

## C0. Introduction

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### C0.1

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#### **(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 115,000 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.

Our portfolio is arranged into five segments: Chemicals, Performance Products, Functional Materials and Solutions, Agricultural Solutions and Oil and Gas. In 2017, BASF posted sales of €64.5 billion and income from operations before special items of approximately €8.5 billion. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (AN). Further information on BASF is available on the internet at [www.basf.com](http://www.basf.com).

With the "We create chemistry" strategy, BASF has set itself ambitious goals in order to strengthen its position as the world's leading chemical company. We want to contribute to a sustainable future and have embedded this into our corporate purpose: "We create chemistry for a sustainable future." We live our corporate purpose by sourcing and producing responsibly, acting as a fair and reliable partner, and connecting creative minds to find the best solutions for market needs. For us, this is what successful business is all about.

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 2017, we achieved a reduction of 35.5%. Since 1990, we have been able to lower our overall greenhouse gas emissions from chemical operations by 48% and reduce specific emissions by 75%. 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 2017: 54.3%).

We also offer solutions that help our customers to avoid greenhouse gas emissions. For example, customers' use of products from 23 climate protection product groups sold in 2017 avoids 570 million metric tons of CO<sub>2</sub>e according to our estimations. We invest about half of our annual Research and Development (R and D) expenditures (€1.888 billion total R and D expenses in 2017) on product and process innovations where the R and 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 2017	December 31 2017	No	<Not Applicable>
Row 2	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 3	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Row 4	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>

## C0.3

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

Algeria  
Argentina  
Australia  
Austria  
Azerbaijan  
Bangladesh  
Belarus  
Belgium  
Bolivia (Plurinational State of)  
Brazil  
Bulgaria  
Canada  
Chile  
China  
China, Hong Kong Special Administrative Region  
Colombia  
Costa Rica  
Cote d'Ivoire  
Croatia  
Czechia  
Denmark  
Dominican Republic  
Ecuador  
Egypt  
El Salvador  
Ethiopia  
Finland  
France  
Germany  
Greece  
Guatemala  
Hungary  
India  
Indonesia  
Iran (Islamic Republic of)  
Ireland  
Israel  
Italy  
Jamaica  
Japan  
Jordan

Kazakhstan  
Kenya  
Latvia  
Libya  
Malaysia  
Malta  
Mexico  
Morocco  
Myanmar  
Nepal  
Netherlands  
New Zealand  
Nicaragua  
Norway  
Pakistan  
Panama  
Paraguay  
Peru  
Philippines  
Poland  
Portugal  
Republic of Korea  
Romania  
Russian Federation  
Serbia  
Singapore  
Slovakia  
Slovenia  
Spain  
Sri Lanka  
Sweden  
Switzerland  
Taiwan (Province of China)  
Thailand  
Trinidad and Tobago  
Turkey  
Ukraine  
United Kingdom of Great Britain and Northern Ireland  
United States of America  
Uruguay  
Uzbekistan  
Venezuela (Bolivarian Republic of)  
Viet Nam

## C0.4

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

EUR

## C0.5

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**(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 (Equity share, excl JV & associated comp.)

**(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) 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. 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 chairs BASF's Corporate Sustainability Board (CSB), 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 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	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	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 and D initiatives

**C1.2**

**(C1.2) Below board-level, provide the highest-level management 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.**

**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 "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.

**C1.3**

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

Yes

**C1.3a**

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**(C1.3a) Provide further details on the incentives provided for the management of climate-related issues.**

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

Director on board

**Types of incentives**

Monetary reward

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**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.

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**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.

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**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.

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**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.

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**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.

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

Other, please specify (Project leaders R and D)

**Types of incentives**

Monetary reward

**Activity incentivized**

Other, please specify (Developing climate protection products)

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**Comment**

R and 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 2017 result in an annual greenhouse gas emission reduction of about 17,000 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	30	Timeframe aligned with wider enterprise risk management process. Note that BASF has not defined an upper limit for long-term assessments. The number given is an indicative value to highlight that considerations can cover a timeframe of several decades.

**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) 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 low-carbon furnace, 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 350 production sites in diverse environments in more than 80 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 350 production sites in diverse environments in more than 80 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 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 (350+ sites in 80+ 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 using the Pfister et al. methodology 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: 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 and defined a corporate goal 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):

(a) Situation: Various external stakeholder groups advocate for carbon leakage regulation under the EU ETS with severe negative effects on competitiveness according to internal analyses. (b) Task: Inform stakeholders and policymaker about industry perspective, advocating for alternative proposals. (c) Action: BASF Energy and Climate Policy group engaged in public consultations and stakeholder meetings to explain industry's point of view. (d) Result: Policymakers considered industry arguments in legislative process.

## 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

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**(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 driver**

Policy and legal: 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. 73% 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 (MRV) duties and financial market obligations like the Market Abuse Regulation (MAR, entering into force in 2018). Policy measures like 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 will increase the price of certificates under the EU ETS and thus our cost burden for BASF's European operations. 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

**Potential financial impact**

77000000

**Explanation of financial impact**

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. In order to provide the requested single value, we therefore entered the mean value of this range, plus the additional administrative costs. Internally, we continue planning with the before mentioned range.

**Management method**

i) We mitigate direct impacts of cap and trade schemes/carbon taxes by reducing our GHG emissions in line with our target: -40% specific GHG emissions by 2020 compared to 2002 (BASF excl. Oil and Gas). Here, increasing our energy efficiency is a key contribution and therefore backed by a separate target: cover 90% of our primary energy demand with certified energy management (ISO 50001) by 2020 (BASF incl. Oil and Gas). Each year multiple reduction projects are assessed, kicked off and implemented. For example, more than 80 energy efficiency measures were implemented in Europe in 2017. +++ ii) We actively engage with decision makers and governments at the regional, federal, and EU level on climate and energy-related issues. Case

study (STAR approach): (a) Situation: The total number of certificates for free allocation to industry foreseen by the commission was too low to prevent burdening of even the best installations. (b) Task: Review of total number of certificates needed from industry perspective. (c) Action: We joined forces with other industry sectors and gave data to studies calculating the necessary number of free certificates. In 2017 we addressed Members of the EU Parliament (MEPs) via associations and directly (including a visit of MEPs to our Ludwigshafen site) to share the findings of the calculations and highlight the risks for industry. (d) Result: The final ETS agreement allows shifting additional 3 % of certificates from auctioning to free allocation.

#### **Cost of management**

3300000

#### **Comment**

i) Investments for reducing GHG emissions result in no net additional costs. All investments are economically reasonable, i.e. cost savings during operation will justify initial investment costs according to BASF's profitability criteria. Calculations also include a carbon price. +++ ii) 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 2017. BASF co-financed a study by VIK (German association for industrial energy consumers), highlighting cost burdens for industry for selected products.

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#### **Identifier**

Risk 2

#### **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 driver**

Policy and legal: Increased operating costs (e.g., higher compliance costs, increased insurance premiums)

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

BASF has plants in South Korea and China which are already regulated under the existing cap and trade schemes. In fact, these schemes already cover a total of 17% of our Scope 1 emissions as of 2017. Certificates need exceeds free allocation, but the financial impact is moderate so far. However, the planned national ETS in China will increase the number of affected BASF plants (BASF operates a total of 26 production sites in greater China), and depending on the final rules for the ETS the impact may be more significant. Production costs may increase, if more emissions allowances have to be purchased and/or the price for electricity increases. We assume that we are not able to pass on these carbon costs, as global spreading of carbon pricing schemes is limited and slow.

#### **Time horizon**

Medium-term

#### **Likelihood**

Very likely

#### **Magnitude of impact**

Medium-high

#### **Potential financial impact**

50000000

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

As the (financial) impact of the national ETS in China on BASF depends on the ultimate regulation and on BASF's future investments (due to a lack of certificates for new installations), a trustworthy forecast on the financial implications of this risk is difficult. Estimates calculate with €10-100 million as order of magnitude. In order to provide the requested single value, we therefore entered the mean value of this range. Internally, we continue planning with the before mentioned range.

