagement. +++ Reference to CDP question number: C6.10 +++ Type of verification and frequency: limited assurance, annual process
C7. Emissions breakdown	Year on year change in emissions (Scope 1 and 2)	ISAE3000	The data point is given within our integrated annual report. All sustainability-related performance information according to GRI Standards ("Comprehensive" application option) in the "BASF Report 2021", published under <a href="https://report.basf.com/2021/en/">https://report.basf.com/2021/en/</a> , were subject to the assurance engagement. +++ Reference to CDP question number: C7.9 +++ Type of verification and frequency: reasonable assurance, annual process
C8. Energy	Energy consumption	ISAE3000, ISAE3410	The data point is given within our integrated annual report. All sustainability-related performance information according to GRI Standards ("Comprehensive" application option) in the "BASF Report 2021", published under <a href="https://report.basf.com/2021/en/">https://report.basf.com/2021/en/</a> , were subject to the assurance engagement. +++ Reference to CDP question number: C8.2a +++ Type of verification and frequency: limited assurance, annual process

## C11. Carbon pricing

### C11.1

**(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?**

Yes

### C11.1a

**(C11.1a) Select the carbon pricing regulation(s) which impacts your operations.**

Denmark carbon tax  
 EU ETS  
 Korea ETS  
 Shanghai pilot ETS  
 Switzerland carbon tax  
 Switzerland ETS

### C11.1b

**(C11.1b) Complete the following table for each of the emissions trading schemes you are regulated by.**

#### EU ETS

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**% of Scope 1 emissions covered by the ETS**

52

**% of Scope 2 emissions covered by the ETS**

0

**Period start date**

January 1, 2021

**Period end date**

December 31, 2021

**Allowances allocated**

9,430,596

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO<sub>2</sub>e**

11,709,117

**Verified Scope 2 emissions in metric tons CO<sub>2</sub>e**

0

### Details of ownership

Facilities we own and operate

### Comment

Some parts of our operations receive energy from internal distribution grids fed by our own energy generation as well as imported energy, i.e. the exact source of energy cannot be attributed correctly. Therefore, we are not able to separate Scope 1 and Scope 2 for our emissions relevant under the ETS and report all emissions under Scope 1. Further, note that following the rules of the EU ETS, verified emissions include emissions from carbon capture and utilization step within the ammonia value chain. Such emissions are not relevant under Scope 1 according to the GHG Protocol standard and were excluded for calculation of the share of Scope 1 emissions covered by the ETS.

### Korea ETS

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#### % of Scope 1 emissions covered by the ETS

2.2

#### % of Scope 2 emissions covered by the ETS

9.9

#### Period start date

January 1, 2021

#### Period end date

December 31, 2021

#### Allowances allocated

662,326

#### Allowances purchased

20,000

#### Verified Scope 1 emissions in metric tons CO<sub>2</sub>e

417,195

#### Verified Scope 2 emissions in metric tons CO<sub>2</sub>e

245,131

### Details of ownership

Facilities we own and operate

### Comment

### Shanghai pilot ETS

---

#### % of Scope 1 emissions covered by the ETS

1.5

#### % of Scope 2 emissions covered by the ETS

23.1

**Period start date**

January 1, 2021

**Period end date**

December 31, 2021

**Allowances allocated**

876,927

**Allowances purchased**

46,000

**Verified Scope 1 emissions in metric tons CO2e**

284,687

**Verified Scope 2 emissions in metric tons CO2e**

569,731

**Details of ownership**

Facilities we own and operate

**Comment**

Note that in addition to Scope 1 and Scope 2, emissions from waste disposal (85,177 metric tons CO2e in 2021) that belong to Scope 3 are covered by the Shanghai Pilot ETS.

**Switzerland ETS****% of Scope 1 emissions covered by the ETS**

0.2

**% of Scope 2 emissions covered by the ETS**

0

**Period start date**

January 1, 2021

**Period end date**

December 31, 2021

**Allowances allocated**

29,216

**Allowances purchased**

0

**Verified Scope 1 emissions in metric tons CO2e**

40,301

**Verified Scope 2 emissions in metric tons CO2e**



0

**Details of ownership**

Facilities we own and operate

**Comment****C11.1c**

(C11.1c) Complete the following table for each of the tax systems you are regulated by.

**Denmark carbon tax****Period start date**

January 1, 2021

**Period end date**

December 31, 2021

**% of total Scope 1 emissions covered by tax**

0.01

**Total cost of tax paid**

50,000

**Comment****Switzerland carbon tax****Period start date**

January 1, 2021

**Period end date**

December 31, 2021

**% of total Scope 1 emissions covered by tax**

0.2

**Total cost of tax paid**

170,000

**Comment****C11.1d**

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

## STRATEGIC APPROACH

(1) We strive to constantly reduce our GHG emissions in the most cost-efficient way in order to reduce our exposure to the various systems.

