

## C0. Introduction

---

### C0.1

---

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

At BASF, we create chemistry for a sustainable future. As the world's leading chemical company, we combine economic success with environmental protection and social responsibility. The approximately 122,000 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.

As of 2019, BASF's activities have been grouped into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. In 2018, BASF posted sales of €62.7 billion and income from operations before special items of approximately €6.4 billion. BASF shares are traded on the stock exchanges in Frankfurt (BAS) and Zurich (AN). Further information on BASF is available on the internet 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 for Climate-related Financial Disclosure (TCFD).

We have defined sustainability focus areas in our corporate strategy to position ourselves in the market and at the same time, meet the growing challenges along the value chain: We source responsibly; We produce safely for people and the 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.

We aim to reduce our greenhouse gas emissions per metric ton of sales product by 40% by 2020, compared with baseline 2002. In 2018, we achieved a reduction of 34.2%. Since 1990, we have been able to lower our overall greenhouse gas emissions from chemical operations by 49% and reduce specific emissions by 74%. Regarding energy efficiency, we want to have introduced certified energy management systems (ISO 50001) at all relevant production sites by 2020, covering 90% of our primary energy demand (status 2018: 73.0%).

We will pursue a new goal from 2019 onward: CO<sub>2</sub>-neutral growth until 2030. BASF commits to keeping its greenhouse gas emissions flat at the 2018 level until 2030 – even though we are targeting considerable annual production growth. This goal includes other greenhouse gases according to the Greenhouse Gas Protocol, which are converted into CO<sub>2</sub> equivalents (CO<sub>2</sub>e). We bundled all measures that will help us reach our climate target and enable further reductions in the long term in a global Carbon Management. We will maintain the KPI "greenhouse gas emissions per metric ton of sales product" as well as our energy efficiency goal as reporting indicators to track our progress in decoupling growth from emissions and in introducing energy management systems.

We also offer solutions that help our customers to avoid greenhouse gas 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. An analysis of 22 climate protection product groups revealed that customers’ use of products sold in 2018 helps to avoid 640 million metric tons of CO2 equivalents. We invest about half of our annual Research and Development (R&D) expenditures (€2.028 billion total R&D expenses in 2018) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection.

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 guarantees of the future developments and results outlined therein. These are dependent on a number of 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
Row 1	January 1 2018	December 31 2018	No	<Not Applicable>

C0.3

---

**(C0.3) Select the countries/regions for which you will be supplying data.**

Argentina  
Australia  
Bahrain  
Belgium  
Brazil  
Canada  
Chile  
China  
Colombia  
Czechia  
Denmark  
Egypt  
Finland  
France  
Germany  
India  
Indonesia  
Ireland  
Italy  
Japan  
Kazakhstan  
Malaysia  
Mexico  
Netherlands  
New Zealand  
Norway  
Panama  
Peru  
Poland  
Puerto Rico  
Republic of Korea  
Russian Federation  
Saudi Arabia  
Singapore  
Slovakia  
South Africa  
Spain  
Sweden  
Switzerland  
Taiwan, Greater China  
Thailand  
Turkey  
United Arab Emirates  
United Kingdom of Great Britain and Northern Ireland  
United States of America  
Viet Nam

**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 consolidation approach to your Scope 1 and Scope 2 greenhouse gas inventory.**

Other, please specify (Production sites of fully consolidated companies and proportionally consolidated joint operations worldwide. Emissions were included pro rata, based on BASF's stake.)

## 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  
Methanol  
Polymers  
Adipic acid

#### **Bulk inorganic chemicals**

Ammonia  
Fertilizers  
Nitric acid  
Chlorine and Sodium hydroxide  
Soda Ash  
Hydrogen  
Oxygen  
Other industrial gasses

#### **Other chemicals**

Specialty chemicals  
Specialty organic chemicals  
Other, please specify (>60k specific product applications)

## 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
Director on board	A member of the Board of Executive Directors of BASF has the overall responsibility for climate protection as part of the Board member's wider responsibility for the Environment, Health and Safety Division of BASF. In this role, the Board member takes care for the accounting of greenhouse gas emissions in BASF Group, development of climate protection targets, monitoring of target performance, advancing measures towards target achievement and promoting/aligning climate-related issues in areas under responsibility of other Board members (e.g. procurement, R&D). The head of BASF's Environment, Health and Safety Division, which has oversight for all climate protection topics in BASF, reports directly to the Board member.
Director on board	Another Board member has the overall responsibility for sustainability and takes care that climate-related work is integrated in and aligned with the various tools of BASF's sustainability management. The Board member chairs BASF's Corporate Sustainability Board (CSB), BASF's central steering committee for sustainable development. It is comprised of the heads of business, corporate and functional units as well as of the regions. The head of BASF's Environment, Health and Safety Division, which has oversight for all climate protection topics in BASF, is also a member of the CSB. 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 Environment, Health and Safety Division is discussed and aligned with the CSB in support of sustainable development and preparation of climate-related Board level discussions

**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 – some meetings	<p>Reviewing and guiding strategy</p> <p>Reviewing and guiding major plans of action</p> <p>Reviewing and guiding risk management policies</p> <p>Overseeing major capital expenditures, acquisitions and divestitures</p> <p>Monitoring and overseeing progress against goals and targets for addressing climate-related issues</p>	<p>Our Management Board reviews at least annually major climate-related topics like, for instance: - Climate-related risks and opportunities - Target performance - Budgets for functions and business units involved in climate-related topics - Carbon price forecasts - Progress on specific measures supporting BASF's sustainability strategy In addition, depending on need, the following topics are addressed: - Investment decisions - Requests for approval of specific action plans, e.g. new R&amp;D initiatives Example of how a selected mechanism contributes to the Board's oversight of climate issues in more detail: 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>

**C1.2**

**(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
Environment/ Sustainability manager	Both assessing and managing climate-related risks and opportunities	As important matters arise

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:**

**Position in the company:** The President of the Functional Division Environment, Health and Safety (EHS) represents the highest responsibility for overall governance for climate protection below Board of Directors (= delegation of governance from Board). The President leads the Functional Division EHS and reports directly to the Board member with overall responsibility for EHS and climate-related topics within BASF. The Functional Division EHS integrates major global functionalities required for preparing top management decisions on climate protection, such as corporate environmental goal setting, controlling and reporting, energy efficiency activities and climate change monitoring.

**Monitoring process:** The President of the Functional Division EHS is briefed regularly on current and emerging climate change-related issues by the Environmental Manager heading the "Global Support Environmental Protection" unit within the Functional Division EHS, which covers these issues constantly as part of its core responsibilities.

Furthermore, the President is a member of the Environment, Energy and Climate Coordination Circle (EECCC), which is a committee led and organized by the "Energy and Climate Policy" unit of BASF. It is comprised of the heads of business, corporate and functional units with heads of EHS, Corporate Development, Legal, European Site and Verbund Management as well as staff of Board members as permanent members. The committee serves as a platform for information sharing and strategic discussion of climate and energy policy topics across company units.

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 the 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 Environment, Health and Safety Division is discussed and aligned with the CSB in support of sustainable development and preparation of climate-related Board level discussions.

**Environmental Manager:**

**Position in the company:** The Environmental Manager heads the "Global Support Environmental Protection" unit within the Functional Division EHS and is in reporting line to the President of the Function Division EHS (= delegation of governance from President). The Environmental Manager is involved in briefings to Board members on a case-by-case basis.

**Monitoring process:** The unit led by the position is in charge of monitoring / analyzing climate change related risk and opportunities, treating requests of internal/external stakeholders, carbon accounting (corporate carbon footprint) and collection of respective data, updating the status of goals and emissions performance and guidance for continuous improvement, creating information materials, steering improvement projects. It maintains an internal network of EHS experts with link into operations. Furthermore, the Management Team for Climate Protection (MTCP) is headed by the unit. This committee comprises members from different corporate units (e.g. sustainability strategy, advocacy, investor relations, procurement) and regional representatives, and constantly reviews climate-related topics, especially risks and opportunities. As head of the unit, the Environmental Manager is supervising the outcomes of and issues arising from these activities, e.g. via regular meetings, jour fixes and internal updates, and is thus bearing responsibility for the assessment, monitoring and management of such climate related issues.

## C1.3

---

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

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).**

**Who is entitled to benefit from these incentives?**

Director on board

**Types of incentives**

Monetary reward

**Activity incentivized**

Efficiency target

**Comment**

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 corporate emission reduction target.

---

**Who is entitled to benefit from these incentives?**

Executive officer

**Types of incentives**

Monetary reward

**Activity incentivized**

Efficiency target

**Comment**

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.

---

**Who is entitled to benefit from these incentives?**

Environment/Sustainability manager

**Types of incentives**

Monetary reward

**Activity incentivized**

Efficiency target

**Comment**

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.

---

**Who is entitled to benefit from these incentives?**

Process operation manager

**Types of incentives**

Monetary reward

**Activity incentivized**

Efficiency target

**Comment**

In the context of continuous improvement of operational excellence, process operation managers are incentivized to increase energy efficiency and reduce emissions in BASF plants.

---

**Who is entitled to benefit from these incentives?**

Other, please specify (Marketing manager/account executive)

**Types of incentives**

Monetary reward

**Activity incentivized**

Other, please specify (Sales of climate protection products)

---



**Comment**

Marketing manager’s performance is measured, amongst other KPIs, against sales targets, including sales of climate protection products.

**Who is entitled to benefit from these incentives?**

Other, please specify (Project leaders R&D)

**Types of incentives**

Monetary reward

**Activity incentivized**

Other, please specify (Developing climate protection products)

**Comment**

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.

**Who is entitled to benefit from these incentives?**

All employees

**Types of incentives**

Monetary reward

**Activity incentivized**

Emissions reduction project

**Comment**

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 2018 result in an annual greenhouse gas emission reduction of about 25,000 metric tons of CO2e.

## C2. Risks and opportunities

### C2.1

**(C2.1) Describe what your organization considers to be short-, medium- and long-term horizons.**

	From (years)	To (years)	Comment
Short-term	0	2	Timeframe aligned with wider enterprise risk management process.
Medium-term	2	8	Timeframe aligned with wider enterprise risk management process.
Long-term	8		Timeframe aligned with wider enterprise risk management process.

### C2.2

**(C2.2) Select the option that best describes how your organization's processes for identifying, assessing, and managing climate-related issues are integrated into your overall risk management.**

Integrated into multi-disciplinary company-wide risk identification, assessment, and management processes

### C2.2a

**(C2.2a) Select the options that best describe your organization's frequency and time horizon for identifying and assessing climate-related risks.**

	Frequency of monitoring	How far into the future are risks considered?	Comment
Row 1	Six-monthly or more frequently	>6 years	

**C2.2b**

**(C2.2b) Provide further details on your organization's process(es) for identifying and assessing climate-related risks.**

**Reference to existing standards used:**

Climate-related risks 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). BASF's risk management process applies to the company as well as to individual assets.

**Integration of climate-related risk into enterprise risk management (ERM):**

Climate-related risk reporting is systematically integrated into the aggregated opportunity/risk exposure of the BASF Group delivered twice a year by Corporate Controlling and Finance to BASF Group's management. The climate-related exposure assessment is provided by the BASF Management Team for Climate Protection (MTCP), including experts from environment, health and safety (EHS), corporate sustainability strategy, advocacy, corporate technology, investor relations, new business, procurement, and regional representatives. The MTCP meets at least quarterly to exchange on the following risks and opportunities:

**Company level:**

Reputation: The teams of investor relations, corporate strategy and advocacy monitor external stakeholder (e.g. investors, analysts, NGOs) expectations and brand perception and report regularly in the MTCP to assess effects for BASF's reputation on a consolidated basis.

Market development: BASF's subsidiary scouting for new business areas assesses opportunities for new climate protection products, and a team of business unit (BU) representatives regularly evaluates customer expectations regarding the carbon performance of our products. Major findings are fed into the MTCP discussion for identification of trends relevant at corporate level, e.g. regarding fit with the BASF strategy.

Technology: BASF's corporate technology experts regularly review new technological developments with regard to 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 and reported to the MTCP as appropriate, depending on the magnitude and likelihood of impact.

**Asset level:**

Regulatory: A team of experts from BUs and central functions analyses local and regional developments of regulation affecting BASF directly (e.g., regulation of energy efficiency/consumption, emission limits, carbon pricing systems) or other parts of the value chains where BASF is involved and may be indirectly affected (e.g. regulation for products of key customers). In addition, the corporate Energy and Climate Policy group reviews aggregated effects from local developments (e.g. global dissemination of ETS) and global progress on climate protection (e.g. Paris Agreement). The major findings from the assessments are reported to the MTCP.

Climate/weather change: Potential physical 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. The information from asset level assessments is also made available to the MTCP for a comprehensive risk assessment by the corporate team. The assessment includes a view on interruption of supply chains and logistics for BASF products, i.e.

upstream and downstream risks.

**Assessment of size and scope of identified risks:**

Risks and opportunities are evaluated based on three major aspects: (a) their potential financial implications for BASF, (b) the ability to threaten BASF's license to operate, (c) the probability of occurrence.

**Definition of substantive impact:**

A specific risk or opportunity is considered as having a substantive impact, if the resulting deviation from planned earnings exceeds €2 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-high = €10-100 million, Medium = €2-10 million, Low-medium = less than €2 million and Low = insignificant. If a new risk is identified that could have an impact on earnings of more than €10 million, it must be immediately reported to the Board of Executive Directors.

**Determination of the relative significance of climate-related risks in relation to other risks:**

The ERM framework, as laid out in a BASF Risk Management Policy and the Risk Management Process document, ensures that all risks are reported according to the same principles of quantification in a comparable manner. Corporate Controlling 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.

C2.2c

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

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	Rationale for relevance: BASF as an energy- and emissions-intensive company is directly affected by current and emerging regulation targeting energy use and efficiency as well as reduction of emissions. Such regulation can result in significant cost burdens for production. +++ Risk example: A high number of power plants and chemical plants of BASF are regulated under the European ETS. Changes of prices for emission certificates can have a substantial impact on their cost of production. +++ Inclusion in assessment: Hence, a team of experts from business units and central functions analyses emission certificate costs for all BASF plants included in the EU ETS. The findings are fed back into the BASF Management Team for Climate Protection, which prepares the climate-related part of the aggregated opportunity/risk exposure report of the BASF Group delivered twice a year to the Board of Directors.
Emerging regulation	Relevant, always included	Rationale for relevance: BASF as an energy- and emissions-intensive company is directly affected by current and emerging regulation targeting energy use and efficiency as well as reduction of emissions. Such regulation can result in significant cost burdens for production. +++ Risk example: BASF has operations in Singapore, which may be affected by the Singapore Carbon Tax, potentially leading to higher operational costs for BASF based on the GHG emissions that fall under the tax scheme +++ Inclusion in assessment: A team of experts from business units and central functions conducts an impact assessment for the planned regulation. The findings are fed back into the BASF Management Team for Climate Protection, which prepares the climate-related part of the aggregated opportunity/risk exposure report of the BASF Group delivered twice a year to the Board of Directors.
Technology	Relevant, sometimes included	Rationale for relevance: 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. +++ Risk example: BASF's corporate technology experts regularly review new developments for power-to-x technologies, given that chemicals are discussed to be a potential option for energy storage and sector coupling under the power-to-x concept. +++ Inclusion in assessment: Technology-specific findings are integrated into medium-term and long-term strategic analyses on the future of BASF's production setup and reported to the BASF Management Team for Climate Protection as appropriate, depending on the magnitude and likelihood of impact. The Management Team prepares the climate-related part of the aggregated opportunity/risk exposure report of the BASF Group delivered twice a year to the Board of Directors.
Legal	Not relevant, explanation provided	BASF monitors the development of litigation in all areas and geographies relevant to the company. While there is an overall increase of such litigations, there is no case indicating that the chemical industry, nor BASF in particular, will become subject to lawsuits or other forms of legal disputes with a clear relation to climate change 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 at the moment, and not receiving an in-depth assessment. 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".