#### **Management method**

i) We mitigate direct impacts of carbon pricing by reducing our GHG emissions in line with our targets for climate protection and energy efficiency. A total of 7 sites in BASF Greater China have been certified according to ISO 50001 since 2016. One more site is planned for 2018. +++ ii) We work actively and closely with industry bodies to have a direct dialogue with the government in the preparation for the national ETS. BASF was invited by local authorities in China to share experience and give training to enterprises potentially enrolled in the national ETS. Also, 2017 we met a Chinese delegation in Berlin, discussing lessons learned from the EU ETS and giving advice. Case study for our policy engagement (STAR approach): (a) Situation: The total number of certificates for free allocation to industry foreseen by the government might be too low to prevent a correction factor burdening even best installations. (b) Task: Review certificates allocation methodology from industry perspective. (c) Action: We joined

association forces with peer group companies for the studies of products benchmarking for allocating free certificates for the national ETS. In 2017 we addressed the issue to policy decision makers / government via associations. (d) Result: Product benchmark based allocation is applied to the power sector in the current national ETS. The method will likely also be used for some chemical products when they are required to join the national ETS after 2020.

#### Cost of management

0

#### Comment

i) Investments for reducing GHG emissions result in no net additional costs. All investments are economically reasonable, i.e. cost savings during operation will justify initial investment costs according to BASF's profitability criteria. A price for carbon is included in the profitability calculations. +++ ii) No significant additional costs are linked to this activity as it is mainly covered by our personnel expenses.

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#### Identifier

Risk 3

#### 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 driver

Reputation: Reduced revenue from decreased demand for goods/services

#### 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) is constantly increasing. 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 in climate protection is a typical area of consideration within sustainability. For example, 28 major customers of BASF, representing about 4% of our sales, requested information on our climate protection activities through the CDP Supply Chain Programme in 2017. Lack of corporate engagement and performance in this area (e.g. receiving a low score in supplier performance reviews) 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

#### Potential financial impact

150000000

#### Explanation of financial impact

If the customers requesting information on our climate protection activities through the CDP Supply Chain Programme (28 customers representing 4% of our sales in 2017) reduce demand by 10% due to a low CDP score this would result in loss of sales in the order of €100-200 million. In order to provide the requested single value, we therefore entered the mean value of this range. Internally, we continue planning with the before mentioned range.

#### Management method

BASF exchanges with customers and reports transparently on its climate protection strategy, carbon footprint and its efforts to reduce GHG emissions in public media (e.g. Corporate Report, website) and in direct communication with customers (e.g. bilateral discussions, supplier performance reviews). Case study for this method, following the STAR approach: (a) Situation: In 2017, a customer in Europe requested to receive information on transport-related GHG emissions for all products purchased from BASF in Germany and UK and shipped to customer sites in Europe in the last 12 months for refining of the customer's carbon footprint. (b) Task: Share information on transport-related emissions in the requested timeframe with the customer. (c) Action: Door-to-door management of BASF's Regional Supply Chain Services derived emissions data based on data and estimates of mode of transport, transport distances and emission factors. Assumptions and results were discussed with the customer. (d) Result: The customer acknowledged BASF's expertise and competent support, which contributed to strengthening the supply relationship.

## Cost of management

300000

## Comment

The cost of management represents an estimate of costs for the dialogue with customers on sustainability, including climate change issues, handled by our corporate sustainability team where a major share of the respective customer support on central level is delivered (e.g. over 150 sustainability-related customer requests like supplier performance reviews in 2017). About two full time employees at a cost of about €150,000 each a year have specialized on this area. Contributions by other central and business units result in no specific additional costs as they are covered by their standard budgets.

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## Identifier

Risk 4

## 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 driver

Reputation: 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 (64 million, value around €5,600 million at year-average stock price 2017) 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

## Potential financial impact

100000000

## Explanation of financial impact

7 % of BASF shares (64 million, value around €5,600 million at year-average stock price 2017) 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 exactly. We have therefore stated the lower boundary of the range to provide a single value.

## Management method

BASF holds an open dialogue with all stakeholders, including investors, and reports transparently through various media and initiatives on its climate protection strategy and its efforts to reduce GHG emissions. Our Corporate Report, response to CDP, website and investor dialogues are standard activities in this context. Moreover, we engage individually via other channels (e.g. events, publications). Case study (STAR approach): (a) Situation: Role of business for climate protection is subject to public discussion, leading to increased scrutiny of investors regarding GHG-intensive companies like BASF. (b) Task: Disseminate information about BASF positions, activities and performance in this area to demonstrate that BASF manages this topic properly. (c) Action: In 2017, we presented and discussed information on climate protection at BASF (e.g. GHG target performance) in our mainstream investor roadshows (more than 50 events in total in London, Paris, Frankfurt, and other cities). At SRI conferences in Paris, at investor visits to BASF's headquarter in Ludwigshafen, and in frequent telephone conferences with investors, focus of

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discussions with ~30 investors was on climate protection and energy efficiency. We also joined the World Economic Forum's CEO Climate Leaders initiative in 2017. (d) Result: Better understanding for BASF engagement at capital market participants, increasing the likelihood that investors keep BASF shares in support of the climate protection strategy.

**Cost of management**

450000

**Comment**

For the open dialogue with all stakeholders on climate change issues we have three full time employees at a cost of about €150,000 each a year.

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C2.4

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**(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

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**(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 driver**

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

**Company- specific description**

BASF's primary energy use amounted to 57.3 million MWh in 2017, 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). Examples are funding opportunities under the German "Step up" and KfW funding programs (funding e.g. waste heat recovery measures) which BASF has already applied for successfully in 2017. 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

**Potential financial impact**

9500000

**Explanation of financial impact**

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

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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

i) 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 (ISO 50001) at all relevant production sites by 2020, covering 90% of our primary energy demand (status 2017: 54.3%). +++ ii) We continuously run operational excellence programs triggering annual energy efficiency measures. Case study for this method, following the STAR approach: (a) Situation: BASF has set up the "Drive – Drive Efficiency" program to further enhance operational excellence. It runs from 2016 to 2018 and includes efficiency measures in production, engineering, maintenance, logistics, procurement and administration. (b) Task: Within Drive all BASF sites and plants have to propose measures within a central project database where opportunities are tracked. (c) Action: In 2017, 85 additional energy efficiency measures proposed were approved by the global Energy Management team, which also controlled the implementation in the different plants all over the world – 177 measures were implemented, and an additional 35 entered implementation. (d) Result: From the measures implemented in 2017, BASF will save over € 9 million per year in energy cost, contributing about 80,000 t of annual CO<sub>2</sub>e savings. The database allows to track measures as best practice examples for other sites.

#### Cost to realize opportunity

9300000

#### Comment

Costs relate to the investment required in the reporting year to implement the energy efficiency measures proposed and approved within the operational excellence program.

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#### 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 driver

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 and EED 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

#### Potential financial impact

200000000

#### Explanation of financial impact

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

i) We engage in several associations and standardization bodies to consult on higher standards for energy-efficient construction (e.g. CEFIC, PlasticsEurope, PU Europe, BDI Gebäude AG). For example, in 2017 we advocated via our associations for an ambitious revision of the Energy Performance of Buildings Directive (EPBD) to achieve a highly energy efficient and decarbonized

building stock by 2050 in the EU. +++ ii) We promote the benefits of insulation materials. Case study (STAR approach): (a) Situation: Concerns about business case for thermal insulation, especially for deep renovation at architects, craftsmen and house owners. This also results in a lack of political action. (b) Task: Convince about benefits of solution. (c) Action: Demonstrate benefits of solution in partnerships, demonstration projects and initiatives in the buildings sector. In 2017, we showcased the strength of our products in a new building in Mumbai, which meets the silver standards of the LEED green buildings verification system. Further, our subsidiary BASF Bauen + Wohnen completed the energy-efficient renovation of landmarked houses in Ludwigshafen. (d) Result: BASF actively disseminates evidence for cost-efficient near zero energy houses, supporting more ambitious legislation for new buildings and renovation (e.g. the revised EPBD adopted in 2018). +++ iii) We invest in R and D of new low-carbon insulation solutions. Central sustainability tools (e.g. Eco-Efficiency Analysis) support this work

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

3300000

#### **Comment**

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 2017 (including via our associations).