(2) We continuously evaluate the current and future status of our relevant GHG emissions in relation to the compliance status. We purchase allowances or plan such purchases in case of (projected) exceeding allocated allowances. We factor the respective costs into our financial planning process and Enterprise Risk Management.

## APPLICATION OF STRATEGY

(1) Emission reduction: We have set climate protection goals for 2030 and 2050 and have adopted comprehensive carbon management with five strategic levers to achieve these goals. Carbon management applies globally and thus also affects the sites and plants regulated by carbon pricing systems, which set up their site-specific reduction strategies in line with the global ambition and timeline, leading to lower exposure to the carbon pricing systems over time. For example, our site in Antwerp plans to reduce emissions significantly mainly via switching to renewable energy and investing in one of the largest carbon capture and storage projects under the North Sea.

(2) Evaluation of compliance status: We have established regional expert teams for the carbon pricing systems in Europe and Asia, which continuously monitor the current compliance status in close cooperation with the site and plant managers and coordinate cost-optimized purchase of allowances. The teams also play a key role in the analysis of short-term to long-term developments in the different carbon pricing systems. They are supported by site/plant managers, corporate experts for the emission reduction levers, as well as experts for regional and local advocacy trends. The assessments are conducted at least annually and include considerations of potential carbon price developments in the various schemes. The results are included in the financial planning process and Enterprise Risk Management.

## C11.2

**(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?**

No

## C11.3

**(C11.3) Does your organization use an internal price on carbon?**

Yes

## C11.3a

**(C11.3a) Provide details of how your organization uses an internal price on carbon.**

### **Objective for implementing an internal carbon price**

Stress test investments

### **GHG Scope**

Scope 1

Scope 2

### **Application**

Investment projects (capital expenditure, acquisitions)

### **Actual price(s) used (Currency /metric ton)**

### **Variance of price(s) used**

Differentiated, evolutionary pricing driven by the specific assessment, e.g. geography and timeframe of an investment.

### **Type of internal carbon price**

Shadow price

### **Impact & implication**

Carbon pricing is considered in internal assessments of capital investment projects. BASF has set up a structured process to evaluate investment projects (e.g. capital expenditures, acquisitions), including impacts on the environment (e.g. climate) and respective costs. The process considers a project base case as well as the option to assess alternative scenarios. Carbon pricing can be attributed to any case depending on strategic goals as well as the expected likelihood and magnitude of impact. In this way, it directly affects the evaluation of the economic viability of the capital expenditure business case. The focus of carbon pricing is on direct emissions (Scope 1), but since we are part of an energy-intensive industry and the purchase of energy is significant, related cost effects on the energy supply side (Scope 2) may be taken into account where relevant. The price of carbon considered depends on various factors driven by the specific assessment, e.g. geography and timeframe of an investment. Sometimes, several pricing scenarios may be used to evaluate uncertainties in future regulatory environments. The internal price is combined of two components: (a) a basic price driven by existing and upcoming regulations, which is determined via scenario analysis by global procurement under consideration of input from several internal stakeholders, (e.g. technical and governmental affairs experts assessing the latest regulatory trends), (b) a strategic premium to foster internal climate action, determined by the economic evaluations group.

### **Objective for implementing an internal carbon price**

Navigate GHG regulations

### **GHG Scope**

Scope 1

Scope 2

**Application**

Production facilities

**Actual price(s) used (Currency /metric ton)****Variance of price(s) used**

Differentiated, evolutionary pricing driven by geography and timeframe of the analysis.

**Type of internal carbon price**

Shadow price

**Impact & implication**

Carbon pricing plays a role in internal assessments of operational costs of our production facilities, the rationale being that costs originating from respective pricing schemes have an impact on the cost-benefit ratio of operations. The focus is on emissions from our own sites (Scope 1), but since we are part of an energy-intensive industry and the purchase of energy is significant, related cost effects on the energy supply side (Scope 2) may be taken into account case-by-case. The price of carbon considered depends on geography and the timeframe of the analysis. Sometimes, several pricing scenarios are used to evaluate uncertainties in future regulatory environments. The internal price is determined via scenario analysis by global procurement under consideration of input from several internal stakeholders, e.g. technical and governmental affairs experts assessing the latest regulatory trends.

**Objective for implementing an internal carbon price**

Other, please specify

Value-to-society assessment

**GHG Scope**

Scope 1

Scope 2

Scope 3

**Application**

External direct and indirect suppliers, BASF own operations, customer industries

**Actual price(s) used (Currency /metric ton)**

70

**Variance of price(s) used**

Evolutionary pricing using a base value for 2015 (70 EUR) and assuming an increase of 3% per year.

