

# BASF SE - Water Security 2019

## W0. Introduction

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## W0.1

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## (W0.1) Give a general description of and introduction to your organization.

At BASF, we create chemistry for a sustainable future. As the world's leading chemical company, we combine economic success with environmental protection and social responsibility. The approximately 122,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world.

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

The company purpose "we create chemistry for a sustainable future" has embedded sustainability even further within the company. Within the journey of contributing to a more sustainable future, water was identified as a key topic for BASF. Increasing world population, the change in consumer behaviour and increasing demand for higher standards of living all characterize the importance of water stewardship.

BASF is also committed to the Sustainable Development Goals of the United Nations, which comprise the goal to ensure availability and sustainable management of water and sanitation for all (SDG 6 – Clean Water and Sanitation).

To promote water stewardship and to increase BASF's resilience towards this resource we pursue the goal of establishing sustainable water management at all sites in water stress areas and at all Verbund sites by 2025 by applying the European Water Stewardship (EWS) standard. After introducing the standard at our European sites in 2013, we started the global implementation and in 2018 we introduced the standard at five additional sites. In 2015, external audit awarded us with the gold-level certification for our extensive application of the EWS standard and water management at the production site in Tarragona, Spain. Our Verbund site in Ludwigshafen received the EWS standard gold-level certification in 2014.

In order to prevent unanticipated emissions and the pollution of surface or groundwater, we create water protection strategies for our production sites as part of the Responsible Care initiative. The wastewater protection plans involve evaluating wastewater in terms of risk and drawing up suitable monitoring approaches. We use audits to check that these measures are being implemented and complied with.

Based on the findings of IPCC AR5 (and subsequent studies e.g. Aqueduct Water Risk Atlas by WRI), we analyzed all BASF Verbund sites worldwide in terms of future water stress. Consequential, we do not expect climate change to have a significant impact on the water supply at these sites in the near future.

We use our eco-efficiency analysis to evaluate products and processes with respect to their emissions to water and their consumptive water use.

We have just recently implemented the AWARE (Available WAtER REMaining) Water Assessment methodology into our eco-efficiency analysis. The Aware Methodology is the WULCA consensus characterization model for water scarcity footprints: assessing impacts of water consumption based on available water remaining (AWARE). BASF assesses its value to society - economic, social and environmental benefits and costs - in monetary terms using PwC's TIMM method. The scope includes the supply chain (tier 1 to tier n), own operations and customer industries. With regard to water, emissions and consumption are integrated.

Using the Sustainable Solution Steering® method BASF conducted sustainability assessments of its entire product portfolio. Products and solutions related to € 2,3 billion in sales make a particular contribution to water improvements in the value chain.

With these initiatives and projects, among others, BASF is able to use its expertise and innovation to find sustainable solutions to growing water related issues, such as scarcity or quality, worldwide.

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.

**(W-CH0.1a) Which activities in the chemical sector does your organization engage in?**

- Bulk organic chemicals
- Bulk inorganic chemicals
- Specialty organic chemicals
- Specialty inorganic chemicals

**W0.2**

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**(W0.2) State the start and end date of the year for which you are reporting data.**

	Start date	End date
Reporting year	January 1 2018	December 31 2018

**W0.3**

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**(W0.3) Select the countries/regions for which you will be supplying data.**

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

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

#### W0.4

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**(W0.4) Select the currency used for all financial information disclosed throughout your response.**

EUR

#### W0.5

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**(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.**

Other, please specify (Production sites; based on equity share)

Other: BASF Group's scope of consolidation for its financial reporting comprises BASF SE, with its headquarters in Ludwigshafen, Germany, and all of its fully consolidated material subsidiaries. Joint operations are proportionally consolidated. Shares in joint ventures and associated companies are accounted for, if material, using the equity method in the BASF Group Consolidated Financial Statements.

**W0.6**

**(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?**

Yes

**W0.6a**

**(W0.6a) Please report the exclusions.**

Exclusion	Please explain
Administrative sites (e.g. sales offices)	BASF only reports water inputs/outputs for its production sites. The water inputs/outputs from its various administrative sites are not collected since their contribution to BASF's total water inputs/ outputs is not significant (<0.1%)
Associated/affiliated companies over which BASF has significant influence but does not have financial control (so-called B-companies) or from subsidiaries that are considered to be immaterial from a BASF point of view (so-called C-companies)	The contribution of the water inputs/outputs from BASF's B- and C- companies to BASF's total water inputs/outputs is not significant (< 2%). Thus, they are not collected and reported.

**W1. Current state**

**W1.1**

**(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.**

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital	Important	Direct use: Coolant (87%), also as solvent or cleaning agent, and product input. Rationale: Many of our products rely on freshwater as product or process input, with strict quality parameters. With impure water, product quality is severely affected/efforts for water pre-treatment rise. 2018, 81% of water withdrawal was from surface water/freshwater sources. Hence, freshwater availability is considered vital for operations. Future: At this time, we expect no significant changes in importance, as core processes and product lines will remain. Future shifts in product portfolio could alter this status. Indirect use: Many suppliers are chemical factories and use water as coolant and solvent. Rationale: Water use heavily depends on sector/product. For instance, hydrocarbons require lots of process steam and cooling water. Other products are less dependent on freshwater. Therefore the availability is important, but not in all cases vital for operations in our supply chain. Future: At this time, we expect no significant changes of dependency in our supply chain, as core groups of procured materials will remain. Future shifts in product portfolio could alter this status.
Sufficient amounts of recycled, brackish and/or produced water available for use	Vital	Important	Direct use: Mainly cooling. Rationale: 14% of withdrawal was from brackish/seawater in 2018: a significant share that cannot be readily replaced by other sources. We recirculate water as much as possible, to withdraw less. Future: At this time, we expect no significant changes, as use of brackish water depends on availability/local conditions. Use of recycled water may be increased to decrease freshwater dependency. Indirect use: Mainly coolant (brackish), solvent (recycled). Rationale: Use and importance of brackish/recycled water depends on process, availability and local conditions. Therefore this aspect is important, but not in all cases vital for operations. Future trends: At this time, we expect no significant changes in water dependency in our supply chain, as core groups of procured materials will remain in place. However, future shifts in the product portfolio could alter this status. Use of recycled water or reuse of wastewater may be increased due to limited freshwater supply.

**(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?**

	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	100%	BASF collects data on water supply, water use, and water discharge at site level in a global database, named REHSA (Reporting EHS Application). Data entry and maintenance have precise reporting requirements. Training sessions are conducted to ensure that the same data standards are implemented around the world. We publicly report the information for the entire company in the annual BASF report and the database is audited externally. 100% of BASF production sites are monitored for total volumes of water withdrawals. Data in the REHSA is updated annually.
Water withdrawals – volumes from water stressed areas	100%	Water stress areas were defined using the tool developed by Pfister et al., 2009. From 2019 onward, we will define water stress areas using the Aqueduct tool. BASF collects data on water supply, water use, and water discharge at site level in a global database, named REHSA (Reporting EHS Application). Data entry and maintenance have precise reporting requirements. Training sessions are conducted to ensure that the same data standards are implemented around the world. We publicly report the information for the entire company in the annual BASF report and the database is audited externally. 100% of BASF production sites from water stressed areas are monitored for volumes of water withdrawals. Data in the REHSA is updated every six months for larger sites, and annually for smaller sites. The percentage of water from water stressed areas is calculated annually for strategic and reporting purposes.
Water withdrawals – volumes by source	100%	BASF collects data on water supply, water use, and water discharge at site level in a global database, named REHSA (Reporting EHS Application). Data entry and maintenance have precise reporting requirements. Training sessions are conducted to ensure that the same data standards are implemented around the world. We publicly report the information for the entire company in the annual BASF report and the database is audited externally. 100% of BASF production sites are monitored for volumes of water withdrawals by sources. Data in the REHSA is updated annually.
Entrained water associated with your metals & mining sector activities - total volumes [only metals and mining sectors]	<Not Applicable>	<Not Applicable>
Produced water associated with your oil & gas sector activities - total volumes [only oil and gas sector]	<Not Applicable>	<Not Applicable>
Water withdrawals quality	76-99	BASF collects quality data on a local site level. It is not part of the REHSA (Reporting EHS Application) but carried out according to site specific processes and guidelines, where required. Therefore, we assume coverage of 100% of relevant sites, or a slightly lesser coverage if all sites are taken into account. Withdrawals quality is monitored taking into account the type of withdrawal, e.g. there are specific criteria for sea water withdrawals etc. The frequency of monitoring varies according to local requirements for the production process – in some cases, a continuous monitoring is in place. In other cases, monitoring is updated in regular intervals, e.g. annually.
Water discharges – total volumes	100%	BASF collects data on water supply, water use, and water discharge at site level in a global database, named REHSA (Reporting EHS Application). Data entry and maintenance have precise reporting requirements. Training sessions are conducted to ensure that the same data standards are implemented around the world. We publicly report the information for the entire company in the annual BASF report and the database is audited externally. 100% of BASF production sites are monitored for total volumes of water discharges. Data in the REHSA is updated annually.
Water discharges – volumes by destination	100%	BASF collects data on water supply, water use, and water discharge at site level in a global database, named REHSA (Reporting EHS Application). Data entry and maintenance have precise reporting requirements. Training sessions are conducted to ensure that the same data standards are implemented around the world. We publicly report the information for the entire company in the annual BASF report and the database is audited externally. 100% of BASF production sites are monitored for volumes of water discharges by destination. Data in the RCDB is updated annually.
Water discharges – volumes by treatment method	100%	BASF collects data on water supply, water use, and water discharge at site level in a global database, named REHSA (Reporting EHS Application). Data entry and maintenance have precise reporting requirements. Training sessions are conducted to ensure that the same data standards are implemented around the world. We publicly report the information for the entire company in the annual BASF report and the database is audited externally. 100% of BASF production sites are monitored for volumes of water discharges by treatment method. Data in the REHSA is updated annually.
Water discharge quality – by standard effluent parameters	100%	BASF collects data on water supply, water use, and water discharge at site level in a global database, named REHSA (Reporting EHS Application). Data entry and maintenance have precise reporting requirements. Training sessions are conducted to ensure that the same data standards are implemented around the world. We publicly report the information for the entire company in the annual BASF report and the database is audited externally. 100% of BASF production sites are monitored for quality by standard effluent parameters. Data in the REHSA is updated annually.

	% of sites/facilities/operations	Please explain
Water discharge quality – temperature	76-99	BASF collects discharge temperature data on a local site level. It is not part of the REHSA (Reporting EHS Application) but carried out according to site specific processes and requirements. Time intervals vary depending on requirements, and can also be continuous. In some cases, we also monitor/calculate not only temperature amounts but also heat input to e.g. surface water bodies. Therefore, we assume coverage of 100% of relevant sites (i.e. all sites with discharges of cooling water), or a slightly lesser coverage if all sites are taken into account.
Water consumption – total volume	100%	BASF collects data on water consumption at each site in a global database named REHSA (Reporting EHS Application). Data entry and maintenance have precise reporting requirements. Training sessions are conducted to ensure that the same data standards are implemented around the world. 100% of BASF production sites are monitored for total volumes of water consumption. Data are updated annually.
Water recycled/reused	100%	BASF collects data on water supply, water use, and water discharge at site level in a global database, named REHSA (Reporting EHS Application). Data entry and maintenance have precise reporting requirements. Training sessions are conducted to ensure that the same data standards are implemented around the world. We publicly report the information for the entire company in the annual BASF report and the database is audited externally. 100% of BASF production sites are monitored for water recycled and reused. Data in the RCDB is updated annually.
The provision of fully-functioning, safely managed WASH services to all workers	100%	BASF signed the “Pledge for Access to Safe Water, Sanitation and Hygiene at the Workplace” (WASH) of the World Business Council for Sustainable Development (WBCSD). By signing the pledge, BASF strengthened its commitment to provide access to water, sanitation and hygiene at the workplace at an appropriate level of standard for all employees. The Department Corporate Health Management is responsible for the management of occupational health and general Health topics of BASF employees, and the coordination and auditing of occupational medicine in 100 % of BASF production sites worldwide. Part of this responsibility are the topics sanitation and hygiene at the workplace. Sites are audited on a regular basis - 5 year interval if no negative findings were identified, or more frequently in case of findings. Audit results and action items are tracked in an audit database. We performed 22 audits in 2018 and 34 Health Performance Control visits.