	Relevance & inclusion	Please explain
Market	Relevant, sometimes included	Rationale for relevance: BASF offers more than 60,000 solutions 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. +++ Risk example: 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). +++ Inclusion in assessment: 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 and reported to the BASF Management Team for Climate Protection as appropriate, depending on the magnitude and likelihood of impact. The Management Team prepares the climate-related part of the aggregated opportunity/risk exposure report of the BASF Group delivered twice a year to the Board of Directors.
Reputation	Relevant, always included	Rationale for relevance: BASF has a significant corporate carbon footprint (e.g. global Scope 1+2+3 emissions rank #63 of the Global 250 according to an analysis of Thomson Reuters, 2017) and its portfolio comprises products with a high GHG intensity. 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 of BASF who is becoming increasingly outspoken about the risk of climate change for the financial market) or sustainability-oriented customers perceive BASF business activities to be misaligned with the growing global momentum to act against climate change this will pose a reputational risk to the company that can ultimately lead to lower sales and a reduced market valuation. +++ Risk example: BASF is in the company focus list of various investor-led initiatives aiming to engage with the world's largest corporate GHG emitters to curb emissions, e.g. Climate Action 100+. +++ Inclusion in assessment: Investor relations of BASF is closely monitoring activities of the initiative and engaging with the stakeholders. Being a member of the BASF Management Team for Climate Protection, which prepares the climate-related part of the aggregated opportunity/risk exposure report of the BASF Group delivered twice a year to the Board of Directors, investor relations provides information on related developments and risks directly for the report.
Acute physical	Relevant, always included	Rationale for relevance: BASF operates more than 360 production sites in diverse environments in more than 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 intrinsic risk factor with potential significant impact on individual sites and therefore need to be assessed for relevance. +++ Risk example: BASF operates production sites in regions potentially vulnerable to 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. +++ Inclusion in assessment: 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 and also made available to the BASF Management Team for Climate Protection for consideration in the aggregated opportunity/risk exposure report of the BASF Group delivered twice a year to the Board of Directors.
Chronic physical	Relevant, always included	Rationale for relevance: BASF operates more than 360 production sites in diverse environments in more than 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 excluded as intrinsic risk factor with potential significant impact on individual sites and therefore need to be assessed for relevance. +++ Risk example: 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. +++ Inclusion in assessment: 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 and also made available to the BASF Management Team for Climate Protection for consideration in the aggregated opportunity/risk exposure report of the BASF Group delivered twice a year to the Board of Directors.
Upstream	Relevant, sometimes included	Rationale for relevance: BASF has more than 70,000 suppliers. Given the global setup and size of the supplier base, intrinsic transitional and physical risks from climate change cannot be systematically excluded for all suppliers and therefore need to be assessed case-by-case to avoid supply chain interruptions. +++ Risk example: Tropical cyclones can hamper normal operations by disrupting our supply chain due to strong winds and flooding in coastal regions and can require a shutdown of individual production sites. The impact of climate change on frequency and magnitude of tropical cyclones is under scientific discussion and therefore still uncertain. A significant increase in the frequency and magnitude of tropical cyclones may reduce local production capacity. +++ Inclusion in assessment: Such kind of risks from climate change for supply chains of 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 and also made available to the BASF Management Team for Climate Protection for consideration in the aggregated opportunity/risk exposure report of the BASF Group delivered twice a year to the Board of Directors.

	Relevance & inclusion	Please explain
Downstream	Relevant, sometimes included	Rationale for relevance: (i) Transportation of BASF products to customers is subject to the same physical risks as described for our production base, i.e., given the global setup (360+ sites in 90+ countries) physical risks from climate change cannot be excluded as intrinsic risk factor with potential significant impact on individual downstream site logistics. (ii) Change of demand for BASF products by our customers down the value chain is a typical downstream risk with manifold potential links to climate change, e.g. regulation towards low-carbon solutions in our customer industries or change of buying behavior towards low-carbon solutions by end consumers for final products from our customers due to a higher awareness for climate change. +++ Risk example: In view of the negative implications of excessive use of plastics, including emissions from burning, several countries have started to regulate the use of plastic bags more rigorously. This regulation is a risk for interruption of the business model of the producers of plastic bags, requiring them to come up with more eco-friendly solutions. BASF offers bio-based plastics material qualifying to satisfy this demand. +++ Inclusion in assessment: BASF experts from the responsible business unit closely follow-up on the regulatory changes around important product groups and assess the indirect impact on BASF. The findings are integrated into strategic considerations for business development and reported to the BASF Management Team for Climate Protection as appropriate, depending on the magnitude and likelihood of impact. The Management Team prepares the climate-related part of the aggregated opportunity/risk exposure report of the BASF Group delivered twice a year to the Board of Directors.

## C2.2d

---

## **(C2.2d) Describe your process(es) for managing climate-related risks and opportunities.**

Climate-related risk/opportunity management is integrated into the company-wide enterprise risk management (ERM) process based on the COSO II Framework. A network of risk managers in business, functional and corporate units, in the regions and at Verbund sites advances the implementation of appropriate management practices of specific opportunities and risks in daily operations. Following the principle of decentralized ERM, climate-related risks and opportunities are usually managed by the local, regional and corporate 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. The central BASF Management Team for Climate Protection (MTCP) can be involved by responsible units by (a) informing the MTCP about their decisions and management alignment steps, or (b) consulting the MCTP for guidance. The aggregation of risk management information at MCTP level warrants that individual management steps are aligned and appropriate also from a wider corporate perspective.

### **Case study – physical risks (STAR approach):**

(a) Situation: Water availability at our sites may be affected by climate change, potentially endangering continuity of operations. (b) Task: BASF corporate environment unit tasked to identify risk exposed sites and suggest risk response. (c) Action: Analysis of worldwide production sites regarding their location in water stress areas and proposal to implement water stewardship as integral management tool at affected sites as risk response to manage water impacts and reduce water withdrawal. (d) Result: An initial analysis using Pfister et al. in 2011 led to identification of a first set of sites in water stress areas. In 2018, a follow-up analysis using the Aqueduct tool (World Resources Institute, 2015) and considering the tighter definition of water stress given by the Global Reporting Initiative standard led to an extended set of sites in water stress areas (about twice as big as the first set). Based on the initial analysis, the Board of Directors approved the implementation of sustainable water management in line with the principles of the European Water Stewardship Standard – at all locations in water stressed areas and Verbund sites until 2025. Following the second analysis in 2018, the approval was extended to the wider set of sites and the timeline for achievement was set to 2030. A corporate goal was defined to this end. BASF achieves high rates of water reuse/recycling (especially for cooling water) in the affected locations.

### **Case study – transition risks (STAR approach):**

Situation: A narrow implementation of carbon leakage regulation under the EU ETS was found to have potentially severe negative effects on competitiveness according to internal analyses. For instance, hydrogen/syngas is not yet traded very much and thus was at risk of not fulfilling the criteria for carbon leakage under the EU ETS. Task: Inform stakeholders and policymaker about industry perspective, prove carbon leakage risk for hydrogen/syngas. Action: Mitigation of this risk was appointed to the BASF Energy and Climate Policy group, engaging in public consultations and stakeholder meetings to explain industry's point of view. In 2018, we joined forces with other companies and associations to provide data and information required to keep hydrogen/syngas on the carbon leakage list. Result: Policymakers considered industry arguments in legislative process. The carbon leakage list for the 4th trading period (starting 2021) includes hydrogen/syngas production.

## **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.**

#### **Identifier**

Risk 1

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

---

Direct operations

### Risk type

Transition risk

### Primary climate-related risk driver

Policy and legal: Increased pricing of GHG emissions

### Type of financial impact

Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

### Company- specific description

BASF's main regulatory risk derives from additional cost burdens from the EU ETS compared to global competitors which do have no comparable additional costs. In fact, approx. 55% of our Scope 1 emissions are covered by the EU ETS, and have to be backed by the appropriate allowances. The risk of additional costs for BASF results from a lack of free allowances even for the best performers, increasing prices for the certificates which we will have to buy, and substantial administrative costs due to monitoring, reporting and verification duties and financial market obligations from EU financial market regulations (e.g. Markets in Financial Instruments Directive II, European Market Infrastructure Regulation and the Market Abuse Regulation). Several policy measures will increase the price of certificates under the EU ETS and thus our cost burden for BASF's European operations. Inter alia, the at least -40% GHG emission reduction goal which results in a steeper 2030 cap, the Market Stability Reserve (MSR) including its additional strengthening and even invalidation of a massive amount of allowances, and additional political interventions in the early fourth trading period to align with the Paris Agreement. Additional measures to reduce emissions can only partially compensate for price increases, as the measures are becoming more costly as well. Even though the efficiency of BASF's plants is above average, a lack of free allowances leads to a loss of competitiveness compared to non-European competitors. Also, we face the risk that electricity prices increase due to increasing costs for emission allowances (both for electricity from the external market and from BASF's own power plants, which are also covered by the ETS), while compensation for these costs may decrease. Regulations have to be amended for the time after 2020.

### Time horizon

Medium-term

### Likelihood

Likely

### Magnitude of impact

Medium-high

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

Yes, an estimated range

### Potential financial impact figure (currency)

<Not Applicable>

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

50000000

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

100000000

### Explanation of financial impact figure

We estimate that BASF may potentially be short of 2-4 million certificates per year in the 4th trading period. The financial impact will depend strongly on the ETS price. Assuming an average certificate price of 25 €/t in line with assumptions given in the impact assessment of the EU Commission, BASF would face additional annual costs of €50-100 million. Administrative costs are in the order of €2 million.

### Management method

We mitigate direct cost impacts by reducing GHG emissions intensity. We have set a global target of CO<sub>2</sub>-neutral growth until 2030 (i.e. growth with stable GHG emissions). We enable emission reductions by (1) improving energy/process efficiency: Each year multiple reduction projects are assessed, kicked off and implemented (>160 measures in EU implemented in 2018). (2) Increasing the share of renewable energy in our power supply. (3) Developing new technologies for long term emission reduction in an R&D program. Further, we actively engage with decision makers and governments at the regional, federal and EU level on climate and energy-related issues. Case study: Situation: Hydrogen/syngas is not yet traded very much and thus was at risk of not fulfilling the criteria for carbon leakage under the EU ETS. Task: Prove carbon leakage risk for hydrogen/syngas. Action: In 2018, we joined forces with other companies and associations to provide data and information required to keep hydrogen/syngas on the carbon leakage list. Result: The carbon leakage list for the 4th trading period (starting 2021) includes hydrogen/syngas production. 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. Direct costs for representing BASF's interests (climate change + other topics) to EU institutions in Brussels are estimated at approx. €3.3 million in 2018.



**Cost of management**

3300000

**Comment**

---

**Identifier**

Risk 2

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

Customer

**Risk type**

Transition risk

**Primary climate-related risk driver**

Market: Changing customer behavior

**Type of financial impact**

Reduced demand for goods and/or services due to shift in consumer preferences

**Company- specific description**

BASF supplies products to numerous customers in nearly every part of the world. The number of customers considering sustainability-related information in their supply relationships (e.g. sustainability criteria in supplier performance reviews, sustainability characteristics of purchased products) is constantly increasing. For example, the corporate sustainability team handled >200 sustainability-related customer requests like supplier performance reviews in 2018, an increase of more than 25% compared to 2017. Given BASF's significant corporate carbon footprint and its portfolio comprising products with a high GHG intensity (e.g. ammonia, nitric acid or high-value chemicals), company engagement and performance in climate protection is a typical area of consideration within sustainability. For example, 31 major customers of BASF, representing about 4% of our sales, requested information on our climate protection activities through the CDP Supply Chain Programme in 2018. Lack of corporate engagement and performance in this area (e.g. receiving a low score in supplier performance reviews, limited ability to address customer-specific questions on climate-related topics around purchased products) poses a risk to impact the customer relationship such that BASF products face lower demand or even get delisted completely by the customer.

**Time horizon**

Medium-term

**Likelihood**

About as likely as not

**Magnitude of impact**

High

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

Yes, an estimated range

**Potential financial impact figure (currency)**

&lt;Not Applicable&gt;

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

100000000

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

200000000

**Explanation of financial impact figure**

We estimate the impact of changing customer behaviour to be high (i.e. more than €100 million). For example, if the customers requesting information on our climate protection activities through the CDP Supply Chain Programme (31 customers representing 4% of our sales in 2018) reduce demand by 10% due to a low CDP score this would result in loss of sales in the order of €100-200 million p.a. This range was selected as indicative figure for the high impact.

**Management method**

BASF exchanges with customers (e.g. bilateral discussions, supplier performance reviews, CDP SC program) on its carbon footprint, climate protection strategy & measures – information which is also reported transparently through public media (e.g. Corporate Report, website). Further, customer-specific requests related to climate are addressed. Case study: Situation: In 2018, a customer approached BASF to conduct a joint analysis of value chain related GHG emissions for alternative routes of raw material supply with the target to reduce supplier-related GHG emissions. Task: Conduct life cycle analysis for alternative scenarios in close cooperation with the customer. Action: BASF and customer sustainability experts worked closely together (e.g. in workshops, regular calls) to run the analyses, evaluate options to further reduce product-related emissions and discuss the findings. Result:



Customer acknowledged BASF's expertise and competent support, strengthening the supply relationship. Explanation of cost: We estimate that ~25 FTE (cost of ~€150,000 each p.a.) in corporate units are dedicated to support the customer dialogue on sustainability, including climate change (e.g. the corporate sustainability team handled >200 sustainability-related customer requests like supplier performance reviews in 2018). Contributions by marketing managers in business units result in no specific additional costs as they are covered by their standard budgets.

#### Cost of management

3750000

#### Comment

---

#### Identifier

Risk 3

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

Direct operations

#### Risk type

Transition risk

#### Primary climate-related risk driver

Reputation: Increased stakeholder concern or negative stakeholder feedback

#### Type of financial impact

Reduction in capital availability

#### Company- specific description

BASF has a significant corporate carbon footprint (e.g. global Scope 1+2+3 emissions rank #63 of the Global 250 according to an analysis of Thomson Reuters, 2017) and its portfolio comprises products with a high GHG intensity (e.g. ammonia, nitric acid or high-value chemicals). As a global industry leader, BASF is expected to act proactively on the challenges of climate change. BASF is in the company focus list of various investor-led initiatives aiming to engage with the world's largest corporate GHG emitters to curb emissions, e.g. Climate Action 100+. If major investors (e.g. BlackRock, the largest single shareholder of BASF who is becoming increasingly outspoken about the risk of climate change for the financial market) perceive BASF business activities to be misaligned with the growing global momentum to act against climate change this will pose a reputational risk to the company. 7 % of BASF shares (68 million, value around €5,500 million at year-average stock price 2018) are held by shareholders who describe socially responsible investment (SRI) being at the core of their investment strategy. In case of a major reputational loss this group may divest a significant number of shares which will reduce BASF's market value. Moreover, there is potential risk of exclusion from thematic (climate) funds.

#### Time horizon

Medium-term

#### Likelihood

About as likely as not

#### Magnitude of impact

High

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

Yes, an estimated range

#### Potential financial impact figure (currency)

<Not Applicable>

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

100000000

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

200000000

#### Explanation of financial impact figure

7 % of BASF shares (68 million, value around €5,500 million at year-average stock price 2018) are held by shareholders who describe socially responsible investment (SRI) being at the core of their investment strategy. In case of a major reputational loss this group may divest a significant number of shares which will reduce BASF's market value. The effect on market valuation is estimated to be high (i.e. more than €100 million) but cannot be quantified more exactly. The selected range is indicative of this high impact.

#### Management method

BASF engages in active dialogue with relevant stakeholders, including investors, and reports transparently on its climate protection

---

strategy and measures via regular standardized activities (e.g. Corporate Report, CDP response, website, investor dialogues) and individual formats (e.g. events, publications). Case study: Situation: Role of business for climate protection is subject to public discussion, leading to increased scrutiny of investors regarding GHG-intensive companies like BASF. Task: Disseminate information about BASF positions, activities and performance in this area to demonstrate that BASF manages this topic properly. Action: In 2018, we presented and discussed information on climate protection at BASF (e.g. GHG target performance) in our mainstream investor roadshows (>60 events in total globally). At SRI conferences and roadshows in London, Paris, Amsterdam, Copenhagen, Stockholm and Frankfurt, at investor visits to BASF's headquarter in Ludwigshafen, and in frequent telephone conferences with investors, focus of discussions with ~40 investors was on climate protection and energy efficiency. We also publicly supported the TCFD recommendations in 2018. Result: Better understanding for BASF engagement at capital market participants, increasing likelihood that investors keep BASF shares in support of the climate protection strategy. Explanation of cost: For the open dialogue with all stakeholders on climate change we have 3 FTE at a cost of ~€150,000 each p.a.

#### **Cost of management**

450000

#### **Comment**

---

#### **Identifier**

Risk 4

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

Direct operations

#### **Risk type**

Physical risk

#### **Primary climate-related risk driver**

Acute: Increased severity of extreme weather events such as cyclones and floods

#### **Type of financial impact**

Reduced revenue from decreased production capacity (e.g., transport difficulties, supply chain interruptions)

#### **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. 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 over the years 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 had assessed physical risks from climate change for the site in 2015 and concluded that significant changes in the risk of extreme weather events will materialize beyond 2050 and that the existing adaptation 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, 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 whether global warming has already changed the likelihood of occurrence and/or intensity of extreme weather events at the site such that it has become more vulnerable, even with the existing countermeasures designed to mitigate the impact of historically observed weather extremes at the site. The question is at the edge of current climate research and therefore results are subject to large uncertainties. For Ludwigshafen, extended analyses in cooperation with external partners indicated that an increased risk from more frequent and intense extreme weather events with the previously described impacts cannot be excluded.