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#### **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 driver**

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

#### **Potential financial impact**

2500000000

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

The global light vehicle production is projected to increase to more than 100 million units by 2020. The exponential growth of electro 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. We have provided the mean value of this range.

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

i) We expand our production capacities to satisfy future customer demand. Case study (STAR approach): (a) Situation: Relevance of mobility is growing in the Asia-Pacific region and more vehicles are manufactured locally in India. (b) Task: BASF needs to expand its local production network in India to best meet local demands of this growth, in line with BASF's Asia Pacific strategy and in support of Make in India and other government initiatives. (c) Action: In 2017, BASF Catalysts inaugurated a new mobile emissions catalysts manufacturing site in India, doubling its local manufacturing capacity. (d) Result: BASF Catalysts is better positioned to respond to the increase in demand for advanced emissions control solutions in India. ii) BASF actively engages in partnerships fostering low-carbon mobility, e.g. the German "national platform for electric mobility" or the Global Battery Alliance.

+++ iii) We invest in R and D of low-carbon solutions for the automotive sector, e.g. BASF is exploring next-generation battery material concepts, which is expected to make ranges of 300 to 600 kilometers affordable for the mass market. Central sustainability tools (e.g. Eco-Efficiency Analysis) support this work.

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

700000000

#### **Comment**

BASF has invested approximately €300 million, over the past four years, in manufacturing and research and development in India. Further, BASF invests in the expansion of its mobile emissions catalysts production site in Poland and announced its intention to invest up to €400 million to build large-scale production plants for cathode materials in Europe and intent to secure raw materials supply from Norilsk Nickel. This illustrates the company's long-term commitment to become a global leader in battery materials.

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#### **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 driver**

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 30%. (2) In Italy, all lightweight plastic bags must be certified compostable. In the future, same shall apply to fruit and vegetable bags including the biobased content criteria. (3) In 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

#### **Potential financial impact**

24000000

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

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**

i) BASF demonstrates the value of compostable bags to legislators and customers in pioneer projects in the countries. Case study (STAR approach): (a) Situation: In France BASF introduced certified compostable fruit and vegetable bags in supermarkets together with local authorities, retailers, and NGOs. (b) Task: Increase acceptance of bags by information and education of customers. (c) Action: We engaged consumers by preparing posters for the retail stores explaining how to use compostable bags for more convenient organic waste collection (ongoing in 2017). We also educated consumers that disposing of kitchen waste in landfills causes around 80 times more CO<sub>2</sub>eq. emissions than composting kitchen waste. The local composters confirmed full compostability of the bags. (d) Result: Participating stakeholders confirmed the positive project results to the legislator. +++ ii) BASF also highlights the benefits of its products through externally reviewed life cycle assessments (LCA) on the use of compostable

shopping bags. For example, we conducted two LCAs to advocate for exclusion of certified compostable bags from the Italian law on plastic bags. +++ iii) 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).

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

500000

#### **Comment**

i) Total costs for the pilot projects in France were about €200,000. +++ ii) Average costs per LCA approximately €150,000. +++ iii) No significant additional costs are linked to the lobbying activities as they are mainly covered by our personnel expenses.

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#### **Identifier**

Opp5

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

Customer

#### **Opportunity type**

Products and services

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

Development of climate adaptation and insurance risk solutions

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

Increased revenue through new solutions to adaptation needs (e.g., insurance risk transfer products and services)

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

Water scarcity and a growing demand for water will force a shift from conventional water sources (e.g. ground and surface water) to desalination and water reuse combined with an efficient use of water. The need for cutting-edge water treatment technologies provides new opportunities for BASF's broad portfolio of water chemicals. Our solutions are used in industrial and municipal water treatment to purify raw water, to protect cooling towers, boilers and desalination plants from scale and corrosion and to treat wastewater to enable water reuse. For example, BASF provides a comprehensive range of water treatment chemicals, including organic coagulants and high molecular weight flocculants specifically designed for the solid/liquid separation process in potable water.

#### **Time horizon**

Short-term

#### **Likelihood**

Likely

#### **Magnitude of impact**

Medium-high

#### **Potential financial impact**

50000000

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

In 2020 we estimate €50 million of our turnover and €11 million of our EBITDA from innovations derived from BASF's Water Chemicals portfolio launched since 2015.

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

i) Establishment of a market facing business unit combining all products for the water industry from BASF to position itself as a leading provider for water treatment chemicals. +++ ii) Market need oriented development of products. Case study for newly introduced Sokalan® AF-X following the STAR approach: (a) Situation: Growing demand for water via desalination processes causing foam/scale formation at operation, decreasing efficiency of the desalination units. (b) Task: Development of a novel antifoam for thermal seawater desalination. (c) Action: In 2017, BASF launched Sokalan® AF-X a novel antifoam providing excellent foam control properties at low dosage rates for thermal seawater desalination plants. Sokalan® AF-X is fully water-soluble, not requiring continuous stirring when brought into solution saving CapEx and energy for the customer, and is in addition readily biodegradable (OECD 301b). (d) Result: BASF product portfolio further enhanced by addressing the need for differentiated chemistry to enable desalination processes. With the product launch BASF is fostering its position as a leading provider for water chemicals.

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

0

#### **Comment**

i) No significant additional costs are linked to these actions as they are mainly covered by our personnel expenses. +++ ii) Approx.

1% of our turnover are dedicated to development of new products

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#### Identifier

Opp6

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

Direct operations

#### Opportunity type

Markets

#### Primary climate-related opportunity driver

Other

#### Type of financial impact driver

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 (64 million, value around €5,600 million at year-average stock price 2017) 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

#### Potential financial impact

100000000

#### Explanation of financial impact

7 % of BASF shares (64 million, value around €5,600 million at year-average stock price 2017) 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 exactly. We have therefore stated the lower boundary of the range to provide a single value.

#### Strategy to realize opportunity

BASF holds an open dialogue with all stakeholders, including investors, and reports transparently through various media and initiatives on its climate protection strategy and its efforts to reduce GHG emissions. Our Corporate Report, response to CDP, website and investor dialogues are standard activities in this context. Moreover, we engage individually via other channels (e.g. events, publications). Case study for this method, following the STAR approach: (a) Situation: SRI-oriented investors analyse BASF share for investment opportunities. (b) Task: Disseminate information about BASF positions, activities and performance regarding sustainability, including climate change, to attract capital from respective investors. (c) Action: In 2017, we presented and discussed information on climate protection at BASF (e.g. GHG target performance) in our mainstream investor roadshows (more than 50 events in total globally). At SRI conferences in Paris, at investor visits to BASF's headquarter in Ludwigshafen, and in frequent telephone conferences with investors, focus of discussions with ~30 investors was on climate protection and energy efficiency. (d) Result: Better understanding for BASF engagement at SRI-oriented investors, increasing the likelihood that this group includes BASF shares in its portfolio.

#### Cost to realize opportunity

450000

#### Comment

For the open dialogue with all stakeholders on climate change issues we have three full time employees at a cost of about €150,000 each a year.

## 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 2017, about 9% 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 criteria in supplier performance reviews (e.g. EcoVadis, CDP Supply Chain Program) 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 in climate protection is a typical assessment area. BASF exchange with customers on our climate protection strategy and efforts to reduce GHG emissions (e.g. through bilateral discussions, supplier performance reviews) has significantly increased as a consequence. The customer relations management mitigates potential reputational risks. +++ Magnitude: In 2017, major customers of BASF representing more than 20% of our sales 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 200 measures per year that increase energy efficiency in processes (total more than 750 measures, saving 565,000 t CO <sub>2</sub> e). Our activities are accompanied and driven by respective climate protection targets. BASF's first climate protection target dates back to 2002. Currently, we have set the goal to reduce our greenhouse gas emissions per metric ton of sales product by 40% by 2020, compared with baseline 2002 (status 2017: -35.5%). +++ Magnitude: In 2017, we have invested about EUR 20,000,000 per year (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 and 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 and 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 and D expenditures (€1.888 billion total R and D expenses in 2017) on product and process innovations where the R and 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 73% of our global 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 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 and 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 and D are "resources, environment and climate". We invest about half of our annual R and D expenditures (€1.888 billion total R and D expenses in 2017) on product and process innovations where the R and D target is related to energy/resource efficiency and climate protection and 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: Products serving energy/resource efficiency and climate protection belong to the product group making a particular contribution to sustainability in the value chain, dubbed Accelerators in our Sustainable Solution Steering® approach to portfolio steering. We aim to increase the share of Accelerator sales to 28% in 2020 and have achieved a share of 27.3% in 2017.
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 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**

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**(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)**

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**(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.**

In development, we plan to complete it within the next 2 years

**C3.1c**

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**(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: We aim to reduce our GHG emissions per metric ton of sales product by 40% by 2020, compared with baseline 2002.