**Type of internal carbon price**

Shadow price

**Impact & implication**

The monetary valuation of GHG emissions through carbon pricing is one component of BASF's Value-to-Society approach, a new method developed by BASF with external experts to perform the first monetary assessment of the economic, ecological, and social impacts of its business activities along the value chain. The purpose of BASF's Value-to-Society approach is to assess our 'real' contribution to a sustainable future as comprehensively as possible. We quantify and value the financial and non-financial external effects of our business activities in society in a common unit – in Euro. The results reflect our 'real' value contribution, our benefits, and costs to society. We assess our relevant impacts along our entire supply chain, our own operations, and our customer industries. The impacts of our products in their consumer use phase and end-of-life are covered case-by-case. The carbon price within Value-to-Society has been derived based on a meta-analysis of the recent social cost of carbon estimates. The costs of GHG emissions to society through climate change are independent of the location of the source of the emission, therefore a single social cost of carbon is applied to all locations globally. The climate impact of additional tons of CO<sub>2</sub>e is expected to rise over time. Therefore, it is assumed that the real social cost of carbon increases every year by 3%, as recommended by the IPCC. Value-to-Society assessments improve the understanding of the relevance of specific economic, social and environmental impacts and their interdependencies along the different levels of our value chain. This transparency supports the integrated character of our actions, contributing to BASF's long-term success. The results enable us to monitor progress over time in a comprehensive way in monetary terms from a macro-perspective, demonstrate our value contribution, and take better-informed decisions regarding the relevance of various business impacts by adding a macro-societal, integrated financial, and non-financial perspective.

## C12. Engagement

### C12.1

#### (C12.1) Do you engage with your value chain on climate-related issues?

- Yes, our suppliers
- Yes, our customers/clients
- Yes, other partners in the value chain

### C12.1a

#### (C12.1a) Provide details of your climate-related supplier engagement strategy.

---

##### Type of engagement

Information collection (understanding supplier behavior)

##### Details of engagement

Collect climate change and carbon information at least annually from suppliers

**% of suppliers by number**

10

**% total procurement spend (direct and indirect)**

55

**% of supplier-related Scope 3 emissions as reported in C6.5****Rationale for the coverage of your engagement**

BASF is a founding member of Together for Sustainability (TfS). The focus is on standardizing supplier evaluations globally. Suppliers are evaluated by independent experts either in on-site audits or online assessments. The latter are conducted by EcoVadis, a ratings agency providing information on suppliers' sustainability performance, including greenhouse gas emissions, energy reduction projects and certifications. In 2021, 5,817 online assessments were performed by the TfS members. BASF is heavily engaged in the TfS workstream which launched a new program on Scope 3 emissions in 2021, to develop a methodology to calculate upstream greenhouse gas emissions. TfS members can use this data to manage emissions reduction programs. In 2021, BASF launched the Supplier CO2 Management Program, to systematically gather data on upstream Scope 3 emissions, specifically our suppliers' Product Carbon Footprint data for the raw materials we purchase, to identify medium-term measures for optimization.

**RATIONALE FOR COVERAGE**

Over 70,000 Tier 1 suppliers worldwide supply us with raw materials, chemicals, investment goods and consumables, and perform services. Due to this large number, suppliers are evaluated based on risk (i.e., materiality of supply relationship, country and industry-specific risks). We also use observations from our employees in procurement and information from internal/ external databases, such as the TfS initiative. Our third-party evaluations are therefore focused on the most relevant suppliers, which are Tier 1 suppliers showing an elevated sustainability risk potential as identified by our risk matrices, purchasers' assessments or other sources. By 2025, we aim to have conducted sustainability evaluations for 90% of the BASF Group's relevant spend (=procurement spend with relevant suppliers) and will develop action plans where necessary. We also aim to have 80% of suppliers improve their sustainability performance upon re-evaluation by 2025. In 2021, 85% of the relevant spend had been evaluated and of the suppliers re-evaluated, 74% had improved. Both targets are embedded in the target agreements of persons responsible for procurement. Out of the total amount of suppliers in our portfolio in 2021, 10% had a valid sustainability evaluation. This represents a coverage of 55% of the spend, out of the total spend we had with these suppliers in 2021.

**Impact of engagement, including measures of success**

The scores in our EcoVadis assessments can be positively influenced by, e.g., reporting on energy use and greenhouse gas (GHG) emissions or emission reduction projects.

This enables BASF to promote adequate emissions management. In 2021, over 40% of assessed suppliers reported on energy use and GHG emissions, nearly 30% claimed to be using renewable energy and over 15% were CDP respondents. In addition, 10% reported on scope 3 GHG emissions and nearly 10% had an ISO 50001 certification (energy management system). Some suppliers also claimed to have joined the Science Based Targets initiative. Beyond our engagement with suppliers, we worked with the Low-Carbon Emitting Technologies Initiative to harmonize the methodological approaches used to calculate Scope 3 emissions. In 2021, BASF also launched the Supplier CO<sub>2</sub> Management Program to systematically gather data on upstream Scope 3 emissions, specifically our suppliers' Product Carbon Footprint data for the raw materials we purchase, to identify medium-term measures for optimization. Till the end of 2021, more than 700 suppliers were approached, accounting for 50% of Scope 3 emissions.

