

Module: Introduction**Page: Introduction****CC0.1****Introduction**

Please 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 114,000 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 & Solutions, Agricultural Solutions and Oil & Gas. In 2016, BASF posted sales of €57.6 billion and income from operations before special items of approximately €6.3 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.

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 2016, we achieved a reduction of 37.2%. Since 1990, we have been able to lower our overall greenhouse gas emissions from chemical operations by 50% 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 2016: 42.3%).

We also offer solutions that help our customers to avoid greenhouse gas emissions. For example, customers' use of products from 24 climate protection product groups sold in 2016 avoids 540 million metric tons of CO₂e according to our estimations. We invest about half of our annual R&D expenditures (€1.863 billion total

R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection.

Forward-Looking Statements:

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

CC0.2

Reporting Year

Please state the start and end date of the year for which you are reporting data.

The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.

We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.

Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed
Fri 01 Jan 2016 - Sat 31 Dec 2016

CC0.3

Country list configuration

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

Select country

CC0.4

Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

EUR(€)

CC0.6

Modules

As part of the request for information on behalf of investors, companies in the electric utility sector, companies in the automobile and auto component manufacturing sector, companies in the oil and gas sector, companies in the information and communications technology sector (ICT) and companies in the food, beverage and tobacco sector (FBT) should complete supplementary questions in addition to the core questionnaire.

If you are in these sector groupings, the corresponding sector modules will not appear among the options of question CC0.6 but will automatically appear in the ORS navigation bar when you save this page. If you want to query your classification, please email respond@cdp.net.

If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below in CC0.6.

Further Information

Module: Management

Page: CC1. Governance

CC1.1

Where is the highest level of direct responsibility for climate change within your organization?

Board or individual/sub-set of the Board or other committee appointed by the Board

CC1.1a

Please identify the position of the individual or name of the committee with this responsibility

- i) Michael Heinz, Board member and Industrial Relations Director, responsible for Environment, Health and Safety, has the overall responsibility for climate protection. He chairs BASF's Corporate Sustainability Board (CSB), which is BASF's central steering committee for sustainable development, including climate protection. 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.
- ii) Dr. Beate Ehle, President of the Functional Division Environment, Health and Safety, is BASF's Climate Protection Officer. She reports directly to Michael Heinz and is a member of the CSB. The Functional Division integrates major global functionalities required for preparing decisions of the CSB on climate protection, such as corporate environmental goal setting, controlling and reporting, energy efficiency activities and climate change monitoring.

CC1.2

Do you provide incentives for the management of climate change issues, including the attainment of targets?

Yes

CC1.2a

Please provide further details on the incentives provided for the management of climate change issues

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Director on board	Monetary reward	Emissions reduction target Efficiency target	
Corporate executive team	Monetary reward	Emissions reduction target Efficiency target	

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Executive officer	Monetary reward	Emissions reduction project Energy reduction project Efficiency project Other: Further individual operative / strategic targets concerning climate-related activities, e.g. sales of climate protection products	
Environment/Sustainability managers	Monetary reward	Other: Individual targets concerning climate-related projects or activities	
Process operation managers	Monetary reward	Emissions reduction project Energy reduction project Efficiency project	
Other: Marketing manager/account executive	Monetary reward	Other: Individual targets on sales of climate protection products	
Other: Project leaders R&D	Monetary reward	Other: Individual targets on the development of new products for climate protection and adaptation to climate change	
All employees	Monetary reward	Other: 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 2016 result in an annual greenhouse gas emission reduction of about 17,500 metric tons of CO2e.	

Further Information

CC2.1

Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

CC2.1a

Please provide further details on your risk management procedures with regard to climate change risks and opportunities

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	Global: BASF's multinational operations require to consider climate change basically across the whole world. This coverage is facilitated via 57 global and regional business units, as well as central research, functional and corporate units, interlinked in a matrix-type structural setup.	> 6 years	Corporate Controlling and Finance informs BASF Group's management twice a year on the aggregated opportunity/risk exposure of the BASF Group. The climate-related exposure assessment is provided by the BASF Management Team for Climate Protection, including experts from environment, health and safety (EHS), corporate sustainability strategy, advocacy, corporate technology, investor relations, new business, procurement, and regional representatives. If a 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.

CC2.1b

Please describe how your risk and opportunity identification processes are applied at both company and asset level

BASF's risk management process applies to the company as well as to assets. The BASF Management Team for Climate Protection (MTCP) is the central platform meeting 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.

Asset level:

Regulatory/carbon-market: A team of experts from BUs and central functions analyses emission certificate costs for all BASF plants included in the EU ETS. A similar process is in place worldwide for locations with significant BASF production sites to evaluate the impact of existing/planned carbon regulations. As these costs pose a significant risk to BASF, an annual report is prepared for the Board of Executive Directors.

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.

CC2.1c

How do you prioritize the risks and opportunities identified?

Risks and opportunities are evaluated based on three major aspects:

- their potential financial implications for BASF,
- the ability to threaten BASF's license to operate,
- the probability of occurrence.

We have defined the magnitude of impact to be linked to the following net financial implications for BASF's EBIT: High > €100 million, Medium-high = €10-100 million, Medium = €2-10 million, Low-medium < €2 million and Low = insignificant. A specific risk or opportunity is considered material, if the resulting deviation from planned earnings exceeds €2 million. If a 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.

CC2.1d

Please explain why you do not have a process in place for assessing and managing risks and opportunities from climate change, and whether you plan to introduce such a process in future

Main reason for not having a process	Do you plan to introduce a process?	Comment
--------------------------------------	-------------------------------------	---------

CC2.2

Is climate change integrated into your business strategy?

Yes

CC2.2a

Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process

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). This includes the status check for the emission reduction 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. Three major internal reporting lines are used continuously to collect and report 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, acting as BASF’s Climate Protection Officer (CPO). The CPO 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 CPO 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. Example how the business strategy has been influenced

Energy efficiency is a key strategic element, both in terms of cost reduction as an energy-intensive company and as a contribution to reduce emissions. Therefore, we have set a new energy efficiency target in 2015: 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. In 2016, we have continued to roll out measures supporting to achieve this target. For example, external audits in accordance with ISO 50001 were conducted at the first two Chinese sites, and we started up new CHP plants at several sites. These efforts contribute to our ongoing emission reduction target, which constitutes an essential part of our business strategy.

iii. Aspects influencing the strategy

Major climate related aspects influencing the strategy are regulatory changes, reputation and customer-related risks and opportunities. The importance of the different aspects varies depending on the business unit (BU). (1) BUs that supply base chemicals are particularly influenced by carbon market regulations. (2) BUs providing climate protection solutions are more strongly influenced by market-development opportunities and thus focus on the further development and promotion of these products.

iv. Influence on short-term strategy (<2 years)

The implementation of projects for increase of energy efficiency and reduction of raw material demand, which are closely linked to reduction of GHG emissions, is an ongoing process. It contributes significantly to the continuous improvement of our operational excellence representing an objective of our short-term strategy. The awareness for these projects and their relevance have clearly increased through consideration of the co-benefit for climate protection.

Our communication is also influenced by climate change. For example, exchange on product carbon footprint data has become more relevant in customer relationships.

v. Influence on long-term strategy (10+ years)

Climate change influences our long-term investment decisions. We have integrated an impact assessment of potential GHG emissions from new/expanded plants in the wider decision-making process within the BASF committee in charge of investment project approvals. This assessment includes, for example, long-term expectations on carbon policies and carbon pricing, as well as the effect on our climate protection target.

Long-term business opportunities and risks from changing market demands are integrated in the R&D and product portfolio strategies of the BUs. We want to increase the share of sales from our products that contribute particularly to sustainability in the value chain ("Accelerators") and have backed this claim with a separate target (proportion of sales from Accelerator products in 2020: 28%). Accelerators "Climate Change & Energy" reflect our wide portfolio of climate protection products helping to reduce GHG emissions or increase energy efficiency.

vi. Strategic advantage

The strategy has led to early action on energy efficiency and GHG emission reduction in production, resulting in above-average efficiency of our plants and a higher resilience against production cost increase through carbon pricing compared to our competitors. Moreover, integration of opportunities for climate protection products into the long-term business strategies offers early mover advantages for our solutions in the marketplace. Our activities also enhance awareness of external stakeholders, positioning us a leading solution provider, which is also underpinned by top scores in major sustainability ratings (e.g. inclusion in DJSI, listing in FTSE4Good Index Series).

vii. Examples of substantial business decisions in 2016

We established a joint venture with Avantium to offer bio-based furandicarboxylic acid as a low-carbon solution to our customers and thus exploit climate-related business opportunities, which was the aspect of climate change that has influenced the business decision. Further, we entered the market for advanced carbon materials with acquisition of EnerG2 to expand our portfolio of solutions for large battery producers and thus drive the transition to a low-carbon energy system, again pursuing climate-related business opportunities.

viii. Influence of Paris Agreement

The Paris Agreement (PA) has confirmed our early action for climate protection and that we have established the right strategy and measures. This comprises our research priorities and organizational set-up to steer the process. We expect that the PA will lead to more significant global changes in the mid- to long-term if countries start ratcheting up climate protection efforts in line with the overall goal. We are monitoring developments in all regions and will advance our approach accordingly.

ix. Use of forward-looking scenarios

We use forward-looking scenarios for a range of corporate tasks, e.g. planning of large capital investments, strategic planning and risk and opportunities assessment. We consider scenarios with a higher ambition for climate protection than currently observed for some of these tasks (e.g. strategic planning), and a 2°C

scenario is also discussed in this context.

CC2.2b

Please explain why climate change is not integrated into your business strategy

CC2.2c

Does your company use an internal price on carbon?

Yes

CC2.2d

Please provide details and examples of how your company uses an 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 focus is on 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 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.

CC2.3

Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)

Direct engagement with policy makers
Trade associations
Funding research organizations

Other

CC2.3a

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 major exceptions	<p>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. We exchanged knowledge with visitors from Korea and China in Europe. and participated in bilateral meetings in Korea to inform about experiences with the European ETS and help to establish meaningful ETS systems globally. We advocate for global carbon pricing (e.g. as chair of the B20 Energy, Climate & Resource Efficiency Taskforce).</p>	<p>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 carbon-neutral production. We know the ETS reaches its goal (GHG reduction); but we support a better design of the ETS and a better harmonization between different energy and climate policies past 2020. EU climate goals must refocus 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.</p>
Energy efficiency	Support with minor exceptions	<p>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. We have participated in stakeholder consultations. 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</p>	<p>EPBD and the ETS need to be better aligned. While the EED Impact Assessment clearly identifies the need to double the rate of building renovation to achieve the target, the EPBD foresees a much lower increase of renovation activity. Thus, the EPBD should better secure the contribution of buildings to energy efficiency increase. 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</p>

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
		<p>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 US Energy Policy Modernization Act of 2016 enjoyed BASF support for key provisions on energy efficiency. In particular, the legislation would 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.</p>	<p>efficiency gains. Otherwise such a target may lead to additional cost burdens, limit growth and may export economic production to other regions.</p>
Clean energy generation	Support with major exceptions	<p>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.</p>	<p>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. BASF promotes fracking, as a substitution of coal by gas can significantly lower GHG emissions.</p>

CC2.3b

Are you on the Board of any trade associations or provide funding beyond membership?