**iii. Examples of substantial business decisions in 2017 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

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We extended our portfolio of bio-based materials as a low-carbon solution for customers to exploit climate-related business opportunities. For example, we introduced Elastopir® produced with our biomass balance approach and used by Falk Bouwsystemen to produce sandwich panels, and we delivered biomass-balanced Styropor® to Schaumplast GmbH und Co.KG, and we developed a bio-based clearcoat in cooperation with Covestro and Audi. Further, we doubled our production capacity for mobile emission catalysts in India and expanded our catalyst site in Poland to benefit from increasing demand for catalysts due to more stringent regulations.

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

We promoted R and D activities and joined partnerships to be able to advance long-term climate-related business opportunities. For example, we signed a development agreement with bse Engineering to transform CO<sub>2</sub> and surplus (green) electricity into methanol. Further, we inaugurated a new Innovation Campus in Mumbai, India, which will investigate solutions for challenges related to energy, food and clean water, limited resources, and a rising world population. Other partnerships were established or strengthened with TODA (increase investments in cathode materials to enable e-mobility), the European Space Agency (promote innovative digital services for more efficient agriculture, also leading to lower environmental impact), the Global Battery Alliance (support a more sustainable battery value chain), and the Ellen MacArthur Foundation (fostering circular economy approaches by joining the “Circular Economy 100” program and the “New Plastic Economy” program).

Aspect: mitigation of climate change by reducing emissions in operations

We have initiated and controlled the implementation of more than 170 energy efficiency measures in different plants all over the world in 2017. We also inaugurated a more resource efficient enzyme-based production plant for biocatalyzed acrylamide in Nanjing, China. Further, we invested in modern production technology for high performance silica adsorbents in Nienburg, Germany that sets new standards in efficiency and sustainability of production, including reduced GHG emissions from operations.

### C3.1d

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**(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 in 2017. To this end, we joined the “Circular Economy 100” program and the “New Plastic Economy” program of the Ellen MacArthur Foundation. 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>

**C4. Targets and performance**

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**C4.1**

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

Intensity target

**C4.1b**

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**(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

**% reduction from baseline year**

40

**Metric**

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

**Base year**

2002

**Start year**

2011

**Normalized baseline 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

**% achieved (emissions)**

89

**Target status**

Underway

**Please explain**

The target applies to BASF's global business without our oil and gas activities that are bundled in the Wintershall Group, 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 Int1 is in line with a 2°C path.

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

-12

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

0

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**C4.2**

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**(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**

29

**Target Status**

Underway

**Please explain**

We set ourselves a new energy efficiency goal in 2015 covering both the chemicals and the oil and gas businesses. 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

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**C4.3**

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**(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**

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

	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	47	
To be implemented*	213	242000
Implementation commenced*	60	129000
Implemented*	346	250000
Not to be implemented	49	

## C4.3b

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

**Activity type**

Energy efficiency: Processes

**Description of activity**

Process optimization

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

80000

**Scope**

Scope 1

Scope 2 (location-based)

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in CC0.4)**

9500000

**Investment required (unit currency – as specified in CC0.4)**

9300000

**Payback period**

<1 year

**Estimated lifetime of the initiative**

Ongoing

**Comment**

In 2017, our global Energy Management Team has initiated and controlled implementation of 177 individual 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, 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. For example, at our Antwerp site we completed a heat integration project at one plant (6,000 t CO2 emissions reduction). In North America, we substituted an energy-intense ozonolysis step by a more efficient reactor process (-6,500 t CO2). At our Shanghai Pudong site we saved fuel energy for a spray drying process (-4,500 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 2017. Since many projects benefit from a combination of different activities highlighted by CDP (e.g. heat recovery and cooling technology) and belong to the same overarching internal program, we decided to represent them jointly under "Process optimization".

**Activity type**

Other, please specify (Material consumption reduction)

*Description of activity: Reduction of raw material demand by increasing material efficiency of processes*

**Description of activity**

<Not Applicable>

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

170000

**Scope**

Scope 3

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in CC0.4)**

36000000

**Investment required (unit currency – as specified in CC0.4)**

9000000

**Payback period**

<1 year

**Estimated lifetime of the initiative**

Ongoing

**Comment**

In 2017, 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 McIntosh site resulting in higher selectivity and therefore less raw material consumption. In another plant in our Ludwigshafen site, we improved the control concept by implementing an advanced process controller leading to increased plant stability and reduced raw material consumption. In our Camacari site in Brazil, we stabilized the production by improved control and analytics in a distillation process leading to reduced losses.

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C4.3c

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**(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 and D expenditures (€1.888 billion total R and expenses in 2017) on product and process innovations where the R and D target is related to energy/resource efficiency and climate protection. For example, we have developed a new hydrosulfite for the paper industry that allows the customer to produce higher quality paper while saving energy at the same time.
Partnering with governments on technology development	BASF is involved in several government sponsored R and D initiatives on new technology development. For example, we are a member of the PEFerence project which received a grant from the European Joint Undertaking on Bio-Based Industries (BBI JU) in 2017. The BBI JU is a public-private partnership between the EU and the bio-based industries. The PEFerence consortium aims to replace a significant share of fossil-based polyesters, such as polyethylene terephthalate (PET), and packaging materials like glass and metal with 100% bio-based furanics polyesters.
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 23 product groups and their respective global sales volumes in 2017 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 high performance synthetic bio-hydraulic fluids offer extended drain intervals and exceptional wear and corrosion protection. They additionally provide measurable fuel savings and hence CO2 emission reductions. +++ 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**

9

**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. For the year 2017, we calculated that the use of the 23 climate protection product groups that were sold in the reporting year enables customers to reduce their emissions from 990 to 420 million metric tons of CO2e, thus preventing 570 million metric tons of CO2e 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 6% of the emissions avoided in 2017 are attributable to BASF.

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## C5. Emissions methodology

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### C5.1

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**(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**

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**(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**

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**C6.1**

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**(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?**

**Row 1**

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

18775000

**End-year of reporting period**

<Not Applicable>

**Comment**

**C6.2**

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**(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**

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**C6.3**

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

**Row 1**

**Scope 2, location-based**

3796000

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

4517000

**End-year of reporting period**

<Not Applicable>

**Comment**

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**C6.4**

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**(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

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**C6.4a**

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**(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 the 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).

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**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 the 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.

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**C6.5**

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**(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 CO2e

55466000

### 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, AR4, 2007. (iv) Methodology and assumptions: We analyzed the GHG emissions of our procured raw materials and precursor manufacturing at BASF's suppliers' facilities (including merchandise) by calculating the cradle-to-gate emissions, including all direct GHG emissions from raw material extraction, precursor manufacturing and transport, as well as indirect emissions from energy use. To do so, we determined the quantity of each single product purchased, and then applied emission factors for about 80 percent of the purchased products (by weight). We multiplied the CO2e 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 drums 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 CO2e

1639000

### 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, AR4, 2007. (iv) Methodology and assumptions: The GHG emissions that are associated with BASF's capital goods purchased in 2017 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

2651000

### Emissions calculation methodology

(i) Activity data: The quantities of fuel and energy (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, AR4, 2007. (iv) Methodology and 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 CO2-e emission factors. The GHG emissions from the extraction, production and transportation of fuels consumed in the generation of electricity and steam purchased by BASF in 2017 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, 2017). The fuel shares were then multiplied by the respective CO2-e emission factors to result in the overall CO2-e emissions. Generation of electricity, steam, heating and cooling that is consumed in a transmission and distribution (T and D) system: GHG emissions associated with losses of purchased electricity and steam were estimated based on our location-based Scope 2 emissions for 2017 and a grid-related loss factor of 7 percent for Germany. Losses associated with our own T and 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