## W1.2b

**(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, and how do these volumes compare to the previous reporting year?**

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	1745000	Lower	Total amount of water withdrawn was somewhat lower due to increased use of recirculating cooling processes instead of once-through cooling and due to lower production mainly at our Verbund site in Ludwigshafen. Future trends: At this time, we expect no significant changes in total water withdrawal, as core groups of procured materials will remain in place. However, further extension of our facilities or a future change in product portfolio could alter this status.
Total discharges	1614000	Lower	Total amount of water discharged was somewhat lower due increased use of recirculating cooling processes instead of once-through cooling and due to lower production mainly at our Verbund site in Ludwigshafen. Future trends: At this time, we expect no significant changes in total water discharges, as core groups of procured materials will remain in place. However, higher production, further extension of our facilities or a future change in product portfolio could alter this status.
Total consumption	67000	Much lower	Water consumption is the sum of all water that has been withdrawn and incorporated into products, waste, evaporated, consumed by humans or livestock, polluted to a point of being unusable by others, and therefore not released back to surface water, groundwater, third party over the course of the reporting period. At BASF water consumption is mainly due to evaporation in recirculating cooling processes. A smaller fraction is incorporated into products or consumed by other processes. Water consumption in 2018 was much lower than in 2017. For evaporation in cooling processes the reported volume was slightly lower than our assumed evaporation rate in 2017. The main reason for much lower consumption however is the revised calculation of water in product: Water in products on group level is now calculated from the average water content of the volume sales. The figures do not balance using basic calculation “Withdrawals = Consumption + discharges” due to measurement uncertainties for discharged cooling water in open channels. Future trends: At this time, we expect no significant changes in total water consumption, as core groups of procured materials will remain in place. However, higher production / further extension of our facilities or a future change in product portfolio could alter this status.

## W1.2d

**(W1.2d) Provide the proportion of your total withdrawals sourced from water stressed areas.**

	% withdrawn from stressed areas	Comparison with previous reporting year	Identification tool	Please explain
Row 1	1.16	About the same	Other, please specify (Pfister et al., 2009)	All our sites have to report their water withdrawal (see question W 1.2). We used a tool developed by the ETH Zurich (Pfister et al, 2009) to assess which of our sites are located in water stress areas. These are defined as regions where 60% or more of the available water is used by industry, household and agriculture. The tool thus calculates a water stress index (WSI) following a logistic function between 0.01 to 1, taking into account the local freshwater withdrawal-to-availability ratio with additional adjustments. The data for the WSI values per watershed is available. Based on the results, we can filter water data to show only withdrawals for these sites. All the identified sites have to assess the sustainability of their water supply (BASF Global Goal). The evaluation is updated at the end of each Calendar Year, with a special focus on new BASF production sites. The evaluation is conducted centrally for all sites by water experts in our corporate Environmental Protection unit . Explanation of change: In 2017 water withdrawal by the sites in water stress areas was 1.03% of BASFs total withdrawal. The difference is not significant and is due to a lower volume of water abstracted in non-water stress areas.

**W1.2h**

**(W1.2h) Provide total water withdrawal data by source.**

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	1409000	Lower	Fresh surface water is the most important source for water supply. Most of the water is used for once-through cooling at our site in Ludwigshafen. The water is taken from the river and is given back to it after use without having contact to chemicals. The decrease in freshwater withdrawal was mainly for decreased once-through and increased recirculating cooling flow in combination with lower production at our Ludwigshafen site (last year: 1472000 megaliters). Future trends: Since water withdrawal in our operations is affected by production output due to cooling water use, it may increase to a certain extent with growing production.
Brackish surface water/Seawater	Relevant	246000	Lower	Brackish water has a relevant share within BASF's overall water withdrawals. Most of the brackish water is withdrawn and discharged at our site in Antwerp, located near the sea. The brackish water is taken from the harbor and discharged back after use in a recirculating cooling system. The decrease in brackish water withdrawal was mainly for decreased cooling purposes (last year: 258000 megaliters). Future trends: Since water withdrawal in our operations is affected by production output due to cooling water use, it may increase to a certain extent with growing production.
Groundwater – renewable	Relevant	66000	About the same	Groundwater water has a rather small, but relevant share within BASF's overall water withdrawals, especially for higher quality water requirements. We do not yet distinguish between renewable and non-renewable groundwater supply in our BASF REHSA database, but most groundwater supply comes from renewable resources. The amount is roughly the same as last year, which was at 65000 megaliters. Future trends: At this time, we expect no significant changes in groundwater water withdrawal in our operations, as core groups of procured materials will remain in place. However, future shifts in the product portfolio could alter this status.
Groundwater – non-renewable	Not relevant	<Not Applicable>	<Not Applicable>	We do not yet distinguish between renewable and non-renewable groundwater supply in our BASF Responsible Care database, but most groundwater supply comes from renewable resources. Future trends: At this time, we expect no significant changes in ground water withdrawal in our indirect operations, as core groups of procured materials will remain in place. However, future shifts in the product portfolio could alter this status.
Produced/Entrained water	Not relevant	<Not Applicable>	<Not Applicable>	Produced water is not a relevant withdrawal source for BASF, since water requirements can regularly be met using other, more accessible sources. -The situation has not changed since 2017. Future trends: At this time, we expect no significant changes in withdrawal from produced water.
Third party sources	Relevant	24000	About the same	Third party source is mainly drinking water (23000 megaliters). Wastewater from another organization accounts for about 1000 megaliters. This represents a rather small share of our overall withdrawals, but the relevance is constituted by the dependence on and interrelations with external stakeholders. The amount is virtually constant compared to the 2017 figures (21000 megaliters). Future trends: At this time, we expect no significant changes in withdrawal from third party sources regarding drinking water. The amount of wastewater from other organization is expected to increase.



## W1.2i

### (W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	Relevant	1344000	Lower	Fresh surface water is the most important source for water supply. Most of the water is used for once-through cooling at our site in Ludwigshafen. The water is taken from the river and is given back to it after use without having contact to chemicals. The decrease in discharge was mainly for decreased once-through and increased circulated cooling water flow and decreased production at our Ludwigshafen site (last year: 1487000 megaliters). Future trends: Since water discharge in our operations is affected by production output due to cooling water use, it may increase to a certain extent with growing production.
Brackish surface water/seawater	Relevant	239000	Lower	Some sites are located nearby the coast and brackish water or the sea is the destination for discharge. The lower discharge into brackish water is the result of lower cooling water discharge at the site in Antwerp (last year: 250000 megaliters). Future trends: Since water discharge in our operations is affected by production output due to cooling water use, it may increase to a certain extent with growing production.
Groundwater	Relevant	10000	About the same	Water discharge via soil to water beneath the soil surface or water discharge into isolated geological formations. This represents a rather small share of our overall discharges, but the relevance is constituted by the potential ecological implications. The level is equal to the previous year (10000 megaliters). Future trends: At this time, we expect no significant changes in discharges to groundwater.
Third-party destinations	Relevant	21000	About the same	Includes all water treated in a wastewater treatment plant (WWTP) which is not operated by BASF - municipal and private owned WWTP. This represents a rather small share of our overall discharges, but the relevance is constituted by the dependence on and interrelations with external stakeholders. The amount is within the same range as the 2017 figures (19000 megaliters). Future trends: At this time, we expect no significant changes in discharges to third party sources.

## W1.2j

### (W1.2j) What proportion of your total water use do you recycle or reuse?

	% recycled and reused	Comparison with previous reporting year	Please explain
Row 1	51-75	About the same	Most of the water is recycled in cooling processes. In 2018 the percentage recycled or reused was 75% for total BASF. In 2017 the percentage recycled or reused was 72%. The insignificantly higher value for 2018 is mainly the result of the increased volume of recirculating cooling water use in Ludwigshafen. Impact: The recycling of cooling water reduces the dependence on fresh water supply, however it is often combined with higher energy demand. In regions with high water availability like in Ludwigshafen, once-through cooling is more energy efficient and therefore the preferred process. In regions with low water availability recycling of cooling water is preferred, as this greatly reduces water withdrawals. Correspondingly the percentage recycled and reused in our sites located in water stress regions is considerably higher (99%) compared to total BASF. Future trends: At this time, we expect no significant changes in water reuse/recycling.

## W-CH1.3

### (W-CH1.3) Do you calculate water intensity for your activities in the chemical sector?

Yes

## W-CH1.3a

**(W-CH1.3a) For your top five products by production weight/volume, provide the following water intensity information associated with your activities in the chemical sector.**

**Product type**

Bulk organic chemicals

**Product name**

Ethylene

**Water intensity value (m3)**

1.21

**Numerator: water aspect**

Freshwater consumption

**Denominator: unit of production**

m3

**Comparison with previous reporting year**

Higher

**Please explain**

We define water consumption as water not returned to its original environment (includes evaporated water, water contained in products and consumed as part of chemical reactions). Water intensities at BASF plants are vastly different depending on location and a number of boundary conditions for each plant (even for the same product). Our largest site in Ludwigshafen was chosen as meaningful example for 4 major products. Hot summers can lead to less fresh water available as well as higher river water temperatures due to drought. In such periods, recooled water volume is increased, which results in more evaporation (consumption) and higher water intensities. This was the case during 2018, hence the higher water intensities compared to the previous year. How metrics are used/strategy to manage intensities: The more water is recirculated (and partially evaporated/consumed), the more electricity for pumping is needed, representing a cost factor and causing GHG emissions. The recirculated water portion of the cooling water cycle is continuously monitored to maintain an optimum of GHG emission, water consumption and once-through cooling mode. The main parameters determining this optimum are regulatory constraints (max. effluent temp., receiving water body temp., max. fresh water intake) as well as electricity prices and pumping capacity. In our strategic effort to reduce GHG emissions, we therefore seek to limit recooling, thus also calculated water intensities. On site level, the recirculation rate/water intensity is a central parameter to plan internally for future demand of cooling capacities to be added and is part of the long term development strategy of the sites.

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**Product type**

Bulk organic chemicals

**Product name**

Propylene

**Water intensity value (m3)**

1.21

**Numerator: water aspect**

Freshwater consumption

**Denominator: unit of production**

m3

**Comparison with previous reporting year**

Higher

**Please explain**

We define water consumption as water not returned to its original environment (includes evaporated water, water contained in products and consumed as part of chemical reactions). Water intensities at BASF plants are vastly different depending on location and a number of boundary conditions for each plant (even for the same product). Our largest site in Ludwigshafen was chosen as meaningful example for 4 major products. Hot summers can lead to less fresh water available as well as higher river water temperatures due to drought. In such periods, recooled water volume is increased, which results in more evaporation (consumption) and higher water intensities. This was the case during 2018, hence the higher water intensities compared to the previous year. How metrics are used/strategy to manage intensities: The more water is recirculated (and partially evaporated/consumed), the more electricity for pumping is needed, representing a cost factor and causing GHG emissions. The recirculated water portion of the cooling water cycle is continuously monitored to maintain an optimum of GHG emission, water consumption and once-through cooling mode. The main parameters determining this optimum are regulatory constraints (max. effluent temp., receiving water body temp., max. fresh water intake) as well as electricity prices and pumping capacity. In our strategic effort to reduce GHG emissions, we therefore seek to limit recooling, thus also calculated water intensities. On site level, the recirculation rate/water intensity is a

central parameter to plan internally for future demand of cooling capacities to be added and is part of the long term development strategy of the sites.