Yes

CC2.3c

Please enter the details of those trade associations that are likely to take a position on climate change legislation

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
ICCA (International council of chemical associations)	Consistent	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.	i. Support new studies on energy savings by products of the chemical industry and promotion of relevant ICCA studies (Buildings Roadmap, Catalysis Roadmap, Bio Roadmap), to which BASF contributed; ii. Support of ICCA positioning and communication at COP 22; iii. Contribution to guidelines and best-practice examples: Life-cycle analysis, carbon accounting and reporting
Cefic (European chemical industry council)	Consistent	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.	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)
ACC (American chemistry council)	Consistent	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.	Membership and input in relevant working groups
ERT (European Round Table of Industrialists)	Consistent	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.	Membership and input in relevant working groups
VCI (Verband der chemischen Industrie, German chemical industry association)	Consistent	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.	Membership and input in relevant working groups/board
WBCSD (World business council for sustainable)	Consistent	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	i. Membership and input in relevant working groups; ii. Support promotion of relevant WBCSD documents, e.g. at the COP 22; iii. Contribution to guidelines and best-practice

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
development)		carbon accounting and through the introduction of global carbon pricing mechanisms.	examples, e.g. life-cycle analysis
BE (Business Europe) and German BDI	Consistent	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.	Membership and input in relevant working groups
CBCSD (China Business Council for Sustainable Development)	Consistent	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.	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.
PUEurope	Consistent	Support of legislation and funding for energy efficiency of buildings (fully consistent) and sometimes for an energy cap (inconsistent)	Membership and input in relevant working groups/board

CC2.3d

Do you publicly disclose a list of all the research organizations that you fund?

No

CC2.3e

Please provide details of the other engagement activities that you undertake

Engagement in working groups, for example:

- Chair of the Business-20 (B20) Energy, Climate and Resource Efficiency Taskforce
- 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 & Climate Issues"
- Member of Innovationsforum Energiewende

Contribution to consultations and external studies, for example:

- Public consultation on the recommendations of the Task Force on Climate-Related Financial Disclosures
- Case study for the European Commission's new platform for promoting the benefits of energy efficiency in industry
- Commenting on the draft of the International Energy Agency's "Energy Technology Perspectives"
- Input to the German Society for Chemical Engineering and Biotechnology (Dechema) work on new climate-neutral technologies

Publications, conferences, and other public relations work, for example:

- Peer reviewed article in journal "Chemie in unserer Zeit" on climate change and politics
- Panel discussion on energy and climate change in ZEIT conference "Energie und Klimaschutz"
- Panel discussion on German-Chinese Dialogforum Energiewende
- Presentation at Argus Emissions Market Conference
- 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

CC2.3f

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, who acts as BASF's Climate Protection Officer 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 & 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.

CC2.3g

Please explain why you do not engage with policy makers

Further Information

Page: CC3. Targets and Initiatives

CC3.1

Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?

Intensity target

CC3.1a

Please provide details of your absolute target

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment
----	-------	-------------------------	----------------------------	-----------	--	-------------	---------------------------------	---------

CC3.1b

Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int1	Scope 1+2 (location-based)	93%	40%	Metric tonnes CO2e per metric tonne of product	2002	0.897	2020	Yes, but this target has not been approved as science-based by the Science Based Targets initiative	The target applies to BASF's global business without our oil and gas activities that are bundled in the Wintershall Group. The target covers all GHG emissions from the six Kyoto gases CO2, N2O, CH4, HFCs, PFCs, and SF6. In 2013 NF3 has been added to the GHG Protocol standard. Our operations do not require or result in the generation of NF3, so that the target definition is unaffected by this amendment. +++ 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 Decarbonisation 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.

CC3.1c

Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	Decrease	9.7			The provided estimate for BASF's future absolute GHG emissions applies to our global business without the Oil & Gas segment Wintershall. It is based on an assumed production volume growth of 4% per year for BASF, considering the volume of sales products in 2016 as starting point for the estimation.

CC3.1d

Please provide details of your renewable energy consumption and/or production target

ID	Energy types covered by target	Base year	Base year energy for energy type covered (MWh)	% renewable energy in base year	Target year	% renewable energy in target year	Comment
----	--------------------------------	-----------	--	---------------------------------	-------------	-----------------------------------	---------

CC3.1e

For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Int1	78%	93%	

CC3.1f

Please explain (i) why you do not have a target; and (ii) forecast how your emissions will change over the next five years

CC3.2

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

CC3.2a

Please 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	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Company-wide	<p>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 24 product groups and their respective global sales volumes in 2016 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.</p> <p>+++ Building & 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. +++</p> <p>Mobility: BASF's fuel additives sold under the trademark Keropur® are mixed in small quantities with the fuel and produce better combustion in the engine. Thus, fuel consumption is reduced and premature wear on the engine is prevented, which in turn reduces the</p>	Avoided emissions	Addressing the Avoided Emissions Challenge-Chemicals sector	5%	More than 40% but less than or equal to 60%	<p>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 2016, we calculated that the use of the 24 climate protection product groups that were sold in the reporting year enables customers to reduce their emissions from 1,110 to 570 million metric tons of CO₂e, thus preventing 540 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</p>

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
	<p>output of pollutants and greenhouse gases. +++ 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: BASF's nitrification inhibitor ensures that the ammonium contained in fertilizers is metabolized more slowly by bacteria in the soil, thus resulting in a reduction in nitrous oxide. The fertilizer can supply crops with nutrients more efficiently, and the crop requires fertilization much less frequently. This decreases greenhouse gas emissions.</p>					<p>contribution of our climate protection products to their respective value chain using an economic allocation approach and concluded that on average 11% of the emissions avoided in 2016 are attributable to BASF.</p>

CC3.3

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

Yes

CC3.3a

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	63	
To be implemented*	250	290000
Implementation commenced*	59	100000
Implemented*	328	345000
Not to be implemented	65	

CC3.3b

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Processes	<p>In 2016, our global Energy Management Team has initiated and controlled the implementation of more than 150 individual measures in different plants all over the world that result in savings of fuel, electricity, steam, cooling water etc. The projects included a wide range of energy conservation measures, including chemical process modifications, process heat integration, advanced process control systems implementation, general energy conservation practices, including lighting and steam traps, incinerator fuel reductions, new combined heat and power plants, boiler efficiency upgrades, tower packing replacement, HVAC upgrades and others. For example, an additional burner upgrade at our US steamcracker operated as joint venture with Total Petrochemicals led to fuel savings and corresponding CO2 emissions reduction of 20,000 tons (t) per year. At the HDO/Neol unit at our Freeport site we achieved almost 10,000 t CO2 emission reduction by process control and incineration optimization. Use of purge gas for steam generation instead of flaring at our Syngas plant at Ludwigshafen site avoided 15,000 t CO2. In the Asia Pacific region, operations adjustments at TDI plant at Korean Yeosu site resulted in almost 7,000 t CO2 reduction. Another</p>	175000	Scope 1 Scope 2 (location-based) Scope 2 (market-based)	Voluntary	23600000	21800000	1-3 years	Ongoing	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	core area of improvement was electricity and steam generation. In total 3 new cogeneration units to produce heat and electricity were put in operation in 2016 at the European sites (Pontecchio-Marconi, Illertissen, Düsseldorf-Holthausen) with resulting CO2 savings of more than 20,000 t. All of these exemplary activities are part of our long-existing global energy efficiency management and operational excellence program. The ideas for the measures are generated in individual energy efficiency analyses of the production processes that are initiated by the Energy Efficiency Team. This is even more pronounced with the further implementation of ISO 50001 certified energy management systems globally. Support for decisions on implementation and central controlling of the annually implemented measures is also handled by this team. The monetary savings reported here stem from the reduced energy consumption and relate only to those measures implemented in 2016.								
Other	In 2016, we have initiated and implemented 170 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.	170000	Scope 3	Voluntary	31700000	21500000	<1 year	Ongoing	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
	reduces our corporate carbon footprint in Scope 3 (category 1). For example, we optimized the catalyst in a petrochemical plant in our Geismar site resulting in higher selectivity and therefore less raw material consumption. In another plant in our Antwerp site, we improved the control concept by implementing a model predictive controller leading to increased plant stability and reduced raw material consumption. In our Lampertheim site we introduced online-GC analytics in a distillation process leading to reduced solvent losses.								

CC3.3c

What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Dedicated budget for low carbon product R&D	We invest about half of our annual R&D expenditures (€1.863 billion total R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection. For example, we have developed a new acrylic resin that can be processed in a simple and especially environmentally friendly manner; the only by-product generated is water.

Method	Comment
Partnering with governments on technology development	BASF is involved in several government sponsored R&D initiatives on new technology development. For example, in 2016 we founded the Advanced Research Center Chemical Building Blocks Consortium (ARC CBBC) together with other members from industry, the Netherlands Ministry of Economic Affairs, as well as other key knowledge institutes. ARC CBBC's mission includes research on new processes and products aimed at energy-efficient processes, use of sustainable and green raw materials, and alternative energy carriers and components for chemical building blocks. Another example is the EU-supported project PRODIAS where we investigate white biotechnology methods and processes that allow products based on renewable materials to be produced efficiently and with fewer resources.
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 m ³ 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.

If you do not have any emissions reduction initiatives, please explain why not

Further Information

Page: CC4. Communication

CC4.1

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	Status	Page/Section reference	Attach the document	Comment
In mainstream reports (including an integrated report) but have not used the CDSB Framework	Complete	Chapter "Energy and Climate Protection" in the BASF 2016 annual report, pp. 103-106	https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/CC4.1/BASF_Report_2016.pdf	
In voluntary communications	Complete	Company Internet, start page of relevant section: http://www.basf.com/climate_protection	https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/CC4.1/BASF Website Part Energy and Climate Protection_2017-06.pdf	

Further Information

Module: Risks and Opportunities

Page: CC5. Climate Change Risks

CC5.1

Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

- Risks driven by changes in regulation
- Risks driven by changes in physical climate parameters
- Risks driven by changes in other climate-related developments

CC5.1a

Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
International agreements	The Paris Agreement foresees to limit global warming to "well below two degrees". If forced unilaterally, related policy measures on national or regional level pose a risk to BASF as an energy-intensive company. The EU and especially Germany, where BASF has its largest assets, pose the highest burden on industry.	Increased operational cost	3 to 6 years	Direct	Very likely	High	We estimate that policy changes might lead to additional costs in the order of €100-300 million per year. Details are given in the following rows.	BASF applies a range of methods to manage this risk: i) Emission reductions – pushed by respective corporate targets. +++ ii) Engagement with policymakers (e.g. for global carbon pricing). +++ iii) An internal carbon pricing for investment decision. +++ iv) Check of portfolio and R&D to reduce exposure to carbon risks. Details are given in the following rows.	No significant additional costs, activities are mainly part of our usual business and therefore covered by our personnel expenses. Examples for individual management methods are given in the following rows.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Risks result from (a) increasing operating costs due to unilateral carbon pricing, (b) competitive disadvantage compared to peers based in countries with lower standards, (c) inability to pass on costs in a global market. Details are given in the following rows.								
Cap and trade schemes	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. Costs are resulting from a lack of free allowances even for the best performers, increasing prices for the certificates which we will have	Increased operational cost	3 to 6 years	Direct	Likely	Medium-high	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	i) We mitigate the direct impact of cap and trade schemes and carbon taxes by reducing our GHG emissions in line with our respective target: -40% specific GHG emissions by 2020 compared to 2002 (BASF excl. Oil & Gas). Increasing our energy efficiency is a key contribution to GHG emission reduction and therefore backed by a separate target:	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)