2227000

### Emissions calculation methodology

(i) Activity data: Quantities and types of goods procured in 2017 were obtained from BASF internal business data management systems. The current modal split of chemical transport in Europe was derived from the McKinnon Report "Measuring and Managing CO2 Emissions from the Transport of Chemicals in Europe". (ii) Emissions factors: CO2 emission factors were taken from the McKinnon Report. For trucks in Asia, a higher 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, AR4, 2007. (iv) Methodology and assumptions: Three different categories of procured products were defined for the calculation: (i) raw materials and naphtha, (ii) natural gas and industrial gases and (iii) technical and capital goods and packaging. (i) The GHG emissions associated with the transportation of raw materials and naphtha 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, the modal split included road, ocean-going vessel, barge, rail and air. In all other regions, solely transportation by truck was assumed. The transportation distance in each region was estimated by logistics experts. (ii) Emissions from the 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. The distance for the transportation of industrial gases was assumed to be 0.5 km since most of the gases are produced on-site. The distance for the transportation of natural gas was assumed to be 1,000 km. (iii) The GHG emissions that are associated with transportation of BASF's technical and capital goods purchased in the reporting year were estimated by assuming that the technical goods are 100% material and made from carbon steel whereas the capital goods have a material content of 50% and are made from 60% stainless steel and 40% carbon steel. The weight of the 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. The corresponding GHG emissions were calculated by multiplying quantity by an emission factor for truck and a transportation distance.

### 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 CO2e

701000

### 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 our in-house Responsible Care 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, AR4, 2007. (iv) Methodology and 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 CO2e

191000

### 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> conversion factors for short-haul, medium-haul and long-haul flights were taken from [www.carbonplanet.com](http://www.carbonplanet.com). CO<sub>2</sub> conversion factors for short and long-distance travel by train and for business travel by rental car were taken from World Resources Institute (2015). GHG Protocol tool for mobile combustion. Version 2.6. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR4, 2007. (iv) Methodology and 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 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> emissions, using an average CO<sub>2</sub> conversion factor for long and short distance 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> emissions using an average passenger car CO<sub>2</sub> conversion factor derived from the GHG Protocol tool for mobile combustion (Version 2.6).

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

100

### Explanation

## Employee commuting

### Evaluation status

Not relevant, calculated

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

273000

### 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 2009. (ii) Emissions factors: The CO<sub>2</sub> emissions factors used were taken from World Resources Institute (2015). GHG Protocol tool for mobile combustion. Version 2.6. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR4, 2007. (iv) Methodology and assumptions: CO<sub>2</sub> emissions from employee commuting in Europe were calculated based on the results of a representative poll conducted among BASF SE employees in 2009. Employees were asked about the distance travelled between their homes and workplaces and their means of transportation. CO<sub>2</sub> emissions were calculated by multiplying the travelled distance (220 days per year back and forth) with the respective CO<sub>2</sub> 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

338000

### Emissions calculation methodology

(i) Activity data: Leased cars: Vehicle miles as defined in the leasing contracts for BASF SE employees for 2017. Leased office and storage space: Leased office and storage space for the reporting year was obtained from BASF internal business data management systems. Leased equipment: The monetary purchasing volume for leased equipment in 2017 was derived from BASF internal business data management systems. (ii) Emissions factors: The CO<sub>2</sub> emissions factors for the leased cars were provided by the car manufacturers. They differentiate between fuel type (diesel/gasoline) as well as cubic capacity. The energy consumption per square meter of office space in Europe and South America was taken from [www.lfu.bayern.de](http://www.lfu.bayern.de). For Asia and North America it was taken from a study of the WBCSD. CO<sub>2</sub> emissions factors per MWh were obtained from the International Energy Agency (IEA, 2017). The 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, AR4, 2007. (iv) Methodology and 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 the leased space and the annual energy consumption per square meter of office and storage space, respectively. No distinction was made between office and storage space. 3) The GHG emissions from leased equipment such as hardware (i.e. computers or printers) were assessed based on the monetary purchasing volume in 2017 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

1864000

### Emissions calculation methodology

(i) Activity data: Quantities and types of products sold in 2017 as well as their means of transportation were obtained from BASF internal business data management systems. (ii) Emissions factors: The CO2 emission factors used (except pipeline transport) are specific factors calculated for BASF's outbound transport activities; for pipeline transport the CO2 emission 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, AR4, 2007. (iv) Methodology and assumptions: For the calculation of the GHG emissions associated with the transport of BASF products sold in 2017, the respective shipments from BASF sites to BASF customers were evaluated taking into account 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

### Emissions calculation methodology

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

### 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 and 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

42722000

### Emissions calculation methodology

(i) Activity data: Quantities and types of products sold in 2017 were obtained from BASF internal business data management systems. (ii) Emissions factors: The CO<sub>2</sub> emissions factor for crude oil was taken from IPCC. The CO<sub>2</sub> emissions factor for natural gas was calculated on the basis that natural gas is solely methane that is entirely converted into CO<sub>2</sub>. (iii) GWP values: GWPs were mainly taken from IPCC, AR4, 2007. Only the GWPs of some fluorinated hydrocarbons are manufacturers' information. (iv) Methodology and assumptions: For the calculation of the GHG emissions associated with the use of sold 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 and 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 CO<sub>2</sub> 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 2017 that form greenhouse gases: Nitrogenous fertilizers release nitrous oxide to the atmosphere because of microbial action in the soil. The associated GHG emissions were calculated based on the amount of N-containing fertilizers sold in 2017, the nitrogen content and on the fact that about 1% (in the presence of a nitrification inhibitor only 0.5%) of the nitrogen contained in the fertilizer is converted into N<sub>2</sub>O-N. CO<sub>2</sub> from the use of urea (as fertilizer and solution for diesel engines) was calculated based on the sold product quantity and the contained CO<sub>2</sub> amount. 3) GHG emissions from products sold in 2017 that contain greenhouse gases such as dry ice, CO<sub>2</sub> as gas for the beverage industry and HFCs as foaming agents to produce polyurethane foams: GHG emissions from dry ice and CO<sub>2</sub> 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 the 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

20040000

### Emissions calculation methodology

(i) Activity data: Quantity of the products (raw materials, pre-products and packaging) purchased in 2017 and percentage of BASF's sales in Europe and in the other regions was 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 the UN Statistics Division and by Eurostat. (ii) Emissions factors: The emissions factor for landfill was obtained from the GaBi database. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR4, 2007. (iv) Methodology and assumptions: GHG emissions from the disposal of all BASF products (except the products that are already disposed of during their use phase and accounted for in the respective category) manufactured in 2017 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, taking into account the region-specific proportions of the different disposal methods. The same range of chemicals as in Category 1 was considered for end-of-life options. The amount of CO<sub>2</sub> a compound emits when incinerated can be determined by its C-content. Therefore, the CO<sub>2</sub> emissions for all products incinerated were calculated by multiplying CO<sub>2</sub> 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 and Reporting Corporate GHG Emissions in the Chemical Sector Value Chain, the total emissions from incineration with energy recovery was allocated to the waste treatment and the energy generation with a zero emission factor by using an economic allocation approach based on the proportions of total costs of waste treatment and total revenues from the 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 CO<sub>2</sub>-e 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 less than 0.1 million tons of CO2-e.

### 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

### Emissions calculation methodology

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

### Explanation

Not relevant as BASF does not own or operate franchises.