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#### Product type

Bulk organic chemicals

#### Product name

Benzene

#### Water intensity value (m3)

0.23

#### Numerator: water aspect

Freshwater consumption

#### Denominator: unit of production

m3

#### Comparison with previous reporting year

Higher

#### Please explain

We define water consumption as water not returned to its original environment (includes evaporated water, water contained in products and consumed as part of chemical reactions). Water intensities at BASF plants are vastly different depending on location and a number of boundary conditions for each plant (even for the same product). Our largest site in Ludwigshafen was chosen as meaningful example for 4 major products. Hot summers can lead to less fresh water available as well as higher river water temperatures due to drought. In such periods, recooled water volume is increased, which results in more evaporation (consumption) and higher water intensities. This was the case during 2018, hence the higher water intensities compared to the previous year. How metrics are used/strategy to manage intensities: The more water is recirculated (and partially evaporated/consumed), the more electricity for pumping is needed, representing a cost factor and causing GHG emissions. The recirculated water portion of the cooling water cycle is continuously monitored to maintain an optimum of GHG emission, water consumption and once-through cooling mode. The main parameters determining this optimum are regulatory constraints (max. effluent temp., receiving water body temp., max. fresh water intake) as well as electricity prices and pumping capacity. In our strategic effort to reduce GHG emissions, we therefore seek to limit recooling, thus also calculated water intensities. On site level, the recirculation rate/water intensity is a central parameter to plan internally for future demand of cooling capacities to be added and is part of the long term development strategy of the sites.

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#### Product type

Bulk organic chemicals

#### Product name

Ammonia

#### Water intensity value (m3)

0.28

#### Numerator: water aspect

Freshwater consumption

#### Denominator: unit of production

m3

#### Comparison with previous reporting year

Higher

#### Please explain

We define water consumption as water not returned to its original environment (includes evaporated water, water contained in products and consumed as part of chemical reactions). Water intensities at BASF plants are vastly different depending on location and a number of boundary conditions for each plant (even for the same product). Our largest site in Ludwigshafen was chosen as meaningful example for 4 major products. Hot summers can lead to less fresh water available as well as higher river water temperatures due to drought. In such periods, recooled water volume is increased, which results in more evaporation (consumption) and higher water intensities. This was the case during 2018, hence the higher water intensities compared to the previous year. How metrics are used/strategy to manage intensities: The more water is recirculated (and partially evaporated/consumed), the more electricity for pumping is needed, representing a cost factor and causing GHG emissions. The recirculated water portion of the cooling water cycle is continuously monitored to maintain an optimum of GHG emission, water consumption and once-through cooling mode. The main parameters determining this optimum are regulatory constraints (max. effluent temp., receiving water body temp., max. fresh water intake) as well as electricity prices and pumping capacity. In our strategic effort to reduce GHG emissions,

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we therefore seek to limit recooling, thus also calculated water intensities. On site level, the recirculation rate/water intensity is a central parameter to plan internally for future demand of cooling capacities to be added and is part of the long term development strategy of the sites.

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## W1.4

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### (W1.4) Do you engage with your value chain on water-related issues?

Yes, our suppliers

Yes, our customers or other value chain partners

## W1.4a

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### (W1.4a) What proportion of suppliers do you request to report on their water use, risks and/or management information and what proportion of your procurement spend does this represent?

#### Row 1

##### % of suppliers by number

1-25%

##### % of total procurement spend

26-50

#### Rationale for this coverage

Our suppliers are evaluated based on risk due to the size and scale of our supplier portfolio. We define relevant suppliers as those showing an elevated sustainability risk potential as identified by our risk matrices and our purchasers' assessments. We also use further sources of information to identify relevant suppliers such as evaluations from Together for Sustainability (TfS). Incentivation: We work together in an open and transparent way to realize long-term benefits for both sides. In doing so, we create added value that goes above and beyond procurement alone, for example by developing solutions to target market-specific customer requirements together with our suppliers. Our buyers integrate results of the evaluations into their supplier management. The sustainability results can be used in bonus malus scheme and as awarding criterion. Suppliers may be excluded from participating in tenders because of poor sustainability evaluation results.

#### Impact of the engagement and measures of success

Information requested: In online assessments, suppliers are requested to report on water use, mgmt. procedures, wastewater handling and existence of a water policy. In TfS on-site audits, internal water policies, reports, protection concepts for wastewater effluents, containment measures and water-related impact reduction practices are examined. Use of information: Suppliers' performance in these areas impacts their evaluation result. If we identify potential for improvement, we support suppliers in developing measures. We conduct another review according to a defined timeframe based on the sustainability risk measured. Measure of success: By 2020, we aim to evaluate the sustainability performance of 70% of BASF Group's relevant suppliers and develop action plans for any necessary improvements. Proportion evaluated by the end of 2018 was 60% (2017: 56%). Success is also measured through re-assessments/ audits.

#### Comment

## W1.4b

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#### (W1.4b) Provide details of any other water-related supplier engagement activity.

##### Type of engagement

Incentivizing for improved water management and stewardship

##### Details of engagement

<Not Applicable>

##### % of suppliers by number

<Not Applicable>

##### % of total procurement spend

<Not Applicable>

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

BASF is a founding member of the Together for Sustainability (TfS) initiative of leading chemical companies for global standardization of supplier evaluations and auditing. With the help of TfS, we obtain pertinent sustainability information of our raw material suppliers, providers of technical goods/services and logistics operations, with the goal to promote sustainable development in the supply chain. Our suppliers are evaluated based on risk due to the size and scale of our supplier portfolio. We define relevant suppliers as those showing an elevated sustainability risk potential as identified by our risk matrices and our purchasers' assessments. We also use further sources of information to identify relevant suppliers such as evaluations from TfS. When selecting suppliers, buyers can access evaluation reports on the suppliers' sustainability performance. Buyers are encouraged and trained to integrate available evaluation results into awarding processes and business decisions.

##### Impact of the engagement and measures of success

<Not Applicable>

##### Comment

<Not Applicable>

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#### W1.4c

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#### (W1.4c) What is your organization's rationale and strategy for prioritizing engagements with customers or other partners in its value chain?

We integrate sustainability information on BASF and its products in day-to-day business with our **customers**. **Method/strategy:** We use a range of sustainability tools to support interaction with customers: lifecycle assessment tools (Eco-Efficiency Analysis, SEEBALANCE®, AgBalance™) or tools for systematic analysis of the sustainability landscape in a value chain. Exact intensity and modus of interaction (e.g. one-to-one meetings, workshops, joint projects, seminars) is customer-dependent.

**Prioritization:** Our engagement with customers essentially covers our entire customer base. Findings from our sustainability tools allow us to identify hot spots; prioritization for working with specific customers is primarily driven by our divisions based on opportunities. We have segmented our portfolio regarding contribution to sustainability (including reduction of water use), using the Sustainable Solution Steering® method. Products with substantial sustainability contribution in the value chain are classified as Accelerators. We **measure success** of these Accelerators by their percentage within the sales volume.

We also undertake sector specific engagements: For instance, via our Agricultural Products division, we engage with selected agricultural **customers, networks, initiatives and also local water utilities**.

**Method and strategy:** Partnerships to jointly develop and disseminate best management practices to reduce water use and pollution. This can apply to optimized product use of e.g. herbicides, technical innovations like mulch films, optimized irrigation practices or alternative cultivation techniques like dry-seed rice.

**Prioritization:** Partner must be influencers in strategic value chains (crop-specific) and willing to cooperate with industry. **Success** is measured by number of touchpoints with value chain players (e.g. number of engaged farmers or advisors), as well as Agricultural Products product sales within these value chains.

## W2. Business impacts

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### W2.1

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#### (W2.1) Has your organization experienced any detrimental water-related impacts?

Yes

### W2.1a

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#### (W2.1a) Describe the water-related detrimental impacts experienced by your organization, your response, and total financial impact.

##### Country/Region

Germany

##### River basin

Rhine

##### Type of impact driver

Physical

##### Primary impact driver

Drought

##### Primary impact

Supply chain disruption

##### Description of impact

Production at BASF's largest site Ludwigshafen depends on the adjacent river Rhine in two ways: (a) withdrawal of water mainly for cooling purposes, (b) transportation of raw materials and final products via barges. In 2018, the site experienced an exceptional drought and heat, which caused an extremely long and intense phase of low river water levels and very high water-temperatures during the peak of the heatwave. As a consequence, high water temperature was limiting cooling capacity and low water levels were limiting transport by barge. The existing measures were insufficient to mitigate all impacts, which ultimately led to decreased production capacity and a significant negative earnings impact of around €250 million mainly due to missing transport capacities for raw materials. The figure represents the negative earnings impact due to limited production capacity (i.e. the delta between planned and realized production) at the Ludwigshafen site in 2018, which was triggered by extreme weather in the respective year (high water temperature limiting cooling capacity, low water level limiting transport) and is considered as an estimate for impact of similar future events.

##### Primary response

Other, please specify (Increase supply chain resilience (local storage, alternative transport modes))

##### Total financial impact

270000000

##### Description of response

BASF initiated several specific, targeted measures to increase the resilience of the Ludwigshafen site against potentially more frequent and prolonged phases of very high water-temperature and very low water levels (inter alia, expansion of storage capacity, alternative choices for transport, increase of recooling capacity). The impact figure includes a) the negative earnings impact of €250 million due to limited production capacity (i.e. the delta between planned and realized production) at the Ludwigshafen site in 2018, which was triggered by extreme weather in the respective year (high water temperature limiting cooling capacity, low water level limiting transport) and b) the estimated total costs in the next two years for all measures planned and initiated to increase the resilience of the Ludwigshafen site (€ 20 million).

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### W2.2

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**(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?**

Yes, fines

**W2.2a**

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**(W2.2a) Provide the total number and financial value of all water-related fines.**

**Row 1**

**Total number of fines**

1

**Total value of fines**

12000

**% of total facilities/operations associated**

0.3

**Number of fines compared to previous reporting year**

Higher

**Comment**

Water-related fines are historically on a low level. Last year, the number slightly increased.

**W2.2b**

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**(W2.2b) Provide details for all significant fines, enforcement orders, and/or penalties for water-related regulatory violations in the reporting year, and your plans for resolving them.**

**Type of penalty**

Fine

**Financial impact**

12000

**Country/Region**

Brazil

**River basin**

Paraiba Do Sul

**Type of incident**

Effluent limit exceedances

**Description of penalty, incident, regulatory violation, significance, and resolution**

Environmental authorities since 2017 started using more stringent legislation concerning toxicity level. BASF received an environmental fine of €12,000 in September 2018 concerning the release of the final effluent in the Paraiba do Sul River in disagreement with the standards. We treat this as significant. Resolution: BASF invested 14 Million €2015-2018 to comply with the new law. Among them are: Segregation of some streams of high toxicity potential and use of other destruction or treatment technologies +++ development of other technologies as activated coal filter and ozone in the wastewater treatment in order to control and reduce the toxicity level within legal requirements +++ higher frequency monitoring of toxicity parameter +++ get certification of internal lab in order to get analytical results faster. As a result, the issue has been resolved.