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	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). According to Commission suggestions, from 2020 onwards even the most efficient plants will not get sufficient free allowances, e.g. due to flat-rate benchmark adaptations not reflecting technological realities (e.g. for ammonia, steamcrackers or heat), Carbon Leakage classification (e.g. for hydrogen, which is not traded in large amounts, but part of the						assessment of the EU Commission, BASF would face additional annual costs of €50-100 million. Administrative costs are in the order of €2 million .	cover 90% of our primary energy demand with certified energy management systems, ISO 50001, by 2020 (BASF incl. Oil & Gas). Each year multiple projects are assessed, kicked off and implemented to improve our GHG emission performance. For example, in 2016 more than 65 energy efficiency measures were implemented in Europe. +++ ii) We actively engage with decision makers and governments at the regional, federal, and European level on climate and energy-related issues. Case study for this method, following the STAR approach: (a) Situation: Some member states (MS) proposed a "Tiered Approach" for	Estimated costs directly related to representing BASF's interests (climate change and other topics) to EU institutions in Brussels amount to approx. €2.2 million in 2016. BASF co-financed a study by VIK (German association for industrial energy consumers), highlighting cost burdens for industry for selected products.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	value for traded products) and the Cross Sectoral Correction Factor. Policy measures like the at least -40% GHG reduction goal which results in a steeper 2030 cap, the Market Stability Reserve (MSR) incl. 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 and thus our cost burden. Even though the efficiency of our plants is above average, a lack of free allowances leads to a loss of competitiveness compared to non-European							Carbon Leakage which would have reduced free allowances for major parts of our production. (b) Task: Critical review of Tiered Approach from industry perspective. (c) Action: In 2016 we analysed statistical data on carbon intensity from 2000 onwards. We showed that the approach relied on data not firm enough to build regulation on it. We disseminated our findings to Members of the European Parliament and authorities of MS either directly or through industry associations. (c) Result: The concept did not find support in the parliament and council.	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	competitors. There is the additional risk of increasing electricity prices from increasing costs for emission allowances (both for electricity from the external market and from our own power plants), while compensation for these costs may decrease. The compensation in Germany is above EU average, but a (partly) European harmonization is discussed. Regulations in Germany have to be amended for the time after 2020.								
Cap and trade schemes	BASF has plants in South Korea and China which are already regulated under the existing cap and trade schemes. Certificates need exceeds free	Increased operational cost	1 to 3 years	Direct	Very likely	Medium	As the (financial) impact of the national ETS in China on BASF depends on the ultimate regulation and on BASF's future investments (due	i) We mitigate the direct impact of cap and trade schemes and carbon taxes by reducing our GHG emissions in line with our respective target (-40% specific GHG	i) Investments for reducing GHG emissions result in no net additional costs. All investments are economically reasonable, i.e. cost savings

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	allocation, but the financial impact is moderate so far. However, the planned national ETS in China will increase the number of affected plants, 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 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.						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.	emissions by 2020, baseline 2002, BASF excl. Oil & Gas), which is backed by an energy efficiency target (cover 90% of our primary energy demand with certified energy management systems, ISO 50001, by 2020, BASF incl. Oil & Gas). Each year multiple projects are pursued to reduce our emissions. For example, in 2016 external audits in accordance with ISO 50001 were conducted at the first two Chinese sites in the Shanghai metropolitan region. +++ ii) We actively engage with decision makers and governments on climate and energy-related issues. For example, in 2016 we met with	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.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								Chinese delegations in Berlin and Brussels, discussing lessons learned from the EU ETS and giving advice. High level BASF representatives met representatives of Chinese authorities to exchange opinions. Moreover, BASF was invited by local authorities in China to give training to enterprises potentially enrolled in the national ETS.	
Renewable energy regulation	BASF has major production facilities in Germany. At our large and some medium production sites we produce and consume electricity on-site. Under the German renewable energy regulation (EEG) allocation of subsidies for electricity generation from renewable energy	Increased operational cost	1 to 3 years	Direct	About as likely as not	Medium-high	If existing on-site steam and power plants will continue to be exempted there will be no additional financial burdens compared to status-quo. However, if we install new installations or have major changes to our existing ones,	i) We mitigate the impact of increasing electricity costs by optimizing electricity production and consumption. This is part of our energy efficiency target (cover 90% of our primary energy demand with certified energy management systems, ISO 50001, by 2020, BASF incl. Oil &	i) Investments for increasing energy efficiency 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. +++ ii)

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	sources to the consumer of electricity has been constantly increasing (up to 63.54 €/MWh in 2016), but existing on-site electricity production is exempted. So BASF is not significantly burdened with EEG allocation. However this legislation is updated nearly bi-annually (last time in 2016). Besides German interests, EU state aid regulation has to be taken into account. Thus, a risk of future burdens remains. This leads to uncertainties for investment decisions.						there is already a disadvantage. If this risk would materialize for all existing installations, we estimate additional costs in the order of magnitude of €75 million, depending on the final level of charge set by legislation.	Gas). Each year multiple projects are pursued to reduce our emissions. For example, in 2016 we started up new highly efficient combined heat and power (CHP) plants at the German sites in Düsseldorf-Holthausen and Illertissen +++ ii) We actively engage with decision makers and governments on climate and energy-related issues. The regular exchange with politicians takes place at the regional, federal, and European level. For example, in 2016 we shared data with German Federal Ministry for Economic Affairs and Energy and explained our cost structure and the positive effects of heat-driven industrial CHP production. Beyond	Estimated costs directly related to representing BASF's interests (climate change and other topics) to EU institutions in Brussels amount to approx. €2.2 million in 2016.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								that, we have been engaged in various formats such as Innovationsforum Energiewende (If.E) hosted by the German trade union for mining, chemistry, energy (IG BCE).	

CC5.1b

Please describe your inherent risks that are driven by changes in physical climate parameters

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other physical climate drivers	BASF operates production sites in regions potentially vulnerable to lower precipitation levels and increased frequency of cyclones due to climate change. Respective changes in physical climate parameters can lead to lack of water for	Reduction/disruption in production capacity	>6 years	Direct	Unlikely	Low	We estimate low financial implication due to this risk (<€10 million). Details are given in the following rows.	BASF applies mainly the following management methods: i) Integration of physical risks into BASF's site management plans. +++ ii)	i, ii) No significant additional costs, activities are mainly covered by our personnel expenses. +++ iii) Insurance

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	processes and transport and more extreme weather conditions, which represent an inherent risk for our production capacity and/or logistics. Details are given in the following rows.							Consideration of physical risks in investment decisions for capital expenditure projects. +++ iii) Integration of natural hazards in property damage and business interruption insurances. Details and examples are given in the following rows.	policy costs depend on the sums to be insured.
Change in precipitation pattern	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). Most sites require water for their production processes and cooling,	Other: Reduction in production capacity and/or increased logistics costs	>6 years	Direct	Unlikely	Low	We estimate low financial implication due to this risk (<€10 million). Previous assessments for our sites based on regional and global climate studies (e.g. KLIWAS for Germany; IPCC, AR5	i) BASF has established site management plans covering all major current and projected local risks. The management plans are revisited regularly, considering	No significant additional costs are linked to these actions as they are mainly covered by our personnel expenses

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	and many sites use nearby waterways for logistics. Climate change is projected to affect 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.						WG2 and WG1, CORDEX) show that the relevant water regimes will not change significantly by climate change within the next decade. Experience with past extreme events of very low water levels in rivers, e.g. at our sites in Ludwigshafen, Germany (2013), Paulinia, Brazil (2014), showed that the net financial impact of such events on BASF group is negligible.	new information on potential risks driven by physical climate change. The respective information is provided by corporate and regional BASF climate experts who cooperate closely with renowned research institutions to make state-of-the-art information about local climate change easily accessible and usable for decision makers within BASF. Case study for this method, following the STAR approach: (a) Situation: Risk profile of	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>site Ludwigshafen under review, including potential future risks. (b) Task: Local BASF expert to provide input on potential physical climate change related risk for the site. (c) Action: In 2016, BASF cooperated with the Climate Service Center Germany to develop a prototype "Climate Fact-Sheet" for Ludwigshafen providing quantitative information about local climate change in a format</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>compatible with existing risk management processes. The prototype was rolled out and integrated into the review of the site management plan. (d) Result: Management decisions at site level are supported by an extended knowledge base on local climate change. +++ ii) We buffer temporary shortages in production at single sites by flexible production management within our global site network. +++ iii) We integrated</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								water criteria and different water scenarios in investment decisions for capital expenditure projects.	
Tropical cyclones (hurricanes and typhoons)	BASF operates almost 50 production sites in typical cyclone areas in North America (e.g. Freeport and Geismar located in the Gulf of Mexico) and Asia (e.g. our twelve Japanese sites). Tropical cyclones 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	Reduction/disruption in production capacity	>6 years	Direct	Unlikely	Low	We estimate low financial implication due to this risk (<€10 million). The IPCC, AR5 report states that the frequency of tropical cyclones will not change significantly in areas relevant for our sites within the next 10 years. Potential changes will materialize slowly and therefore can be covered by adaptation within our existing business	i) BASF has established site management plans covering all major current and projected local risks. The management plans are revisited regularly, considering new information on potential risks driven by physical climate change. The respective information is provided by corporate and regional	No significant additional costs are linked to these actions as they are mainly covered by our personnel expenses

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	cyclones may reduce local production capacity.						<p>processes. Experience with past events, e.g. the hurricanes Katrina and Rita (2005) hitting our sites in the Gulf of Mexico, showed that the net financial impact on BASF group was negligible.</p>	<p>BASF climate experts who cooperate closely with renowned research institutions to make state-of-the-art information about local climate change easily accessible and usable for decision makers within BASF. +++ ii) We buffer temporary shortages in production at single sites by flexible production management within our global site network. +++ iii) The risks due to hurricanes are integrated in our investment decisions for capital</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								expenditure projects in the affected regions.	

CC5.1c

Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other drivers	The global transition to a low-carbon economy entails reputation and market risks for BASF, if (a) the company is perceived by external stakeholders not to lead / keep up with the change or even hampering it, and if (b) BASF's	Other: Multidimensional impact	>6 years	Direct	About as likely as not	High	Financial implications may result principally from lower demand for our products (e.g. reduced trust in brand, inability to make the right product offer) and a reduced shareholder value. Details are given in the following rows.	BASF applies a range of methods to manage this risk on which we elaborate in the following rows: i) Transparent communication on BASF contributions to combat climate change, positions and activities, e.g. in open dialogues with stakeholders, including investors, customers, policy makers and civil	i) – iii) Open stakeholder dialogues: €750,000 per year. No significant additional costs for other activities as they are covered by our corporate budgets. +++ iv) We invest about half of our annual R&D expenditures (€1.863 billion total R&D expenses in 2016) on product and process innovations where the R&D target is

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	portfolio is not fit to satisfy changing customer demands for a low-carbon world. Details and examples are given in the following rows.							society, reporting in various media and initiatives (e.g. Corporate Report, CDP). +++ ii) Engagement in the development of public standards for GHG emissions accounting. +++ iii) Active portfolio management to increase robustness and offer more sustainable solutions. +++ iv) R&D for solutions satisfying the new customer demands. Examples and case studies for our management approach are given in the following rows.	related to energy/resource efficiency and climate protection.
Reputation	BASF has a significant corporate carbon footprint (e.g. global Scope 1+2 emissions rank	Reduced stock price (market valuation)	>6 years	Direct	About as likely as not	High	6 % of BASF shares (56 million, value around €4,000 million at year-average stock price 2016) are	BASF holds an open dialogue with all stakeholders, including investors, and reports	For the open dialogue with all stakeholders on climate change issues we have three full time employees at a