#### **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)**

250000000

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

<Not Applicable>

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

<Not Applicable>

### Explanation of financial impact figure

The figure represents the negative earnings impact due to limited production capacity (i.e. the delta between planned and realized production) 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 impact of similar future events.

### Management method

BASF initiated several specific, 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 (inter alia, expansion of storage capacity, alternative choices for transport, increase of recooling capacity). Case study: Situation: Low water level limits navigability of river for standard shipping vessels. Task: Investigate alternative options for transport of goods. Action: In 2018, we started to hire specific vessels still being able to navigate even at very low water levels. Result: Longer usability of waterway as mode of transport and higher flexibility to switch between different modes of transport, preventing bottlenecks in logistics. Explanation of cost: The figure represents the estimated total costs in the next two years for all measures planned and initiated to increase the resilience of the Ludwigshafen site.

### Cost of management

20000000

### 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.

#### Identifier

Opp1

#### 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

#### Type of financial impact

Reduced operating costs (e.g., through efficiency gains and cost reductions)

#### Company-specific description

BASF's primary energy use amounted to 57.4 million MWh in 2018, highlighting the relevance of energy for our operations (BASF is among the top 250 companies regarding fuel consumption reported to CDP). 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 are 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. 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 medium term.

**Time horizon**

Current

**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)**

15600000

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

<Not Applicable>

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

<Not Applicable>

**Explanation of financial impact figure**

The financial impact represents the annual monetary savings resulting from the energy efficiency measures implemented globally 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.

**Strategy to realize opportunity**

We implement energy management systems at all relevant sites and have set an energy efficiency target to this end: We want to have introduced certified energy management systems at all relevant production sites by 2020, covering 90% of our primary energy demand (status 2018: 73.0%). Further, we continuously run operational excellence programs triggering annual energy efficiency measures. Case study: Situation: BASF has set up the "Drive – Drive Efficiency" program to further enhance operational excellence. It ran from 2016 to 2018 and included efficiency measures in production, engineering, maintenance, logistics, procurement and administration. Task: Within Drive all BASF sites and plants had to propose measures within a central project database where opportunities are tracked. Action: In 2018, 261 additional energy efficiency measures proposed were approved by the global Energy Management team, which also controlled implementation in the different plants all over the world – 254 measures were implemented, and another 96 entered implementation. Result: From the measures implemented in 2018, BASF will save around € 16 million per year in energy cost, contributing about 130,000 t of annual CO2e savings. The database allows to track measures as best practice examples for other sites. Explanation of cost: Costs relate to the investment required in the reporting year to implement the energy efficiency measures proposed and approved within the operational excellence program.

**Cost to realize opportunity**

11600000

**Comment**

---

**Identifier**

Opp2

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

Customer

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Type of financial impact**

Increased revenue through demand for lower emissions products and services

**Company-specific description**

BASF's product portfolio contains innovative solutions for thermal insulation of buildings. For example, we offer Neopor®, Styrodur® and Elastopor® for insulation up to a nearly zero energy home standard, the flexible insulation material Slentex® and the heavy-duty panel SLENTITE®. 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, the revision of the EPBD (Energy Performance of Buildings Directive) and EED (Energy Efficiency Directive) in Europe will foster energy efficiency in buildings in Europe and

provide better funding for renovation. This will lead to an 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)**

200000000

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

<Not Applicable>

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

<Not Applicable>

**Explanation of financial impact figure**

A rough conservative estimation approach indicates a potential of additional annual sales in the order of €200 million driven by an increased building renovation rate in the EU, if implementation of the provisions from the EPBD regulation is fully supported.

**Strategy to realize opportunity**

We expand production capacities and introduce new products into the market. Next to that, we engage in several associations and standardization bodies on standards for energy-efficient construction (e.g. CEFIC, PlasticsEurope, PU Europe, BDI Gebäude AG). Further, we promote the benefits of insulation materials in demonstration projects. For example, in 2017 we showcased our products in a new building in Mumbai (silver standard LEED green buildings). Finally, 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: Global demand for high performance, gray insulation material grows strongly. Task: Improve supply to better meet demand. Action: In 2018, we expanded the global capacity for our gray insulation material Neopor® by 40,000 tons per year. Result: BASF is better able to meet the growing demand and benefit from market growth. Explanation of cost: Costs for investment in production are business confidential information. Estimated costs directly related to representing BASF's interests (climate change and other topics) to EU institutions in Brussels amount to approx. €3.3 million in 2018.

**Cost to realize opportunity**

3300000

**Comment**

---

**Identifier**

Opp3

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

Customer

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Type of financial impact**

Increased revenue through demand for lower emissions 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 100 million units by 2020. BASF expects the share of chemicals in average vehicles to increase because of automotive industry trend towards energy efficiency and clean energy, driven by emissions performance regulations. BASF drives new technologies, e.g. we offer advanced cathode materials for lithium-ion batteries, which play a key role in determining battery performance, energy density, service life and safety. BASF also provides solutions for battery cell frames, cooling and thermal management. A 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 and growing profit margins for BASF.

**Time horizon**

Medium-term

**Likelihood**

Very likely

**Magnitude of impact**

High

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

Yes, an estimated range

**Potential financial impact figure (currency)**

<Not Applicable>

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

2000000000

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

3000000000

**Explanation of financial impact figure**

The global light vehicle production is projected to increase to more than 100 million units by 2020. The exponential growth of electric vehicles worldwide along with the complementary energy related solutions for conventional vehicles (lightweight construction, emissions catalysts for clean diesel engines, fuel additives for gasoline and diesel vehicles) would offer a potential for increase of BASF annual sales by around 20-30% in 2025. Based on current total automotive-driven sales of about €11billion, this would result in an annual increase of €2-3 billion.

**Strategy to realize opportunity**

We expand production capacities and introduce new products into the market in the areas of lightweight engineering concepts and battery materials. To this end, we invest in R&D of low-carbon solutions for the automotive sector, e.g. next-generation battery materials which are expected to make ranges of 300-600 km affordable for the mass market. Central sustainability tools (e.g. Eco-Efficiency Analysis) support this work. Further, we actively engage in partnerships fostering low-carbon mobility (e.g. Global Battery Alliance). Case study: Situation: Electric drive concepts and fuel cells require specific technical properties and high functionality of materials. Task: Meet the design challenges to further replace metal parts with plastics to save weight and make cars more efficient. Action: In 2018, we collaborated with many customers to come up with individual solutions adapted to their needs. For example, we provided a tailor-made Ultramid to manufacture a number of fuel cell system components integrated as standard in the new Mercedes GLC F-CELL. Result: High customer satisfaction makes BASF a preferred technology partner and drives sales. Explanation of cost: In 2018 BASF invested about €400 million in research in functional materials and solutions, which include mobility solutions. Further, BASF invests €400 million to build a large-scale production for cathode materials in Finland by 2020. The sum of these investments has been entered below.

**Cost to realize opportunity**

800000000

**Comment****Identifier**

Opp4

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

Customer

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Type of financial impact**

Increased revenue through demand for lower emissions products and services

**Company-specific description**

BASF is a global market leader in the production of biobased and biodegradable plastics. In the agriculture, consumer and packaging industry, these BASF products are used to design more sustainable solutions by promoting resource efficiency (which supports climate protection) and healthier soils. Recent regulatory initiatives and new laws to tighten standards on single use plastic bags in several countries represent a significant market opportunity for these BASF products: (1) In France, fruit and vegetable plastic bags must be certified home-compostable and have a minimum biobased content of 40%. (2) In Italy, all lightweight and fruit

and vegetable plastic bags must be certified compostable. In addition, fruit and vegetable plastic bags must have a minimum biobased content of 40%. (3) In some regions of India, all lightweight plastic bags shall be compostable. BASF can offer products to satisfy these law requirements and is therefore well positioned to become a lead supplier.

#### **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)**

24000000

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

<Not Applicable>

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

<Not Applicable>

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

The French Association for Plastic Packaging estimates the market for fruit and vegetable plastic bags in France to have a total size of €100-150 million. The Italian Association for biodegradable plastics estimates the market for lightweight plastic bags to be around €80-100 million (plus fruit and vegetable plastic bags €60-80 million). As a market leader in the production of certified compostable plastics, BASF captures a significant share of these markets. Regarding India, the market impact of the regulation is difficult to quantify and depends on the implementation of the law at the level of the regional states. The figure entered above describes the assumed revenue impact of BASF gaining an additional 10% of market share for the described products within said countries (using the lower estimates for the respective market sizes).

#### **Strategy to realize opportunity**

BASF demonstrates the value of compostable bags to legislators and customers in pioneer projects in the countries and also highlights the benefits of its products through several externally reviewed life cycle assessments (LCA) on the use of compostable shopping bags. Further, BASF actively lobbies for the benefits of the biodegradable and biobased products through associations (e.g. Bioplastics in Europe) and in direct contact with stakeholders (e.g. legislators). Case study: Situation: In France BASF introduced certified compostable fruit and vegetable bags in supermarkets together with local authorities, retailers, and NGOs. Task: Increase acceptance of bags by information and education of stakeholders. Action: In 2018 we published the results of an externally reviewed LCA study on certified compostable, partially biobased fruit and vegetable bags in France. Result: Communication of the findings from the LCA study to French stakeholders as well as the international scientific community led to increased understanding and acceptance of certified compostable, partially biobased fruit and vegetable bags. Explanation of cost: Total costs for the pilot projects in France were about €200,000. Average costs per LCA amount to approximately €150,000, while no significant additional costs are linked to the lobbying activities as they are mainly covered by our personnel expenses. In total, we estimate costs of €500,000.

#### **Cost to realize opportunity**

500000

#### **Comment**

---

#### **Identifier**

Opp5

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

Direct operations

#### **Opportunity type**

Markets

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

Other

#### **Type of financial impact**

Other, please specify (Increased capital availability)

#### **Company-specific description**

---



BASF has a significant corporate carbon footprint (e.g. global Scope 1+2+3 emissions rank #63 of the Global 250 according to an analysis of Thomson Reuters, 2017) and its portfolio comprises products with a high GHG intensity (e.g. ammonia, nitric acid or high-value chemicals). As a global industry leader, BASF is expected to act proactively on the challenges of climate change: BASF is in the company focus list of various investor-led initiatives aiming to engage with the world's largest corporate GHG emitters to curb emissions, e.g. Climate Action 100+. Recognizing its potential impact on climate and its role for a sustainable future, BASF has embedded sustainability into its company purpose and taken the task to make positive contributions in the area of resources, environment and climate. 7 % of BASF shares (68 million, value around €5,500 million at year-average stock price 2018) are held by shareholders who describe socially responsible investment (SRI) being at the core of their investment strategy. If major investors perceive BASF business activities to be contributing to or even leading the growing global momentum to act against climate change this will pose a reputational benefit for the company, ultimately resulting in an opportunity to attract financial capital and increase market valuation. Moreover, there is an opportunity for inclusion in thematic (climate) funds.

#### **Time horizon**

Medium-term

#### **Likelihood**

About as likely as not

#### **Magnitude of impact**

High

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

Yes, an estimated range

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

<Not Applicable>

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

100000000

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

200000000

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

7 % of BASF shares (68 million, value around €5,500 million at year-average stock price 2018) are held by shareholders who describe socially responsible investment (SRI) being at the core of their investment strategy. In case of further improvement of our reputation this group may decide to increase its share in BASF, and we may be able to attract other investors of the same kind. The effect on market valuation is estimated to be high (i.e. more than €100 million) but cannot be quantified more exactly. The selected range is indicative of this high impact.

#### **Strategy to realize opportunity**

BASF engages in active dialogue with relevant stakeholders, including investors, and reports transparently on its climate protection strategy and measures via regular standardized activities (e.g. Corporate Report, CDP response, website, investor dialogues) and individual formats (e.g. events, publications). Case study: Situation: SRI-oriented investors analyse BASF share for investment opportunities. Task: Disseminate information about BASF positions, activities and performance regarding sustainability, including climate change, to attract capital from respective investors. Action: In 2018, we presented and discussed information on climate protection at BASF (e.g. GHG target performance) in our mainstream investor roadshows (>60 events in total globally). At SRI conferences and roadshows in London, Paris, Amsterdam, Copenhagen, Stockholm and Frankfurt, at investor visits to BASF's headquarter in Ludwigshafen, and in frequent telephone conferences with investors, focus of discussions with ~40 investors was on climate protection and energy efficiency. Result: Better understanding for BASF engagement at SRI-oriented investors, increasing the likelihood that this group includes BASF shares in its portfolio. Explanation of cost: For the open dialogue with all stakeholders on climate change we have 3 FTE at a cost of about €150,000 each p.a.

#### **Cost to realize opportunity**

450000

#### **Comment**

---

## C2.5

---



**(C2.5) Describe where and how the identified risks and opportunities have impacted your business.**

	Impact	Description
Products and services	Impacted for some suppliers, facilities, or product lines	Climate change and the global transition to a low-carbon economy have started to impact BASF's portfolio steering process by becoming factored into the strategic portfolio analyses conducted by the business units together with corporate strategy to understand whether products are (a) benefiting from the change (e.g. solutions for water-stressed areas, material for low-carbon construction and transport); (b) at risk (e.g. catalysts for mobile combustion engines); (c) remaining unaffected (e.g. pigments) and to take appropriate management steps. BASF's wide, diverse portfolio principally contains products from all these areas. 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 renewable energy (e.g. products for wind and solar power), more sustainable construction (e.g. additives for lower emissions from concrete) and transport (e.g. materials for electric vehicles), and first steps of adaptation (e.g. water solutions). On the other hand, sales of products potentially at risk have not been impacted so far according to our analyses, since business as usual is still pre-dominant. +++ Magnitude: In 2018, about 10% 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 Sustainable Solution Steering). The majority of our sales is currently not impacted.
Supply chain and/or value chain	Impacted	Value chain: The number of BASF customers considering sustainability-related information in their supply relationships (e.g. sustainability-oriented supplier performance reviews like EcoVadis, CDP Supply Chain Program, or sustainability characteristics of purchased products) has constantly increased in past years. Given BASF's significant corporate carbon footprint and its portfolio comprising products with a high GHG intensity, company engagement and performance in climate protection is a typical area of consideration within sustainability. BASF exchange with customers (e.g. through bilateral discussions, supplier performance reviews) on our climate protection strategy, efforts to reduce GHG emissions and options to address specific climate-related customer needs has significantly increased as a consequence. The customer relations management mitigates potential reputational risks. +++ Magnitude: In 2018, major customers of BASF representing a significant share of our sales (more than 20%) requested sustainability performance information including climate-related topics. The customer relation activities are considered to support and expand this business.
Adaptation and mitigation activities	Impacted	Based on a growing awareness for climate change and its relevance for energy-intensive companies, mitigation activities have already become relevant to BASF in the mid-1990s when the first measures for catalytic decomposition of nitrous oxide from adipic acid and nitric acid plants at the BASF sites in Ludwigshafen and Antwerp were kicked off. This engagement has continuously evolved since then to become part of BASF's wider sustainability management nowadays, driven by sustainability as an integral part of BASF's corporate strategy and reflecting our company purpose "We create chemistry for a sustainable future". The implementation of eco-efficiency analysis for our solutions in 1996 and the calculation of the first comprehensive corporate carbon footprint (Scope 1-3) in 2008 highlight further milestones. Moreover, our annual reporting of integration of climate change into our business strategy and emission reduction measures within the CDP questionnaire demonstrates our long-standing commitment and thus how our business has been impacted. For example, in the last five years we have reported between 100 and 250 measures per year that increase energy efficiency in processes (total more than 900 measures, saving approx. 620,000 t CO2e). Our activities are accompanied and driven by respective climate protection targets. BASF's first climate protection target dates back to 2002. Up to end of 2018, our goal was to reduce our greenhouse gas emissions per metric ton of sales product by 40% by 2020, compared with baseline 2002 (status 2018: -34.2%). As of 2019, we want to achieve CO2-neutral growth until 2030 and keep our GHG emissions flat at the 2018 level. +++ Magnitude: In 2018, we have invested about EUR 20,000,000 (about 0.5% of total capital expenditures) for mitigation measures linked to improvement of energy efficiency in processes and reduction of raw material demand. All investments are economically reasonable, i.e. cost savings during operation will justify initial investment costs according to BASF's profitability criteria.
Investment in R&D	Impacted	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. The focus area "resources, environment and climate" highlights directly that climate-related risks and opportunities have impacted the area of R&D investments, showing that BASF has focused and intensified this topic to come up with proper solutions. +++ Magnitude: We invest about half of our annual R&D expenditures (€2.028 billion total R&D expenses in 2018) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection.
Operations	Impacted	BASF operates plants in Europe, Korea and China that are liable to Emission Trading Schemes, indicating that carbon pricing as a regulatory risk has already materialized. +++ Magnitude: Currently we face no substantial financial impact. In Korea and China, only a limited number of plants with no or low emissions exceeding free allocation of certificates are affected. About 55% of our global Scope 1 emissions are liable to the EU ETS, but due to our highly efficient plant setup and balancing certificate deficits with a surplus from the previous trading period we are able to keep current cost burden acceptable.
Other, please specify	Please select	