#### IMPACT OF SUPPLIER ENGAGEMENT STRATEGY

BASF has engaged with some suppliers that produce caustic soda using renewable energy sources. This caustic soda has a significantly lower carbon footprint than the one conventionally produced. According to the ISO 14067 (carbon footprint of products) calculation methodology, the reduction could reach around 30%.

#### MEASURE OF SUCCESS

a) share of relevant spend we cover with evaluations (status 2021: 85%), and  
b) percentage of evaluated suppliers that improve their sustainability performance upon re-evaluation (status 2021: 74%). These indicators are part of the company targets.

#### THRESHOLD OF SUCCESS

By 2025, we aim to have conducted sustainability evaluations for 90% of the BASF Group's relevant spend (=procurement spend with relevant suppliers) and will develop action plans where improvement is necessary. We also aim to have 80% of suppliers improve their sustainability performance upon re-evaluation by 2025. In addition, climate change is an explicit component of BASF's sourcing strategies: When elaborating a procurement strategy, buyers are required to consider potential threats and opportunities related to climate change.

#### Comment

Spend calculated according to International Financial Reporting Standards (IFRS).

## C12.1b

**(C12.1b) Give details of your climate-related engagement strategy with your customers.**

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#### Type of engagement & Details of engagement

Education/information sharing

Share information about your products and relevant certification schemes (i.e. Energy STAR)

**% of customers by number**

100

**% of customer - related Scope 3 emissions as reported in C6.5**

0

**Please explain the rationale for selecting this group of customers and scope of engagement**

SCOPE OF ENGAGEMENT

In line with increasingly ambitious climate protection targets, CO<sub>2</sub> transparency is becoming more and more important for us and our customers. To increase transparency on the emission intensity of our products for our customers, we developed a digital, externally certified solution to determine product carbon footprints (PCF) for almost the entire portfolio of BASF's around 45,000 sales products in line with international standards (ISO 14044, ISO 14067, Greenhouse Gas Protocol Product Standard). In 2021, we started to roll out this offer to our customers, e.g., by promoting it in bilateral exchanges about sustainability-related information in day-to-day business, or in responses to sustainability-related customer requests. We also started to make the automated PCF calculation approach available to interested industry players by way of partnerships. As a first step, IT companies will be able to translate BASF's methodology and in-house solution into marketable software through licensing agreements. For example, such agreements have been established with Atos, iPoint or sphera.

RATIONALE FOR COVERAGE/SIZE OF ENGAGEMENT

We set coverage of 100% as we consider the PCFs to be a relevant offer for essentially our entire customer base of more than 90,000 companies in view of the increasing demand for CO<sub>2</sub> transparency in the supply chain. For example, a growing number of companies require Scope 3 upstream data driven by commitments for science-based targets. Note regarding % Scope 3 emissions: A value of zero is given because in line with current reporting standards BASF does not calculate and report GHG emissions from the processing of sold products, which would be one relevant Scope 3 category in this context.

**Impact of engagement, including measures of success**

IMPACT OF ENGAGEMENT

BASF strengthens the relationship with the customer by demonstrating credibility and know-how on climate-related topics as well as offering innovative solutions. The transparency of our product carbon footprints enables us to target our CO<sub>2</sub> reduction measures to those areas where our customers can later achieve the greatest value added from lower carbon emissions in the value chain, i.e., we are able to offer tailored



low-carbon solutions best aligned with our customers' individual needs. For example, in 2021 we were able to offer the first products with a certified reduced carbon footprint through the use of renewable energy. Such kinds of offers are of growing importance in many of our customer industries. Almost half of the top 20 companies in the BASF-relevant Fast-Moving Consumer Goods, Apparel, Automotive, Electronics, and Packaging industries have defined Scope 3 emission reduction targets.

#### MEASURES OF SUCCESS

- (1) The marketing of reduced PCF solutions based on a fully PCF-transparent product portfolio is still at an early stage, but the turnover with such kinds of products is expected to become an important measure of success for our business units.
- (2) At BASF Group level, we measure the success of products with a substantial sustainability contribution in the value chain (including reduction of GHG emissions and improving energy efficiency), classified as Accelerators in our externally validated Sustainable Solution Steering, by their total annual sales. We already reached our 2025 Accelerator sales target of €22 billion in 2021. Consequently, we will update our product portfolio steering target over the course of 2022.
- (3) Finally, we use feedback from our customers through the CDP Supply Chain Program and their supplier performance reviews to measure the impact of our activities.

#### THRESHOLD FOR SUCCESS

The main indicator for success from a BASF Group perspective is total annual sales with Accelerator products, which are benchmarked against a respective target. We already reached our 2025 Accelerator sales target of €22 billion in 2021, i.e. the threshold for success.