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>#49 of the Global 500 according to an analysis of BSD Consulting and Thomson Reuters, 2016) and its portfolio comprises products with a high GHG intensity. 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</p>						<p>held by shareholders who describe socially responsible investment 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. >€100 million) but cannot be quantified exactly.</p>	<p>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: Role of business for climate protection is subject to public discussion, leading to increased scrutiny of investors whether shares of GHG-intensive companies like BASF are still</p>	<p>cost of about €150,000 each a year.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>that can ultimately lead to a reduced market valuation. Moreover, there is potential risk of exclusion from thematic (climate) funds.</p>							<p>adequate within their investment portfolios in view of the global transition. (b) Task: Disseminate information about BASF positions, activities and performance in this area to demonstrate that BASF manages this topic properly. (c) Actions: In 2016 we presented and discussed information on climate protection at BASF (e.g. GHG target performance) in our mainstream investor roadshows (>50 events in total in London, Paris, Frankfurt, and other cities). In a SRI field trip to our Ludwigshafen site and a SRI conference in Paris, focus of discussions with</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								~20 investors was on climate protection and energy efficiency. (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.	
Reputation	BASF supplies products to numerous customers in nearly every part of the world. The number of customers considering sustainability criteria in supplier performance reviews is constantly increasing. Given BASF's significant	Reduced demand for goods/services	3 to 6 years	Direct	About as likely as not	High	In 2016, 26 major customers of BASF, representing about 4% of our sales, requested information on our climate protection activities through the CDP Supply Chain Programme. If this customer group reduces demand by 10%	BASF exchanges with customers and reports transparently on its climate protection strategy 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	For the dialogue with customers on sustainability, including climate change issues, we have about two full time employees at a cost of about €150,000 each a year.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>corporate carbon footprint and its portfolio comprising products with a high GHG intensity, company engagement in climate protection is a typical assessment area. Lack of corporate engagement and performance in this area poses a risk to receive a low score in supplier performance reviews and thus impact the customer relationship such that BASF products face lower demand or even get delisted completely by the customer.</p>						<p>due to a low CDP score this would result in loss of sales in the order of €100-200 million.</p>	<p>reviews). Case study for this method, following the STAR approach: (a) Situation: Customers ask for information on climate protection strategy at BASF to conduct supplier performance review. (b) Task: Disseminate information about BASF positions, activities and performance in this area. (c) Actions: In 2016 our corporate sustainability team provided input to about 200 supplier performance reviews (e.g. strategy for addressing climate change) and exchanged with numerous customers in bilateral discussions. (d) Result: BASF</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								receives a good score in the customer ratings and rankings, supporting the continuation of the supply relationship.	
Changing consumer behavior	BASF sells products to many industries, among them sectors with significant carbon footprint (e.g. transport). Changing consumption patterns towards an increasing demand for climate-friendly products and technologies in these sectors (e.g. electric vehicles for transport) pose a risk for our sales of products for the established customer solutions (e.g.	Reduced demand for goods/services	>6 years	Indirect (Client)	More likely than not	Low	Negligible on BASF Group level. The wide-ranging product portfolio of the company will compensate a shift in consumption patterns, i.e., increased sales of products for climate protection are considered to make up a potential partial loss in sales for less favored customer solutions.	i) We actively manage our product portfolio to increase its robustness and offer more sustainable solutions in line with our company purpose "We create chemistry for a sustainable future". The portfolio steering is backed by our Sustainable Solution Steering® tool, wherein 95.9% of our entire portfolio of more than 60,000 specific product applications had been covered by the end of 2016. +++ ii) We integrate	i), ii) No specific additional costs are associated with these actions as they are covered by our corporate budgets. +++ iii) We invest about half of our annual R&D expenditures (€1.863 billion total R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	catalysts for mobile combustion engines).							<p>information on changing customer needs (e.g. from bilateral customer discussions, market surveys) when building long-term strategies for the business units that develop, produce, market and sell our products. +++ iii) We develop more sustainable solutions in line with our corporate target to increase the share of solutions with substantial sustainability contribution in the value chain to 28% by 2020 (status 2016: 27.2%). For example, we engage with partners from industry and university in the project FELIZIA (Solid Electrolytes as Enablers for</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								Lithium Cells in Automotive Applications, funded by the German Federal Ministry of Education and Research) to develop a new generation of batteries for electric vehicles.	

CC5.1d

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC5.1e

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC5.1f

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

Further Information

Page: CC6. Climate Change Opportunities

CC6.1

Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

- Opportunities driven by changes in regulation
- Opportunities driven by changes in physical climate parameters
- Opportunities driven by changes in other climate-related developments

CC6.1a

Please describe your inherent opportunities that are driven by changes in regulation

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
International agreements	BASF's product portfolio contains many solutions to the	Other: Increased demand for existing products/services	3 to 6 years	Indirect (Client)	More likely than not	High	In 2016, about 5% of total BASF sales can be	BASF exploits the opportunities by several	i) No significant additional costs, activity is mainly covered

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	task of decarbonisation . With the Paris Agreement coming into force in 2016 we expect demand for these solutions to grow. This is due to a variety of policy measures being defined on national and international level. Selected examples are given in the following rows.	+ new products/services					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 markets for these technologies are expected to grow at an above average rate due to regulatory influences.	management methods: i) marketing of our existing solutions, ii) investing into R&D of new solutions for climate protection, iii) partnering with customers and other stakeholders to offer and develop tailor-made solutions addressing market needs. Examples and case studies for our management approach are given in the following rows.	by our personnel expenses. +++ ii) We invest about half of our annual R&D expenditures (€1.863 billion total R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection. +++ iii) No estimate available: The budget for individual partnerships and initiatives is project-specific.
Product efficiency regulations and standards	BASF's product portfolio contains innovative solutions for thermal insulation of buildings. For	Increased demand for existing products/services	3 to 6 years	Indirect (Client)	Very likely	Medium-high	A rough conservative estimation approach indicates a potential of additional annual sales in	i) We engage in several associations and standardization bodies to consult on higher	i) No significant additional costs are linked to advocacy activities as they are mainly covered by our personnel

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>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</p>						<p>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.</p>	<p>standards for energy-efficient construction (e.g. PU Europe, BDI Gebäude AG). For example, in 2016 we supported a business leaders call for an EU vision for a Nearly Zero Building stock by 2050. +++ ii) We promote the benefits of insulation materials. Case study for this method, following the STAR approach: (a) Situation: Concerns about business case for thermal insulation, especially for deep renovation at architects, craftsmen and</p>	<p>expenses. Estimated costs directly related to representing BASF's interests (climate change and other topics) to EU institutions in Brussels amount to approx. €2.2 million in 2016. +++ ii) Investment sum on average below €1 million per showcase in demonstration projects. +++ iii) We invest about half of our annual R&D expenditures (€1.863 billion total R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resourc</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	provide better funding for renovation. This will lead to an increasing demand for innovative insulation products for the building and construction sector.							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 2016 we showcased the strength of our products in a new laboratory building at our site in Ludwigshafen, which received a gold certificate from the German Sustainable Building Council. BASF Bauen & Wohnen (BASF's	efficiency and climate protection.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								<p>housing subsidiary) renovated its apartments with an average renovation quota of about 2.6 % during the last 15 years. (d) Result: BASF actively disseminates evidence for cost-efficient near zero energy houses, supporting more ambitious legislation for new buildings and renovation. This is recognized in the EU Energy Efficiency impact assessments (EPBD, EED). +++ iii) We invest in R&D of new low-carbon</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								insulation solutions. Central sustainability tools (e.g. Eco-Efficiency Analysis) support this work.	
Product efficiency regulations and standards	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 and electrolytes for lithium-ion batteries, which play a key role	New products/business services	3 to 6 years	Indirect (Client)	Very likely	High	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	i) To give an example for our management of the described opportunity, BASF actively engages in the "national platform for electric mobility". Under the initiative experts from industry, science, politics and society consult the government to strengthen Germany as a manufacturer and service provider in all	i) No significant additional costs, activity is mainly covered by our personnel expenses. +++ ii) We invest about half of our annual R&D expenditures (€1.863 billion total R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>in determining battery performance, energy density, service life and safety. BASF also provides solutions for battery cell frames, cooling and thermal management.</p>						<p>gasoline and diesel vehicles) would offer a potential for increase of BASF sales by around 20-30% in 2025, based on current total automotive-driven sales of about €10 billion.</p>	<p>matters relating to future powertrain vehicles and to develop Germany as a lead market. +++ ii) We invest in R&D of low-carbon solutions for the automotive sector, e.g. BASF is exploring next-generation battery material concepts, including lithium-sulfur technology, 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</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Product labeling regulations and standards	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	Increased demand for existing products/services	1 to 3 years	Indirect (Client)	Very likely	High	The French Association for Plastic Packaging estimates the market for fruit & 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 (fruit & vegetable plastic bags €60-80 million). As a market leader in the production of certified compostable plastics, BASF captures a significant	work. i) BASF demonstrates the value of compostable bags to legislators and customers in pioneer projects in the countries. For example, in three regions in France BASF introduced certified compostable fruit & vegetable bags in all supermarkets together with local authorities, retailers, and NGOs. We engaged consumers by preparing posters for the retail stores explaining how to use compostable bags for more	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.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>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</p>						<p>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.</p>	<p>convenient organic waste collection. We also educated consumers that disposing off kitchen waste in landfills causes around 80 times more CO2eq. emissions than composting kitchen waste. The local composters confirmed full compostability of the bags. Participating stakeholders confirmed the positive project results to the legislator. +++ ii) BASF highlights the benefits of its products through externally reviewed life cycle assessments (LCA) on the use of</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	and is therefore well positioned to become a lead supplier.							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).	
Renewable energy regulation	BASF develops and markets products for the renewable energy industry, e.g. for	New products/business services	3 to 6 years	Indirect (Client)	Very likely	Medium-high	The International Energy Agency (IEA) estimates in their New	i) We engage in several associations such as PU Europe (Polyurethane	i) No significant additional costs, activity is mainly covered by our personnel

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	production of wind turbines, solar power plants and energy storage. The many already existing provisions to increase the share of renewable energy, such as the EU Directive on renewable energies, the new EU 2030 targets or other national targets and promotion mechanisms for renewable energies around the globe, will lead to a further continuous increase in demand for BASF's products that go into this sector.						<p>Policies Scenario in the World Energy Outlook 2016 annual investments of about €300 billion in renewables between 2016 and 2040. Considering that wind energy and solar PV represents only a share of the investment in renewables and that BASF will tap a share of this market, a rough conservative estimation approach indicates a potential of additional annual sales in the order of >€100 million.</p>	<p>Europe) and WindEurope to support the market uptake of renewable energy solutions. +++ ii) We invest in R&D of low-carbon solutions for the energy sector. Central sustainability tools (e.g. Eco-Efficiency Analysis) support this work.</p>	<p>expenses. +++ ii) We invest about half of our annual R&D expenditures (€1.863 billion total R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection.</p>

CC6.1b

Please describe your inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other physical climate opportunities	Continued global warming will require increased measures for adaptation in a wide range of sectors, e.g. water systems, agriculture and buildings. BASF's portfolio offers various solutions to this end with a respective positive market outlook. Selected examples are given in the following rows.	Other: Increased demand for existing products/services + new products/services	>6 years	Indirect (Client)	More likely than not	High	We estimate that the increasingly felt consequences of global warming might lead to additional revenues of >€100 million per year. Details are given in the following rows.	BASF exploits the opportunities by several management methods: i) Marketing of our existing solutions. +++ ii) Investing into R&D of new solutions for climate protection. +++ iii) Partnering with customers and other stakeholders to offer and develop tailor-made solutions addressing market needs. Examples and case studies for our management approach are given in the following rows.	i) No significant additional costs, activity is mainly covered by our personnel expenses. +++ ii) We invest about half of our annual R&D expenditures (€1.863 billion total R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection. +++ iii) No estimate available: The budget for individual partnerships and initiatives is project-specific.
Change in precipitation extremes and	Water scarcity and a growing demand for water will force	New products/business services	>6 years	Indirect (Client)	Likely	Medium-high	In 2020 we estimate €50 million of our turnover and	i) Establishment of a market facing business unit combining	i) No significant additional costs are linked to these actions as

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
droughts	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						€11 million of our EBITDA from innovations derived from BASF's Water Chemicals portfolio launched since 2015.	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® RO 3500 following the STAR approach: (a) Situation: Growing demand of water reuse via reverse osmosis (RO) causing different scales and decreasing efficiency of RO systems. (b) Task: Development of a multifunctional antiscalant performing at a variety of	they are mainly covered by our personnel expenses. +++ ii) 2% of our turnover are dedicated to development of new products

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	reuse.							<p>reused water qualities. (c) Action: In 2016 BASF launched a multifunctional antiscalant with Sokalan® RO 3500. The product ensures less scale formation leading to improved plant efficiencies, reduced cleaning cycles and enhanced overall performance of RO plants. Compared to commonly used phosphonate based chemistry Sokalan® RO 3500 is not causing eutrophication to water bodies. (d) Result: BASF product portfolio further enhanced by addressing the need for</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								differentiated chemistry to enable water reuse. With the product launch BASF is fostering its position as a leading provider for water chemicals.	
Change in precipitation extremes and droughts	BASF offers solutions that help to increase the robustness of infrastructure under extreme weather conditions. The increased likelihood of extreme weather under global warming conditions offers new business opportunities for such products. Examples: (1) Elastocoast® is a dike protection system. This solution can be used for the	Increased demand for existing products/services	>6 years	Indirect (Client)	More likely than not	Low-medium	Estimates on the financial implications are considered sensitive business information and cannot be disclosed.	We foster the awareness for our solutions by demonstration projects. For example, in the area of coastal protection, BASF has worked together with universities to show the sustainability of the use of Elastocoast® and to demonstrate the long-lasting stability of this coastal protection system. Over 20 projects in more than five countries have	No significant additional costs are linked to these actions as they are mainly covered by our standard budgets (e.g. personnel expenses in corporate communication, general marketing budgets).