## Investments

### Evaluation status

Relevant, calculated

### Metric tonnes CO2e

2311000

### 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, AR4, 2007. (iii) Methodology and 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

100

### Explanation

## Other (upstream)

### Evaluation status

### Metric tonnes CO2e

### Emissions calculation methodology

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

### Explanation

Other (downstream)

Evaluation status

Metric tonnes CO2e

Emissions calculation methodology

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

Explanation

## C6.7

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

No

## C6.10

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**(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**

0.00035

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

22571000

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

64475000000

**Scope 2 figure used**

Location-based

**% change from previous year**

8.4

**Direction of change**

Decreased

**Reason for change**

BASF's GHG emissions per unit total revenue decreased by 8.4% in 2017 compared with 2016. The absolute Scope 1 and Scope 2 emissions increased by 2.7% in 2017 compared with 2016, however revenues increased by even 12.0% (increase by €6.9 billion), resulting in an overall strong decrease of the indicator value. The increase in revenues was mainly attributable to significantly higher prices in the chemicals business, as well as volumes growth in all segments. The increase of GHG emissions in 2017 is the net effect of lower emissions due to our emission reduction measures and divestments (accounting for -0.6% and -0.5% of Scope 1+2 emissions, respectively) which were overcompensated by increasing emissions due to acquisitions (+0.2% of Scope 1+2 emissions), higher output (+1.5% of Scope 1+2 emissions) and changes in standard operating conditions (+2.0% 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 177 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 more than 80,000 t CO2e. For example, we completed a heat integration project at one plant at our Antwerp site (6,000 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 17,000 t CO2e.

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**Intensity figure**

199.2

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

22571000

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**Metric denominator**

full time equivalent (FTE) employee

**Metric denominator: Unit total**

113310

**Scope 2 figure used**

Location-based

**% change from previous year**

1.2

**Direction of change**

Increased

**Reason for change**

BASF increased its GHG emissions per FTE employee in 2017 compared with 2016 by 1.2%. The number of BASF full time equivalent employees increased slightly by 1.5% while absolute Scope 1 and Scope 2 emissions increased by even 2.7%, resulting in an increase of the indicator value. The higher headcount was primarily due to acquisitions. The increase of GHG emissions in 2017 is the net effect of lower emissions due to our emission reduction measures and divestments (accounting for -0.6% and -0.5% of Scope 1+2 emissions, respectively) which were overcompensated by increasing emissions due to acquisitions (+0.2% of Scope 1+2 emissions), higher output (+1.5% of Scope 1+2 emissions) and changes in standard operating conditions (+2.0% of Scope 1+2 emissions). Example for reduction measure: At our Antwerp site we completed a heat integration project at one plant (6,000 t CO2 emissions reduction).

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**Intensity figure**

0.579

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

20716000

**Metric denominator**

Other, please specify (metric ton of sales product)

**Metric denominator: Unit total**

35791000

**Scope 2 figure used**

Location-based

**% change from previous year**

2.7

**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. The metric numerator in 2017 was 20.716 million t CO2e, therefore we arrive at an intensity of 0.579 through  $(20,716,000/35,791,000) = 0.579$ . The value for 2016 was 0.564 (GHG emissions: 19.976 million t CO2e; sales products: 35.446 million t). +++ BASF increased its GHG emissions per metric ton of sales products in 2017 compared with 2016 by 2.7%. The volume of sales products increased by 1.0%. 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) increased by 3.7% in 2017. The increase of emissions resulted from the higher output (accounting for +1.7% of Scope 1+2 emissions, if taking BASF w/o Oil and Gas as a basis), acquisitions (+0.2% of Scope 1+2 emissions) and changes in standard operating conditions (+3.0% of Scope 1+2 emissions) which were slightly counterbalanced by lower emissions due to our emission reduction measures and divestments (-0.6% and -0.5% of Scope 1+2 emissions, respectively). Example for reduction measure: At our Antwerp site we completed a heat integration project at one plant (6,000 t CO2 emissions reduction).

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## C7. Emissions breakdowns

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## C7.1

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**(C7.1) Does your organization have greenhouse gas emissions other than carbon dioxide?**

Yes

### C7.1a

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**(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	17899000	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	48000	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	747000	IPCC Fourth Assessment Report (AR4 - 100 year)
Other, please specify (sum HFCs)	81000	IPCC Fourth Assessment Report (AR4 - 100 year)

## C7.2

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

Country/Region	Scope 1 emissions (metric tons CO2e)
Belgium	3818000
Brazil	105000
China	474000
France	66000
Germany	9252000
India	50000
Italy	62000
Japan	8000
Republic of Korea	395000
Spain	26000
United States of America	3891000
Other, please specify (Rest of world)	628000

## C7.3

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

By facility

### C7.3b

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**(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	7856000	49.49594	8.431191
Antwerp, Belgium	4383000	51.32405	4.285598
Kuantan, Malaysia	395000	3.967425	103.4237
Freeport, USA	1170000	29.00441	-95.3933
Geismar, USA	876000	30.21022	-91.0345
Rest of world	4095000		

**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	16969000	<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	565000	1215000	1938000	0
Brazil	25000	25000	275000	0
China	702000	702000	1345000	0
France	12000	99000	135000	0
Germany	438000	439000	1385000	0
India	54000	54000	70000	0
Italy	9000	9000	26000	0
Japan	42000	42000	103000	0
South Korea	283000	283000	736000	0
Spain	30000	11000	107000	0
United States of America	1106000	1100000	2409000	10000
Other, please specify (Rest of world)	530000	538000	1563000	0

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	565000	1214000
Kuantan, Malaysia	141000	141000
Freeport, USA	173000	173000
Geismar, USA	48000	48000
Rest of world	2869000	2941000

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	3747000	4468000	
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)	13	(i) 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, AR4, 2007. (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)	6900000	BASF is selling methane through its oil and gas subsidiary Wintershall.
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?**

Increased

**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.
Other emissions reduction activities	130000	Decreased	0.6	BASF's Scope 1 and Scope 2 emissions decreased by 130,000 metric tons (t) of CO2e in 2017 compared to 2016 due to emissions reduction activities implemented in 2017. Our total Scope 1 and Scope 2 emissions in 2016 was 21,978,000 t CO2e (note that this is a restated figure, value given in last year's reporting to CDP: 21,920,000 t CO2e), therefore we arrived at 0.6% through $(130,000/21,978,000)*100 = 0.6\%$ . Major drivers for the emission reduction have been measures to increase the energy efficiency of processes, and to reduce process emissions.
Divestment	100000	Decreased	0.5	The emissions from our operations decreased by 0.5% (corresponding to 100,000 metric tons of CO2e) in 2017 compared to 2016 due to the divestment of some businesses in several countries (e.g. China, Spain, and USA). For example, we divested our inorganic specialties business and therewith transferred a US production site, and we concluded the sale of a production site for electrolytes in China. Our total Scope 1 and Scope 2 emissions in 2016 was 21,978,000 t CO2e (note that this is a restated figure, value given in last year's reporting to CDP: 21,920,000 t CO2e), therefore we arrived at 0.5% through $(100,000/21,978,000)*100 = 0.5\%$ .
Acquisitions	45000	Increased	0.2	In 2017 BASF acquired several businesses in various countries (e.g. Germany, Switzerland, Mexico) which overall accounted for an increase of 0.2% (corresponding to 45,000 metric tons of CO2e) of our Scope 1 and Scope 2 emissions in comparison to 2016. For example, we took over the western European Construction Chemicals business from the Henkel group, and we completed the acquisition of GRUPO Thermotek, a leading manufacturer of waterproofing systems in Mexico. Our total Scope 1 and Scope 2 emissions in 2016 was 21,978,000 t CO2e (note that this is a restated figure, value given in last year's reporting to CDP: 21,920,000 t CO2e), therefore we arrived at 0.2% through $(45,000/21,978,000)*100 = 0.2\%$ .
Mergers	0	No change	0	Category not relevant in actual year-on-year comparison.
Change in output	330000	Increased	1.5	We raised sales volumes in 2017. If no measures to reduce emissions had been introduced, i.e. assuming that the GHG intensity of our various businesses in 2016 had continued to apply in 2017, the increased production would have resulted in an increase in Scope 1 and Scope 2 GHG emissions of 1.5% (corresponding to 330,000 metric tons of CO2e) in 2017 in comparison to 2016. Our total Scope 1 and Scope 2 emissions in 2016 was 21,978,000 t CO2e (note that this is a restated figure, value given in last year's reporting to CDP: 21,920,000 t CO2e), therefore we arrived at 1.5% through $(330,000/21,978,000)*100 = 1.5\%$ .
Change in methodology	0	No change	0	Category not relevant in actual year-on-year comparison.
Change in boundary	0	No change	0	Category not relevant in actual year-on-year comparison.
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	448000	Increased	2	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 2017, changes in local operating conditions resulted in a net increase of emissions of 2.0% (corresponding to 448,000 metric tons of CO2e) compared to 2016. Our total Scope 1 and Scope 2 emissions in 2016 was 21,978,000 t CO2e (note that this is a restated figure, value given in last year's reporting to CDP: 21,920,000 t CO2e), therefore we arrived at 2.0% through $(448,000/21,978,000)*100 = 2.0\%$ .