## C12.1d

### **(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.**

BASF cooperates with numerous other partners in the value chain, besides suppliers and customers. Among these are industry peers, specialized partners, as well as businesses sharing common interests at individual BASF production sites to promote specific emission reduction technologies. Our strategy for engagement derives from the five strategic levers for reducing our GHG emissions (gray-to-green energy, power-to-steam, new technologies, bio-based feedstocks, and continuous operational excellence), which are operationalized by a range of projects on the corporate and site level. BASF continuously investigates which projects can contribute best to the individual levers and how – including a review of options to enter partnerships for increasing the likelihood of success of a project. Based on this analysis, partnerships with the best cost-benefit profile are prioritized and developed strategically.

#### MEASURES OF SUCCESS

Each project follows specific milestones, e.g. reaching a certain technology maturity level after a dedicated time period, and success will be assessed based on milestone achievement.

#### EXAMPLES

(1) We are a member of the Antwerp@C consortium (consisting of Air Liquide, BASF, Borealis, ExxonMobil, INEOS, Fluxys, Port of Antwerp, Total) in the Port of Antwerp where BASF operates a large chemical Verbund site. Case study (STAR approach): Situation: The Port of Antwerp is one of the largest integrated energy and chemicals clusters in Europe and the port management seeks new ways to collaborate on GHG emissions reduction. Task: Engage companies at the port to investigate joint options for emissions reduction. Action: End of 2019, Port of Antwerp brought seven leading chemical and energy companies together in the Antwerp@C consortium to work on a feasibility study evaluating carbon capture storage (CCS) installation, which was granted funding by the EU in 2020. Result: In 2021, the consortium carried out the feasibility study and decided to move on to the next phase and start engineering studies. These will further investigate the construction of a central "backbone" throughout the port of Antwerp. The project has the potential to reduce the GHG emissions within the port by half until 2030.

(2) We joined forces with SABIC and Linde to realize the world's first electrically heated steam cracker furnace. The goal is to drive concepts and faster implementation through combined strengths where BASF and SABIC bring in extensive know-how and intellectual property in developing chemical processes as well as long-standing experience and knowledge in operating steam crackers, while Linde contributes through expertise and intellectual property in developing and building steam cracking furnace technologies and driving future industry commercialization. To develop and pilot the concept, we signed a cooperation agreement with SABIC and Linde in 2021 and jointly applied for funding to build a demonstration plant.

(3) We collaborate with Security Matters, Ltd, a company focused on digitizing physical objects on the blockchain to enable a circular and closed loop economy, to develop solutions for better plastics traceability and circularity. The cooperation aims to improve recycling infrastructures and performance properties and quality of recycled plastics in support of a circular economy.

## C12.2

### **(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?**

Yes, climate-related requirements are included in our supplier contracts

## C12.2a

### **(C12.2a) Provide details of the climate-related requirements that suppliers have to meet as part of your organization's purchasing process and the compliance mechanisms in place.**

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#### **Climate-related requirement**

Climate-related disclosure through a non-public platform

### Description of this climate related requirement

Due to a large number of suppliers, they are evaluated based on risk (i.e., the materiality of the supply relationship, country, and industry-specific risks). We also use observations from our employees in procurement and information from internal/external databases, such as the Together for Sustainability (TfS) initiative. BASF is a founding member of TfS. The focus is on standardizing supplier evaluations globally. Suppliers are evaluated by independent experts either in on-site audits or online assessments. The latter is conducted by EcoVadis, a rating agency providing information on suppliers' sustainability performance, including greenhouse gas emissions, energy reduction projects, and international certifications. Suppliers participating in an evaluation are required to answer climate-related questions. If we identify deviations from standards, we ask suppliers to implement corrective measures within a reasonable time frame. We support them in their efforts, e.g., with training on environmental topics. We review our suppliers' progress according to a defined timeframe based on the sustainability risk identified, or after five years at the latest. Our expectations of our suppliers are laid down in the global Supplier Code of Conduct. We support our suppliers in implementing our requirements, which include using resources efficiently, applying energy-efficient technologies, reducing emissions to air, and minimizing negative impacts on climate change.

### % suppliers by procurement spend that have to comply with this climate-related requirement

55

### % suppliers by procurement spend in compliance with this climate-related requirement

100

### Mechanisms for monitoring compliance with this climate-related requirement

On-site third-party verification

Supplier scorecard or rating

### Response to supplier non-compliance with this climate-related requirement

Retain and engage

## C12.3

**(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?**

### Row 1

#### Direct or indirect engagement that could influence policy, law, or regulation that may impact the climate

Yes, we engage directly with policy makers

Yes, we engage indirectly through trade associations

Yes, we engage indirectly by funding other organizations whose activities may influence policy, law, or regulation that may significantly impact the climate

**Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?**

Yes

**Attach commitment or position statement(s)**

 C12.3\_Governance II.pdf

 C12.3\_Governance.pdf

**Describe the process(es) your organization has in place to ensure that your engagement activities are consistent with your overall climate change strategy**

The Board of Directors decides on BASF's climate change strategies, taking thorough analysis by experts and practitioners at the working level into account. The heads of the Corporate Development unit and the Net Zero Accelerator project report to the Board of Directors and have the key position to ensure consistency of actions resulting from the decisions.