**C2.6**

**(C2.6) Describe where and how the identified risks and opportunities have been factored into your financial planning process.**

	Relevance	Description
Revenues	Impacted	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&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&D are "resources, environment and climate". We invest about half of our annual R&D expenditures (€2.028 billion total R&D expenses in 2018) on product and process innovations where the R&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. +++ Magnitude: In 2018, about 10% 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 aim to achieve €22 billion in total Accelerator sales by 2025 (2018: €15 billion).
Operating costs	Impacted for some suppliers, facilities, or product lines	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. +++ Magnitude: We estimate a total burden of up to €100 million per year (global aggregate view), i.e. a medium-high financial impact considering BASF's system for classification of financial implications.
Capital expenditures / capital allocation	Impacted	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. 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 capital expenditure projects. For example, business cases for capital expenditures in Europe will include potential costs of European carbon regulation. Different technology options 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. +++ Magnitude: The process is valid for all major capital expenditure projects and acquisitions. The financial impact varies strongly, depending on the nature of the project (e.g. physical conditions at location of plant(s), level of emissions, regulatory context). The consideration of climate-related aspects can lead to significant additional costs in specific cases.
Acquisitions and divestments	Impacted	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 risk scenario cases. 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 acquisitions. For example, business cases for acquisitions in Europe will consider potential costs of European carbon regulation. Different acquisition models taken into account within the business case will show varying carbon costs, e.g. in relation to the level of control achieved through the acquisition, which directly impacts the assessment of economic viability for the various models. +++ Magnitude: The process is valid for all major capital expenditure projects and acquisitions. The financial impact varies strongly, depending on the nature of the project (e.g. physical conditions at location of plant(s), level of emissions, regulatory context). The consideration of climate-related aspects can lead to significant additional costs in specific cases.
Access to capital	Not impacted	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. Some risks have a potentially substantive financial impact (e.g. reduced market valuation of more than €100 million in case of significant divestment of shares after major reputational loss). However, 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 and opportunities 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. "A1/P-1/outlook stable" by Moody's, "A/A-1/outlook stable" by Standard and Poor's and "A/S-1/outlook stable" by Scope.
Assets	Not impacted	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 has pointed to impacts triggering the need to factor them into financial planning related to our assets or our liabilities. Rated "A1/P-1/outlook stable" by Moody's, "A/A-1/outlook stable" by Standard and Poor's and "A/S-1/outlook stable" by Scope, BASF enjoys good credit ratings.
Liabilities	Not impacted	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 has pointed to impacts triggering the need to factor them into financial planning related to our assets or our liabilities. Rated "A1/P-1/outlook stable" by Moody's, "A/A-1/outlook stable" by Standard and Poor's and "A/S-1/outlook stable" by Scope, BASF enjoys good credit ratings.
Other	Please select	

**C3. Business Strategy**

**C3.1**

**(C3.1) Are climate-related issues integrated into your business strategy?**

Yes

**C3.1a**

---

**(C3.1a) Does your organization use climate-related scenario analysis to inform your business strategy?**

Yes, qualitative and quantitative

**C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b**

---

**(C-AC3.1b/C-CE3.1b/C-CH3.1b/C-CO3.1b/C-EU3.1b/C-FB3.1b/C-MM3.1b/C-OG3.1b/C-PF3.1b/C-ST3.1b/C-TO3.1b/C-TS3.1b) Indicate whether your organization has developed a low-carbon transition plan to support the long-term business strategy.**

Yes

**C3.1c**

---

**(C3.1c) Explain how climate-related issues are integrated into your business objectives and strategy.**

With the “We create chemistry” strategy, we want to contribute to a sustainable future (which includes combating climate change) and have embedded this into our corporate purpose: “We create chemistry for a sustainable future.” 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.

**i. How the business strategy has been influenced**

The key elements of the “We create chemistry” strategy are reviewed at least annually by the Board of Directors (BoD). Three major internal reporting lines are used continuously to collect and report climate-related information to influence the strategy: (1) Climate-related topics, especially risks and opportunities, are continuously reviewed by the Management Team for Climate Protection, comprising members from different corporate units (e.g. sustainability strategy, advocacy, investor relations, procurement) and regional representatives. Major findings are forwarded to the head of the Functional Division EHS. The EHS head reports directly to the BoD. (2) Regular policy updates based on the ongoing collection of respective information are provided by the climate and energy advocacy team to the EHS head and the BoD. (3) The corporate sustainability strategy unit integrates climate change in the wider sustainability frame, considering input from internal and external stakeholders.

**ii. Link of business strategy to emission reduction target**

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. We are focusing on issues where we as a company can make a significant contribution. Climate protection has been identified as such an area and is backed with a respective target linked to the strategy. Up to end of 2018, our target was to reduce our greenhouse gas emissions per metric ton of sales product by 40% by 2020, compared with baseline 2002. As of 2019, we set a new climate protection target stating that we will keep our GHG emissions stable on 2018 level until 2030 while we want to grow production by 50% to address increasing societal needs for chemical products. Target achievement will imply a GHG emission intensity reduction of about 30% and is backed by a comprehensive set of actions covering shift to CO<sub>2</sub>-neutral power in energy procurement, enhancing operational excellence and further measures to be developed at a later stage (e.g. use of offsets).

**iii. Examples of substantial business decisions in 2018 and/or with relevance in the reporting year (sorted by primary aspect of climate change that has influenced the business decision)**

Aspect: exploit climate-related business opportunities, based on increased demand for low-carbon products

We extended our portfolio of bio-based materials as a low-carbon solution for customers to exploit climate-related business opportunities. For example, we launched new product lines for our Glasurit® and R-M® refinish paint brands for automotive produced with our biomass balance approach. We also started production of biomass-balanced methanol, developed a foam system based on renewable raw materials, and our customer Nippon Paint introduced the first interior paint in China based on bio-based dispersions from BASF. Further, we increased our production capacity for Neopor® due to strong global demand. Neopor® is used as insulation material for increasing the energy efficiency of buildings.

Aspect: advance long-term climate-related business opportunities, based on need for innovative products for climate change mitigation, adaption and resilience

We promoted R&D activities and joined partnerships to be able to advance long-term climate-related business opportunities. For example, we have started to invest in the carbon recycling company LanzaTech, which has developed a technology for gas fermentation that first enables ethanol to be produced from residual gases containing carbon monoxide and hydrogen. By re-using waste streams instead of incinerating them, industrial companies can reduce carbon dioxide emissions. Further, we collaborate with the Earth observation company VanderSat to provide farmers with high-precision, field-specific crop optimization data, helping them to make more accurate agronomic decisions and reducing material input and emissions in this way. Other partnerships were established or strengthened with the World Plastics Council (uniting efforts to promote responsible use of plastics) and arc-net (collaborate to use blockchain technology for livestock sustainability).

Aspect: mitigation of climate change by reducing emissions in operations

We have initiated and controlled the implementation of more than 250 energy efficiency measures in different plants all over the world in 2018. Further, we reduced the carbon footprint of our production by starting to purchase green electricity for our facilities in Canada. We bundled these and other measures that will help us reach our climate target and enable further reductions in the long term in a global Carbon Management.

C3.1d

---

**(C3.1d) Provide details of your organization’s use of climate-related scenario analysis.**

Climate-related scenarios	Details
Other, please specify (3 custom scenarios, increasing ambition)	<p>Objective of analysis: Circular economy will become a key contributor to a low-carbon economy, transforming value chains and decoupling growth and resource consumption. Customer industries of BASF will be affected by this trend to a variable extent, and consequently the impact on BASF’s value generation will also vary. The aim of the scenario analysis was to evaluate the impact in more detail. Methodology (scenario definition, inputs, assumptions analytical methods): The level of impact was assessed in three scenarios, for which the level of international policy response and action on circular economy, driven by climate change, is the central differentiator: (a) Base = business as usual, no change of regulation, (b) Moderate = known or expected changes of regulation lead to higher circularity, (c) Progressive = assuming more stringent regulation will force a much higher level of circularity. The scenarios were applied to three major customer industries of BASF (automotive, construction, consumer goods representing about 50% of total sales). For each scenario, key drivers of change were identified and underpinned by a set of assumptions about direction and magnitude of change, based on extensive literature research. Examples for assumptions: (1) automotive: number of shared cars, 80-fold increase from the base scenario to the progressive scenario; (2) construction: renovation rate, doubling from the base scenario to the progressive scenario; (3) consumer goods: percentage of arable land where precision farming is applied, four-fold increase from the base scenario to the progressive scenario. The impact of each scenario on the sales of each strategic business unit (SBU) of BASF was subsequently derived allocating relevant scenario drivers to each SBU, assessing the direction and magnitude of impact for the relevant drivers on each SBU, and calculating the financial impact relative to the base scenario. Time horizon covered + relevance to BASF: Projections were made up to 2030. This timeframe is of specific strategic relevance to BASF to ensure that asset structure and business models support future success in view of complex, uncertain boundary conditions and dynamics resulting from changing ambition for climate protection. Areas of BASF covered: The analysis covered all strategic business units (SBUs) of the entire BASF Group. Summary of results: Total BASF sales show significant upside potential in the moderate as well as in the progressive scenario. Construction trends have the strongest impact on BASF sales in the moderate scenario, whereas automotive trends have the strongest impact on sales in the progressive scenario. Reporting of results: Results were shared internally with representatives from operating divisions, which manage the SBUs, and relevant corporate units in the context of regular group meetings dedicated to sustainability topics. Reporting was limited to internal stakeholders. Integration of results into business objectives / strategy: Results informed the next steps of the internal process for developing a BASF position and strategy regarding circular economy. The strategic approach, including the findings from the scenario analysis, was finally presented to and approved by the Board of Directors. Example of how the results have directly influenced business objectives / strategy: Considering the findings regarding the potential impact of circular economy on BASF business, we promoted the establishment of strategic partnerships in this area. To this end, we joined the “Circular Economy 100” program and the “New Plastic Economy” program of the Ellen MacArthur Foundation in 2017 as well as the World Plastics Council in 2018. We also kicked off an internal scouting project to investigate selected business opportunities in more detail.</p>
Other, please specify (Carbon pricing scenario for investment)	<p>Objective of analysis: Capital expenditure projects face financial risks due to potential national or regional legislation fostering the implementation or strengthening of a carbon price on emissions. The objective of the analysis is to assess the impact of carbon pricing on the investment. Methodology (scenario definition, inputs, assumptions analytical methods): A single scenario for carbon price development in the EU was developed based on extensive literature research of pricing assumptions, company-internal evaluation of regulatory drivers within the European Emissions Trading System, and consulting with external experts. The assumptions and scenario setup are reviewed annually by an internal expert group. Time horizon covered + relevance to BASF: Projections were made up to 2035, covering the timeframe relevant to BASF regarding planning of investment projects and the first years of plant operation which are specifically important in the assessment of profitability. Areas of BASF covered: The scenario is applied to all investment projects in the EU and case-by-case in other regions, depending on the likelihood of implementation of carbon pricing systems in these regions. Although based on EU assumptions, the scenario is applied globally based on the assumption that it represents a conservative global approach for the evaluation. Summary of results: The scenario shows an increasing carbon price up to 2035. The impact depends on the individual business case. Reporting of results: The scenario is available to all units in the operating divisions and at regional and corporate level that are involved in the complex multi-dimensional assessment process for capital expenditure projects. The process is coordinated by the Economic Evaluations group within our Corporate Development division. Integration of results into business objectives / strategy: The findings from the scenario analysis complement the base case evaluation of the investment project and are forwarded to the internal decision-making bodies for review and consideration.</p>

C-AC3.1e/C-CE3.1e/C-CH3.1e/C-CO3.1e/C-EU3.1e/C-FB3.1e/C-MM3.1e/C-OG3.1e/C-PF3.1e/C-ST3.1e/C-TO3.1e/C-TS3.1e

Implementation target/pathway and timeframes:

In 2018 we presented our vision for the contribution of BASF towards a low-carbon economy up to 2030 and beyond.

First, we set a new climate protection target stating that we will keep our GHG emissions stable on 2018 level until 2030 while we want to grow production by 50% to address increasing societal needs for chemical products. Target achievement will imply a GHG emission intensity reduction of about 30% and is backed by a comprehensive set of actions covering shift to CO<sub>2</sub>-neutral power in energy procurement, enhancing operational excellence and further measures to be developed at a later stage (e.g. use of offsets).

Second, in parallel to the 2030 target and underlying measures, we initiated R&D activities to develop breakthrough technologies for low emission production after 2030. We focus on base chemicals in our R&D work, as these are responsible for 70% of the GHG emissions of the chemical industry but are an indispensable starting point for the value chain and all our innovation. By electrification and new processes, base chemicals could be produced almost GHG emission free. Currently around 100 employees are involved in the R&D program. The first pilot plants are to be built in the coming years. A core element will be the production of emission-free hydrogen based on (initially) fossil methane. The world's first electric heating concept for steam cracker is also to be developed. BASF's steam crackers require a temperature of 850°C to split crude petroleum (naphtha) for further processing. If this temperature could be reached with electricity from renewable sources, instead of the currently used natural gas, a reduction in CO<sub>2</sub> emissions of up to 90% would be possible. On the basis of innovative catalyst systems also a CO<sub>2</sub>-free synthesis pathway for olefins, the largest intermediate in the chemical industry in terms of volume, is being developed.

The R&D program as well as the reduction of CO<sub>2</sub> emissions from our production by improving energy and process efficiency and increasing the share of renewable energies in our global power supply form the major pillars in our Carbon Management set up in 2018 to help us reach our new climate target 2030 and enable further reductions in the long term.

Challenges:

Target achievement for 2030 relies on fully functional internal processes to operationalize the set of measures backing the target, as well as supporting economic conditions for the investments needed during that timeframe. Regarding the R&D work targeting to enable further reductions in the long term, the technical feasibility of the new chemical processes needs to be proven first. Next to this technical challenge, the high amount of energy needed for these technologies has to come from renewable sources and needs to be available at competitive prices. The question of the competitiveness of the new technologies is closely linked to a political framework supporting their implementation. Industries such as the chemical industry, which are facing international competition and cannot pass on additional costs caused by low-carbon technologies to their customers, depend on a compensation of these additional costs. This is a prerequisite for making investments in low-emission production processes sustainable in the long term. Globally comparable carbon pricing would be the best solution to achieve this. Climate protection must therefore take place at a global level in order to be effective, cost-efficient and economically compatible.

## C4. Targets and performance

---

### C4.1

---

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

Intensity target

## C4.1b

---

**(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).**

**Target reference number**

Int 1

**Scope**

Scope 1+2 (location-based)

**% emissions in Scope**

93

**Targeted % reduction from base year**

40

**Metric**

Other, please specify (Tons CO2e per ton of sales product)

**Base year**

2002

**Start year**

2011

**Normalized base year emissions covered by target (metric tons CO2e)**

0.897

**Target year**

2020

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

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science Based Targets initiative

**% of target achieved**

86

**Target status**

Underway

**Please explain**

The target applies to BASF's global business without our discontinued oil and gas activities, and without emissions related to the generation of steam and electricity for sale to third parties. +++ Claim that target is science-based: According to the SBT initiative a science-based target has the following definition: "Targets adopted by companies to reduce GHG emissions are considered "science-based" if they are in line with the level of decarbonization required to keep global temperature increase below 2°C compared to preindustrial temperatures, as described in the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)." (SBT initiative, 2015: Sectoral Decarbonization Approach, page 7). The CDP report "Back to the laboratory" (2015) investigated the level of ambition of Int1 using the Sectoral Decarbonization Approach as a tool. It was found that Int 1 is in line with a 2°C path.