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>construction of new and the heightening or stabilization of existing dams to protect from more frequent hurricanes or cyclones that challenge current coastal protection systems. (2) Elastolit is a lightweight polyurethane utility pole with proven higher durability and better manageability than commonly used concrete utility poles. These characteristics translate to significant cost and time savings and thus a competitive advantage in regions facing more frequent and severe extreme</p>							<p>already been carried out and are showcases of this innovative technology. In 2016, Elastocoast received the "Innovation in Green Technology" award from the Korean-German Chamber of Commerce and Industry. Regarding the utility poles made from Elastolit, BASF installed some as part of a pilot project in the Guangdong province of China in 2014. The poles demonstrated outstanding wind resistance during typhoon Rammansun, where more than 70,000 concrete and metal utility</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	weather events like hurricanes or cyclones.							poles were destroyed.	
Change in mean (average) temperature	Global warming will force measures to stabilize indoor temperature in the comfort zone. This offers new opportunities for BASF's solutions for the buildings sector. For example, our exterior insulation materials, e.g. polystyrene foams known under the trade name Styropor®, Styrodur®, Neopor® or Elastopor®, support heat management of building components.	Increased demand for existing products/services	>6 years	Indirect (Client)	More likely than not	Low	We estimate that additional sales driven only by the need for temperature stabilization will be low (<€10 million) compared to the significantly higher effects of regulation (described above) where 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 (EU only).	BASF is partnering with architects, builders and homeowners as well as participating in many projects and initiatives around the globe to show its high-end innovative products and technologies and to position itself as a solution provider and competent partner. To this end, BASF has built several show houses in various regions. In addition, we participate in showcase projects all around the world. For example, in 2016 we	Investment sum on average below €1 million per showcase in demonstration projects.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								continued work on the world's tallest certified passive house in Tianjin Eco-City.	

CC6.1c

Please describe your inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Other drivers	The global transition to a low-carbon economy entails reputation and market opportunities for BASF, if (a) the company is perceived by external stakeholders to lead / keep up with the change, and if (b) BASF's	Other: Multidimensional impact	>6 years	Direct	About as likely as not	High	Financial implications may occur principally from higher demand for our products (e.g. increased trust in brand, ability to make the right product offer) and an increased shareholder value. Details are given in	BASF applies a range of methods to manage this opportunity on which we elaborate in the following rows: i) Transparent communication on BASF contributions to combat climate change, positions and activities, e.g. in open dialogues with stakeholders, including investors, customers, policy	i) – iii) Open stakeholder dialogues: €450,000 per year. No significant additional costs for other activities as they are covered by our corporate budgets. +++ iv) We invest about half of our annual R&D expenditures (€1.863 billion

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	portfolio is fit to satisfy changing customer demands for a low-carbon world. Details and examples are given in the following rows.						the following rows.	makers and civil society, reporting in various media and initiatives (e.g. Corporate Report, CDP). +++ ii) Engagement in the development of public standards for GHG emissions accounting. +++ iii) Active portfolio management to increase robustness and offer more sustainable solutions. +++ iv) R&D for solutions satisfying the new customer demands. Examples and case studies for our management approach are given in the following rows.	total R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection.
Reputation	BASF has a significant corporate carbon footprint (e.g. global Scope 1+2 emissions rank #49 of	Increased stock price (market valuation)	>6 years	Direct	About as likely as not	High	6 % of BASF shares (56 million, value around €4,000 million at year-average stock price 2016) are held by	BASF holds an open dialogue with all stakeholders, including investors, and reports transparently through various media and	For the open dialogue with all stakeholders on climate change issues we have three full time employees at a cost of about

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>the Global 500 according to an analysis of BSD Consulting and Thomson Reuters, 2016) and its portfolio comprises products with a high GHG intensity. 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. If major investors perceive BASF</p>						<p>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. >€100 million) but cannot be quantified exactly.</p>	<p>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</p>	<p>€150,000 each a year.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>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.</p>							<p>respective investors. (c) Actions: In 2016 we presented and discussed information on climate protection at BASF (e.g. GHG target performance) in our mainstream investor roadshows (>50 events in total in London, Paris, Frankfurt, and other cities). In a SRI field trip to our Ludwigshafen site and a SRI conference in Paris, focus of discussions with ~20 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.</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Reputation	BASF supplies products to numerous customers in nearly every part of the world. Our leading position as an integrated global chemical company gives us the chance to make important contributions in the areas of (1) resources, environment and climate, (2) food and nutrition and (3) quality of life, in line with our company purpose: "We create chemistry for a sustainable future". Recognition of these contributions by our customers will	Increased demand for existing products/services	3 to 6 years	Direct	About as likely as not	Unknown	We are not able to separate the quantitative effect of a good reputation in our customer relationships.	BASF exchanges with customers and reports transparently on its climate protection strategy 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). The customer-related communication is often embedded in a wider discussion of BASF's approach to sustainability, and in this context we promote our sustainability strategy and management tools (e.g. Eco-Efficiency Analysis, SEEBALANCE®, AgBalance™, Product Carbon Footprint). For	No significant additional costs result from these activities as they are covered by our corporate budgets.

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	expand and accelerate our opportunities to contribute. For example, we can reduce barriers to enter partnerships with customers on new products, or we can build on the positive reputation to promote sustainable solutions in our existing portfolio.							example, in 2016 we have launched Value-To-Society, the first monetary assessment of the economic, ecological, and social impacts of our business activities along the value chain.	
Changing consumer behavior	BASF enables many industries to contribute to climate protection and energy efficiency with their products and technologies. For example, Elastocool® is a polyurethane rigid foam for	Other: Increased demand for existing products/services and new products/services	>6 years	Indirect (Client)	Very likely	High	In 2016, about 5% of total BASF sales can be attributed to products and solutions that make a particular contribution to climate protection and energy efficiency. The markets for	i) We manage the opportunities linked to an increasing demand for existing products for energy efficiency and climate protection as part of our daily marketing. +++ ii) Opportunities are identified through our central Science Relations & Innovation	i), iii) No significant additional costs are linked to these actions as they are mainly covered by our standard budgets (e.g. marketing and corporate communication budgets). +++ ii) We invest about half of our annual R&D

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>insulating refrigerators with excellent insulation properties, and X-SEED is a hardening accelerator which saves energy and reduces GHG emissions in concrete production. Along with an increasing climate awareness of consumers, there will be an increasing market demand for such high efficiency products, in particular for those with positive cost implications (no-regret options). The increasing demand will be relevant for our existing products, but it</p>						<p>these technologies are expected to grow at an above average rate. Note that growth can be driven by changing customer behaviour but also result from regulatory changes as stated under the respective opportunities section. The exact cause cannot be differentiated in this case.</p>	<p>Management as well as R&D departments, and operating units. Intensive exchange and cooperation with our customers and partners from industry and science is a core element for the identification and pursuing of market trends. For example, in 2016 we became a founding partner of the public-private Advanced Research Center Chemical Building Blocks Consortium aiming for breakthroughs to meet future demand for energy and materials. +++ iii) Additionally, we engage in various initiatives and associations to promote the benefits of products for energy efficiency and climate protection. For example, we</p>	<p>expenditures (€1.863 billion total R&D expenses in 2016) on product and process innovations where the R&D target is related to energy/resource efficiency and climate protection.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>also expands to new solutions. Global warming forces many customers to look for completely new low-carbon technologies. The right chemical material is often the key to new technologies. Our broad material know-how enables us to bring forward innovative solutions. For example, we work on new battery materials to foster electric vehicles.</p>							<p>are member of PU Europe (Polyurethane Europe) and WindEurope. In the USA, our program NEED (Neighborhood Energy Efficiency Drive) supports homeowners with recommendations for decreasing energy consumption by using BASF products at home renovation.</p>	

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC6.1e

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC6.1f

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

Further Information

Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading

Page: CC7. Emissions Methodology

CC7.1

Please provide your base year and base year emissions (Scopes 1 and 2)

Scope	Base year	Base year emissions (metric tonnes CO2e)
Scope 1	Tue 01 Jan 2002 - Tue 31 Dec 2002	21693000
Scope 2 (location-based)	Tue 01 Jan 2002 - Tue 31 Dec 2002	5243000
Scope 2 (market-based)		

CC7.2

Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

Please select the published methodologies that you use

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

CC7.2a

If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

CC7.3

Please give the source for the global warming potentials you have used

Gas	Reference
CO2	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	IPCC Fourth Assessment Report (AR4 - 100 year)
N2O	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-23	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-32	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-125	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-134a	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-143a	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-152a	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-227ea	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-245ca	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-245fa	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: HFC-365mfc	IPCC Fourth Assessment Report (AR4 - 100 year)
Other: PFC-218	IPCC Fourth Assessment Report (AR4 - 100 year)
NF3	IPCC Fourth Assessment Report (AR4 - 100 year)

CC7.4

Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference
Other: Please see attached Excel spreadsheet under "Further Information"			

Further Information

Note regarding CC7.3: The source information applies to the GHG emissions data in the reporting year (2016), while the base year (2002) emissions have been derived using global warming potentials from the IPCC Second Assessment Report. It was found that the change of GWP source has no material impact on the data for 2002 and therefore the results were not recalculated in order to maintain consistency with earlier reporting. +++ Note regarding CC7.4: Emission factors are given in the attached Excel spreadsheet "CDP-worksheet-for-question-cc7.4.xlsx".