In our advocacy work, we act in compliance with our Global Code of Conduct, its core values and the rules and principles set out in our Policy on Government Relations and Advocacy. As associations act on behalf of their members, we ask them to apply the same principles.

We assure global alignment of our advocacy work and our activities in associations via established governance processes and internal networks that include all world regions. Direct climate policy-related corporate activities are mainly stipulated and performed by Energy and Climate Policy (Corporate Communications and Government Relations unit) and Sustainability Strategy (Corporate Development unit) organizations in BASF. Representatives have regular meetings (about monthly) with relevant BASF colleagues (e.g. experts in energy procurement, greenhouse gas reporting, BASF's energy efficiency unit, sustainability responsables in business divisions). The corporate groups are connected to a network of BASF representatives with analogous functions globally, through email and web conference to receive regular updates. Taking into account developments in climate protection technologies and policies, we jointly agree on BASF's positions and publish our common view on the company website. Our positions serve as a yardstick against which we and others measure our own and our industry group's activities.

We regularly review the positions and activities on climate and energy policies of our major associations and publish our findings on the internet. If an association's position on an issue that is core to BASF's membership fundamentally deviates from BASF's position or our principles and values, BASF increases its engagement in that association to improve alignment or to demand that the association stops advocating against our interests or our values and principles. If no agreement can be found, an overarching assessment of the association's performance, positions, views and membership value

regarding all issues relevant for BASF is performed. Based on this, a decision is taken on the future of our membership in this association.

## C12.3a

**(C12.3a) On what policy, law, or regulation that may impact the climate has your organization been engaging directly with policy makers in the reporting year?**

### **Focus of policy, law, or regulation that may impact the climate**

Emissions trading schemes

### **Specify the policy, law, or regulation on which your organization is engaging with policy makers**

The EU ETS works on the 'cap and trade' principle. A cap is set on the total amount of greenhouse gases that can be emitted by the installations covered by the system. It is reduced over time so that total emissions fall.

Within the cap, installations buy or receive emissions allowances, which they can trade with one another as needed. Sufficient free allocation of allowances shall safeguard the international competitiveness of industrial sectors at risk of carbon leakage. Rules for free allocation reflect technological progress.

After each year, an installation must surrender allowances to cover fully its emissions. If an installation reduces its emissions, it can sell spare allowances to another installation that is short of allowances.

This brings flexibility that ensures emissions are cut where it costs the least to do so.

### **Policy, law, or regulation geographic coverage**

Regional

### **Country/region the policy, law, or regulation applies to**

Europe

### **Your organization's position on the policy, law, or regulation**

Support with minor exceptions

### **Description of engagement with policy makers**

- We publish our position actively on our website and highlight our messages in the public and non-public discussion.
- Participation in stakeholder consultation on ETS and CBAM
- Direct meetings with MEPs, government, and European Commission
- Invitation of MEPs and state representatives to site visits
- Event in our Brussels office and presentation of our view
- Contribution to positioning papers and consultations (e.g. Cefic, VCI, BDI, BusinessEurope)

### **Details of exceptions (if applicable) and your organization's proposed alternative approach to the policy, law or regulation**

- New plants must be economically operable before the existing plants become unprofitable due to loss of carbon leakage (CL) protection.
- Free allocation and compensation for additional electricity costs must be fully maintained to protect against carbon leakage. If this is no longer possible due to the tightening of the ETS cap, the carbon leakage protection should be supplemented by financial compensation.
- Support of carbon-free installations (e.g, by contracts for difference) should be further strengthened to speed up the transition. ETS income should be fully used to support the transition of the sectors covered
- We oppose Carbon Border Adjustment Mechanisms as an alternative to ETS carbon leakage protection, as it cannot protect the chemical industry:
  - WTO compatible export solutions are missing,
  - Value chains are not covered and thus not protected from Carbon Leakage any longer.
  - To include value chains, carbon footprinting calculations need to be globally harmonized
  - Feasibility of customs operations needs to be assured

**Have you evaluated whether your organization's engagement is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

**Focus of policy, law, or regulation that may impact the climate**

Renewable energy generation

**Specify the policy, law, or regulation on which your organization is engaging with policy makers**

The revision of the EU Renewable Energy Directive aims at increasing the overall Renewable Energy Sources (RES) generation capacity. It further intends to foster cross-border RES supply and trading, and to strengthen joint projects and efforts between Member States. It is also setting targets for industry, incl. a green hydrogen target, with an overall intention to push the Member States setting the right conditions for industry. BASF fully supports the intention, but is sceptical with regard to fix and not technology-open hydrogen targets.

**Policy, law, or regulation geographic coverage**

Regional

**Country/region the policy, law, or regulation applies to**

Europe

**Your organization's position on the policy, law, or regulation**

Support with minor exceptions

**Description of engagement with policy makers**

- We publish our position on hydrogen actively on our website.
- Publicly available contribution to EU consultation
- We highlight our messages in the public and non-public discussion.