**% change anticipated in absolute Scope 1+2 emissions**

-19

**% change anticipated in absolute Scope 3 emissions**

0

---

## C4.2

---

**(C4.2) Provide details of other key climate-related targets not already reported in question C4.1/a/b.**

**Target**

Other, please specify (Energy efficiency / implement ISO 50001)

**KPI – Metric numerator**

Primary energy demand of sites covered by energy management systems in accordance with ISO 50001

**KPI – Metric denominator (intensity targets only)**

Total primary energy demand

**Base year**

2015

**Start year**

2015

**Target year**

2020

**KPI in baseline year**

0.395

**KPI in target year**

0.9

**% achieved in reporting year**

66

**Target Status**

Underway

**Please explain**

By 2020, we want to have introduced certified energy management systems (DIN EN ISO 50001) at all relevant production sites. The selection of relevant sites is determined by the amount of primary energy used and local energy prices. Taken together, this represents 90% of BASF's primary energy demand. +++ Note that BASF has not officially defined a base year for this target. We focus on achieving a 90% coverage of our primary energy demand through certified energy management systems in 2020. In the CDP questionnaire, we set the start year as base year to allow for showing a base year KPI and calculating the level of progress.

**Part of emissions target**

**Is this target part of an overarching initiative?**

No, it's not part of an overarching initiative

**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	89	
To be implemented*	430	686000
Implementation commenced*	195	230000
Implemented*	424	284900
Not to be implemented	107	



## C4.3b

---

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

**Initiative type**

Energy efficiency: Processes

**Description of initiative**

Process optimization

**Estimated annual CO2e savings (metric tonnes CO2e)**

133000

**Scope**

Scope 1

**Voluntary/Mandatory**

Voluntary

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

15600000

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

11600000

**Payback period**

<1 year

**Estimated lifetime of the initiative**

Ongoing

**Comment**

In 2018, our production sites have implemented 254 measures worldwide that result in savings of fuel, electricity, steam, cooling water etc. Projects included a wide range of energy conservation measures, e.g. chemical process modifications, further process heat integration, advanced process control systems implementation, fuel switches to lower carbon footprint, boiler efficiency upgrades, optimization in steam systems, energy reduction in wastewater treatment plants operations. For example, at our Pasadena site the batch cycle times in the plasticizer process were decreased by optimizing each process step, leading to reduced steam use corresponding to 5300 t CO2 reduction. At our Kuantan petrochemical site fuel consumption for rain water incineration was reduced through a more effective drainage water separation (-2000 t CO2). All these activities are part of our global energy efficiency management and operational excellence program. Efficiency analyses of the production processes are complemented with further implementation of ISO 50001 certified energy management systems. Monetary savings reported here stem from reduced energy consumption and relate only to those measures implemented in 2018. 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". Activities also address Scope 2.

---

**Initiative type**

Low-carbon energy purchase

**Description of initiative**

Other, please specify (Green energy procurement based on mix of wind and hydro power)

**Estimated annual CO2e savings (metric tonnes CO2e)**

2900

**Scope**

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**

BASF Canada newly signed an agreement for green electricity supply for 2018 onwards.

---

**Initiative type**

Other, please specify (Material consumption reduction in terms of a reduction of raw material demand by increasing material efficiency of processes)

**Description of initiative**

<Not Applicable>

**Estimated annual CO2e savings (metric tonnes CO2e)**

149000

**Scope**

Scope 3

**Voluntary/Mandatory**

Voluntary

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

32000000

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

8300000

**Payback period**

<1 year

**Estimated lifetime of the initiative**

Ongoing

**Comment**

In 2018, we have initiated and implemented 169 projects that lead to a reduction of raw material demand for our operations. The lower demand helps to avoid emissions resulting from the production of these raw materials, i.e. reduces our corporate carbon footprint in Scope 3 (category 1). For example, we optimized the raw material consumption factor in our Kankakee site in the U.S. resulting in higher selectivity and therefore less raw material consumption. In another plant in our Ludwigshafen site, we improved the flow distribution in the reactor leading to increased yield and reduced raw material consumption. In our Ankleshwar site in India, we stabilized the production by improved process parameters in the chemical process and by improved nanofiltration leading to reduced losses.

---

**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 about half of our annual R&D expenditures (€2.028 billion total R&D expenses in 2018) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection. For example, we have developed a modified isocyanate for the woodworking industry that allows the customer to use a lower temperature in the production process, which increases production speed while saving energy at the same time.
Partnering with governments on technology development	BASF is involved in several government sponsored R&D initiatives on new technology development. For example, we are a member of the Carbon2Chem® project which receives funding from the German Federal Ministry of Education and Research until 2020 and aims at using emissions from steel production as raw material for chemicals.
Financial optimization calculations	We use WRIS, an economic analysis and information system tool, as the standard tool for the valuation of capital expenditure projects, research and development projects, and for production cost calculations. The project valuation is carried out based on the discounted cash flow methodology. In a sensitivity analysis, the effects of varying assumptions on the project value can be checked. A price for carbon is included in the calculations.
Internal price on carbon	Carbon pricing plays a role in internal assessments on 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, South Korea. Moreover, compliance with air quality regulations can have an impact on emission of GHGs, e.g. the German Technical Instruction on Air Quality Control restricts the concentration of nitrous oxide emissions from production of nitric acid to 0.8 g per m3 since 2010 for BASF plants. 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.
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 or do they enable a third party to avoid GHG emissions?**

Yes

**C4.5a**

**(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.**

**Level of aggregation**

Company-wide

**Description of product/Group of products**

BASF products are involved in many climate protection technologies. Therewith we enable energy efficiency and climate protection in a variety of sectors, such as in the construction industry, in the automotive industry, and in industrial processes. In total 22 product groups and their respective global sales volumes in 2018 were considered for calculating the GHG emissions that are avoided by our customers using our climate protection products. These include but are not limited to the following product examples. +++ Building and Living: Chemical insulation materials based on expanded polystyrene such as Neopor® and Styropor® have excellent thermal insulation properties. They are among others used as part of an External Thermal Insulation Composite System to improve the thermal insulation of outer walls, thereby reducing energy consumption and GHG emissions. +++ Mobility: BASF's innovative integrated process technology for OEM coating reduces the number of applied layers through integrating the primer functionality into the basecoat layer, thereby leading to shorter coating processes. This results in measurable energy and resource savings and in a reduction of CO<sub>2</sub>e as well as VOC emissions. +++ Industry: BASF catalysts decompose nitrous oxide from production of nitric acid and adipic acid. The catalyst transforms the highly potent greenhouse gas nitrous oxide almost completely into the components of air, nitrogen and oxygen. +++ Energy Generation: Wind and solar power help to mitigate greenhouse gas emissions. BASF products contribute to making technologies for generating energy from wind and sun more efficient, such as epoxy systems and other materials to produce rotor blades, grouting materials for the construction of the foundation of wind turbines or sodium nitrate as thermal energy storage media for all concentrated solar power technologies. +++ Agriculture: The ammonium stabilizer DMPP is the main component in BASF's Vizura® fertilizer additive, which helps to increase plant uptake efficiency. This reduces the use of fertilizers or liquid manure and cuts nitrous oxide emissions by 50% on average.

**Are these low-carbon product(s) or do they enable avoided emissions?**

Avoided emissions

**Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions**

Addressing the Avoided Emissions Challenge- Chemicals sector

**% revenue from low carbon product(s) in the reporting year**

10

**Comment**

Our calculations of avoided GHG emissions are based on the chemical industry standard of the International Council of Chemical Associations (ICCA) and the World Business Council for Sustainable Development (WBCSD), published in 2013 and revised in 2017. For the year 2018, we calculated that the use of the 22 climate protection product groups that were sold in the reporting year enables customers to reduce their emissions from 1,000 to 360 million metric tons of CO<sub>2</sub>e, thus preventing 640 million metric tons of CO<sub>2</sub>e emissions. The calculation of avoided GHG emissions is based on individual life cycle analyses (LCAs) that we conduct using BASF's proven Eco-Efficiency Analysis method. Hence, avoided emissions are the difference between the life cycle greenhouse gas emissions from our solution and the solution it is compared to for achieving the same user benefit. Life cycle avoided emissions almost always arise from the efforts of multiple partners along the value chain. Attributing these avoided emissions to individual partners or products is challenging due to a variety of reasons. Nevertheless, we have assessed the individual contribution of our climate protection products to their respective value chain using an economic allocation approach and concluded that on average 5% of the emissions avoided in 2018 are attributable to BASF.

---

## C5. Emissions methodology

---

### C5.1

---

**(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).**

**Scope 1**

**Base year start**

January 1 2002

**Base year end**

December 31 2002

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

21693000

**Comment**

**Scope 2 (location-based)**

**Base year start**

January 1 2002

**Base year end**

December 31 2002

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

5243000

**Comment**

**Scope 2 (market-based)**

**Base year start**

**Base year end**

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

**Comment**

**C5.2**

---

**(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 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 CO2e?**

**Reporting year**

**Gross global Scope 1 emissions (metric tons CO2e)**

18418000

**Start date**

January 1 2018

**End date**

December 31 2018

**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**

## C6.3

---

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

**Reporting year**

**Scope 2, location-based**

3361000

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

3657000

**Start date**

January 1 2018

**End date**

December 31 2018

**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 CO<sub>2</sub> 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).

---

**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 extrapolated to be less than 1%, which we consider to be insignificant. We periodically reassess the contribution from our administrative sites. GHG emissions from assets leased by BASF are accounted for as Scope 3 emissions

---

**Source**

Acquisitions 2018 (businesses and assets acquired from Bayer; acquisition of a single production site in the context of forming a cooperative venture with Toda)

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

Emissions excluded due to recent acquisition

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

Emissions excluded due to recent acquisition

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

Emissions excluded due to recent acquisition

**Explain why this source is excluded**

In 2018 BASF closed the acquisition of a range of businesses and assets from Bayer as well as of one production site from Toda. In line with the stepwise business integration process, GHG emissions data of the newly acquired businesses were not included in the 2018 inventory of BASF Group. Note that due to the limited time period the newly acquired businesses belonged to BASF in 2018 and/or their small size their emissions can also be considered not relevant in comparison to BASF's overall carbon footprint (<0.5% contribution).

---

**C6.5**

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

## Purchased goods and services

### Evaluation status

Relevant, calculated

### Metric tonnes CO<sub>2</sub>e

48550000

### Emissions calculation methodology

(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 (thinkstep), 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 90 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 by the GHG conversion factors from the Defra 2012 Guidelines.

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

0

### Explanation

## Capital goods

### Evaluation status

Relevant, calculated

### Metric tonnes CO<sub>2</sub>e

1900000

### Emissions calculation methodology

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 turn-key projects, 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 was then multiplied by the respective GHG conversion factor and subsequently added up to the total GHG emissions from capital goods.

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

0

### Explanation



## Fuel-and-energy-related activities (not included in Scope 1 or 2)

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

2906000

### Emissions calculation methodology

(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 the German Federal Statistical Office. (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 cradle-to-gate CO2e 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 (91% for steam generation; 37% for electricity generation). The share of the different fuel types of the total amount of primary energy was then calculated based on the fuel shares of electricity generation (IEA, Key World Energy Statistics, 2018). The fuel shares were then multiplied by the respective CO2e emission factors to result in the overall CO2e 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 of 7 percent for Germany. 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.

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

0

### Explanation

## Upstream transportation and distribution

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

1937000

### Emissions calculation methodology

(i) Activity data: Quantities and types of goods procured in the reporting year were obtained from BASF internal business data management systems. The current modal split of chemical transport in Europe was derived from the McKinnon Report. (ii) Emissions factors: The CO2 emission factors used were taken from the McKinnon Report: "Measuring and Managing CO2 Emissions from the Transport of Chemicals in Europe". For trucks in Asia, a higher CO2 emission factor of 90 g CO2 per t\*km was assumed. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) Methodology & assumptions: For calculation of GHG emissions associated with transportation of all procured products to BASF sites three different categories of procured products were defined: (i) raw materials, naphtha and industrial gases (bulk delivery) (ii) natural gas and industrial gases (pipeline) and (iii) technical & capital goods and packaging. (i) GHG emissions associated with transportation of raw materials, naphtha and industrial gases (bulk delivery) were calculated by multiplying the quantities of products procured by a transportation distance and by an emissions factor for the mode of transport. For all procured products in Europe, modal split included road, sea vessel, barge, rail and air. In all other regions, solely truck transport was assumed. Transportation distance in each region was estimated by logistics experts. (ii) Emissions from transportation of natural gas and industrial gases were calculated by multiplying the quantity of the product purchased by an emission factor for pipeline and a transportation distance. Distance for the transportation of industrial gases was assumed to be 0.5 km since most of the gases are produced on-site. Distance for the transportation of natural gas was assumed to be 1,000 km. (iii) GHG emissions associated with transportation of BASF's technical & capital goods purchased in the reporting year were estimated based on monetary purchasing volume assuming that technical goods are 100% material and made from carbon steel whereas capital goods have a material content of 50% and are made from 60% stainless steel and 40% carbon steel. 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.

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

0

### Explanation

## Waste generated in operations

### Evaluation status

Not relevant, calculated

### Metric tonnes CO<sub>2</sub>e

717000

### Emissions calculation methodology

(i) Activity data: The quantities of solid waste and waste water 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, waste water 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 are accounted for in our Scope 1 emissions. The GHG emissions from off-site waste incineration and on- and off-site landfill were calculated as follows: 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 with this factor and assuming that all of the carbon is converted into CO<sub>2</sub> during combustion results in the CO<sub>2</sub> emissions from waste incineration. The GHG emissions from landfill were calculated by multiplying the amount of landfilled waste with the GHG emission factor for landfilled plastic waste. Plastic waste was chosen because it is a common inert chemical product showing average decomposition behavior for a carbon containing chemical in terms of greenhouse gases. 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 non-biodegradable 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.

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

0

### Explanation

## Business travel

### Evaluation status

Not relevant, calculated

### Metric tonnes CO<sub>2</sub>e

211000

### Emissions calculation methodology

(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. (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 (2018). CO<sub>2</sub>e emissions factors for travel with train per country were taken from: SNCF, 2014-2015 for France; UBA, 2017 for Germany; Thalys Network, 2017 for Belgium; Ferrovie dello stato italiane, 2017 for Italy; ÖBB, 2016 for Austria; DEFRA, 2018 for UK; EPA, 2018 for the US; Via Rail, 2017 for Canada; the average of India GHG Program, 2015 and Japan's Eco-Mo Foundation, 2018 for Asia Pacific; and the average of the European emission factors for Spain. CO<sub>2</sub>e emissions factors for business travel by rental car were taken from DEFRA's GHG Conversion Factors for Company Reporting (2018) and EPA's Emission Factors for Greenhouse Gas Inventories (2018). (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, which are collected through external partners such as travel agencies and monitored by BASF's Travel Management, were converted to CO<sub>2</sub> equivalents using conversion factors for the average passenger in short-haul, medium-haul and long-haul flights. b) GHG emissions from business travel by train: Rail miles that are collected through external partners such as Deutsche Bahn or travel agencies and monitored by our Travel Management 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. (c) GHG emissions from business travel by car: Driven kilometers that are collected by car rental companies and monitored by BASF's Travel Management were converted into CO<sub>2</sub>-e emissions using an average passenger car CO<sub>2</sub>-e conversion factor taken from DEFRA (2018) and EPA (2018).

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

0

### Explanation

## Employee commuting

### Evaluation status

Not relevant, calculated

### Metric tonnes CO<sub>2</sub>e

236000

### Emissions calculation methodology

(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 (2018) for employee commuting in Europe and Asia and from EPA's Emission Factors for Greenhouse Gas Inventories (2018) 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) with 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 with the number of employees, number of working days and an average emission factor for cars per km.

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

0

### Explanation

## Upstream leased assets

### Evaluation status

Not relevant, calculated

### Metric tonnes CO<sub>2</sub>e

270000

### Emissions calculation methodology

(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. Energy consumption (electricity and heat energy) per square meter of office space and warehouses in Europe was taken from a study of the German Federal Ministry for Economic Affairs and Energy (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. CO<sub>2</sub> emissions factors per MWh were obtained from the International Energy Agency (IEA), 2018 based on data of the year 2016. CO<sub>2</sub>e emissions factors per MWh of heat from natural gas and light fuel oil were obtained from GaBi database. 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 and the corresponding GHG conversion factors.

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

0

### Explanation

## Downstream transportation and distribution

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

1817000

### Emissions calculation methodology

(i) Activity data: Quantities and types of products sold in the reporting year as well as their means of transportation were obtained from BASF internal business data management systems. (ii) Emissions factors: The CO2 emissions factors used (except for pipeline transport) are specific factors calculated for BASF's outbound transport activities; for pipeline transport the CO2 emissions factor was taken from the McKinnon Report "Measuring and Managing CO2 Emissions from the Transport of Chemicals in Europe". For trucks in Asia, a higher CO2 emissions factor of 90 g per t\*km was assumed. (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 considering regional differences. The transport distances from each Verbund site and in the different regions Europe, North America, South America and Asia were determined by internal experts. The GHG emissions associated with the transport of BASF's sold products were calculated by multiplying product quantity by the relevant transport distance and by the respective CO2 emissions factor.