Attachments

[https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/ClimateChange2017/CC7.EmissionsMethodology/CDP-worksheet-for-question-cc7.4.xlsx](https://www.cdp.net/sites/2017/16/1516/Climate%20Change%202017/Shared%20Documents/Attachments/ClimateChange2017/CC7.EmissionsMethodology/CDP-worksheet-for-question-cc7.4.xlsx)

Page: CC8. Emissions Data - (1 Jan 2016 - 31 Dec 2016)

CC8.1

Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

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

CC8.2

Please provide your gross global Scope 1 emissions figures in metric tonnes CO₂e

18036000

CC8.3

Please describe your approach to reporting Scope 2 emissions

Scope 2, location-based	Scope 2, market-based	Comment
We are reporting a Scope 2, location-based figure	We are reporting a Scope 2, market-based figure	

CC8.3a

Please provide your gross global Scope 2 emissions figures in metric tonnes CO₂e

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
3884000	4506000	

CC8.4

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

CC8.4a

Please 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	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded
GHG emissions from mobile combustion	Emissions are not relevant	No emissions from this source	No emissions from this source	We do not report CO2 emissions from mobile combustion since their contribution to BASF's total GHG emissions is not significant (less than 0.1 % of BASF's total GHG emissions).
CO2 emissions from administrative sites/offices (e.g. sales offices)	Emissions are not relevant	Emissions are not relevant	Emissions are not relevant	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.
Chemetall business acquired from Albemarle Corp. in December 2016.	Emissions excluded due to a recent acquisition	Emissions excluded due to a recent acquisition	Emissions excluded due to a recent acquisition	BASF acquired the business of Chemetall from Albemarle Corp., Charlotte, North Carolina only on December 14, 2016, and the ongoing business integration process did not allow for immediate inclusion of relevant Chemetall data from mid December until end of the year for the reporting year 2016 already. Note that due to the short time period Chemetall belonged to BASF in 2016 the emissions of the newly acquired business can also be considered not relevant in comparison to BASF's overall carbon footprint (<1% contribution).

CC8.5

Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Data Gaps Metering/ Measurement Constraints	Data gaps arise from the fact that BASF does not collect GHG emissions from all emission sources. GHG emissions from mobile combustion and administrative sites are not accounted for in our GHG emissions reporting system as they have been projected to be collectively much less than 2% of BASF's total GHG emissions. Data from the business of Chemetall acquired in mid-December 2016 only were considered neither, but emissions from mid-December until end of 2016 relevant for the BASF carbon footprint are estimated to be small (<1% of BASF's total GHG emissions). +++ Metering/Measurement uncertainty may arise e.g. from a faulty measurement, from a not accurately determined carbon content of a fuel or from an estimation method based on a discontinuous measurement. BASF's worldwide GHG emissions data show the lowest sources of error for Europe and new plants, partly because of the measurement equipment being of higher accuracy, high frequency of measuring and the legal regulations and requirements. About 80% of our Scope 1 emissions in Europe (i.e. about 50% of our global emissions) are subject to the EU ETS and thus to directives and requirements of the Monitoring and Reporting Guidelines of the European Commission (EU Directive 2007/589/EG). All emissions subject to EU ETS have to be reported with a maximum uncertainty of +/- 1.5 %.
Scope 2 (location-based)	More than 2% but less than or equal to 5%	Data Gaps Assumptions Metering/ Measurement Constraints	Data gaps arise from the fact that BASF does not collect the electricity and heat supply figures from administrative sites. The respective Scope 2 emissions were determined to be lower than 0.1% of BASF's total GHG emissions. Data from the business of Chemetall acquired in mid-December 2016 only were considered neither, but emissions from mid-December until end of 2016 relevant for the BASF carbon footprint are estimated to be small (<1% of BASF's total GHG emissions). +++ Assumptions: The applied CO2 factors for imported steam are based on best available assumptions on the effectiveness of the steam generation and the fuel basis in the supplier's generation unit in the case when no factor is explicitly specified. The uncertainty is estimated to be more than 2% but less than 5% for Scope 2 emissions from steam import. +++ Metering/measurement constraints: Uncertainties due to measurement constraints of electricity and steam supply are overall estimated to be lower than 1% as these streams represent also the basis for the energy billing.
Scope 2 (market-based)	More than 2% but less than or equal to 5%	Data Gaps Assumptions Metering/ Measurement Constraints	Data gaps arise from the fact that BASF does not collect the electricity and heat supply figures from administrative sites. The respective Scope 2 emissions were determined to be lower than 0.1% of BASF's total GHG emissions. Data from the business of Chemetall acquired in mid-December 2016 only were considered neither, but emissions from mid-December until end of 2016 relevant for the BASF carbon footprint are estimated to be small (<1% of BASF's total GHG emissions). +++ Assumptions: The applied CO2 factors for imported steam are based on best available assumptions on

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
			the effectiveness of the steam generation and the fuel basis in the supplier's generation unit in the case when no factor is explicitly specified. The uncertainty is estimated to be more than 2% but less than 5% for Scope 2 emissions from steam import. Further uncertainty results from the lack of information about the residual mix in those countries where no supplier-specific emission factors were applied. Following the Scope 2 guidance, the location-based data were used in these cases. +++ Metering/measurement constraints: Uncertainties due to measurement constraints of electricity and steam supply are overall estimated to be lower than 1% as these streams represent also the basis for the energy billing.

CC8.6

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

CC8.6a

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Limited	https://www.cdp.net/sites/2017/16/1516/Climate Change	1-7	ISAE3000	100

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
		assurance	2017/Shared Documents/Attachments/CC8.6a/BASF CDP.pdf			
Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/CC8.6a/BASF CDP.pdf	1-7	ISAE 3410	100

CC8.6b

Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emission Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission

CC8.7

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

CC8.7a

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/CC8.7a/BASF CDP.pdf	1-7	ISAE3000	100
Location-based	Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/CC8.7a/BASF CDP.pdf	1-7	ISAE 3410	100
Market-based	Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/CC8.7a/BASF CDP.pdf	1-7	ISAE3000	100
Market-based	Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/CC8.7a/BASF CDP.pdf	1-7	ISAE 3410	100

CC8.8

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment
Progress against emissions reduction target	
Year on year change in emissions (Scope 1 and 2)	
Year on year emissions intensity figure	
Other: Sustainability performance information in BASF 2016 annual report	All sustainability-related performance information according to GRI G4 in the "BASF Report 2016", published under www.bericht.basf.com/2016/en , was subject of the assurance engagement.

CC8.9

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

CC8.9a

Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

Further Information

Page: CC9. Scope 1 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC9.1

Do you have Scope 1 emissions sources in more than one country?

Yes

CC9.1a

Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e
----------------	----------------------------

Country/Region	Scope 1 metric tonnes CO2e
Belgium	3569000
Brazil	99000
China	383000
France	58000
Germany	9034000
India	31000
Italy	51000
Japan	9000
South Korea	385000
Spain	28000
United States of America	3756000
Rest of world	633000

CC9.2

Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

By facility

By GHG type

CC9.2a

Please break down your total gross global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)

CC9.2b

Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
Ludwigshafen, Germany	7627000	49.495935	8.431191
Antwerp, Belgium	3569000	51.324050	4.285598
Kuantan, Malaysia	251000	3.967425	103.423724
Freeport, USA	936000	29.004413	-95.393282
Geismar, USA	833000	30.210215	-91.034488
Rest of world	4820000		

CC9.2c

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
CO2	17376000
CH4	45000
N2O	528000
HFCs	87000

GHG type	Scope 1 emissions (metric tonnes CO2e)
PFCs	0
SF6	0
NF3	0

CC9.2d

Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)

Further Information

BASF reports GHG emissions for selected Verbund sites, countries, regions and globally. However, our internal GHG emissions accounting and reporting system captures GHG emissions from all sites and plants and also at business division level. We manage GHG emissions at plant level. The data at business division level are for internal purposes only.

Page: CC10. Scope 2 Emissions Breakdown - (1 Jan 2016 - 31 Dec 2016)

CC10.1

Do you have Scope 2 emissions sources in more than one country?

Yes

CC10.1a

Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes 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	577000	1024000	1982000	0
Brazil	20000	20000	247000	0
China	754000	754000	1414000	0
France	13000	100000	135000	0
Germany	395000	443000	1162000	0
India	53000	54000	66000	0
Italy	20000	23000	61000	0
Japan	40000	40000	100000	0
South Korea	272000	272000	710000	0
Spain	32000	64000	127000	0
United States of America	1175000	1170000	2628000	10000
Rest of world	533000	542000	1571000	0

CC10.2

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By facility

CC10.2a

Please break down your total gross global Scope 2 emissions by business division

Business division	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
-------------------	---	---

CC10.2b

Please break down your total gross global Scope 2 emissions by facility

Facility	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
Ludwigshafen, Germany	0	0
Antwerp, Belgium	577000	1024000
Kuantan, Malaysia	142000	142000
Freeport, USA	165000	165000
Geismar, USA	51000	51000
Rest of world	2949000	3124000

CC10.2c

Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
----------	--	--

Further Information

BASF reports GHG emissions for selected Verbund sites, countries, regions and globally. However, our internal GHG emissions accounting and reporting system captures GHG emissions from all sites and plants and also at business division level. We manage GHG emissions at plant level. The data at business division level are for internal purposes only.

Page: CC11. Energy

CC11.1

What percentage of your total operational spend in the reporting year was on energy?

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

CC11.2

Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	MWh
Heat	0
Steam	3762000
Cooling	0

CC11.3

Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year

67539000

CC11.3a

Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Anthracite	1097000
Diesel/Gas oil	260000
Distillate fuel oil No 6	12000
Natural gas	44691000
Other: Residual fuels (usually from own production and not purchased)	21479000

CC11.4

Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
Energy attribute certificates, Renewable Energy Certificates (RECs)	10000	0	

CC11.5

Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
15045000	6441000	10535000	0	0	

Further Information

Page: **CC12. Emissions Performance**

CC12.1

How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?

Decreased

CC12.1a

Please 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

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities	1.1	Decrease	BASF's Scope 1 and Scope 2 emissions decreased by 243,000 metric tons (t) of CO ₂ e in 2016 compared to 2015 due to emissions reduction activities implemented in 2016. Our total Scope 1 and Scope 2 emissions in

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
			the previous year was 22,170,000 t CO ₂ e, therefore we arrived at 1.1% through $(243,000/22,170,000)*100 = 1.1\%$. Major drivers for the emission reduction have been measures to increase the energy efficiency of processes, and to reduce process emissions.
Divestment	0.7	Decrease	The emissions from our operations decreased by 0.7% (corresponding to 166,000 metric tons of CO ₂ e) in 2016 compared to 2015 due to the divestment of some businesses in several countries (e.g. Italy, Netherlands, Spain, and USA). For example, we divested our global photoinitiator business, and we completed the sale of the global polyolefin catalysts business in 2016.
Acquisitions	0.2	Increase	In 2016 BASF acquired several businesses in various countries (e.g. China, USA) which overall accounted for an increase of 0.2% (corresponding to 43,000 metric tons of CO ₂ e) of our Scope 1 and Scope 2 emissions in comparison to 2015. For example, we completed the acquisition of the business of Guangdong Yinfan Chemistry in China, leading to an expansion of our automotive refinish coatings production capacity.
Mergers	0	No change	Category not relevant in actual year-on-year comparison.
Change in output	1.7	Increase	We raised sales volumes in 2016. If no measures to reduce emissions had been introduced, i.e. assuming that the GHG intensity of our various businesses in 2015 had continued to apply in 2016, the increased production would have resulted in an increase in Scope 1 and Scope 2 GHG emissions of 1.7% (corresponding to 385,000 metric tons of CO ₂ e) in 2016 in comparison to 2015.
Change in methodology	0	No change	Category not relevant in actual year-on-year comparison.
Change in boundary	0	No change	Category not relevant in actual year-on-year comparison.
Change in physical operating conditions	0	No change	Category not relevant in actual year-on-year comparison.
Unidentified	0	No change	Category not relevant in actual year-on-year comparison.
Other	1.2	Decrease	BASF is accounting GHG emission from more than 250 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 2016, changes in local operating conditions resulted in a net decrease of emissions of 1.2% (corresponding to 269,000 metric tons of CO ₂ e) compared to 2015.