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**W3. Procedures**

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**W-CH3.1**

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**(W-CH3.1) How does your organization identify and classify potential water pollutants associated with its activities in the chemical sector that could have a detrimental impact on water ecosystems or human health?**

The BASF Global EHS Leadership Team is responsible for identifying water pollutants globally.

Impacts considered: We identified and classified pollutants of global relevance. These are heavy metals (due to toxicity for humans and other organisms), and substances causing eutrophication (organic carbon, nitrogen, phosphorus), leading to reduced oxygen availability in water bodies and therefore can decimate water organisms and damage ecosystems. We continuously collect data of these pollutants in our Responsible Care Database globally.

Additional pollutants are identified and classified depending on local regulations.

The BASF Global Requirement "Environmental Protection" requires that all production facilities conduct a Water Risk Assessment where applicable, including cooling water protection, firefighting water retention and management of spillages and leakages, process wastewater, surface water and steam condensate. The protective measure to be implemented are determined depending on the probability of an event and the severity of its impact.

On site level, environmental impact classes have to be determined including volume and eco-toxicological/toxicological properties of substances handled in the plant (H-phrases as in safety data sheets) and the local conditions including type of receiving water body (river, lake, sea), size and water flow conditions, ecology, use of water body (drinking water, fishing etc.). The site/plant manager is responsible for conducting a Water Risk Assessment and implement measures. The local EHS-Function contributes expert knowledge for conducting Water Risk Assessments. The structured approach of the Water Risk Assessment is intended to identify all possible harmful events in a globally consistent manner. This enables BASF to exchange experiences and share learnings, thus continuously improving the environmental safety of its production sites. BASF's global audit team checks the Water Risk Assessment documentation of sites regularly and files shortcomings in a report to the Board of Directors.

Regarding our products, documentation and classification is following legal requirements and standards on international and market level, among others the UN Globally Harmonized System of Classification and Labelling of Chemicals.

The basic water-related impacts mentioned above (toxicity to humans and natural ecosystems, eutrophication) are also taken into account when assessing potential pollutants in the value chain. BASF is a founding member of "Together for Sustainability" (TFS), an initiative of the leading chemical companies. TFS evaluates the environmental performance of suppliers with audits, also taking into account wastewater prevention and treatment. Additionally, the specific potential impacts of our products are assessed in relation to the context, e.g. in the case of herbicides in agricultural applications. This typically applies to products which are distributed to end-consumers.

The largest portion of BASF's product portfolio consists of industrial products which are distributed for further processing in virtually all industries. Here, the focus of potential impacts on water is on the safety of transport of these industrial products to our industrial customers. We want our products to be safely loaded, transported, handled and stored. This is why we depend on reliable logistics partners, global standards and an effective organization. Our goal is to minimize risks along the entire transportation chain – from loading and transportation to unloading. Some of our guidelines for the transportation of goods which are hazardous to the aquatic environment go above and beyond national and international requirements. We have defined global guidelines and requirements for the storage of our products and regularly monitor compliance with these. We regularly assess the environmental risks of transportation and storing raw materials and sales products with high hazard potential using our global guideline. This is based on the guidelines of the European Chemical Industry Council (CEFIC). We also have binding global standards for load safety. We stipulate worldwide requirements for our logistics service providers and assess them in terms of safety and quality. Here, we have developed our own evaluation and monitoring tools and also use internationally approved schemes.



**(W-CH3.1a) Describe how your organization minimizes adverse impacts of potential water pollutants on water ecosystems or human health. Report up to ten potential pollutants associated with your activities in the chemical sector.**

Potential water pollutant	Value chain stage	Description of water pollutant and potential impacts	Management procedures	Please explain
Nitrogen	Direct operations	Nitrogen is a common chemical element found in many molecules used in the chemical industry, e.g. ammonia, a building block of many chemical products (e.g. plastics, fertilizer). As such, traces of Nitrogen are typically contained in chemical industry wastewater. Nitrogen levels in wastewater can be reduced biologically (De-Nitrification) to meet regulatory standards. Total emissions of Nitrogen into the aquatic environment amounted to 3100 t in 2018 or about 90 g of total Nitrogen per ton of sales product from the chemicals business. High nitrogen concentrations in aquatic ecosystems raise the level of nutrients, can cause algal blooms and lead to oxygen depletion. This eutrophication process may pose a threat to biodiversity and diminish life in aquatic environments. Loss of biodiversity can cause spiraling negative effects on interconnected ecosystems, e.g. bird populations depending on fish for food.	Compliance with effluent quality standards Other, please specify (Responsible Care Management System ) • <i>Other, Continuous improvement is an objective of the Responsible Care Management System (RCMS)</i>	The Responsible Care Management System (RCMS) triggers continuous improvements via many different measures in production plants and improvements in the waste water treatment plants (WWTP); e.g. the site Guaratinguetá / BASF S.A. in Brazil increased the WWTP removal efficiency. Measurement of results: BASF measures total emission of nitrogen across the group. As a result of the management activities under the RCMS, BASF group reduced nitrogen emission from 4600 (t/a) in 2008 to 3100 (t/a) in 2018.
Heavy metals	Direct operations	The source of heavy metals in effluent are production processes using heavy metals as catalysts or raw materials (e.g. for the manufacture of battery materials, catalytic converters) and the production equipment itself. Steel is an alloy of iron and numerous metals to achieve certain properties (e.g. resistance to rust). Small amounts of these metals are released into the effluent through direct contact with process equipment, e.g. piping, pumps, distillation columns etc. These small releases added up to a total of 23 t in 2018, which translates into a heavy metal release into the aquatic environment of less than 700 mg per t of sales product from the chemicals business. Heavy metals can cause serious toxic effects on aquatic organisms, as they can absorb heavy metals directly from the water or indirectly from food chains.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages Other, please specify (Continuous improvement is an objective of the Responsible Care Management System (RCMS)) • <i>Other, Continuous improvement is an objective of the Responsible Care Management System (RCMS)</i>	Waste water protection plans, in order to avoid unanticipated emissions in the environment, are introduced globally. We have constructed facilities for the improvement of wastewater analytics at our sites in Ludwigshafen, Germany, and Geismar, Louisiana, which help us to identify unanticipated emissions at an even earlier stage. Our site in Nanjing invested in a new WWTP for Cu/Zn removal. Measurement of results: BASF measures total emission of heavy metals across the group. BASF group reduced heavy metal emission from 34 (t/a) in 2008 to 23 (t/a) in 2018.

**W3.3**

**(W3.3) Does your organization undertake a water-related risk assessment?**

Yes, water-related risks are assessed

**W3.3a**

**(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.**

**Direct operations**

**Coverage**

Full

**Risk assessment procedure**

Water risks are assessed as part of an enterprise risk management framework

**Frequency of assessment**

Annually

**How far into the future are risks considered?**

>6 years

**Type of tools and methods used**

Tools on the market  
Enterprise Risk Management  
International methodologies  
Databases

**Tools and methods used**

WRI Aqueduct  
COSO Enterprise Risk Management Framework  
Alliance for Water Stewardship Standard  
Other, please specify (European Water Stewardship (EWS) standard; Water stress index/tool by Pfister et al. ; World Database on Protected Areas (WDPA) ; Community Advisory Panels (CAPs); Environmental Impact Assessment; Sustainability Assessment and Statement)

• *Other: European Water Stewardship (EWS) standard* • *Other: Water stress index/tool by Pfister et al.* • *Other: Integrated Biodiversity Assessment Tool (IBAT)* • *Other: Community Advisory Panels (CAPs)*

**Comment**

Most relevant risk fields that cover water-related risks for direct operations within the Enterprise Risk Management are "Plant availability" , "Change in production quality", "Change in production cost", "Regulation", "Ecology and environmental protection". The risk management is informed by the tools listed.

## Supply chain

### Coverage

Full

### Risk assessment procedure

Water risks are assessed as part of an enterprise risk management framework

### Frequency of assessment

Annually

### How far into the future are risks considered?

>6 years

### Type of tools and methods used

Tools on the market

### Tools and methods used

Other, please specify (Risk matrix and Together for Sustainability evaluations; Maplecroft Risk Atlas; Procurement strategy template; investment decisions.; PwC TIMM Method)

- *Other: Risk matrix and Together for Sustainability evaluations; RepRisk; Procurement strategy template; investment decisions.*
- *Other: PwC TIMM Method*

### Comment

Our suppliers are evaluated based on risk due to the size and scale of our supplier portfolio. We define relevant suppliers as those showing an elevated sustainability risk potential as identified by our risk matrices and our purchasers' assessments. We also use further sources of information to identify relevant suppliers such as evaluations from Together for Sustainability (TfS). The TfS evaluation program is based on third-party online assessments and on-site audits and is simplified for both suppliers and TfS member companies by a globally uniform questionnaire. In addition, the service provider RepRisk provides us with ad-hoc information if any suppliers have been publicly observed in connection with negative sustainability incidents, including water-related aspects. Furthermore, the topic of water is an explicit component of BASF's sourcing strategies, because of its potential to drive sustainability. This means that, when elaborating a procurement strategy, Buyers are required to consider potential threats and opportunities related to water.

## Other stages of the value chain

### Coverage

Partial

### Risk assessment procedure

Water risks are assessed as part of an enterprise risk management framework

### Frequency of assessment

Annually

### How far into the future are risks considered?

>6 years

### Type of tools and methods used

Tools on the market  
International methodologies

### Tools and methods used

Environmental Impact Assessment  
Life Cycle Assessment  
Other, please specify (Other: PwC TIMM Method, internal methods)

### Comment

Product safety risks are considered as a dedicated risk field within the Enterprise Risk Management. This area covers potential harmful impacts by products on man and the environment. The risk management is informed by risk assessment for products, eco-efficiency and environmental impact analyses etc.

## W3.3b

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**(W3.3b) Which of the following contextual issues are considered in your organization's water-related risk assessments?**