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

0

### Explanation

## Processing of sold products

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO2e

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Explanation

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 of and balancing 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

### Metric tonnes CO2e

41509000

### Emissions calculation methodology

(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: CO2 emissions factor for crude oil was taken from IPCC. CO2 emissions factor for natural gas was calculated on the basis that natural gas is solely methane that is entirely converted into CO2. (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 emissions that occur from the use of fuels and feedstock, and GHGs and products that contain or form GHGs that are emitted during use. 1) Oil & Gas: It was assumed that 100% of the oil and gas are combusted for heating purposes. The volume of sold crude oil and natural gas, respectively, was multiplied by the CO2 emissions factor for crude oil and natural gas, respectively, to calculate the GHG emissions associated with the thermal conversion of these products. 2) 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 N2O-N. CO2 from the use of urea (as fertilizer and solution for diesel engines) and from the use of carbonates (as leavening agent) was calculated based on sold product quantity and contained CO2 amount. 3) GHG emissions from products sold in the reporting year that contain greenhouse gases such as dry ice, CO2 as gas for the beverage industry and HFCs as foaming agents to produce polyurethane foams: GHG emissions from dry ice and CO2 liquid 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 (35 % for spray foam and 100% for integral foam).

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

0

### Explanation

## End of life treatment of sold products

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

15954000

### Emissions calculation methodology

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 versus landfill) in each country/region was derived from data on municipal waste treatment provided by Eurostat (2014), UN Statistics Division (2012), and Inter-American Development Bank (2010). (ii) Emissions factors: Emissions factor for landfill was obtained from GaBi database. (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 are disposed of at the end of their lives either by landfilling or by incineration. 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 incineration and landfill for each region, considering region-specific proportions of disposal methods. The same range of chemicals as in Category 1 was considered for end-of-life options. The amount of CO2 a compound emits when incinerated can be determined by its C-content. Therefore, CO2 emissions for all products incinerated were calculated by multiplying CO2 emissions per kg by the amount of pre-product. Incineration with energy recovery was considered proportionately in Europe 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. For the fraction of C-containing products disposed of in landfills, an emission factor for plastic waste was selected. Again, this factor was multiplied by the landfill fraction of the amount of product procured to obtain the CO2e emissions of products landfilled.

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

0

### Explanation

## Downstream leased assets

### Evaluation status

Not relevant, calculated

### Metric tonnes CO2e

100000

### Emissions calculation methodology

BASF owns only a few downstream leased assets. It is estimated by BASF experts that the GHG emissions of this category account for about 5% of the category Upstream Leased Assets, which corresponds to <0.1 million tons of CO2e.

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

0

### Explanation

## Franchises

### Evaluation status

Not relevant, explanation provided

### Metric tonnes CO2e

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Explanation

Not relevant as BASF does not own or operate franchises.

## Investments

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

1858000

### Emissions calculation methodology

i) Activity data: Scope 1 and Scope 2 emissions of BASF's subsidiaries, associated companies and joint ventures 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 as well as from subsidiaries and associated companies that are not financially consolidated due to immateriality are not included in BASF's Scope 1 or Scope 2 emissions. However, the GHG emissions from these companies are determined on a regular basis by inquiring these data from the respective companies. GHG emissions were calculated based on BASF's equity share in these companies, but only from non-consolidated companies of which BASF holds a minimum interest of 20%.

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

0

### Explanation

## Other (upstream)

### Evaluation status

Please select

### Metric tonnes CO2e

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Explanation

## Other (downstream)

### Evaluation status

Please select

### Metric tonnes CO2e

<Not Applicable>

### Emissions calculation methodology

<Not Applicable>

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

<Not Applicable>

### Explanation

## C6.7

---

### (C6.7) Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

## 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

0.000329

#### Metric numerator (Gross global combined Scope 1 and 2 emissions)

21779000

#### Metric denominator

unit total revenue

#### Metric denominator: Unit total

66140000000

#### Scope 2 figure used

Location-based

#### % change from previous year

6

#### Direction of change

Decreased

#### Reason for change

BASF's GHG emissions per unit total revenue decreased by 6.0% in 2018 compared with 2017. The absolute Scope 1 and Scope 2 emissions decreased by 3.5% in 2018 compared with 2017, while revenues increased by 2.6% (increase by €1.7 billion), resulting in an overall strong decrease of the indicator value. The increase in revenues was mainly attributable to higher prices in all segments. This was partly offset by negative currency effects. The decrease of GHG emissions in 2018 is the net effect of lower emissions due to our emission reduction measures (accounting for -1.2% of Scope 1+2 emissions), lower output (-3.0% of Scope 1+2 emissions), changes in methodology (-1.6% of Scope 1+2 emissions) and divestments (-0.1% of Scope 1+2 emissions), which overcompensated increasing emissions due to change in boundary (+0.4% of Scope 1+2 emissions) and changes in standard operating conditions (+1.9% of Scope 1+2 emissions). Emission reduction measures comprise a wide range of activities with major contributions from measures to increase the energy efficiency of processes, and to reduce process emissions. Examples: (1) We implemented 254 individual energy efficiency measures in different plants all over the world. These measures resulted in savings of fuel, electricity, steam, cooling water and ultimately GHG emissions of 133,000 t CO2e. For example, we completed an energy saving project at one plant at our Ludwigshafen site (4,000 t CO2 emissions reduction). (2) We implemented proposals for energy savings and carbon emission reductions collected through our employee suggestion schemes, resulting in a reduction of 25,000 t CO2e. +++ Note: Compared to the figures given in the BASF Report 2018, sales were adjusted to include discontinued oil and gas business and exclude businesses acquired from Bayer (estimated as exact contribution cannot be distinguished) for alignment with



**Intensity figure**

188.4

**Metric numerator (Gross global combined Scope 1 and 2 emissions)**

21779000

**Metric denominator**

full time equivalent (FTE) employee

**Metric denominator: Unit total**

115588

**Scope 2 figure used**

Location-based

**% change from previous year**

5.4

**Direction of change**

Decreased

**Reason for change**

BASF decreased its GHG emissions per FTE employee in 2018 compared with 2017 by 5.4%. The number of BASF full time equivalent employees increased by 2.0% while absolute Scope 1 and Scope 2 emissions decreased by 3.5%, resulting in a strong decrease of the indicator value. The higher headcount resulted from a range of various effects (e.g. hiring of personnel, changes in scope of consolidation). The decrease of GHG emissions in 2018 is the net effect of lower emissions due to our emission reduction measures (accounting for -1.2% of Scope 1+2 emissions), lower output (-3.0% of Scope 1+2 emissions), changes in methodology (-1.6% of Scope 1+2 emissions) and divestments (-0.1% of Scope 1+2 emissions), which overcompensated increasing emissions due to change in boundary (+0.4% of Scope 1+2 emissions) and changes in standard operating conditions (+1.9% of Scope 1+2 emissions). Example for reduction measure: At our Ludwigshafen site we completed an energy saving project at one plant (4,000 t CO<sub>2</sub> emissions reduction). +++ Note: Number of FTE employees excludes employees from businesses acquired from Bayer for alignment with GHG emissions reporting.

**Intensity figure**

0.59

**Metric numerator (Gross global combined Scope 1 and 2 emissions)**

20378000

**Metric denominator**

Other, please specify (Metric ton of sales product)

**Metric denominator: Unit total**

34510000

**Scope 2 figure used**

Location-based

**% change from previous year**

1.9

**Direction of change**

Increased

**Reason for change**

Note: This intensity figure refers to GHG emissions and volume of sales products for BASF without oil and gas, and without emissions related to the generation of steam and electricity for sale to third parties. This metric is the basis for our corporate climate protection target valid in the reporting year. The metric numerator in 2018 was 20.378 million t CO<sub>2</sub>e, therefore we arrive at an intensity of 0.590 through  $(20,378,000/34,510,000) = 0.590$ . The value for 2017 was 0.579 (GHG emissions: 20.716 million t CO<sub>2</sub>e; sales products: 35.791 million t). +++ BASF increased its GHG emissions per metric ton of sales products in 2018 compared with 2017 by 1.9%. The volume of sales products from the businesses within the reporting boundary decreased by 3.6%. The relevant Scope 1 and Scope 2 emissions (BASF without Oil and Gas and without emissions related to the generation of steam and electricity for sale to third parties) decreased by 1.6% in 2018. The decrease of GHG emissions in 2018 is the net effect of lower emissions due to our emission reduction measures (accounting for -1.3% of Scope 1+2 emissions, if taking BASF w/o Oil and Gas as a basis), lower output (-3.4% of Scope 1+2 emissions) and divestments (-0.1% of Scope 1+2 emissions), which overcompensated increasing emissions due to change in boundary (+0.4% of Scope 1+2 emissions) and changes in standard operating conditions (+2.7% of



Scope 1+2 emissions). The change of methodology is no relevant driver within this reporting boundary. Example for reduction measure: At our Ludwigshafen site we completed an energy saving project at one plant (4,000 t CO2 emissions reduction).

## 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 CO2e)	GWP Reference
CO2	17523000	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	64000	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	740000	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (Sum HFCs)	91000	IPCC Fourth Assessment Report (AR4 - 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 CO2e)
Belgium	3670000
Brazil	107000
China	456000
France	52000
Germany	8935000
India	27000
Italy	52000
Japan	15000
Republic of Korea	378000
Spain	28000
United States of America	3983000
Other, please specify (Rest of world)	715000

### 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 CO2e)	Latitude	Longitude
Ludwigshafen, Germany	7521000	49.49594	8.431191
Antwerp, Belgium	3670000	51.32405	4.285598
Kuantan, Malaysia	326000	3.967425	103.4237
Freeport, USA	957000	29.00441	-95.3933
Geismar, USA	844000	30.21022	-91.0345
Rest of world	5100000		

## 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 CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	17126000	<Not Applicable>	
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Electric utility generation activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

## C7.5

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

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted in market-based approach (MWh)
Belgium	225000	614000	927000	0
Brazil	22000	22000	271000	0
China	639000	639000	1350000	0
France	12000	13000	130000	0
Germany	492000	439000	1392000	0
India	40000	40000	56000	0
Italy	8000	11000	25000	0
Japan	61000	61000	140000	0
Republic of Korea	283000	283000	699000	0
Spain	29000	17000	115000	41000
United States of America	1029000	1014000	2542000	26000
Other, please specify (Rest of world)	521000	504000	1553000	26000

## 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 emissions (metric tons CO2e)	Scope 2, market-based emissions (metric tons CO2e)
Ludwigshafen, Germany	0	0
Antwerp, Belgium	225000	614000
Kuantan, Malaysia	144000	144000
Freeport, USA	119000	119000
Geismar, USA	43000	43000
Rest of world	2830000	2737000

## 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 CO2e.**

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Chemicals production activities	3252000	3576000	
Coal production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Metals and mining production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (upstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Oil and gas production activities (downstream)	<Not Applicable>	<Not Applicable>	<Not Applicable>
Steel production activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport OEM activities	<Not Applicable>	<Not Applicable>	<Not Applicable>
Transport services activities	<Not Applicable>	<Not Applicable>	<Not Applicable>

## 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 tCO2e from purchased feedstock	Explain calculation methodology
High Value Chemicals (Steam cracking)	14	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. (ii) Emissions factors: Cradle-to-gate emissions factors were obtained from commercially and publicly available data sources such as GaBi (thinkstep), ecoinvent and PlasticsEurope as well as from BASF’s own LCA database, which is based mainly on primary data. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR5, 2013. (iv) 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 CO2e emissions per kilogram of each product by the respective quantity of the product purchased to determine cradle-to-gate emissions.

**C-CH7.8a**

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

	Sales, metric tons	Comment
Carbon dioxide (CO2)		BASF is selling carbon dioxide, e.g. to the beverage industry. Sales figures are considered confidential business information.
Methane (CH4)	6300000	Sales of natural gas (with the main component being methane) through discontinued oil and gas business in 2018.
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	0	No change	0	Category not relevant in actual year-on-year comparison, since the assessment of emissions performance is based on a location-based Scope 2 figure and self-generation of renewable energy is marginal.
Other emissions reduction activities	265000	Decreased	1.2	BASF's Scope 1 and Scope 2 emissions decreased by 265,000 metric tons (t) of CO2e in 2018 compared to 2017 due to emissions reduction activities implemented in 2018. Our total Scope 1 and Scope 2 emissions in 2017 was 22,571,000 t CO2e, therefore we arrived at 1.2% through $(265,000/22,571,000)*100 = 1.2\%$ . Major drivers for the emission reduction have been measures to increase the energy efficiency of processes, and to reduce process emissions.
Divestment	20000	Decreased	0.1	The emissions from our operations decreased by 0.1% (corresponding to 20,000 metric tons of CO2e) in 2018 compared to 2017 due to the divestment of some businesses in several countries (e.g. Austria, Mexico, and USA). For example, we divested our production site for styrene butadiene-based paper dispersions in Pischelsdorf, Austria, to Synthomer Austria GmbH, a subsidiary of the British specialty chemicals manufacturer Synthomer plc. Our total Scope 1 and Scope 2 emissions in 2017 was 22,571,000 t CO2e, therefore we arrived at 0.1% through $(20,000/22,571,000)*100 = 0.1\%$ .
Acquisitions	0	No change	0	In 2018 BASF acquired several businesses in various countries (e.g. Germany, USA). For example, we closed the acquisition of a range of businesses and assets from Bayer to complement our activities in crop protection, biotechnology and digital farming. However, in line with the stepwise business integration process, GHG emissions data of the newly acquired businesses were not included in the 2018 inventory of BASF Group. Consequently, no change was concluded under this CDP reporting category in 2018 compared to 2017.
Mergers	0	No change	0	Category not relevant in actual year-on-year comparison.
Change in output	670	Decreased	3	In 2018 the volume of sales products from the businesses within the reporting boundary decreased in comparison to 2017. If no measures to reduce emissions had been introduced, i.e. assuming that the GHG intensity of our various businesses in 2017 had continued to apply in 2018, the lower production would have resulted in a decrease in Scope 1 and Scope 2 GHG emissions of 3.0% (corresponding to 670,000 metric tons of CO2e) in 2018 in comparison to 2017. Our total Scope 1 and Scope 2 emissions in 2018 was 22,571,000 t CO2e, therefore we arrived at 3.0% through $(670,000/22,571,000)*100 = 3.0\%$ .
Change in methodology	350	Decreased	1.6	In 2018 we changed the GHG emissions accounting methodology for two sites, which led to a decrease of 1.6% (corresponding to 350,000 metric tons of CO2e) of our Scope 1 and Scope 2 emissions in comparison to 2017. The change of methodology refers to a removal of double counting of certain emissions. Some BASF sites sell energy to third parties, with the energy-related emissions accounted for under Scope 1. If the customer is another BASF Group company, this company will account for the emissions related to the purchase of energy under Scope 2, so these emissions can be reported twice in the overall BASF Group emissions inventory. In 2018, we changed how emissions are allocated for two BASF Group companies with such interdependent operations, so that the double counting of emissions is avoided in this case. Our total Scope 1 and Scope 2 emissions in 2017 was 22,571,000 t CO2e, therefore we arrived at 1.6% through $(350,000/22,571,000)*100 = 1.6\%$ .
Change in boundary	90000	Increased	0.4	The emissions from our operations increased by 0.4% (corresponding to 90,000 metric tons of CO2e) in 2018 compared to 2017 due to changes in boundary. In 2018 we added a range of sites in several countries (e.g. China, Turkey, and USA) following the conclusion that the relevance of the respective companies within the BASF Group has increased such that extension of the reporting scope is appropriate. At the same time, few companies with sites in several countries (e.g. Greece, Thailand) have become less relevant such that they were excluded from reporting. In total, additions and exclusions led to a net increase of emissions of 0.4%. Our total Scope 1 and Scope 2 emissions in 2017 was 22,571,000 t CO2e, therefore we arrived at 0.4% through $(90,000/22,571,000)*100 = 0.4\%$ .
Change in physical operating conditions	0	No change	0	Category not relevant in actual year-on-year comparison.
Unidentified	0	No change	0	Category not relevant in actual year-on-year comparison.
Other	423000	Increased	1.9	BASF is accounting GHG emission from more than 280 production sites globally. Changes in local operating conditions of 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 2018, changes in local operating conditions resulted in a net increase of emissions of 1.9% (corresponding to 423,000 metric tons of CO2e) compared to 2017. Our total Scope 1 and Scope 2 emissions in 2017 was 22,571,000 t CO2e, therefore we arrived at 1.9% through $(423,000/22,571,000)*100 = 1.9\%$ .