**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

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### C8.1

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**(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

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**(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	51188000	51188000
Consumption of purchased or acquired electricity	<Not Applicable>	10000	6341000	6351000
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	0	3741000	3741000
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0	<Not Applicable>	0
Total energy consumption	<Not Applicable>	10000	61270000	61280000

### C-CH8.2a

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**(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)	43418000
Consumption of purchased or acquired electricity	<Not Applicable>	6194000
Consumption of purchased or acquired heat	<Not Applicable>	<Not Applicable>
Consumption of purchased or acquired steam	<Not Applicable>	3741000
Consumption of purchased or acquired cooling	<Not Applicable>	<Not Applicable>
Consumption of self-generated non-fuel renewable energy	<Not Applicable>	0
Total energy consumption	<Not Applicable>	53353000

**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 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**

1094000

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

0

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

246000

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

848000

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

<Not Applicable>

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

0

**Fuels (excluding feedstocks)**

Diesel

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

189000

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

0

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

106000

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

83000

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

<Not Applicable>

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

0

---

**Fuels (excluding feedstocks)**

Distillate Oil

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

10000

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

0

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

2000

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

8000

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

<Not Applicable>

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

0

---

**Fuels (excluding feedstocks)**

Natural Gas

**Heating value**

LHV (lower heating value)

**Total fuel MWh consumed by the organization**

44615000

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

455000

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

13373000

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

4610000

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

<Not Applicable>

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

26177000

---

**Fuels (excluding feedstocks)**

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

**Heating value**

LHV (lower heating value)

---

**Total fuel MWh consumed by the organization**

5280000

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

0

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

0

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

5280000

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

<Not Applicable>

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

0

---

C8.2d

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**(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**

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**(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	10550000	8763000	0	0
Heat	13727000	13727000	0	0
Steam	38476000	35964000	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	8538000	8538000
Heat	11542000	11542000
Steam	35244000	35244000
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**

Solar PV

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

10000

**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 feedstock)

**Total consumption**

11000000

**Total consumption unit**

metric tons

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

3.1

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

12.8

**Heating value**

LHV

**Comment**

The breakdown of our feedstock mix is considered confidential business information. Therefore, we present the sum of feedstock as well as a weighted average emission factor and heating value. Note that all carbon feedstock is not combusted to result in CO2 emissions but used as a raw material 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	66
Natural Gas	8
Coal	0
Biomass	5
Waste	0
Fossil fuel (where coal, gas, oil cannot be distinguished)	21
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.

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**(C-CH9.6) Disclose your organization's low-carbon investments for chemical production activities.****Investment start date**

January 1 2017

**Investment end date**

December 31 2017

**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**

9300000

**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 2017

**Investment end date**

December 31 2017

**Investment area**

Property, plant and equipment

**Technology area**

Other, please specify (Material consumption reduction)

**Investment maturity**

Large scale commercial deployment

**Investment figure**

9000000

**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 2017

**Investment end date**

December 31 2017

**Investment area**

R&amp;D

**Technology area**

Other, please specify (R and 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**

1888000000

**Low-carbon investment percentage**

41 - 60%

**Please explain**

R and 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 and D investment in the focus area "resources, environment and climate" has been stable at about 50% of the total R and 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 2017

**Investment end date**

December 31 2017

**Investment area**

Products

**Technology area**

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

**Investment maturity**

Large scale commercial deployment

**Investment figure**

8262000000

**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

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### C10.1

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**(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**

BASF CDP Letter 2017.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**

BASF CDP Letter 2017.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**

BASF CDP Letter 2017.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**

BASF CDP Letter 2017.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**

BASF CDP Letter 2017.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**

BASF CDP Letter 2017.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**

BASF CDP Letter 2017.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**

BASF CDP Letter 2017.pdf

**Page/section reference**

1-7

**Relevant standard**

ISAE 3410

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## C10.2

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**(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 SRS in the "BASF Report 2017", published under <a href="http://www.bericht.basf.com/2017/en">www.bericht.basf.com/2017/en</a> , was 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 SRS in the "BASF Report 2017", published under <a href="http://www.bericht.basf.com/2017/en">www.bericht.basf.com/2017/en</a> , was 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 SRS in the "BASF Report 2017", published under <a href="http://www.bericht.basf.com/2017/en">www.bericht.basf.com/2017/en</a> , was subject of the assurance engagement. +++ Reference to CDP question number: C7.9 +++ Type of verification and frequency: limited assurance, annual process

## C11. Carbon pricing

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### C11.1

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**(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

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**(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

72.5

### Period start date

January 1 2017

### Period end date

December 31 2017

### Allowances allocated

11800265

### Allowances purchased

0

### Verified emissions in metric tons CO2e

13610581

### Details of ownership

Facilities we own and operate

### Comment

## Korea ETS

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

10.9

### Period start date

January 1 2017

### Period end date

December 31 2017

### Allowances allocated

2001704

### Allowances purchased

41000

### Verified emissions in metric tons CO2e

2041831

### Details of ownership

Facilities we own and operate

### Comment

## Shanghai pilot ETS

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

6.2

### Period start date

January 1 2017

### Period end date

December 31 2017

### Allowances allocated

1093995

### Allowances purchased

35000

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

1159202

### 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 2017

### Period end date

December 31 2017

### Allowances allocated

30608

### Allowances purchased

6529

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

40138

### 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 2017

**Period end date**

December 31 2017

**% of emissions covered by tax**

0.01

**Total cost of tax paid**

45000

**Comment**

**Switzerland carbon tax**

**Period start date**

January 1 2017

**Period end date**

December 31 2017

**% of emissions covered by tax**

0.2

**Total cost of tax paid**

36000

**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 Münster and Düsseldorf, which are covered by the EU ETS scheme, we managed to reduce absolute GHG emissions by about 12,000 tons in total compared to 2016, through various emission reduction activities. We could thus reduce the financial impact through the purchase of additional allowances by about € 70,000, assuming an average certificate price of 6 € per ton CO<sub>2</sub>. 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

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

Yes

**C11.2a**

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**(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**

Energy efficiency: industry

**Project identification**

BD5125 Improving Kiln Efficiency in the Brick Making Industry in Bangladesh

**Verified to which standard**

CDM (Clean Development Mechanism)

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

568

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

568

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Biomass energy

**Project identification**

NP5415 Biogas Support Program - Nepal Activity-3

**Verified to which standard**

CDM (Clean Development Mechanism)

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

296

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

296

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Biomass energy

**Project identification**

NP5416 Biogas Support Program - Nepal Activity- 4

---

**Verified to which standard**

CDM (Clean Development Mechanism)

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

1228

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

1228

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Other, please specify (Energy efficiency)

**Project identification**

BD2765 Installation of Solar Home Systems in Bangladesh

**Verified to which standard**

CDM (Clean Development Mechanism)

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

8480

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

8480

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Energy efficiency: industry

**Project identification**

MD173 Energy efficiency and fuel switching measures for buildings

**Verified to which standard**

CDM (Clean Development Mechanism)

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

171

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

171

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Energy efficiency: industry

---

**Project identification**

BD6085 Improving Kiln Efficiency in the Brick Making

**Verified to which standard**

CDM (Clean Development Mechanism)

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

216

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

216

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Geothermal

**Project identification**

KE3773 Olkaria II Geothermal Expansion Project

**Verified to which standard**

CDM (Clean Development Mechanism)

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

1380

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

1380

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

**Project type**

Hydro

**Project identification**

CN904 Guangrun Hydropower Project in Hubei Province P.R.China

**Verified to which standard**

CDM (Clean Development Mechanism)

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

1807

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

1807

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

**Credit origination or credit purchase**

Credit origination

---

**Project type**

Energy efficiency: own generation

**Project identification**

PK1713 Based Renewable Energy Development in Pakistan

**Verified to which standard**

CDM (Clean Development Mechanism)

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

146

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

146

**Credits cancelled**

No

**Purpose, e.g. compliance**

Compliance

---

## C11.3

---

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

Yes

## C11.3a

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**(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 SCC 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

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### 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**

6

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

39

**% 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. In 2017, we reviewed our evaluation methods for high-risk suppliers in order to focus even more closely on relevant issues. For example, we increased the weighting of industry- and country-specific risks in the evaluation to avoid the ambiguities in the previous system. One of these ambiguities was that our former risk approach did not provide enough risk differentiation. The proportion of relevant suppliers evaluated by the end of 2017 in accordance with the new risk approach was 56%.