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	Relevance & inclusion	Please explain
Water availability at a basin/catchment level	Relevant, always included	Why this issue is relevant: Having sufficient amounts of good quality freshwater available for use is vital for operations: We use water as a coolant, solvent and cleaning agent, as well as to produce our products. In 2018, around 23% of our production sites were located in water stress areas. Around 1% of BASF's total water supply was abstracted from these sites. How it is assessed: Why this issue is relevant: Having sufficient amounts of good quality freshwater available for use is vital for operations: We use water as a coolant, solvent and cleaning agent, as well as to produce our products. How it is assessed: BASF collects quality data on a local site level. It is not part of the REHSA (Reporting EHS Application) but carried out according to site specific processes and guidelines, where required. Therefore, we assume coverage of 100% of relevant sites, or a slightly lesser coverage if all sites are taken into account. Withdrawals quality is monitored taking into account the type of withdrawal, e.g. there are specific criteria for sea water withdrawals etc. The frequency of monitoring varies according to local requirements for the production process – in some cases, a continuous monitoring is in place. In other cases, monitoring is updated in regular intervals, e.g. annually. Also, by applying the European Water Stewardship (EWS) standard (See "Other: EWS" in question W3.3a) at all sites in water stress areas and all Verbund sites by 2025 BASF analyses water availability, quality and water management, as well as potential issues regarding water discharges at local level. Currently, EWS Standards are implemented at 50% of relevant sites (2018).
Water quality at a basin/catchment level	Relevant, sometimes included	Why this issue is relevant: Having sufficient amounts of good quality freshwater available for use is vital for operations: We use water as a coolant, solvent and cleaning agent, as well as to produce our products. How it is assessed: BASF collects quality data on a local site level. It is not part of the REHSA (Reporting EHS Application) but carried out according to site specific processes and guidelines, where required. Therefore, we assume coverage of 100% of relevant sites, or a slightly lesser coverage if all sites are taken into account. Withdrawals quality is monitored taking into account the type of withdrawal, e.g. there are specific criteria for sea water withdrawals etc. The frequency of monitoring varies according to local requirements for the production process – in some cases, a continuous monitoring is in place. In other cases, monitoring is updated in regular intervals, e.g. annually. Also, by applying the European Water Stewardship (EWS) standard (See "Other: EWS" in question W3.3a) at all sites in water stress areas and all Verbund sites by 2025 BASF analyses water availability, quality and water management, as well as potential issues regarding water discharges at local level. Currently, EWS Standards are implemented at 50% of relevant sites (2018).
Stakeholder conflicts concerning water resources at a basin/catchment level	Relevant, always included	Why this issue is relevant: In order to systematically detect the potential for stakeholder conflicts concerning water resources, we have identified all of our production sites within a water stressed area – defined as regions in which more than 60% of available water is used by industry, household and agriculture. In 2018, around 23% of our production sites were located in water stress areas. Around 1% of BASF's total water supply was abstracted from these sites. By 2025, we want to introduce sustainable water management at all sites in water stress areas and at our Verbund sites, covering 93% of BASF's entire 2017 water abstraction. We achieved 50% of this goal in 2018. In our sustainable water management, we consider the quantitative, qualitative and social aspects of water use. How it is assessed: If a stakeholder is concerned about any issue, including issues related to water, he can turn to our compliance hotlines available in all countries we operate in. To be aware of conflicts we provide transparent communication about our activities and are open to critical questions. As we recognize our particular responsibility toward our production sites' neighbours, we discuss current issues with them e. g. in Community Advisory Panels (See "Other: Community Advisory Panels (CAPs) in question W3.3a). A Community Advisory Panel (CAP) consists of a group of individuals who live near or around a chemical facility and who represent the fabric of their community. The CAP meets regularly to discuss common issues of mutual interest. It is a forum for open and honest dialog between citizens and plant management. By encouraging a two-way flow of information, we hope to enhance communication with the communities in which we operate. In 2016/7 we developed new globally applicable requirements for CAPs. The minimum requirements are oriented towards grievance mechanisms outlined in the U.N. Guiding Principles for business and human rights.
Implications of water on your key commodities/raw materials	Relevant, always included	Why this issue is relevant: Our more than 70,000 Tier 1 suppliers play a significant role in value creation at our company. We work in long-term partnership with companies from different industries around the world. They supply us with important raw materials, chemicals, investment goods and consumables, perform a range of services and are innovation partners. BASF acquired raw materials, goods and services for our own production totaling approximately €38.5 billion in value in 2018. Our sustainability-oriented supply chain management contributes to risk management by clarifying our expectations and standards for our suppliers, and by supporting them in carrying out our requirements. We count on reliable supply relationships and want to make our suppliers' contribution to sustainable development transparent to us. How it is assessed: In this context BASF strives to increase its resilience to water risks along the value chain. Therefore, BASF assesses the impact of its business activities on society in monetary terms, using PwC's TIMM methodology (see W3.3). The general scopes include the supply chain (tier 1 to tier n), own operations and customer industries. Water consumption hotspots and water emissions within the supply chain/along the value chain are considered. Results show that the main risks are in the area of water consumption upstream (China, India) and downstream (India, China, USA, Ethiopia).. Measuring and expressing our impact on society in monetary terms improves the understanding of the relevance of specific environmental impacts (including water) and their interdependencies along the different levels of our value chain. The assessments reinforce that water risks are a highly location-specific.
Water-related regulatory frameworks	Relevant, always included	Why this issue is relevant: Water withdrawals and wastewater discharges must comply with national, state and local regulations and permit authorization. Otherwise, we could be faced with severe fines, penalties and other consequences. How it is assessed: BASF environmental and advocacy experts are engaged in constant dialogue with stakeholders including local authorities (See "internal company methods" in question W3.3). Contractual agreements with authorities on reduced abstractions during periods of extreme weather conditions (high temperatures) are in place. We do participate in partnerships at watershed level which focus on sustainable water management e. g. ICPR International Commission for the Protection of the Rhine.

	Relevance & inclusion	Please explain
Status of ecosystems and habitats	Relevant, sometimes included	Why this issue is relevant: Biodiversity is the foundation for numerous ecosystem services, for example air quality, climate, pollination, water purification and soil formation. We as a chemical company depend on ecosystem services and have an impact on them. How it is assessed: For new production sites, Environmental Impact Assessments (EIA) are conducted to assess the impact of construction and production activities on ecosystems and habitats. These EIA are conducted by an external and independent third party. Part of our internal approval process for investment projects at BASF is a sustainability statement, which assesses the potential impacts of the project on ecosystems and habitats by sustainability experts within the company. We investigated our production sites in water risk areas and our integrated manufacturing sites (Verbund sites) to establish which of these are located near internationally protected areas. To do so, we used the World Database on Protected Areas (WDPA, <a href="https://www.iucn.org/theme/protected-areas/our-work/quality-and-effectiveness/world-database-protected-areas-wdpa">https://www.iucn.org/theme/protected-areas/our-work/quality-and-effectiveness/world-database-protected-areas-wdpa</a> ) to identify biodiversity risks (See "Other: WDPA" in W3.3) We did not discover any impact of our activities on biodiversity in these protected areas. If there are indications of changing circumstances, we will re-assess these issues regularly on the individual site level. BASF expects its suppliers to assess the potential impact of site operations on designated protected areas or ecosystems. During TfS on-site audits, suppliers are therefore specifically required to evaluate their impact on the immediate environment by relying on external data or their own measurements. This includes water-related risks, such as groundwater contamination, leakages and wastewater disposal. Not having assessed impacts on ecosystems or having a detrimental impact on biodiversity can lead to a negative finding in the audit report and requires the supplier to implement corrective actions.
Access to fully-functioning, safely managed WASH services for all employees	Relevant, always included	Why this issue is relevant: BASF signed the "Pledge for Access to Safe Water, Sanitation and Hygiene at the Workplace" (WASH) of the World Business Council for Sustainable Development (WBCSD). By signing the pledge, BASF strengthened its commitment to provide access to water, sanitation and hygiene at the workplace at an appropriate level of standard for all employees. How it is assessed: The Department Corporate Health Management is responsible for the management of occupational health and general Health topics of BASF employees, and the coordination and auditing of occupational medicine in BASF group companies worldwide. Part of this responsibility are the topics sanitation and hygiene at the workplace. Sites are audited on a regular basis - 5 year interval if no negative findings were identified, or more frequently in case of findings. Audit results and action items are tracked in an audit database. We performed 22 audits in 2018 and 34 Health Performance Control visits. Tasks and responsibilities are defined in the Corporate Health Management Requirement (See "internal company methods" in question W3.3).
Other contextual issues, please specify	Not considered	

### W3.3c

#### (W3.3c) Which of the following stakeholders are considered in your organization's water-related risk assessments?

	Relevance & inclusion	Please explain
Customers	Relevant, always included	Reason for inclusion: The trust of customers and consumers is essential for the success of BASF, and we are obliged to safeguard their health when using our products. Safety of use instructions and precautionary measures must be aligned with local customs, application technologies and expertise available. BASF's customer portfolio ranges from major global customers and medium-sized regional businesses to local workshops. We align our business models and sales channels with the respective customer groups and market segments. Risk example: We consider potential water related risks from inappropriate product use by our customers. This could apply, for example, to products from our BASF Agriculture Solutions portfolio, like crop protection chemicals, that could affect freshwater bodies if used or disposed of improperly. Method of engagement: We ensure uniformly high standards for product stewardship worldwide and offer our customers training in the safe use of our products e.g. for several herbicides we developed instructions for water protection to enable our customers to easily and reliably optimize the use of our product. For example, for the herbicide Bentazon® we have developed instructions for water protection in the European Union, which enable our customers to easily and reliably optimize the use considering the respective composition of the ground and the time of application.
Employees	Relevant, always included	Reason for inclusion: Our employees are fundamental to achieving the goals of our "We create chemistry" strategy. In keeping with our corporate strategy, we integrate sustainability including water topics into our day-to-day business. Our employees work in interdisciplinary teams on innovative processes and products for a sustainable future. Our innovative strength lies in our global team of highly qualified employees with various specializations Production efficiency and/or quality, as well as production/employee safety at the BASF production sites may be affected by a lack of awareness regarding water-related topics. That may include the improper handling of harmful substances, or the inefficient use of water resources. Method of engagement: The methods used to promote increasing awareness towards environmental topics and continuous improvement of operational management include trainings of our employees, and a rigid quality and process management, in which potential water-related risks for and through employees are identified in a systematic manner. Our Code of Conduct, which has to be acknowledged by all employees, specifies basic principles and rules for behaviour also in the field of Protection of Environment, Health and Safety. We particularly encourage our employees to actively and promptly seek guidance if in doubt. They can consult their managers, dedicated specialist departments, such as the Legal department, and company compliance officers. We have also set up more than 50 external hotlines worldwide that our employees can use – including anonymously – to report potential violations of laws or company guidelines. All hotlines are also open to the public. Each concern is documented according to specific criteria, properly investigated in line with standard internal procedures and answered as quickly as possible. The outcome of the investigation as well as any measures taken are documented accordingly and included in internal reports.