**Details of exceptions (if applicable) and your organization’s proposed alternative approach to the policy, law or regulation**

BASF fully supports increasing availability and access to RES as an inevitable precondition for industry transformation. We also see a need to strengthen European cooperation in renewable energy trading and market integration of RES electricity. Member States need to encourage subsidy-free investments into renewable energy generation.

Regulatory burdens on RES use through requirements for additional quality features need to be avoided. Green power criteria must not hinder RES electrification.

Any “hydrogen target” for the industry needs to focus on encouraging the industry to deploy options that reduce CO<sub>2</sub> emissions of hydrogen production:

- Narrow criteria, such as a locality requirement, must not be applied for the ramp-up of hydrogen integration for essential feedstock use in cost-sensitive and trade-exposed industries.
- All climate-friendly hydrogen technologies must be accepted equally and counted towards any hydrogen target for the industrial sector.
- A general renewable hydrogen target on the Member State level could even undermine planned CO<sub>2</sub> reduction measures, as it does not reflect the different potentials available in various Member States.
- A hydrogen target should focus on on-purpose hydrogen.
- By-product hydrogen, co-product hydrogen, and intrinsic hydrogen have technical and/or financial limitations for replacement.
- Policies need to be in place to address the economic gaps (e.g., CCfD).

**Have you evaluated whether your organization’s engagement is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

## C12.3b

**(C12.3b) Provide details of the trade associations your organization engages with which are likely to take a position on any policy, law or regulation that may impact the climate.**

**Trade association**

European Chemical Industry Council (CEFIC)

**Is your organization’s position on climate change consistent with theirs?**

Consistent

**Has your organization influenced, or is your organization attempting to influence their position?**

We publicly promote their current position

**State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)**

CEFIC is committed to the Paris Agreement. It is convinced that, as one of the largest and most diversified industries in Europe, the chemical industry plays an important role in helping to achieve long-term greenhouse gas emission reductions. Therefore, it is continuously looking at ways to improve production processes, lower the industry's carbon footprint and enable further emission reductions down the value chains. Carbon neutrality: CEFIC supports the EU Green Deal and Europe's ambition to become climate neutral by 2050. It emphasizes the requirement of detailed definitions, the united work of all sectors, and an enabling framework to reach these ambitious targets. CEFIC underlines that increasing the 2030 EU target on greenhouse gas emissions should provide a balanced reduction pathway towards 2050 and redistribute in time the transition effort towards climate neutrality.

A detailed evaluation can be found under "Energy and climate policies" on our website (see [www.basf.com/climate\\_protection](http://www.basf.com/climate_protection)).

**Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)**

**Describe the aim of your organization's funding**

**Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

**Trade association**

BusinessEurope

**Is your organization's position on climate change consistent with theirs?**

Consistent

**Has your organization influenced, or is your organization attempting to influence their position?**

We publicly promote their current position

**State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)**

BusinessEurope stands behind the EU ambition of climate neutrality to reach the objectives of the Paris Agreement. It considers the Paris Agreement as the single most important tool in providing clarity on the direction that society must take to tackle climate



change. BusinessEurope advocates that it is equally important to provide a global level playing field, as reaching the Paris Agreement requires all countries to make significant efforts to reduce emissions.

Carbon Neutrality: BusinessEurope supports the European Green Deal and the EU's ambition to become the first climate neutral continent by 2050 and reduce all greenhouse gas emissions by 55 percent by 2030. Their vision to achieve said targets consists of a climate policy, carbon pricing, regulation of carbon and investment leakage as well as required contributions from all sectors. Furthermore, to stay on track for the 2030 goal, BusinessEurope points out possible impacts on global domestic growth, exports, and costs that have to be taken into consideration.

A detailed evaluation can be found under "Energy and climate policies" on our website (see [www.basf.com/climate\\_protection](http://www.basf.com/climate_protection)).

**Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)**

**Describe the aim of your organization's funding**

**Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

## C12.3c

**(C12.3c) Provide details of the funding you provided to other organizations in the reporting year whose activities could influence policy, law, or regulation that may impact the climate.**

**Type of organization**

Non-Governmental Organization (NGO) or charitable organization

**State the organization to which you provided funding**

Forum für Zukunftsenergien or in English, "Forum for Future Energies" is the Institution for the Energy Sector and Energy Policies for pre-parliamentary debates. It serves as a platform for information and communication on the design of a sustainable energy industry in an interdisciplinary, cross-industry, and cross-interest discourse both on a national level in Berlin and on an international level in Brussels.

**Funding figure your organization provided to this organization in the reporting year (currency as selected in C0.4)**

3,993

**Describe the aim of this funding and how it could influence policy, law or regulation that may impact the climate**

Renewable Energy at competitive costs is essential for BASFs Climate Strategy. The Forum for Future Energies is committed to a secure, cost-effective, resource- and environmentally friendly energy supply for all sectors. It promotes the exchange of experience between science, business, administration, and politics to allow for science-based, broadly agreed solutions. It facilitates discussions in political processes and supports objectification of the debate as well as consensus building. The focus includes information to the public, experts, and energy policymakers through publications, lectures, discussion events or conferences.