CC12.1b

Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

CC12.2

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.000381	metric tonnes CO2e	57550000000	Location-based	21.0	Increase	BASF's GHG emissions per unit total revenue increased by 21% in 2016 compared with 2015. The absolute Scope 1 and Scope 2 emissions decreased by 1.1% in 2016 compared with 2015, however revenues fell by even 18.3% (decrease by €12.9 billion), resulting in an overall strong increase of the indicator value. The decrease in revenues was attributable mostly to the divestiture of the oil and gas trading and storage business in September 2015, which had contributed €10.1 billion to sales in 2015. While the transaction had a major impact in financial terms, the gas trading and storage business was of no relevance for the Scope 1 and Scope 2 emissions, because it was not accounted for within the boundaries of these scopes. The decrease of sales was further driven by a drop in sales prices in our Chemicals and Oil & Gas segment (due to lower oil, gas and raw material prices). Other factors potentially relevant for revenues and/or GHG emissions (e.g. higher sales volumes, acquisitions, emission reduction efforts) had only a negligible effect for the indicator compared to the aforementioned drivers, resulting in the

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
						overall strong increase of the intensity figure.

CC12.3

Please provide any additional intensity (normalized) metrics that are appropriate to your business operations

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
196.3	metric tonnes CO2e	full time equivalent (FTE) employee	111687	Location-based	2.3	Decrease	BASF reduced its GHG emissions per FTE employee in 2016 compared with 2015 by 2.3%. The number of BASF full time equivalent employees increased slightly by 1.2% while absolute Scope 1 and Scope 2 emissions decreased by 1.1%. Acquisitions and hiring of new employees added to our workforce. The decrease of GHG emissions in 2016 resulted from our emission reduction measures (accounting for -1.1% of Scope 1+2 emissions) as well as the impact of divestment and changes in standard operating conditions in our sites (-0.7% and -1.2% of Scope 1+2 emissions, respectively), which overcompensated the impact of higher output from our businesses (estimated to account for +1.7% of Scope 1+2 emissions) and acquisitions (+0.2% of Scope

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.564	metric tonnes CO2e	Other: metric tonne of sales product	35446000	Location-based	3.9	Decrease	<p>1+2 emissions).</p> <p>Note: This intensity figure refers to GHG emissions and volume of sales products for BASF without oil and gas. This metric is the basis for our corporate climate protection target. The metric numerator in 2016 was 19.976 million t CO2e, therefore we arrive at an intensity of 0.564 through $(19,976,000/35,446,000) = 0.564$. The value for 2015 was 0.587 (GHG emissions: 20.133 million t CO2e; sales products: 34.311 million t). +++ BASF reduced its GHG emissions per metric tonne of sales products in 2016 compared with 2015 by 3.9%. The volume of sales products increased by 3.3%. The associated increase of emissions (accounting for +1.4% of Scope 1+2 emissions, if taking BASF w/o Oil & Gas as a basis) was overcompensated by emission reduction activities in our chemical and power plants (-1.2% of Scope 1+2 emissions), as well as the impact of divestment and changes in standard operating conditions in our sites (-0.8% and -0.4% of Scope 1+2 emissions, respectively). Considering also a slight increase of emissions due to acquisitions (+0.2%), overall absolute emissions in 2016 decreased by 0.8% compared to 2015 in the final balance.</p>

Further Information

Page: CC13. Emissions Trading

CC13.1

Do you participate in any emissions trading schemes?

Yes

CC13.1a

Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership
European Union ETS	Fri 01 Jan 2016 - Sat 31 Dec 2016	12130000	157000	13200000	Facilities we own and operate
Korea ETS	Fri 01 Jan 2016 - Sat 31 Dec 2016	669508	0	669508	Facilities we own and operate
Other: Swiss ETS	Fri 01 Jan 2016 - Sat 31 Dec 2016	31036	16039	41755	Facilities we own and operate
Other: Shanghai pilot ETS	Fri 01 Jan 2016 - Sat 31 Dec 2016	1052754	87497	1140251	Facilities we own and operate

CC13.1b

What is your strategy for complying with the schemes in which you participate or anticipate participating?

Our overall strategy for compliance is to effectively reduce GHG emissions in the most cost-efficient way as this reflects our understanding of sustainability. This strategy comprises the continuous implementation of our in-house GHG reduction programs (decrease specific GHG emissions in BASF operations excl. Oil & Gas by 40% until the year 2020 based on 2002; cover 90% of our primary energy demand of BASF operations incl. Oil & Gas with certified energy management systems, DIN EN ISO 50001, by 2020), the realization of CDM projects and the trading of emission allowances. Regarding the EU ETS, BASF has prepared for the third trading period by implementing an adequate and flexible strategy. This takes into account all kinds of emission reduction measures, e.g. use of abatement

technology, increase in energy efficiency, as well as the use of project-based carbon credits and a purchase strategy for EUA. In principle, we apply the same approach to the other regional ETS. The four regionally limited trading schemes in which we participate apply to almost all segments of our businesses. The EU ETS covers BASF's power plants, major steam vessels or compressor stations, the former supplying many of BASF's production plants with electricity and steam, as well as chemical installations from almost all BASF business segments.

CC13.2

Has your organization originated any project-based carbon credits or purchased any within the reporting period?

Yes

CC13.2a

Please provide details on the project-based carbon credits originated or purchased by your organization in the reporting period

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits canceled	Purpose, e.g. compliance
Credit origination	Energy efficiency: industry	IN0707 India: FaL-G Brick Units in Micro Sector-PDD 1	CDM (Clean Development Mechanism)	89	89	No	Compliance
Credit origination	Energy efficiency: own generation	CN1891 China- Animal Manure Management System (AMMS) GHG Mitigation Project, Shandong Minhe Livestock Co. Ltd., Penglai, Shandong Province, P.R. of China	CDM (Clean Development Mechanism)	1448	1448	Yes	Compliance
Credit origination	Biomass energy	CN2221 China- Hubei Eco-Farming Biogas Project Phase I – Project	CDM (Clean Development Mechanism)	1101	1101	Yes	Compliance
Credit origination	Biomass energy	NP0136 Nepal: Biogas Support Program	CDM (Clean Development Mechanism)	497	497	Yes	Compliance

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits canceled	Purpose, e.g. compliance
			Mechanism)				
Credit origination	Biomass energy	NP0139 Nepal: Biogas Support Program	CDM (Clean Development Mechanism)	490	490	Yes	Compliance
Credit origination	Energy efficiency: industry	BD5125 Improving Kiln Efficiency in the Brick Making Industry in Bangladesh	CDM (Clean Development Mechanism)	568	568	Yes	Compliance
Credit origination	Biomass energy	NP5415 Biogas Support Program - Nepal Activity-3	CDM (Clean Development Mechanism)	1250	1250	Yes	Compliance
Credit origination	Biomass energy	NP5416 Biogas Support Program - Nepal Activity- 4	CDM (Clean Development Mechanism)	1214	1214	Yes	Compliance
Credit origination	Energy efficiency: industry	IN4831 India-FaL-G Brick and Blocks Project No.3	CDM (Clean Development Mechanism)	598	598	Yes	Compliance
Credit origination	Other: Energy efficiency	BD2765 Installation of Solar Home Systems in Bangladesh	CDM (Clean Development Mechanism)	7685	7685	Yes	Compliance
Credit origination	Hydro	NP3653 Micro-hydro Promotion	CDM (Clean Development Mechanism)	527	527	Yes	Compliance
Credit origination	Biomass energy	MD160 Moldova Biomass Heating in Rural Communities	CDM (Clean Development Mechanism)	238	238	No	Compliance
Credit origination	Energy efficiency: industry	MD173 Energy efficiency and fuel switching measures for buildings	CDM (Clean Development Mechanism)	23	23	Yes	Compliance
Credit	Biomass	MD159 Moldova Biomass Heating in Rural	CDM (Clean	232	232	No	Compliance

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits canceled	Purpose, e.g. compliance
origination	energy	Communities	Development Mechanism)				
Credit origination	Energy efficiency: industry	BD6085 Improving Kiln Efficiency in the Brick Making	CDM (Clean Development Mechanism)	216	216	No	Compliance

Further Information

Page: CC14. Scope 3 Emissions

CC14.1

Please account for your organization's Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	56279000	<p>(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. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR4, 2007. (iv) Methodology & assumptions: We analyzed the GHG emissions of our procured raw materials and precursor manufacturing at BASF's suppliers' facilities (including merchandise) by calculating the cradle-to-gate emissions, including all direct GHG emissions from raw material extraction, precursor manufacturing and transport, as well as indirect emissions from energy use. To do so, we determined the quantity of each single product purchased, and then applied emission factors for about 80 percent of the purchased products (by weight). 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</p>	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>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. Technical goods were assessed in most instances by calculating material values based on the monetary purchasing volume and determining material quantities based on price. Subsequently, we calculated GHG emissions by multiplying the total amount of the various materials by their respective cradle-to-gate emission factors. Services were assessed by their monetary purchasing volume. 5% of this volume was calculated as consumption of fuel oil. The corresponding GHG emissions were calculated by multiplying the total amount of fuel oil by its cradle-to-gate emission factor.</p>		
Capital goods	Relevant, calculated	2625000	<p>i) Activity data: Monetary purchasing volumes of capital goods purchased in the reporting year were obtained from BASF internal business data management systems. The proportions of material costs in the purchase prices of technical equipment were derived from the German Federal Statistical Office. MEPS carbon steel and world stainless steel prices for 2016 were taken from www.meps.co.uk. (ii) Emissions factors: The cradle-to-gate emissions factors were obtained from commercially and publicly available data sources such as GaBi</p>	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>(thinkstep), ecoinvent or ELCD. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR4, 2007. (iv) Methodology & assumptions: The GHG emissions that are associated with BASF's capital equipment purchased in 2016 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, fabricated equipment etc. were analyzed based on their monetary purchasing volume in 2016. Material values were calculated from the monetary purchasing volume and the share of material costs in total purchasing price. The proportion of material costs in the purchase prices of pumps, apparatus, vessels and other technical equipment were derived from the German Federal Statistical Office and from in-house estimates. It was assumed that material costs refer to the costs associated with the purchase of steel and concrete. The share of two commonly used steel grades of the total amount of steel was investigated in a large-scale project. The resulting proportion of carbon steel to stainless steel was then used for calculating the amount of steel. The corresponding GHG emissions were then calculated by multiplying the total amount of carbon and stainless steel as well as concrete by their respective cradle-to-gate emission factors.</p>		

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, calculated	2646000	(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 & 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 2016 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, 2016). 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	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			consumed in a T&D system: GHG emissions associated with losses of purchased electricity and steam were estimated based on our location-based Scope 2 emissions for 2016 and a grid-related loss factor of 7 percent for Germany. Losses associated with our own T&D system due to our own generation of electricity and steam are already accounted for in our Scope 1 emissions which are based on fuel input. Generation of electricity and steam that is purchased by the reporting company and sold to end users is not applicable to BASF.		
Upstream transportation and distribution	Relevant, calculated	2067000	(i) Activity data: Quantities and types of goods procured in 2016 were obtained from BASF internal business data management systems. (ii) Emissions factors: The CO2 emission factors used were taken from the McKinnon Report: "Measuring and Managing CO2 Emissions from the Transport of Chemicals in Europe". For trucks in Asia, a higher CO2 emission factor of 90 g CO2 per t*km was assumed. (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR4, 2007. (iv) Methodology & assumptions: For the calculation of the GHG emissions associated with the transportation of all procured products to BASF sites three different categories of procured products were defined: (i) raw materials and naphtha, (ii) natural gas and industrial gases and (iii) technical & capital goods and packaging. (i) The GHG emissions associated with the transportation of raw	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>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 1000 km. (iii) The GHG emissions that are associated with transportation of BASF's technical & capital goods and packaging purchased in 2016 were estimated by assuming that the transported weight of technical & capital goods is twice as much as the purchased steel quantity which was calculated as described in Category 2 (Scope 3 emissions from capital goods). Only truck transportation and an average transportation distance of 500 km (in USA 1000 km) were assumed.</p>		
Waste generated in operations	Not relevant, calculated	702000	(i) Activity data: The quantities of solid waste and waste water generated during production at all	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>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 & 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 CO2 during combustion results in the CO2 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,</p>		