	Relevance & inclusion	Please explain
Investors	Relevant, always included	Reason for inclusion: As a global industry leader, BASF is expected by investors to act proactively on the challenges of water-related issues. If major investors perceive BASF business activities to be misaligned with the growing global momentum to act against water insecurity, this will pose a reputational risk to the company that can ultimately lead to a reduced market valuation. Moreover, there is potential risk of exclusion from thematic funds based on ESG criteria. Method of engagement: We are in close dialog with the capital market and rating agencies. We conduct roadshows and attend conferences across Europe to also meet with socially responsible investors (SRI). At these events, we discuss various sustainability topics including water and BASF's approach towards these. In a SRI investor visit to our Ludwigshafen site and SRI conferences in Paris, the discussions with ~30 investors touched water management, among other topics. In addition, one section of our SRI story covers water topics. This presentation is available on our website.
Local communities	Relevant, sometimes included	Reason for inclusion : As a company in the chemical industry, we are aware of the particular responsibility we have towards the local communities around our sites. Negative impacts on water security of local communities by BASF's facilities could arise, for example, through unsustainable water use practices or insufficient effluents management. In accordance with our sustainability strategy & environmental policies, we take appropriate measures to prevent any such impacts, and thus preserve BASF's license to operate. Method of engagement: We aim at engaging openly with our neighbors in various forms of neighborhood dialogs. Our different tools for community relations depend on the specific site context, among them Community Advisory Panels. Mostly used at larger production sites, a Community Advisory Panel is a continuous, long-term discussion forum for open dialog. It consists of a group of individuals who live near or around a chemical facility and who represent the fabric of their community. The CAP meets regularly to discuss issues of mutual interest. It is a forum for open and honest dialog between citizens and site management. Our global internal requirements for Community Advisory Panels have been developed based on the UN Guiding Principles for Business and Human Rights for grievance mechanisms. The goal is to provide the community with the opportunity for direct involvement, while allowing us to better address the local expectations. We can only be successful if we enjoy the trust and support of our neighbors. To be able to assess our impact on local communities, we keep track of our environmental data via our Responsible Care Database, including water discharges and water use at all production sites .:
NGOs	Relevant, sometimes included	Reason for inclusion: If NGOs should come to believe that BASF is not fully transparent and cooperative about water-related issues, e.g. contamination events, this could lead to reputational damages for BASF. Also, BASF selects the sustainability topics it publicly reports on based on the materiality principle. We include stakeholder feedback and concerns, a.o. from NGOs, into the materiality analyses which we conduct on a regular basis (every three to four years). Method of engagement: Continuous exchange with our stakeholders including NGOs is guided by a defined organizational unit within our sustainability management. Together with NGOs, namely the EWP (European Water Partnership) as well as the global AWS (Alliance for Water Stewardship), we developed criteria and indicators for sustainable water management. The membership in the Alliance for Water Stewardship also gives us the opportunity to better understand the other members' expectations, including NGOs, on a continuous basis. Two examples from our Ludwigshafen site (headquarter) for our transparency and dialogue with NGOs: • We always publish a press release if an incident involving water contamination above a certain threshold happens. NGOs can subscribe to these press releases and are thus informed automatically. • We invited the German branch of a global environmental NGO in January 2017 to our Ludwigshafen site after a major incident, to exchange about preventative measures and consequences including our protection system against water pollution.
Other water users at a basin/catchment level	Relevant, sometimes included	Reason for inclusion : BASF is highly interested in maintaining a cooperative relationship with other water users at basin/catchment level. This helps to address and avoid any potential conflicts regarding water use, pricing etc. Also, if water users act out of common interests, policy-related or technological improvements can be advanced quicker and more sustainably. Method of engagement: We do participate in partnerships at watershed level that focus on sustainable water management. The dialog with different stakeholders helps us to learn their expectations. BASF employees are participating as industry representative e. g. in the ICPR (International Commission for the Protection of the Rhine). The ICPR consist of representatives of all the states along the course of river Rhine, of environmental organizations, drinking water producers, shipping, hydroelectric power generators etc. There is a yearly plenary meeting, regularly meetings of the strategy group (2 times a year) and meetings of the multiple working groups (about 2-5 times per year each of the groups) (see also www.iksr.org) CUACSA (Comunitat d'Usuaris d'Aigües de la Cubeta de Sant Andreu de la Barca). CUACSA is the group of water users in the "Sant Andreu de la Barca" river basin in Spain. A BASF employee is member of the "Junta de Govern". The meeting of the "Junta General" is two times per year. There are additional meetings of the "Commissio Operativo" (see meeting calendar at www.cuacsa.org).
Regulators	Relevant, always included	Reason for inclusion: Water withdrawals and wastewater discharges have to comply with national, state and local regulations and permit authorizations. BASF is highly interested in maintaining a cooperative relationship with regulators. This helps to address and avoid any potential conflicts regarding water use, pricing etc. It also allows BASF to anticipate future trends and regulations, thus avoiding uncertainty in this area. Method of engagement: To identify and evaluate the future potential of regulatory changes of sustainability issues including water we are actively involved in external networks like business associations. We engage in constant dialogue with our stakeholders including local authorities. BASF is convinced that trust must be built through transparency and cooperation. This requires a long-term engagement with regulators to improve environmental conditions based on a consensus of priorities and taking into account the interests of each party. On a political level, BASF is active in all concerned associations to play an active role in the development of laws and rules. The political process (especially in Germany and the EU) depends on a constructive exchange between all stakeholders, including NGOs and industry with the goal of developing feasible compromises. BASF is typically in the role of a technical advisor to contribute possible measures within the framework of an industrial enterprise, while NGOs focus on protection goals to be achieved. This exchange is extremely important for BASF since NGOs typically reflect the expectations of large portions of the population. These expectations vis-à-vis our operations and products are to be analyzed and integrated in our business strategy, leading to the development of better technologies and solutions.

	Relevance & inclusion	Please explain
River basin management authorities	Relevant, sometimes included	Reason for inclusion: We do participate in partnerships at watershed level that focus on sustainable water management. The dialog with different stakeholders, including river basin management authorities, helps us to learn their expectations. This helps to address and avoid any potential conflicts regarding water use, volume allocation, pricing etc. It also allows BASF to anticipate future trends and regulations, thus avoiding uncertainty in this area. Method of engagement: BASF is highly interested in maintaining a cooperative relationship with river basin management authorities. BASF employees are participating as industry representatives e. g. in the ICPR (International Commission for the Protection of the Rhine). The ICPR consist of representatives of all the states along the course of river Rhine, of environmental organizations, drinking water producers, shipping, hydroelectric power generators etc. There is a yearly plenary meeting, regular meetings of the strategy group (2 times a year) and meetings of the multiple working groups (about 2-5 times per year each of the groups) (see also www.iksr.org). CUACSA (Comunitat d'Usuaris d'Aigües de la Cubeta de Sant Andreu de la Barca). CUACSA is the group of water users in the "Sant Andreu de la Barca" river basin in Spain. A BASF employee is member of the "Junta de Govern", which has regular meetings several times per year. These meetings of "river basin stakeholders" also address protection measures to be developed, e.g. areas to be dedicated for re-naturalization to serve as retention areas (flood control). A major issue of ICPR is the international coordination of pollution events caused by, e.g. ship accidents. BASF contributes expertise and hardware (vehicles, boats, trucks etc.) to work closely together with river authorities to mitigate negative impacts. BASF is part of a network of chemical companies which actively supports the authorities in case of accidents (TUIS.org).
Statutory special interest groups at a local level	Relevant, sometimes included	Reason for inclusion : BASF is highly interested in maintaining a cooperative relationship with special interest groups. This helps to address and avoid any potential conflicts regarding water use, pricing etc. We can only be successful if we enjoy the trust and support of our neighbors. Negative impacts on water security of local stakeholders by BASF's facilities could arise, for example, through unsustainable water use practices or insufficient effluents management. In accordance with our sustainability strategy & environmental policies, we take appropriate measures to prevent any such impacts, and thus preserve BASF's license to operate. Method of engagement: We do participate in partnerships at watershed level that focus on sustainable water management. For instance, in Tarragona we work together with other companies in the industry industrial area, with a special interest group of local agricultural water users ("Irrigantes") and with the local community.
Suppliers	Relevant, always included	Reason for inclusion: Our sustainability-oriented supply chain management contributes to risk management by clarifying our expectations and standards for our suppliers, and by supporting them in carrying out our requirements. For instance, insufficient water management might lead to potential supply interruptions and could ultimately affect BASF's business continuity. Another example is insufficient effluents protection at BASF's suppliers, which might pose a potential threat to local communities and ecosystems and could eventually put BASF's reputation for effective supply chain sustainability management at risk. In accordance with BASF's Supplier Code of Conduct, we expect our suppliers to minimize their impact on biodiversity, climate change and water scarcity. Suppliers' engagement is key to integrate sustainability as a key topic in their long-term business relationship with us. Methods of engagement: Our suppliers are evaluated based on risk due to the size and scale of our supplier portfolio. We define relevant suppliers as those showing an elevated sustainability risk potential as identified by our risk matrices and purchasers' assessments. We also use further sources of information to identify relevant suppliers such as evaluations from the Together for Sustainability (TfS) initiative. In our third-party sustainability online assessments, suppliers are requested to report on water use, water mgmt. procedures and wastewater handling. Existence of a water policy is another important element of the assessment. In TfS on-site audits, suppliers' internal water policies, reports, protection concepts for wastewater effluents, containment measures and water-related impact reduction practices are examined against standard procedures for water and wastewater management. Finally, we have integrated water criteria and different water scenarios into our processes for investment decisions and in our processes for capital expenditures for property, plant and equipment.
Water utilities at a local level	Relevant, sometimes included	Reason for inclusion: If water withdrawal by one of our sites exceeds a sustainable volume on a local level, this could lead to direct risks through interruptions of water supply for BASF, and to indirect risks through long term depletion of water resources, stakeholder conflicts and reputational damages. BASF expects their suppliers to minimize their impact on biodiversity, climate change and water scarcity, according to the BASF Supplier Code of Conduct. Therefore, integrated in the procurement strategy is the sustainable water abstraction and discharge of third parties at local level. Method of engagement: The topic is addressed in dialogs with local water utilities. In addition, part of the European Water Stewardship Standard, which we implement at our Verbund sites and at sites in water-stressed regions, is the dialog with the water utilities regarding sustainable water supply: in the course of successfully implementing the standard at a location, it is required to assess the provenance of water with the local water utility to identify and act on possible risks.
Other stakeholder, please specify	Not considered	

### W3.3d

**(W3.3d) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.**

BASF's primary tool is our Enterprise Risk Management. It serves as aggregation, assessment & monitoring framework for risks to Corporate level, covering direct operations, upstream & downstream value chain. Most relevant risk fields that cover water-related risks for direct operations within the Enterprise Risk Management are "Plant availability", "Change in production quality", "Change in production cost", "Regulation", "Ecology and environmental protection". The risk management is informed by other tools are used on operational level to determine & analyze risk factors, depending on value chain stage:

**Direct operations:**

Application of tools selected: We use the water stress index (WSI) tool & data developed by Pfister et al. (2009) to determine which production sites are located in water stressed areas. In the planning of new sites and plant extensions, an Environmental Impact Assessment (EIA) is used to assess plant impact on environment.

Rationale: WSI tool provides a clear global data basis & is easily applied. EIA is an internationally accepted standard tool.

Coverage/implementation: WSI: All worldwide production sites, implemented centrally by Group EHS Function.

How outcome informs decision-making: Sites in risk areas need to adopt the European Water Stewardship Standard. Within this management system, appropriate responses to specific risks are derived and decided upon on facility level. EIA: Necessary infrastructure investments above a certain level have to be approved on Corporate level. A sustainability assessment incl. water topics must be included.

**Supply chain:**

Tools used: We use the "Together for Sustainability" (TfS) evaluation program, which is based on third-party online assessments and on-site audits. The service provider RepRisk provides us with ad-hoc information if our medium/high-risk suppliers have been publicly observed in connection with negative sustainability incidents, including water-related aspects.

When elaborating a procurement strategy, Buyers are required to consider potential threats and opportunities related to water.

For the composition of supplier risk matrices that are used to identify our high risks suppliers we use two water related risk indices from the service provider Maplecroft.

Rationale and practical implementation: The evaluation process is simplified for both suppliers and TfS member companies by a globally uniform questionnaire. In our third-party sustainability online assessments, suppliers are requested to report on water use, water mgmt. procedures and wastewater handling. Existence of a water policy is another important element of the assessment.

In TfS on-site audits, suppliers' internal water policies, reports, protection concepts for wastewater effluents, containment measures and water-related impact reduction practices are examined against standard procedures for water and wastewater management.

Coverage: Due to the size and scale of our supplier portfolio, our suppliers are selected for evaluation based on risk, including both country and industry-specific risks. Basis is our global supplier portfolio over all business units. We define relevant suppliers as those showing an elevated sustainability risk potential as identified by our risk matrices and our purchasers' assessments.

Timescale: We have defined a risk response process with clearly defined follow-up processes. Every five years or more frequently, based on current and evolving risk & performance level.

How outcome informs decision-making: If we identify potential for improvement after the evaluation, we support suppliers in developing measures to fulfill our standards. We expect from our suppliers to work on their corrective action plans and close their gaps. We conduct another review according to a defined timeframe based on the sustainability risk measured. If the weak points discovered were particularly severe and we are unable to confirm any improvement, we reserve the right to terminate the business relationship.

The negative news from RepRisk can have an impact in the supplier relationship management. Depending on the reported information, individual follow-up measures are taken.



W4. Risks and opportunities

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W4.1

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**(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?**

Yes, both in direct operations and the rest of our value chain

W4.1a

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#### (W4.1a) How does your organization define substantive financial or strategic impact on your business?

Water is an element of BASF's risk management, which identifies and evaluates opportunities and risks as early as possible to take appropriate measures in order to seize opportunities and minimize risks. The aim is to avoid risks that pose a threat to BASF's continued existence and to make improved managerial decisions to create lasting value.