## 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?**

Location-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 undertakes this energy-related activity
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 MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	0	51418000	51418000
Consumption of purchased or acquired electricity	<Not Applicable>	93000	5385000	5478000
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	0	3722000	3722000
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	360	<Not Applicable>	360
Total energy consumption	<Not Applicable>	93360	60525000	60618360

## C-CH8.2a

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

	Heating value	Total MWh
Consumption of fuel (excluding feedstock)	LHV (lower heating value)	45470000
Consumption of purchased or acquired electricity	<Not Applicable>	5290000
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	3722000
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	360
Total energy consumption	<Not Applicable>	54482360

**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.**

**Fuels (excluding feedstocks)**

Anthracite Coal

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

1022000

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

0

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

202000

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

820000

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

<Not Applicable>

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

0

**Comment**

**Fuels (excluding feedstocks)**

Diesel

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

164000

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

24000

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

98000

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

42000

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

<Not Applicable>

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

0

**Comment**

---

**Fuels (excluding feedstocks)**

Distillate Oil

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

6000

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

0

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

2000

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

4000

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

<Not Applicable>

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

0

**Comment**

---

**Fuels (excluding feedstocks)**

Natural Gas

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

44248000

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

627000

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

13699000

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

4687000

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

<Not Applicable>

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

25235000

---



**Comment**

---

**Fuels (excluding feedstocks)**

Other, please specify (Residual fuels (from own production))

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

5978000

**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**

5978000

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

<Not Applicable>

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

0

**Comment**

---

C8.2d

---

**(C8.2d) List the average emission factors of the fuels reported in C8.2c.**

**Anthracite Coal**

**Emission factor**

335

**Unit**

kg CO2 per MWh

**Emission factor source**

Standard factors according Monitoring-Bericht RWI 1999, used by BASF internal guidelines

**Comment**

**Diesel**

**Emission factor**

266

**Unit**

kg CO2 per MWh

**Emission factor source**

Standard factors according Monitoring-Bericht RWI 1999, used by BASF internal guidelines

**Comment**

**Distillate Oil**

**Emission factor**

281

**Unit**

kg CO2 per MWh

**Emission factor source**

Standard factors according Monitoring-Bericht RWI 1999, used by BASF internal guidelines

**Comment**

**Natural Gas**

**Emission factor**

201

**Unit**

kg CO2 per MWh

**Emission factor source**

Standard factors according Monitoring-Bericht RWI 1999, used by BASF internal guidelines

**Comment**

**Other**

**Emission factor**

230

**Unit**

kg CO2 per MWh

**Emission factor source**

Based on individually determined CO2 factors for each residue stream on site level, here averaged factor determined by each stream on each site with its CO2 emitted and MWh content

**Comment**

**C8.2e**

---

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

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	11425000	10684000	360	360
Heat	14001000	14001000	0	0
Steam	37689000	35692000	0	0
Cooling	0	0	0	0

### C-CH8.2e

---

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

	Total gross generation (MWh) inside chemicals sector boundary	Generation that is consumed (MWh) inside chemicals sector boundary
Electricity	10423000	10423000
Heat	11895000	11895000
Steam	37274000	37274000
Cooling	0	0

### C8.2f

---

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

**Basis for applying a low-carbon emission factor**

Energy attribute certificates, Renewable Energy Certificates (RECs)

**Low-carbon technology type**

Wind

**Region of consumption of low-carbon electricity, heat, steam or cooling**

North America

**MWh consumed associated with low-carbon electricity, heat, steam or cooling**

26000

**Emission factor (in units of metric tons CO<sub>2</sub>e per MWh)**

0

**Comment**

---

**Basis for applying a low-carbon emission factor**

Contract with suppliers or utilities ( e.g. green tariff), supported by energy attribute certificates

**Low-carbon technology type**

Wind

Hydropower

**Region of consumption of low-carbon electricity, heat, steam or cooling**

North America

**MWh consumed associated with low-carbon electricity, heat, steam or cooling**

19000

**Emission factor (in units of metric tons CO<sub>2</sub>e per MWh)**

0

**Comment**

---

**Basis for applying a low-carbon emission factor**

Contract with suppliers or utilities ( e.g. green tariff), supported by energy attribute certificates

**Low-carbon technology type**

Other low-carbon technology, please specify (Renewable electricity mix of different technology types)

**Region of consumption of low-carbon electricity, heat, steam or cooling**

Europe

**MWh consumed associated with low-carbon electricity, heat, steam or cooling**

48000

**Emission factor (in units of metric tons CO<sub>2</sub>e per MWh)**

0

**Comment**

---

**C-CH8.3**

---

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

**Feedstocks**

Other, please specify (Total fuel feedstock. This excludes non-fuel chemical feedstocks)

**Total consumption**

10400000

**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**

12.6

**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-CH8.3a**

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

	Percentage of total chemical feedstock (%)
Oil	67
Natural Gas	10
Coal	1
Biomass	5
Waste	0
Fossil fuel (where coal, gas, oil cannot be distinguished)	17
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)**

3480000

**Direct emissions intensity (metric tons CO2e 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)**

1525000

**Direct emissions intensity (metric tons CO2e 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)**

910000

**Direct emissions intensity (metric tons CO2e 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 benzene production and considers 100% capacity of the operations. BASF's share might be lower.

---

**Output product**

Butadiene (C4 sep.)

**Production (metric tons)****Capacity (metric tons)**

680000

**Direct emissions intensity (metric tons CO2e 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-CH9.6) Disclose your organization's low-carbon investments for chemical production activities.**

**Investment start date**

January 1 2018

**Investment end date**

December 31 2018

**Investment area**

Property, plant and equipment

**Technology area**

Other, please specify (Energy efficiency (e.g. heat recovery))

**Investment maturity**

Large scale commercial deployment

**Investment figure**

11600000

**Low-carbon investment percentage**

81 - 100%

**Please explain**

The implementation of energy efficiency measures is a continuously running improvement process in our operational excellence program, which combines financial benefits from energy saving and environmental benefits from reduction of emissions. Our global Energy Management Team has initiated and controlled the implementation of at least 100 individual measures in different plants all over the world per year over the last five years.

---

**Investment start date**

January 1 2018

**Investment end date**

December 31 2018

**Investment area**

Property, plant and equipment

**Technology area**

Other, please specify (Material consumption reduction)

**Investment maturity**

Large scale commercial deployment

**Investment figure**

8300000

**Low-carbon investment percentage**

81 - 100%

**Please explain**

The implementation of measures to reduce raw material consumption is a continuously running improvement process in our operational excellence program, which combines financial benefits from materials saving and environmental benefits from avoiding emissions resulting from the production of these raw materials. We have initiated and controlled the implementation of at least 150 individual measures in different plants all over the world per year since 2014.

---

**Investment start date**

January 1 2018

**Investment end date**

December 31 2018

**Investment area**

R&D

---

**Technology area**

Other, please specify (R&D for low-carbon solutions)

*Product and process innovations where the R&D target is related to energy/resource efficiency and climate protection*

**Investment maturity**

Applied research and development

**Investment figure**

2028000000

**Low-carbon investment percentage**

41 - 60%

**Please explain**

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. R&D investment in the focus area "resources, environment and climate" has been stable at about 50% of the total R&D spend over the past years and targets product and process innovations related to energy/resource efficiency and climate protection.

---

**Investment start date**

January 1 2018

**Investment end date**

December 31 2018

**Investment area**

Products

**Technology area**

Other, please specify (Promotion of low-carbon solutions)

**Investment maturity**

Large scale commercial deployment

**Investment figure**

8588000000

**Low-carbon investment percentage**

0 - 20%

**Please explain**

BASF offers products and solutions that can help the customer to prevent greenhouse gas emissions and improve energy and resource efficiency. For example, we promote the innovative "biomass balance method", in which fossil resources in our Production Verbund are replaced by renewable resources with sustainability certification. The formulation and quality of the corresponding end products remain unchanged. The marketing and sales activities supporting these products are a low-carbon investment on product level. Since the individual products are managed in various business units and costs are not fully broken down to single solutions, an aggregate number is difficult to derive. Given the total investment sum, which represents overall selling expenses (including marketing and advertising costs, freight costs, packaging costs, distribution management costs, commissions, and licensing costs), we estimate that less than 1% can be attributed to the respective marketing and sales activities.

---

## 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 and/or Scope 2 emissions and attach the relevant statements.**

**Scope**

Scope 1

**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**

BASF18\_CDP-Letter\_2019-05-23.pdf

**Page/ section reference**

1-7

**Relevant standard**

ISAE3000

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

100

---

**Scope**

Scope 1

**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**

BASF18\_CDP-Letter\_2019-05-23.pdf

**Page/ section reference**

1-7

**Relevant standard**

ISAE 3410

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

100

---

**Scope**

Scope 2 location-based

**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**

BASF18\_CDP-Letter\_2019-05-23.pdf

**Page/ section reference**

1-7

**Relevant standard**

ISAE3000

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

100

---

**Scope**

Scope 2 location-based

**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**

BASF18\_CDP-Letter\_2019-05-23.pdf

**Page/ section reference**

1-7

**Relevant standard**

ISAE 3410

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

100

---

**Scope**

Scope 2 market-based

**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**

BASF18\_CDP-Letter\_2019-05-23.pdf

**Page/ section reference**

1-7

**Relevant standard**

ISAE3000

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

100

---

**Scope**

---

Scope 2 market-based

**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**

BASF18\_CDP-Letter\_2019-05-23.pdf

**Page/ section reference**

1-7

**Relevant standard**

ISAE 3410

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

100

---

## C10.1b

---

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

**Scope**

Scope 3- all relevant categories

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Attach the statement**

BASF18\_CDP-Letter\_2019-05-23.pdf

**Page/section reference**

1-7

**Relevant standard**

ISAE3000

---

**Scope**

Scope 3- all relevant categories

**Verification or assurance cycle in place**

Annual process

**Status in the current reporting year**

Complete

**Attach the statement**

BASF18\_CDP-Letter\_2019-05-23.pdf

**Page/section reference**

1-7

**Relevant standard**

ISAE 3410

---

## 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, ISAE 3410	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 2018", published under <a href="http://www.bericht.basf.com/2018/en">www.bericht.basf.com/2018/en</a> , were subject of the assurance engagement. +++ Reference to CDP question number: C4.1b +++ Type of verification and frequency: limited assurance, annual process
C6. Emissions data	Year on year emissions intensity figure	ISAE3000, ISAE 3410	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 2018", published under <a href="http://www.bericht.basf.com/2018/en">www.bericht.basf.com/2018/en</a> , were subject of 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, ISAE 3410	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 2018", published under <a href="http://www.bericht.basf.com/2018/en">www.bericht.basf.com/2018/en</a> , were subject of the assurance engagement. +++ Reference to CDP question number: C7.9 +++ 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 systems in which you participate.**

## EU ETS

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

55

### Period start date

January 1 2018

### Period end date

December 31 2018

### Allowances allocated

11658304

### Allowances purchased

157498

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

13112963

### Details of ownership

Facilities we own and operate

### Comment

Following the rules of the EU ETS, verified emissions include emissions from energy import for some plants as well as from a 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

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

3.7

### Period start date

January 1 2018

### Period end date

December 31 2018

### Allowances allocated

650634

### Allowances purchased

35421

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

686055

### Details of ownership

Facilities we own and operate

### Comment

## Shanghai pilot ETS

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

7

### Period start date

January 1 2018

### Period end date

December 31 2018

### Allowances allocated

1090110

### Allowances purchased

198401

### Verified emissions in metric tons CO2e

1291035

### Details of ownership

Facilities we own and operate

### Comment

## Switzerland ETS

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

0.2

### Period start date

January 1 2018

### Period end date

December 31 2018

### Allowances allocated

30148

### Allowances purchased

23383

### Verified emissions in metric tons CO2e

37544

### Details of ownership

Facilities we own and operate

### Comment

## C11.1c

---

**(C11.1c) Complete the following table for each of the tax systems in which you participate.**

**Denmark carbon tax**

**Period start date**

January 1 2018

**Period end date**

December 31 2018

**% of emissions covered by tax**

0.01

**Total cost of tax paid**

52000

**Comment**

**Switzerland carbon tax**

**Period start date**

January 1 2018

**Period end date**

December 31 2018

**% of emissions covered by tax**

0.2

**Total cost of tax paid**

17000

**Comment**

## C11.1d

---

**(C11.1d) What is your strategy for complying with the systems in which you participate or anticipate participating?**

Our strategic approach to comply with the mentioned schemes consists of several components:

- We strive to constantly reduce our GHG emissions in the most cost-efficient way in order to avoid exceeding the allocated allowances and having to purchase allowances. The realization of CDM projects and the trading of emission allowances are used as additional measures to reduce our exposure.

- We continuously monitor the status of our relevant GHG emissions in relation to the compliance status and factor the costs of exceeded allowances into our financial planning process.

- We assess the further development of the cap and trade schemes and resulting potential financial risk for BASF via our Enterprise Risk Management.

Example for application of the strategy:

Within our facilities in Schwarzheide, which are covered by the EU ETS scheme, we managed to reduce absolute GHG emissions in 2018 by about 600 tons in total compared to 2017, through savings of steam after optimization of process control systems. We could thus reduce the financial impact through the purchase of additional allowances by about € 9,000, assuming an average certificate price of 15 € per ton CO<sub>2</sub> in 2018. This also gives us an indication of efficiency improvements achievable at other locations to mitigate compliance costs, should they become subject to a cap and trade scheme.

## C11.2

---

---

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

Yes

### C11.2a

---

**(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.**

**Credit origination or credit purchase**

Credit origination

**Project type**

Other, please specify (Energy demand)

**Project identification**

RW3404 Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project

**Verified to which standard**

CDM (Clean Development Mechanism)

**Number of credits (metric tonnes CO2e)**

213

**Number of credits (metric tonnes CO2e): Risk adjusted volume**

213

**Credits cancelled**

Yes

**Purpose, e.g. compliance**

Compliance

---

### 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 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 purchase of energy is significant, related cost effects on energy supply side (Scope 2) may be taken into account case-by-case. 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. The internal price is determined by global procurement under consideration of input from several internal stakeholders, e.g. technical and governmental affairs experts assessing latest regulatory trends.

---

### 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 purchase of energy is significant, related cost effects on energy supply side (Scope 2) may be taken into account case-by-case. The price of carbon considered depends on geography and timeframe of the analysis. Sometimes, several pricing scenarios are used to evaluate uncertainties in future regulatory environments. The internal price is determined by global procurement under consideration of input from several internal stakeholders, e.g. technical and governmental affairs experts assessing 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 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 for all locations globally. The climate impact of an 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

### 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**

8

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

45

### **% Scope 3 emissions as reported in C6.5**

### **Rationale for the coverage of your engagement**

Description of engagement: BASF is a founding member of the Together for Sustainability (TfS) initiative of leading chemical companies for the global standardization of supplier evaluations and auditing. With the help of TfS, we obtain pertinent sustainability information of our raw material suppliers, providers of technical goods/services and logistics operations, with the goal to promote sustainable development in the supply chain. The initiative aims to develop and implement a global program for the responsible supply of goods and services and improve suppliers' environmental and social standards. The evaluation process is based on third-party online assessments and/or on-site audits and is simplified for both suppliers and TfS member companies by a globally uniform questionnaire. The supplier assessments provide us with valuable information on their sustainability performance, including GHG emissions, energy and emission reduction projects and relevant international certifications. Rationale for coverage: Our suppliers are evaluated based on risk due to the size and scale of our supplier portfolio. We define relevant suppliers as those showing an elevated sustainability risk potential as identified by our risk matrices and our purchasers' assessments. We also use further sources of information to identify relevant suppliers such as evaluations from TfS. The proportion of relevant suppliers evaluated by the end of 2018 was 60%. This corresponds to 45% of our total procurement spend and 8% of total suppliers by number. By 2020, we aim to evaluate the sustainability performance of 70% of the BASF Group's relevant suppliers (Updated goal 2018: 90% by relevant spent by 2025) and develop action plans for any necessary improvements.