**Have you evaluated whether this funding is aligned with the goals of the Paris Agreement?**

Yes, we have evaluated, and it is aligned

## C12.4

**(C12.4) Have you published information about your organization’s response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).**

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**Publication**

In mainstream reports, incorporating the TCFD recommendations

**Status**

Complete

**Attach the document**

 BASF IR 2021.pdf

**Page/Section reference**

p. 19 (TCFD Recommendations index);  
 p. 26-30 (“Our Strategy”);  
 p. 36-37 (“Targets and Target Achievement”);  
 p. 42-43 (“Our Steering Concept”);  
 p. 45-48 (“Our Sustainability Concept”);  
 p. 109-116 (“We Source Responsibly”);  
 p. 126-132 (“Energy and climate protection”);  
 p. 141-143 (“We Drive Sustainable Solutions”);  
 p. 151-160 (“Opportunities and Risks”)

**Content elements**

Governance  
 Strategy  
 Risks & opportunities  
 Emissions figures  
 Emission targets

Other metrics  
 Other, please specify  
 Value chain engagement

**Comment**


**Publication**

In voluntary communications

**Status**

Complete

**Attach the document**

 C12.4\_Frontpage\_Energy\_and\_Climate\_Protection.pdf

**Page/Section reference**

Entire document

**Content elements**

Governance  
 Strategy  
 Emissions figures  
 Emission targets  
 Other metrics  
 Other, please specify  
 Value chain engagement

**Comment**

This is the overview page of our website section on Energy and Climate Protection, which features nine sub-sections in total.

## C15. Biodiversity

### C15.1

**(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?**

Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity

<p>Row 1</p>	<p>Yes, both board-level oversight and executive management-level responsibility</p>	<p>Corporate-wide governance in terms of steering and controlling BASF Group and ensuring corporate compliance is the overall responsibility of the Board of Executive Directors as a whole. The Corporate Center supports the Board of Executive Directors in steering the company and defining adequate governance. The Corporate Center bundles all group-wide steering and governance activities. Governance topics accountable within Corporate Center are also biodiversity-related topics e.g Environmental protection. EHSQ management system, EHS Data management &amp; reporting</p> <p>Managing Directors are accountable for the compliance of the individual legal entities. This includes adherence to local laws, and local implementation of group-wide Policies and Corporate Requirements, complemented by local Company Requirements if and to the extent needed.</p> <p>A member of the Board of Executive Directors chairs BASF's Corporate Sustainability Board (CSB) the central steering committee for sustainable development, including biodiversity-related topics. It is composed of the heads of selected business, corporate and functional units as well as of regions. The CSB monitors the implementation of the sustainability strategy and cross-divisional initiatives, defines sustainability goals, and approves corporate position papers on sustainability topics – including biodiversity-related topics. Corporate Sustainability Board (CSB) meets on a regularly basis about four times a year. Board member is briefed regularly on current and emerging biodiversity related topics by Vice President Sustainability who covers these topics constantly as part of his responsibilities.</p>
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## C15.2

**(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?**

	<p>Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity</p>	<p>Biodiversity-related public commitments</p>	<p>Initiatives endorsed</p>
<p>Row 1</p>	<p>Yes, we have made public commitments and publicly endorsed initiatives related to biodiversity</p>	<p>Commitment to no conversion of High Conservation Value areas Commitment to secure Free, Prior and Informed Consent (FPIC) of Indigenous Peoples</p>	<p>Other, please specify VBA Value balancing Alliance</p>

### C15.3

**(C15.3) Does your organization assess the impact of its value chain on biodiversity?**

Does your organization assess the impact of its value chain on biodiversity?	
Row 1	Yes, we assess impacts on biodiversity in both our upstream and downstream value chain

### C15.4

**(C15.4) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?**

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?	Type of action taken to progress biodiversity-related commitments
Row 1	Yes, we are taking actions to progress our biodiversity-related commitments	Land/water protection Land/water management



### C15.5

**(C15.5) Does your organization use biodiversity indicators to monitor performance across its activities?**

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	Yes, we use indicators	Pressure indicators Response indicators

### C15.6

**(C15.6) Have you published information about your organization’s response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).**

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Content of biodiversity-related policies or commitments Governance Impacts on biodiversity Details on biodiversity indicators	 1
In mainstream financial reports	Content of biodiversity-related policies or commitments	 2

	Governance Impacts on biodiversity Details on biodiversity indicators	
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 <sup>1</sup>5th\_basf\_palm\_progress\_report\_2020.pdf

 <sup>2</sup>BASF IR 2021.pdf

## C16. Signoff

### C-FI

**(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.**

### C16.1

**(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.**

	Job title	Corresponding job category
Row 1	Member of the Board of Executive Directors, BASF SE	Director on board