##### **Definition:**

We define substantive impact with respect to the achievement of our short-term operational or long-term strategic goals. We understand risk to be any event that can negatively impact the achievement of our short-term operational or long-term strategic goals. We define opportunities as potential successes that exceed our defined goals. In order to effectively measure and manage identified opportunities and risks, we quantify these in terms of probability and economic impact in the event they occur. We use statistical methods to aggregate opportunities and risks into risk factors. This way, we achieve an overall view of opportunities and risks at a portfolio level, allowing us to take effective measures for risk.

##### **Metrics / thresholds:**

In order to prepare the legally required reporting of significant risks and opportunities on Group level, we have set the following criteria for risk and opportunity events to be considered: Events, that have an estimated EBIT-impact of 10 million € or more (subsequent to measures taken, i.e. net risk), and at the same time have an estimated probability of occurrence of 20% or more, OR events, that are assessed to initiate public attention or that are assessed to damage BASF's public image, independent of the magnitude of the impact OR events, that have a current estimated impact below 10 million €, but are assessed to have escalation potential or are assessed to initiate similar, interconnected events.

Where possible, we use statistical methods to aggregate opportunities and risks into risk factors. This way, we achieve an overall view of opportunities and risks at a portfolio level, allowing us to take effective measures for risk management. We describe and classify these by their potential short-term effects on EBIT subsequent to measures taken (i.e. net risk), using a 95% confidence interval per risk factor based on planned values. Here, the lower threshold for reported risk factors is an effect of >€100 million.

##### **Scope:**

The mentioned definitions and thresholds apply regardless to where in the value chain the risk/event is located, i.e. direct operations, supply chain, customers etc.

##### **Example:**

For BASF's direct operations, main causes for substantive change related to water are an interruption or a significant reduction of production. To identify sites that cause substantive change to their business due to water risks, we use a screening process as follows (reviewed annually):

- Identifying sites located in water stressed areas (water stress index according to Pfister et al.)
- Determining whether these sites are considered strategic and account for high sales volume
- Sites that satisfy both criteria are considered to face a risk and hence have the potential to cause substantive changes to our business.

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#### W4.1b

**(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?**

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
Row 1	2	Less than 1%	In total 24% of our production sites are located in water stress areas. The site in Freeport is associated with risks that have a potentially substantive financial impact. The site in Ludwigshafen is exposed to supply chain related risks that have a potentially substantive financial impact.

W4.1c

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**(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive impact on your business, and what is the potential business impact associated with those facilities?**

**Country/Region**

United States of America

**River basin**

Brazos River

**Number of facilities exposed to water risk**

1

**% company-wide facilities this represents**

Less than 1%

**Production value for the metals & mining activities associated with these facilities**

<Not Applicable>

**% company's annual electricity generation that could be affected by these facilities**

<Not Applicable>

**% company's global oil & gas production volume that could be affected by these facilities**

<Not Applicable>

**% company's total global revenue that could be affected**

1-25

**Comment**

The site in Freeport is associated with water stress related risks that have a potentially substantive financial impact.

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**Country/Region**

Germany

**River basin**

Rhine

**Number of facilities exposed to water risk**

1

**% company-wide facilities this represents**

Less than 1%

**Production value for the metals & mining activities associated with these facilities**

<Not Applicable>

**% company's annual electricity generation that could be affected by these facilities**

<Not Applicable>

**% company's global oil & gas production volume that could be affected by these facilities**

<Not Applicable>

**% company's total global revenue that could be affected**

1-25

**Comment**

The site in Ludwigshafen is exposed to supply chain related risks that have a potentially substantive financial impact.

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**W4.2**

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**(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.**

**Country/Region**

United States of America

**River basin**

Brazos River

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### Type of risk

Physical

### Primary risk driver

Increased water scarcity

### Primary potential impact

Increased operating costs

### Company-specific description

Specific risk for our Freeport plant is constituted by several drivers: Higher municipal and industrial demand in the area is expected for the next decades. This could result in an increased competition of different users for the existing water sources (river water, ground water) and an increased price for water in the future. Increased production in 2018 increased water demand by ~5%. This could still be balanced by increased groundwater volumes. In the future, alternative sources for water may need to be considered as well as internal efficiency measures. Possible alternative sources are municipal waste water (only small quantities available), ground water from wells (preferred option, but availability could be insufficient in case of high production growth), and sea water (most abundant, but water desalination is the most energy intensive option). Our analyses show that 5 % of annual withdrawal of the site might have to be substituted by desalinated water, if other alternative sources are not sufficiently available. Using this option would result in significantly higher operating costs. Method: Assessment of current & future water demand vs. availability at the site (source e.g. Aqueduct) 2. Investigation of additional water sources and intensive internal re-use. 3. Economic assessment of alternative water supply options. Depending on global economic development we continuously update our expected water demand taking multiple options into consideration

### Timeframe

4 - 6 years

### Magnitude of potential impact

Medium-low

### Likelihood

Likely

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

Yes, a single figure estimate

### Potential financial impact figure (currency)

400000

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

<Not Applicable>

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

<Not Applicable>

### Explanation of financial impact

We calculated assumed additional operational costs for water desalination to cover a part of the site's water supply. Factors used to determine the relevant share of water supply are the higher water demand expected in the area in the future, as well as improved efficiency of existing facilities, not taking into account potential extensions of the site. In this scenario, 5 % of total annual water withdrawal volume of the site could be affected and might have to be substituted by desalinated water, if we are not able to balance this using other alternative sources. We estimated additional costs per m<sup>3</sup> of desalinated water based on industry reference values. Time horizon: Yearly impact, will manifest after establishment of alternative water supply (i.e. within 4-6 yrs, as described above)

### Primary response to risk

Secure alternative water supply

### Description of response

We are optimizing our infrastructure planning to secure a reliable water supply (taking into account alternative water sources) while minimizing additional operational and investment costs. This involves the in-depth assessment of current and future water situation in the Freeport Area; of BASF's current and future water requirements to define the scale and layout of required infrastructure. All options are evaluated, i.e. seawater desalination, increased well use, expanding existing supply contracts and/or sourcing municipal wastewater as a raw material. These evaluations are regular process steps in the course of assessing site development projects. This is accompanied by the specific implementation planning to tap additional water withdrawal sources (e.g. investment in desalination infrastructure; investment partnerships with other industrial plants in the Freeport area).

### Cost of response

150000

### Explanation of cost of response

The costs of the response strategy (infrastructure planning) were estimated at a moderate level due to the fact that the site is near the sea and desalination is an easy to realize option. Infrastructure planning requires mainly personnel resources. We calculate the required resources as 1 FTE, at an estimated cost of 150 000 € per FTE. Infrastructure planning costs are not significant in relation to overall operational expenses at the facility. This is a recurring cost position.

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## W4.2a

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**(W4.2a) Provide details of risks identified within your value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.**

### Country/Region

Germany

### River basin

Rhine

### Stage of value chain

Supply chain

### Type of risk

Physical

### Primary risk driver

Drought

### Primary potential impact

Supply chain disruption

### Company-specific description

Production at BASF's largest site Ludwigshafen depends on the river Rhine for transportation of raw materials and final products via barges, and withdrawal of water mainly for cooling purposes. Based on extreme weather conditions experienced at the site over the last decades, the robustness for such events was increased by various measures. BASF assessed such risks for the site in 2015 and concluded that existing adaptation measures are appropriate. However, in 2018, the site experienced exceptional drought and heat, causing an extreme phase of low river water levels and very high water-temperatures. As a consequence, low water levels were limiting transport by barge and high water temperature was limiting cooling capacity. Existing measures were insufficient to mitigate all impacts, which led to decreased production capacity mainly due to missing transport capacities for raw materials. The event raised the question whether global warming has already changed the likelihood of occurrence/intensity of extreme weather events at the site such that it has become more vulnerable, even with the existing countermeasures designed to mitigate historically observed weather extremes. The question is at the edge of current climate research; results are subject to large uncertainties. For Ludwigshafen, extended analyses indicated that an increased risk from more frequent and intense extreme weather events with the previously described impacts cannot be excluded

### Timeframe

1 - 3 years

### Magnitude of potential financial impact

High

### Likelihood

Very unlikely

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

Yes, a single figure estimate

### Potential financial impact figure (currency)

250000000

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

<Not Applicable>

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

<Not Applicable>

### Explanation of financial impact

The figure represents the negative earnings impact due to limited production capacity (i.e. the delta between planned and realized production) at the Ludwigshafen site in 2018, which was triggered by extreme weather in the respective year (low water level

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limiting transport as primary impact, high water temperature limiting cooling capacity as secondary impact) and is considered as an estimate for impact of similar future events.

#### Primary response to risk

Other, please specify (Increase supply chain resilience (local storage, alternative transport modes))

#### Description of response

BASF initiated several specific, targeted measures to increase the resilience of the Ludwigshafen site against potentially more frequent and prolonged phases of very low water levels and very high water-temperature: expansion of storage capacity, alternative choices for transport, increase of re-cooling capacity. For instance, in 2018 we started to hire specific vessels still being able to navigate even at very low water levels. This will result in longer usability of waterway as mode of transport and higher flexibility to switch between different modes of transport, preventing bottlenecks in logistics/supply chain.

#### Cost of response

20000000

#### Explanation of cost of response

The figure represents the estimated total costs in the next two years for all measures planned and initiated to further increase the resilience of the Ludwigshafen site.

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### W4.3

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#### (W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes, we have identified opportunities, and some/all are being realized

### W4.3a

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#### (W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

##### Type of opportunity

Products and services

##### Primary water-related opportunity

Other, please specify (Increase the proportion of products that contribute particularly to sustainability in the value chain, and are characterized by, on average, higher growth rates and profitability.)

*Other: Increase the proportion of products that contribute particularly to sustainability in the value chain, and are characterized by, on average, higher growth rates and profitability.*

##### Company-specific description & strategy to realize opportunity

Using the Sustainable Solution Steering method BASF conducted sustainability assessments (also with regard to water) of its entire product portfolio. We largely achieved our previous goal of increasing the proportion of sales from Accelerator products to 28% by 2020 at the end of 2018 (proportion of sales in 2018: 27.7%\*). Strategy: Accelerator products make a substantial sustainability contribution in the value chain. This is why we will pursue a new ambitious goal from 2019 onward: We aim to make sustainability an even greater part of our innovation power and achieve €22 billion in Accelerator sales by 2025. To achieve this goal, we will deeply integrate Sustainable Solution Steering into the research and development pipeline, in business strategies as well as in merger and acquisition projects. In 2018 products and solutions related to € 2 billion in sales made a particular contribution to water improvements in the value chain. This signifies that the potential of the Accelerator approach is already being realized. An example of an Accelerator product specifically in the "water" area is Formic Acid. Here a global market was developed to replace other chemicals for runway and road de-icing. Formic Acid features excellent biodegradability, reducing wastewater treatment costs and the environmental burden. A growing acceptance has the potential to positively impact water scarcity and pollution.

##### Estimated timeframe for realization

Current - up to 1 year

##### Magnitude of potential financial impact

High

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

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Yes, a single figure estimate

**Potential financial impact figure (currency)**

2000000000

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

<Not Applicable>

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

<Not Applicable>

**Explanation of financial impact**

In 2018, our so-called Accelerators that offer a substantial sustainability contribution in the value chain generated about 27.7 of total BASF sales. Products and solutions related to € 2 billion in sales per year make a particular contribution to water improvements in the value chain. This signifies that the opportunity is already being realized.