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

The score in our third-party online assessments provides a direct supplier performance indicator. It can be positively influenced by reporting on energy use and greenhouse gas (GHG) emissions, on energy and emission reduction projects, and by indicating that the supplier reports to CDP or holds ISO 50001 and ISO 14001 certifications. We measure the share of suppliers that report on these topics: In 2018, 48% of assessed suppliers reported on energy use and GHG emissions, corresponding to 45% of our relevant spend; some on their ISO 50001 certification and on CDP participation. By 2020, we aim to evaluate the sustainability performance of 70% of the BASF Group's relevant suppliers and develop action plans for any necessary improvements. The proportion of relevant suppliers evaluated by the end of 2018 was 60%. As part of the updated corporate strategy, by 2025, we aim to have conducted sustainability evaluations for 90 % of BASF Group's relevant spend and will develop action plans where improvement is necessary. We also track the share of assessed suppliers that improve their sustainability performance upon re-evaluation. We will work towards having 80% of suppliers improve here. In addition, climate change is an explicit component of BASF's sourcing strategies, because of its potential to drive sustainability: When elaborating a procurement strategy, buyers are required to consider potential threats and opportunities related to climate change. Examples of positive outcomes with individual suppliers: 1. After taking over part of Bayer Crop Protection Business in 2018, BASF challenged service providers to increase performance and improve cost efficiency for tank containers to North America. With one chosen service provider a new configuration with a higher payload utilization per tank container was established. This reduced transports to Canada by 15%, affecting shipping via truck, deep sea and train. To ensure product availability a back-up solution with an alternate provider was negotiated in parallel. 2. BASF is distinctly increasing the re-usage of packaging. For instance, re-usage of palette and cage of a Composite Intermediate Bulk Containers (CIBC) while using new plastic inner bottle and components ('rebotting of CIBCs') allow BASF to apply circular economy and significantly reduce CO2 emission.

### **Comment**

---

## **C12.1b**

---

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

#### **Type of engagement**

Education/information sharing

#### **Details of engagement**

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

---

## **% of customers by number**

100

## **% 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: We integrate sustainability-related information on BASF and its products, including climate-related information, in day-to-day business with our customers by actively promoting such information as well as responding to respective customer requests. In line with our strategic principle “We innovate to make our customers more successful”, we engage with customers in close partnerships to align our business optimally with our customers’ needs and contribute to their success with innovative and sustainable solutions. We maintain a wide range of sustainability tools to support the interaction with our customers. This includes standard Product Carbon Footprint assessments as well as more comprehensive lifecycle assessments like Eco-Efficiency Analysis, SEEBALANCE® and AgBalance™. The exact modus of interaction (e.g. one-to-one meetings, workshops, joint projects, seminars) and intensity of exchange is customer-dependent. Part of our engagement also includes responding to customer information requests like the CDP Supply Chain Programme or supplier performance reviews. Rationale for coverage/size of engagement: Our proactive information sharing and engagement with customers essentially cover our entire customer base. Note regarding % Scope 3 emissions: Value of zero is given, because in line with current reporting standards BASF does not calculate and report GHG emissions from 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 to the customer by demonstrating credibility and know-how on climate-related topics as well as offering innovative solutions in this area. The buy-in of customers to BASF’s solutions contributes to avoiding emissions along the value chain. Measures of success: (1) We have segmented our portfolio regarding the contribution of our more than 60,000 specific product applications to sustainability (including reduction of GHG emissions and improving energy efficiency), using the externally validated Sustainable Solution Steering method. Products with a substantial sustainability contribution in the value chain are classified as Accelerators, and we measure the success of these Accelerators by their sales volume. We aim to achieve €22 billion in Accelerator sales by 2025 (2018: €15 billion). (2) 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. We also measure the contribution of these products to avoiding GHG emissions and compare the differences between subsequent years. The analysis of 22 climate protection product groups revealed that customers’ use of products sold in 2018 helped to avoid 640 million metric tons of CO<sub>2</sub> equivalents. Every product makes an individual contribution in the value chain of customer solutions. Value chains are assessed in terms of BASF’s economic share of the respective customer solution. On average, 5% of the emissions avoided were attributable to BASF in 2018. (3) Finally, we use feedback from our customer through the CDP Supply Chain Programme and their supplier performance reviews to measure the impact of our activities.

---

### **Type of engagement**

Collaboration & innovation

### **Details of engagement**

Run a campaign to encourage innovation to reduce climate change impacts

## **% of customers by number**

## **% Scope 3 emissions as reported in C6.5**

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

BASF approaches customers by offering our innovative biomass balance approach, which allows to replace fossil resources in our Production Verbund by renewable resources with sustainability certification and allocate the respective sustainability benefit to the customer product. Since the approach is no established standard solution and requires good cooperation between BASF and the customer to enable the customer to highlight the benefits and value proposition in this market, this activity is considered rather a joint innovative step in the customer market than simple promotion of existing solutions. The approach is best suited for customers that have an advanced position regarding understanding and working with sustainability approaches and that operate in markets susceptible to the respective value proposition. BASF has started to promote the method at customers with a respective profile and is extending the offer to a wider customer base in a stepwise approach.

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

Impact of engagement: The fuel switch triggered by BASF’s biomass balance approach results in lower GHG emissions along the value chain. The approach supports customers in offering innovative solutions in their markets, obtaining a competitive edge and thus becoming more successful. BASF is able to live up to its strategic principles of innovating to make customers more successful and driving sustainable solutions. We can demonstrate our engagement and positive contribution, offering a reputational benefit and the opportunity to strengthen and expand customer relationships. Measures of success: The number of products and level of sales linked to the biomass balance approach serve as key performance indicators to measure success.

**Type of engagement**

Collaboration & innovation

**Details of engagement**

Other – please provide information in column 5

**% of customers by number****% Scope 3 emissions as reported in C6.5****Please explain the rationale for selecting this group of customers and scope of engagement**

In cooperation with selected customers, BASF has launched a campaign to promote the sustainability benefits of its Master Builders Solutions construction chemicals. Case studies for selected products highlight quantified sustainable benefits. For example, application of MasterSuna SBS at the concrete producer BRONZO PERASSO shows that using BASF's solution reduces the need to transport sand from remote sites, reducing sand and transportation costs as well as CO2 emissions from transport. The campaign targets companies in the construction industry which is an important customer industry of BASF (our Construction Chemicals division accounts for about 4% of total BASF sales) and becoming increasingly aware of its role and potential for limiting global warming by more efficient processes and products.

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

Impact of engagement: Promotion of BASF Master Builders Solutions construction chemicals with respective potential for avoiding emissions through use by (end-)customers. Measures of success: Incremental sales of Master Builders Solutions construction chemicals driven by engagement campaign.

---

**C12.3**

---

**(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?**

- Direct engagement with policy makers
- Trade associations
- Funding research organizations
- Other

**C12.3a**

---

**(C12.3a) On what issues have you been engaging directly with policy makers?**

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Cap and trade	Support with minor exceptions	The ETS has been the key focus of our lobbying activities in the EU. We promote the EU ETS as key element for the energy and industry sector in a new 2030 EU Energy and Climate framework. We are actively engaged in the further design and development of ETS approaches. Therefore, we analyse data and share the results of our analyses. We openly explain our positions at public meetings and discussions, in conversations with individual political decision makers and other stakeholders, and in stakeholder consultations (e.g. regarding the ETS Innovation fund) and on our website. We advocate for global carbon pricing (e.g. as chair (German presidency) and co-chair (Argentinian presidency) of the B20 Energy, Climate and Resource Efficiency Taskforce). We pushed for the joint statement of B20, C20, L20, T20, W20 and F20 on carbon pricing and advocated for carbon pricing on Twitter.	We support development of new ETS systems in other world regions and the linkage of the EU ETS system with other ETS systems. We support ETS as an EU-wide harmonized and market-based instrument, but free allocation and compensation to prevent carbon leakage beyond 2020 are an essential part to safeguard industrial competitiveness as long as no comparable global system exists. ETS revenues are needed to finance industry research for future carbon-neutral production. We support harmonization between different energy and climate policies past 2020. EU climate goals must focus on the triple objective of cost-competitiveness, energy security and climate protection. Key parameters for all objectives need to be defined and a monitoring process needs to be set up – to enable respective EU policies to be reviewed in case the EU is not on track towards these objectives.
Other, please specify (EU Long Term Strategy/Funding)	Support	In its long-term strategy the EU Commission describes measures, actions and necessities how to further reduce greenhouse gas emissions in the EU with a view to the targets of the Paris Agreement. This includes highlighting the major investments needed. Both on EU and national level, new policies and funding opportunities evolved. We contributed to stakeholder consultations, e.g. for the ETS innovation fund and participated in hearings (national and EU level) on the funding frameworks needed. With our Carbon Management R&D Programme, we develop technologies and processes that are capable to substantially reducing GHG emissions. The competitiveness of such new technologies is closely linked to the political framework. The existing ETS with its free allocation to industry, renewable electricity at competitive prices (our demand may triple at our largest production site in Ludwigshafen) and new funding programs can spur the next development steps towards pilot plants. Support is necessary as long as there is no comparable carbon pricing globally.	We support the legislation on the ETS innovation fund. It is important that funding is available for new technologies directly avoiding CO2 emissions rather than only for CO2 capture technologies (CCU, CCS). We support the general framework set up by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) for additional funding for the transition of the Energy Intensive Industry. However, an adequate financial volume will be needed.
Clean energy generation	Support with major exceptions	We provide information and openly explain our positions at public meetings and discussions, in conversations with individual political decision makers, and in various media. Concerning the German „energy turnaround“ we could safeguard non-burdening of on-site power supply generated in highly efficient combined heat and power plants (CHP) with renewable surcharges due to their positive contribution to energy efficiency and competitiveness of chemical production, following discussions and data sharing with German government and the European Commission. In the US, BASF advocated for restored funding for Advanced Research Projects Agency-Energy (ARPA-E) which was subject of planned cutbacks by the federal government.	Refocus goals on the triple objective of cost-competitiveness, energy security and climate protection. Optimization of costs by i. Research to increase cost efficiency of technologies; ii. Better harmonization of EU targets, instruments and markets across the EU; iii. Better synchronization between development of energy production, grids, storage; iv. Technology-neutral approach to meet climate targets.

**C12.3b**

**(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?**

Yes

**C12.3c**

**(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.**

**Trade association**

ICCA (International council of chemical associations)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

Raise awareness for the specific ways in which the chemical industry can support GHG emissions mitigation and adaptation to

climate change and to advocate for effective climate policies to get a business environment in which the chemical industry can realize this potential best.

**How have you influenced, or are you attempting to influence their position?**

i. Support new studies on energy savings by products of the chemical industry and promotion of relevant ICCA studies, to which BASF contributed; ii. Support of ICCA positioning and communication, e.g. a policy paper supporting effective climate policies; iii. Contribution to guidelines and best-practice examples: Life-cycle analysis, carbon accounting and reporting

---

**Trade association**

Cefic (European chemical industry council)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

Raise awareness for the specific ways in which the chemical industry can support GHG emissions mitigation and adaptation to climate change and to advocate for realization of a business environment in which the chemical industry can realize this potential best.

**How have you influenced, or are you attempting to influence their position?**

i. Membership and active input in relevant working groups/board; ii. Active contribution to increase know-how and initiatives to promote energy efficiency ([www.spice3.eu](http://www.spice3.eu))

---

**Trade association**

ACC (American chemistry council)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

Raise awareness for the specific ways in which the chemical industry can support GHG emissions mitigation and, adaptation to climate change, contribute to energy efficiency and to advocate for realization of a business environment in which the chemical industry can realize this potential best.

**How have you influenced, or are you attempting to influence their position?**

Membership and input in relevant working groups

---

**Trade association**

ERT (European Round Table of Industrialists)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

Raise awareness for ways in which European industry in general can support GHG emission mitigation to climate change and to advocate for framework conditions in Europe that allow industry to mitigate in the most cost-efficient way.

**How have you influenced, or are you attempting to influence their position?**

Membership and input in relevant working groups

---

**Trade association**

VCI (Verband der chemischen Industrie, German chemical industry association)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

Raise awareness for the specific ways in which the chemical industry can support GHG emissions mitigation and adaptation to climate change and to advocate for realization of a business environment in which the chemical industry can realize this potential best.

**How have you influenced, or are you attempting to influence their position?**

i. Membership and input in relevant working groups/board; ii. Active participation in the VCI stakeholder dialogue on decarbonization

---

**Trade association**

---

WBCSD (World business council for sustainable development)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

Advocate for realization of a business environment in which business can support GHG emissions mitigation and adaptation to climate change e.g. through fostering of carbon accounting and through the introduction of global carbon pricing mechanisms.

**How have you influenced, or are you attempting to influence their position?**

i. Membership and input in relevant working groups; ii. Support promotion of relevant WBCSD documents

---

**Trade association**

BE (Business Europe) and German BDI

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

Advocate for realization of a business environment in which industry can support GHG emissions mitigation and adaptation to climate change through its various technological solutions.

**How have you influenced, or are you attempting to influence their position?**

Membership and input in relevant working groups

---

**Trade association**

CBCSD (China Business Council for Sustainable Development)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

CBCSD provides inputs to the government and assists in policy development in order to create a framework that allows business to contribute effectively to sustainable development; they promote exchange and cooperation between Chinese and foreign enterprises to introduce and demonstrate latest progress in environmental and resource management and improve corporate social responsibility.

**How have you influenced, or are you attempting to influence their position?**

BASF is actively sharing ideas, experience and best practice on sustainable development to mobilize more Chinese enterprises to deal with the challenges on EHS, as well as climate change and globalization.

---

**Trade association**

Hong Kong Business Environment Council (BEC) Climate Change Business Forum Advisory Group

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association's position**

BEC's Climate Change Business Forum's advisory group aims to promote awareness of climate change and mitigation and adaptation activities amongst the BEC membership and generally amongst the business community in Hong Kong.

**How have you influenced, or are you attempting to influence their position?**

BASF contributes to BEC events, policy papers, and research on climate change and offers examples of how companies might systematically assess and address climate risks according to our corporate experience.

---

C12.3d

---

**(C12.3d) Do you publicly disclose a list of all research organizations that you fund?**

No

C12.3e

---



---

**(C12.3e) Provide details of the other engagement activities that you undertake.**

Our other engagement activities cover various areas:

**1. Engagement in working groups, for example:**

- Business 20 (active contribution to recommendations on energy, climate and resource efficiency for state and government leaders)
- Member of the Alliance of CEO Climate Leaders (encourage companies to step up their commitment to meeting the targets of the Paris climate accord; co-signatory of an open letter calling for a pledge to increase efforts to reduce emissions, improved analysis and reporting of climate-related financial risks as well as a global carbon pricing mechanism)
- Chair of ISO committee that handles holistic environmental management issues (ISO 14000 series)
- Member of Technical Advisory Group of the Science-based Targets Initiative
- Member of the econsense (Forum for Sustainable Development of German Business) project group "Environmental and Climate Issues"
- VCI Stakeholder Dialog Dekarbonisierung

**2. Contribution to consultations and external studies, for example:**

- Consultation on EU Long Term Strategy
- Consultation on ETS Innovation Fund
- Input to BDI study "Klimapfade für Deutschland" (BDI 2018)
- Input to COP Talanoa Dialogue via our associations
- Interviews and data sharing with scientific organizations about future options for GHG reduction in the chemical industry (e.g. Fraunhofer, DECHEMA)

**3. Publications, conferences, and other public relations work, for example:**

- Release of new BASF strategy (including a new climate protection target, Carbon Management approach)
- Participation in panel discussions at COP 24
- Participation and presentations at conferences (e.g. Argus Emissions Market Conference, Falling Walls Conference, Fraunhofer Symposium "Geschäftsmodell Energiewende")
- Public support for the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)
- Information materials and newsletters for politicians, journalists and public (e.g. sustainability news)
- Showcasing of climate protection products in exhibition in BASF's visitor center in Ludwigshafen

**C12.3f**

---

**(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy 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 head of the Functional Division EHS coordinates reports to the Board of Directors and has the key position to ensure consistency of actions resulting from the decisions.

Direct climate policy-related corporate activities are stipulated and performed by the following corporate groups:

- Energy and Climate Policy (Corporate Communications and Government Relations unit)
- Sustainability Strategy (Corporate Development unit)
- Global Support Environmental Protection (Functional Division Environmental Protection, Health and Safety unit)

Representatives of the three groups have regular meetings (about monthly) with relevant BASF colleagues (e.g. experts in energy procurement, greenhouse gas reporting, BASF's energy efficiency unit, sustainable business community) to exchange about ongoing activities and to align positions to ensure consistency with BASF's strategy in both direct and indirect activities.

The corporate groups are connected to a network of BASF representatives with analogous functions around the world through email and web conference to receive regular updates on local activities and to engage with the local representatives to ensure that activities fit to the corporate strategy.

The management level of the corporate groups supervises consistency of positioning and actions under the strategy through receiving regular updates from the reporting lines and giving guidance on major topics.

## 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).**

**Publication**

In mainstream reports

**Status**

Complete

**Attach the document**

BASF\_Report\_2018.pdf

**Page/Section reference**

p. 25-27 ("Our Strategy"); p. 36-40 ("Integration of Sustainability"); p. 90-91 ("Supplier Management"); p. 103-106 ("Energy and climate protection"); p. 123-130 ("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**

BASF\_website\_energy-climate-section-overview-201906.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 eight sub-sections in total.

---

**C14. 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.**

**C14.1**

---

(C14.1) 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