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

How success is measured: 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. Impact of engagement: Of all the suppliers assessed online in 2017, 51% reported on energy use and GHG emissions. Some suppliers also reported on their ISO 50001 certification and on their participation in the CDP program. During TfS on-site audits, suppliers' internal policies, reports, prevention devices and testing methods are examined against standard procedures for emission prevention, measurement, and control. Moreover, we count on reliable supply relationships and want to make our suppliers' contribution to sustainable development transparent. In order to achieve this, we set ourselves an ambitious goal: 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 2017 in accordance with the new risk approach was 56%. In addition, the topic of climate change is an explicit component of BASF's sourcing strategies, because of its potential to drive sustainability. This means that, when elaborating a procurement strategy, buyers are required to consider potential threats and opportunities related to climate change. Examples of positive outcomes of active engagement with individual suppliers: 1) BASF has supported three different suppliers with the development and implementation of low-weight composite tanks. This reduction of tank weight enables a higher load capacity, which positively impacts the amount of freight transported. Compared to the former tanks, BASF suppliers have achieved an emission reduction of up to 10% per transport operation. 2) BASF's pro-active engagement with the new set-up of Bromotrifluoromethane supply and handling has led to the residue free draining of this ozone-depleting substance and potent GHG in unloading operations, avoiding unnecessary transportation of residual gas back to the supplier and incineration at the supplier's premises.

**Comment**

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**C12.1b**

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

**Type of engagement**

Education/information sharing

**Details of engagement**

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

### Size of engagement

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 all 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 percentage within the sales volume. By 2020, we aim to raise the proportion of sales from Accelerator products to 28% (status 2017: 27.3%). (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 23 climate protection product groups revealed that customers’ use of products sold in 2017 helped to avoid 570 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, 6% of the emissions avoided were attributable to BASF in 2017. (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.

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### Type of engagement

Collaboration & innovation

### Details of engagement

Run a campaign to encourage innovation to reduce climate change impacts

### Size of engagement

### % 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.

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**Type of engagement**

Collaboration & innovation

**Details of engagement**

Other – please provide information in column 5

**Size of engagement**

**% 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 MasterFiber at the precast manufacturer Uniblok shows that using BASF's solution is able to increase efficiency of production by 10%, reduce the weight of steel by 20% and come up with 21% lower global warming potential. 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.

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**C12.3**

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**(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**

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**(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. In China, we worked actively and closely with industry bodies to have direct dialogue with the government and preparation for the coming national ETS. BASF was invited by local authorities in China to share experience and give training to enterprises potentially enrolled in the national ETS. 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. In China, we support the development of certificate allocation methodologies that prevent burdening of the best installations.
Energy efficiency	Support with minor exceptions	In the EU, our engagement has been focused on the revision of the EPBD (Energy Efficiency of Buildings Directive) and the EED (Energy Efficiency Directive). We openly explain our positions at public meetings, in associations and in discussions with individual political decision makers and other stakeholders, give presentations at international conferences and contribute to case studies and publications and join Twitter discussions. We gave presentations on best practices for voluntary energy efficiency measures in industry, based on our own experiences. We have promoted building standards and financial support for energy-efficient, sustainable buildings in all world regions and strive to open up the EPBD for new technologies. We have engaged in sustainable buildings labels (LEED, DGNB, BREAM etc.) and participated in projects that demonstrate how low-energy houses are realistically achievable and cost-effective over time. We engage in green building councils and in projects with different players of the value chain (e.g., housing companies, construction companies, architects) to develop, demonstrate and educate about low energy building. We use these projects as demonstration towards public authorities. Our subsidiary BASF Bauen und Wohnen thermally renovated nearly 40% of the building stock in 15 years – demonstrating the positive effects of building renovation often questioned by politicians. In the US, the Energy Savings and Industrial Competitiveness Act enjoyed BASF support for key provisions on energy efficiency. In particular, the legislation would authorize a pilot program to allow consumers to value efficiency features in mortgage underwriting, encourage the Department of Energy to advance efficiency through model building codes and accelerate the utilization of holistic efficiency measures in federal buildings. Besides that, BASF advocated for restored funding for US Department of Energy programs which were subject of planned cutbacks by the federal government.	While the EED Impact Assessment clearly identifies the need to double the rate of building renovation to achieve the target, the revised EPBD adopted in 2018 will have a positive impact on renovation activity but without fully securing the required increase. Thus, the transition of the EPBD into national law should better define targets and milestones for the renovation of the building stock towards a highly energy efficient and decarbonized building stock in 2050. The EED target must allow for industrial growth and avoid additional cost burdens on industry. Industrial recession is the main factor behind the energy consumption reduction since 2007. An overarching target counting reduction of industrial activity as energy efficiency gain poses a risk – especially, when other sectors do not deliver. Energy-intensive industry should be excluded from an absolute consumption target or the target needs to be breathing with industrial activity. The focus must be on real efficiency gains. Otherwise such a target may lead to additional cost burdens, limit growth and may export economic production to other regions.
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. Moreover, we have been engaged at If.E (Innovationsforum Energiewende - an initiative of the chemical trade union together with German industry) to strengthen innovation. 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

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**(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, or are you attempting to, influence the 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

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**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, or are you attempting to, influence the 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))

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**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, or are you attempting to, influence the position?**

Membership and input in relevant working groups

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**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, or are you attempting to, influence the position?**

Membership and input in relevant working groups

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**Trade association**

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

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

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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, or are you attempting to, influence the position?**

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

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**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, or are you attempting to, influence the position?**

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

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**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, or are you attempting to, influence the position?**

Membership and input in relevant working groups

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**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, or are you attempting to, influence the 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.

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**Trade association**

PUEurope

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

Mixed

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

Support of legislation and funding for energy efficiency of buildings (fully consistent) and sometimes for an energy cap (inconsistent)

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

Membership and input in relevant working groups/board

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## C12.3d

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

No

## C12.3e

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### (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:

- Chair/Co-Chair of the Business-20 (B20) Energy, Climate and Resource Efficiency Taskforce
- Membership in CEO Climate Leaders Alliance
- 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"
- Member of Innovation Forum Energy Shift (Innovationsforum Energiewende)

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

- Consultation on ETS Innovation Fund
- Input to the German Society for Chemical Engineering and Biotechnology (Dechema) Study „Low Carbon energy and feedstock for the European Chemical Industry“ (DECHEMA 2017)
- Input to BDI study “Klimapfade für Deutschland” (BDI 2018)
- Input to the Dena-Study „Integrierte Energiewende“ (dena 2017),
- Interviews and data sharing with scientific organizations about future options for GHG reduction in the chemical industry

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

- Contribution to UN Global Compact German Yearbook with an article on climate action
- Participation in Panel Discussions at COP 23
- Presentation at Argus Emissions Market Conference, Amsterdam
- Participation in scientific conferences on reduction of carbon emissions in industry and usage of CO<sub>2</sub>
- 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

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### **(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

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**(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\_2017.pdf

**Content elements**

Governance

Strategy

Risks & opportunities

Emissions figures

Emission targets

Other metrics

Other, please specify (Value chain engagement)

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**Publication**

In voluntary communications

*BASF website section sustainability - Landing page export <https://www.basf.com/en/company/sustainability/environment/energy-and-climate-protection.html>*

**Status**

Complete

**Attach the document**

Energy and Climate Protection.pdf

**Content elements**

Governance

Strategy

Emissions figures

Emission targets

Other metrics

Other, please specify (Value chain engagement)

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## C14. Signoff

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### C-FI

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**(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

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**(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

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