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>respectively. The CO2-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 CO2. The CO2 emissions were calculated from the residual TOC with a conversion factor of CO2/TOC=3.67.</p>		
Business travel	Not relevant, calculated	178000	<p>(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: CO2 conversion factors for short-haul, medium-haul and long-haul flights were taken from www.carbonplanet.com. CO2 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 & assumptions: The GHG emissions associated with the transportation of all BASF Group</p>	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>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 CO2 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 CO2 emissions, using an average CO2 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 CO2 emissions using an average passenger car CO2 conversion factor derived from the GHG Protocol tool for mobile combustion (Version 2.6).</p>		
Employee commuting	Not relevant, calculated	269000	<p>(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 CO2 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)</p>	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>Methodology & assumptions: CO2 emissions from employee commuting in Europe were calculated based on the results of a representative poll conducted among BASF SE employees in 2009 (4,989 out of 33,812 employees). Employees were asked about the distance travelled between their homes and workplaces and their means of transportation. CO2 emissions were calculated by multiplying the travelled distance (220 days per year back and forth) with the respective CO2 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.</p>		
Upstream leased assets	Not relevant, calculated	265000	(i) Activity data: Leased cars: Vehicle miles as defined in the leasing contracts for BASF SE employees for 2016. Leased office and storage space: Leased office and storage space for the	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>reporting year was obtained from BASF internal business data management systems. Leased equipment: The monetary purchasing volume for leased equipment in 2016 was derived from BASF internal business data management systems. (ii) Emissions factors: The CO2 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. For Asia and North America it was taken from a study of the WBCSD. CO2 emissions factors per MWh were obtained from the International Energy Agency (IEA, 2013). Leased Equipment: The emissions factors for hardware were taken from ADEME Bilan Carbon 5.0 (France). (iii) GWP values: GWP values referring to the time horizon of 100 years were taken from IPCC, AR4, 2007. (iv) Methodology & assumptions: GHG emissions from leased assets were calculated for three different categories. 1) GHG emissions from cars leased by BASF SE were calculated by multiplying the vehicle miles travelled, which were derived from the respective leasing contracts, by the relevant CO2 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</p>		

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			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 2016 and CO2 emission factors for hardware.		
Downstream transportation and distribution	Relevant, calculated	1748000	(1) Activity data: Quantities and types of products sold in 2016 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 & assumptions: For the calculation of the GHG emissions associated with the transport of BASF products sold in 2016, the respective shipments from BASF sites to BASF customers were evaluated taking into account regional	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			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.		
Processing of sold products	Not relevant, explanation provided				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

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
					& 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	Relevant, calculated	45724000	(1) Activity data: Quantities and types of products sold in 2016 were obtained from BASF internal business data management systems. (ii) Emissions factors: The CO2 emissions factor for crude oil was taken from IPCC. The CO2 emissions factor for natural gas was calculated on the basis that natural gas is solely methane that is entirely converted into CO2. (iii) GWP values: GWPs were mainly taken from IPCC, AR4, 2007. Only the GWPs of some fluorinated hydrocarbons are manufacturers’ information. (iv) Methodology & 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 & Gas: It was assumed that 100% of the oil and gas are combusted for heating purposes. The volume of sold crude oil and natural gas, respectively, was multiplied by the CO2 emissions factor for crude oil	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			and natural gas, respectively, to calculate the GHG emissions associated with the thermal conversion of these products. 2) GHG emissions from products sold in 2016 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 2016, 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 N2O-N. CO2 from the use of urea (as fertilizer and solution for diesel truck engines) was calculated based on the sold product quantity and the contained CO2 amount. 3) GHG emissions from products sold in 2016 that contain greenhouse gases such as dry ice, CO2 as gas for the beverage industry and HFCs as foaming agents to produce polyurethane foams: GHG emissions from dry ice and CO2 liquid sold to the beverage industry were considered based on the sold quantity. GHG emissions from HFCs were calculated based on the procured HFC-quantities and the loss rate of HFCs in the polyurethane foams during their use phase (35 % for spray foam and 100% for integral foam).		
End of life treatment of sold products	Relevant, calculated	18304000	i) Activity data: Quantity of the products (raw materials, pre-products and packaging) purchased in 2016 and percentage of BASF's sales in Europe and in the other regions was obtained from BASF	0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			<p>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 United Nations 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 & 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 2016 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 CO2 a compound emits when incinerated can be determined by its C-content. Therefore, the CO2 emissions for all products incinerated were calculated by multiplying CO2 emissions per kg by the amount of pre-product. Incineration with energy</p>		

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			recovery was considered proportionately in Europe and Asia. In accordance with the Guidance for Accounting & Reporting Corporate GHG Emissions in the Chemical Sector Value Chain, 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 CO2-e emissions of products landfilled.		
Downstream leased assets	Not relevant, calculated	100000	BASF owns only a few downstream leased assets. It is estimated by BASF experts that the GHG emissions of this category account for about 5% of the category Upstream Leased Assets, which corresponds to <0.1 million tons of CO2-e.	0.00%	
Franchises	Not relevant, explanation provided				Not relevant as BASF does not own or operate franchises.
Investments	Relevant, calculated	2296000	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	100.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			& 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%.		
Other (upstream)					
Other (downstream)					

CC14.2

Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

Third party verification or assurance process in place

CC14.2a

Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/CC14.2a/BASF CDP.pdf	1-7	ISAE3000	100
Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/16/1516/Climate Change 2017/Shared Documents/Attachments/CC14.2a/BASF CDP.pdf	1-7	ISAE 3410	100

CC14.3

Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

CC14.3a

Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Purchased goods & services	Emissions reduction activities	0.3	Decrease	In 2016, we have initiated and implemented 170 measures that lead to a reduction of raw material demand for our operations. The lower demand helps to reduce emissions resulting from the production of these raw materials, i.e. reduces our corporate carbon footprint in Scope 3, Category 1 by 170,000 t CO ₂ e. For example, we optimized the catalyst in a petrochemical plant in our Geismar site resulting in higher selectivity and therefore less raw material consumption.
Purchased goods & services	Change in methodology	12.8	Increase	The overall increase of GHG emissions in this category is mainly due to the fact that we have changed the provider of our LCA database and life cycle inventory datasets, respectively. In the absence of primary data from our suppliers these LCI datasets are used to assess the GHG emissions associated with the extraction & production of raw material and pre-products purchased in the reporting year.
Capital goods	Change in output	9.1	Decrease	The decrease in GHG emissions in this category can be attributed to the fact that less capital goods were purchased in 2016 compared to 2015. The purchase of capital goods as well as the number of capital projects always fluctuates from year to year.
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Emissions reduction activities	7.2	Decrease	In 2016, we were able to further optimize the resource and energy consumption of our production in numerous projects around the world. New highly efficient combined heat and power plants started up at the German sites in Düsseldorf-Holthausen and Illertissen as well as at Pontecchio Marconi in Italy. Furthermore, process improvements at many additional sites have led to savings in steam and electricity. These savings had the result that less fuel and energy (electricity and steam) had to be purchased in 2016 compared to 2015.
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Change in methodology	17.4	Increase	The overall increase in GHG emissions in this Scope 3 category is linked to the change of our LCA database and life cycle inventory datasets, respectively. The new datasets that were used to calculate the GHG emissions of the fuels purchased in 2016 are characterized by higher cradle-to-gate carbon footprints than the previously used datasets.
Business travel	Emissions reduction activities	45.1	Decrease	In 2016 BASF fostered limitations of business travel by increased cost discipline, driven also by our corporate purpose "We create chemistry for a sustainable future" which calls for contributions to a sustainable future, including efforts for climate protection along the entire value chain.
Use of sold products	Change in output	7.1	Increase	In 2016, our Oil & Gas segment Wintershall increased production of oil and natural gas. Hence, more GHG emissions are produced from burning the respective amounts for heating purposes, leading to an increase in GHG emissions in this category compared to

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
				the previous year.
Investments	Change in output	10.2	Increase	The increase in GHG emissions in this Scope 3 category is due to an increase in production volumes of several of our investments.

CC14.4

Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)

Yes, our suppliers
Yes, our customers

CC14.4a

Please give details of methods of engagement, your strategy for prioritizing engagements and measures of success

i) Methods of engagement:

BASF products are involved in many climate protection technologies. Therewith we enable energy efficiency and climate protection in a variety of sectors. We promote the use of our solutions in customer dialogues and engage in partnerships with customers to find new solutions and demonstrate the benefits of climate protection technologies (e.g. insulation of buildings, electric mobility, biobased packaging materials). The close alignment of our business with our customers' needs is an important component of our "We create chemistry" strategy. 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. In joint ventures, we start working closely together with customers already at an early stage in order to develop new solutions for a specific industry. We offer functionalized materials and solutions tailored to customers' requirements.

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) is customer-dependent.

Part of our engagement also includes responding to customer information requests like the CDP Supply Chain Programme or supplier performance reviews.

ii) Strategy for prioritizing

The alignment of our business with our customers' needs has overall strategic priority. The engagement of individual business units with customers is prioritized based on various criteria, including (but not limited to) strategic relevance of customer, previous engagements, volume of sales to customer, leverage of customer in the market.

iii) Measures of success

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 2016: 27.2%).

The products that help to reduce GHG emissions or increase energy efficiency in this context are dubbed Accelerators "Climate Change & 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 24 climate protection product groups revealed that customers' use of products sold in 2016 helped to avoid 540 million metric tons of CO2 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, 11% of the emissions avoided were attributable to BASF in 2016.

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.

CC14.4b

To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
Active engagement	3627	65%	i) Description of engagement: As a founding member of the initiative Together for Sustainability (TfS), since 2011 BASF has been using EcoVadis assessments and TfS on-site audits to obtain pertinent information on raw material suppliers, as well as providers of technical goods, services and logistics operations. The supplier assessments provide us with valuable information on their sustainability performance, including greenhouse gas (GHG) emissions. +++ ii) Impact of

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
			<p>engagement: These sustainability evaluations raise transparency in the supply chain and enable BASF's engagement with suppliers. The assessments and audits leverage action of suppliers to improve their sustainability performance and thus to become better partners for BASF in view of our expectation to source responsibly, as stated in the focus areas of our strategy. +++ iii) How success is measured: The score in EcoVadis assessments provides a direct supplier performance indicator. It can be positively influenced by reporting on energy use and GHG emissions, by indicating that the supplier reports to CDP and by holding ISO 50001 and ISO 14001 certifications. 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. BASF's overall progress on assessments and audits of suppliers is tracked through a corporate target: by 2020 we aim to evaluate the sustainability performance of 70% of our relevant suppliers according to our risk-based approach, and develop action plans for any necessary improvements. +++ iv) Examples of positive outcomes of active engagement with individual suppliers: 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. 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.</p>

CC14.4c

Please explain why you do not engage with any elements of your value chain on GHG emissions and climate change strategies, and any plans you have to develop an engagement strategy in the future

Further Information

Please find attached the comprehensive BASF Scope 3 report for 2016.

Attachments

Module: Sign Off

Page: CC15. Sign Off

CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Michael Heinz	Member of the Board of Executive Directors, responsibilities: Engineering&Maintenance, EHS, European Site&Verbund Management, Human Resources, Industrial Relations Director, Site Director Ludwigshafen	Board/Executive board

Further Information

CDP 2017 Climate Change 2017 Information Request