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**Type of opportunity**

Products and services

**Primary water-related opportunity**

Sales of new products/services

**Company-specific description & strategy to realize opportunity**

In 2018, BASF prepared to integrate its water chemicals business in a Joint Venture (JV) with SOLENIS. BASF owns 49% of the new JV and is not marketing water chemicals directly anymore. However, the JV opens new opportunities for BASF with better market access and a broader range of technologies/products. 2018 was a year of transition where opportunities were pursued under the umbrella of the JV. BASF has mid- and longterm supply contracts with SOLENIS, which also cover (as an example) the Sokalan RO brands. Case study for water treatment product Sokalan® RO3500: Situation: Growing demand of water reuse via reverse osmosis (RO) causing different scales and decreasing efficiency of RO systems. Task: Development of a multifunctional antiscalant performing at a variety of reused water qualities. Action: In 2016 BASF launched a multifunctional antiscalant with Sokalan® RO3500 . 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® RO3500 is not causing eutrophication to water bodies. Result: BASF product portfolio further enhanced by addressing the need for differentiated chemistry to enable water reuse. With the launch BASF is fostering its position as a leading provider for water chemicals.

**Estimated timeframe for realization**

1 to 3 years

**Magnitude of potential financial impact**

Medium-high

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

Yes, a single figure estimate

**Potential financial impact figure (currency)**

50000000

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

<Not Applicable>

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

<Not Applicable>

**Explanation of financial impact**

For 2020 we had prognosed €50 million of our annual turnover and €11 million of our annual EBITDA from innovations derived from BASF's Water Chemicals portfolio launched since 2015. This estimate was derived based on the previous development of the respective revenues, and an outlook regarding market potentials. This gives an idea of the business perspective for the new the Joint Venture with SOLENIS from 2019 onward.

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## W5. Facility-level water accounting

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### W5.1

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(W5.1) For each facility referenced in W4.1c, provide coordinates, total water accounting data and comparisons with the previous reporting year.

**Facility reference number**

Facility 1

**Facility name (optional)**

Freeport/ TX/ BASF Corporation

**Country/Region**

United States of America

**River basin**

Brazos River

**Latitude**

29.004413

**Longitude**

-95.393282

**Primary power generation source for your electricity generation at this facility**

<Not Applicable>

**Oil & gas sector business division**

<Not Applicable>

**Total water withdrawals at this facility (megaliters/year)**

8925

**Comparison of withdrawals with previous reporting year**

About the same

**Total water discharges at this facility (megaliters/year)**

6920

**Comparison of discharges with previous reporting year**

About the same

**Total water consumption at this facility (megaliters/year)**

4261

**Comparison of consumption with previous reporting year**

About the same

**Please explain**

Change is not substantive. Water consumption is mainly from evaporation in cooling systems

---

**Facility reference number**

Facility 2

**Facility name (optional)**

Ludwigshafen SE

**Country/Region**

Germany

**River basin**

Rhine

**Latitude**

49.494739

**Longitude**

8.433164

**Primary power generation source for your electricity generation at this facility**

<Not Applicable>

**Oil & gas sector business division**

<Not Applicable>

---

**Total water withdrawals at this facility (megaliters/year)**

1326405

**Comparison of withdrawals with previous reporting year**

Lower

**Total water discharges at this facility (megaliters/year)**

1231164

**Comparison of discharges with previous reporting year**

About the same

**Total water consumption at this facility (megaliters/year)**

8784

**Comparison of consumption with previous reporting year**

About the same

**Please explain**

Change is not substantive. Water consumption is mainly from evaporation in cooling systems

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W5.1a

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**(W5.1a) For each facility referenced in W5.1, provide withdrawal data by water source.**

**Facility reference number**

Facility 1

**Facility name**

Freeport/ TX/ BASF Corporation

**Fresh surface water, including rainwater, water from wetlands, rivers and lakes**

8589

**Brackish surface water/seawater**

0

**Groundwater - renewable**

303

**Groundwater - non-renewable**

0

**Produced/Entrained water**

0

**Third party sources**

33

**Comment**

Fresh surface water is the main water source. High proportion of the water is used for cooling.

---

**Facility reference number**

Facility 2

**Facility name**

Ludwigshafen SE

**Fresh surface water, including rainwater, water from wetlands, rivers and lakes**

1304685

**Brackish surface water/seawater**

0

**Groundwater - renewable**

20124

**Groundwater - non-renewable**

0

**Produced/Entrained water**

0

**Third party sources**

1596

**Comment**

Fresh surface water is the main water source. High proportion of the water is used for cooling.

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**W5.1b**

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(W5.1b) For each facility referenced in W5.1, provide discharge data by destination.

**Facility reference number**

Facility 1

**Facility name**

Freeport/ TX/ BASF Corporation

**Fresh surface water**

6525

**Brackish surface water/Seawater**

0

**Groundwater**

395

**Third party destinations**

0.05

**Comment**

---

**Facility reference number**

Facility 2

**Facility name**

Ludwigshafen SE

**Fresh surface water**

1231164

**Brackish surface water/Seawater**

0

**Groundwater**

0

**Third party destinations**

0

**Comment**

Mainly discharge of cooling water from once-through cooling

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W5.1c

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**(W5.1c) For each facility referenced in W5.1, provide the proportion of your total water use that is recycled or reused, and give the comparison with the previous reporting year.**

**Facility reference number**

Facility 1

**Facility name**

Freeport/ TX/ BASF Corporation

**% recycled or reused**

76-99%

**Comparison with previous reporting year**

<Not Applicable>

**Please explain**

Change to previous year is not substantive. High demand on cooling water is mainly satisfied by recycling

---

**Facility reference number**

Facility 2

**Facility name**

Ludwigshafen SE

**% recycled or reused**

26-50%

**Comparison with previous reporting year**

<Not Applicable>

**Please explain**

The volume of recirculated cooling water was higher in 2018 compared to 2017, but both are in the range between 26-50%.

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**W5.1d**

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**(W5.1d) For the facilities referenced in W5.1, what proportion of water accounting data has been externally verified?**

**Water withdrawals – total volumes**

**% verified**

76-100

**What standard and methodology was used?**

BASF Management's Report was audited and approved free of qualification, covering also statements and figures pertaining to sustainability. Audit with limited assurance was conducted in accordance with ISAE 3000 and 3410. Auditor's procedures included detailed document audits of all water indicators reported by all worldwide locations for the purpose of composing aggregated company figures - including water withdrawals total and by source.

**Water withdrawals – volume by source**

**% verified**

76-100

**What standard and methodology was used?**

BASF Management's Report was audited and approved free of qualification, covering also statements and figures pertaining to sustainability. Audit with limited assurance was conducted in accordance with ISAE 3000 and 3410. Auditor's procedures included detailed document audits of all water indicators reported by all worldwide locations for the purpose of composing aggregated company figures - including water withdrawals total and by source.

## Water withdrawals – quality

### % verified

Not verified

### What standard and methodology was used?

BASF collects water withdrawals quality data on a local site level. It is not part of the Responsible Care® Database (REHSA), but carried out according to site specific processes and guidelines, where required. Therefore, it is not included in the verification of water-related data as part of the above mentioned engagement.

## Water discharges – total volumes

### % verified

76-100

### What standard and methodology was used?

BASF Management's Report was audited and approved free of qualification, covering also Statements and figures pertaining to sustainability. Audit with limited assurance was conducted in accordance with ISAE 3000 and 3410. Auditor's procedures included detailed document audits of all water indicators reported by all worldwide locations for the purpose of composing aggregated company figures – including water discharges total and by destination/treatment method.

## Water discharges – volume by destination

### % verified

76-100

### What standard and methodology was used?

BASF Management's Report was audited and approved free of qualification, covering also statements and figures pertaining to sustainability. Audit with limited assurance was conducted in accordance with ISAE 3000 and 3410. Auditor's procedures included detailed document audits of all water indicators reported by all worldwide locations for the purpose of composing aggregated company figures – including water discharges total and by destination/treatment method.

## Water discharges – volume by treatment method

### % verified

76-100

### What standard and methodology was used?

BASF Management's Report was audited and approved free of qualification, covering also statements and figures pertaining to sustainability. Audit with limited assurance was conducted in accordance with ISAE 3000 and 3410. Auditor's procedures included detailed document audits of all water indicators reported by all worldwide locations for the purpose of composing aggregated company figures – including water discharges total and by destination/treatment method.

## Water discharge quality – quality by standard effluent parameters

### % verified

76-100

### What standard and methodology was used?

BASF Management's Report was audited and approved free of qualification, covering also statements and figures pertaining to sustainability. Audit with limited assurance was conducted in accordance with ISAE 3000 and 3410. Auditor's procedures included detailed document audits of all water indicators reported by all worldwide locations for the purpose of composing aggregated company figures - including quality by standard effluent parameters.

## Water discharge quality – temperature

### % verified

Not verified

### What standard and methodology was used?

BASF collects discharge temperature data on a local site level. It is not part of the Responsible Care® Database (RCDB), but carried out according to site specific processes and guidelines, where required. Therefore, it is not included in the verification of water-related data as part of the above mentioned engagement.

## Water consumption – total volume

### % verified

Not verified

### What standard and methodology was used?

Data on water consumption have been collected in the REHSA database but are not included in the BASF Managements Report. Therefore, it is not included in the verification of water-related data as part of the above mentioned engagement.

## Water recycled/reused

### % verified

76-100

### What standard and methodology was used?

BASF Management's Report was audited and approved free of qualification, covering also statements and figures pertaining to sustainability. Audit with limited assurance was conducted in accordance with ISAE 3000 and 3410. Auditor's procedures included detailed document audits of all water indicators reported by all worldwide locations for the purpose of composing aggregated company figures - including amounts of water recycled/reused.

## W6. Governance

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### W6.1

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#### (W6.1) Does your organization have a water policy?

Yes, we have a documented water policy that is publicly available

### W6.1a

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**(W6.1a) Select the options that best describe the scope and content of your water policy.**

Row	Scope	Content	Please explain
1	Company-wide	Description of business dependency on water Description of business impact on water Description of water-related performance standards for direct operations Description of water-related standards for procurement Reference to international standards and widely-recognized water initiatives Company water targets and goals Commitment to align with public policy initiatives, such as the SDGs Commitments beyond regulatory compliance Commitment to water-related innovation Commitment to stakeholder awareness and education Commitment to water stewardship and/or collective action Acknowledgement of the human right to water and sanitation Recognition of environmental linkages, for example, due to climate change	BASF's company-wide water policy (WP) demonstrates the commitment to responsible water use in all our production sites, water catchment areas as well as along the entire value chain. Rationale for scope: Part of the policy is BASF's Responsible Care Management System (RCMS) encompassing environmental and health protection for direct operations and our value chain. It comprises global rules, standards and procedures e.g. to use water sparingly and further reduce emissions to water. Component of RCMS are EHS documents that apply throughout the BASF Group and cover water topics. BASF's water policy acknowledges the human right to water and sanitation and supports respective SDGs, in line with our BASF Group's Position on Human Rights. The BASF Supplier Code of Conduct expects suppliers, inter alia, to use resources efficiently, apply energy-efficient, environmentally friendly technologies, reduce emissions to water, and minimize impacts on biodiversity and water scarcity. Our sustainability-oriented supply chain management also contributes to risk management by clarifying our expectations and standards for our suppliers, and by supporting them in carrying out our requirements. Our WP includes performance standards for supplier, procurement+contracting best practice to secure raw materials supply and boost suppliers awareness. Part of our water policy is the commitment to customer education, within our product stewardship strategy.

**W6.2**

**(W6.2) Is there board level oversight of water-related issues within your organization?**

Yes

**W6.2a**



**(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.**

Position of individual	Please explain
Director on board	One member of our Board of Directors, responsible for Environment, Health and Safety, has the overall responsibility for water issues. The head of BASF's Environment, Health and Safety Division, who has oversight for water topics in BASF, reports directly to the Board member and is a member of BASF's Corporate Sustainability Board (CSB), which is BASF's central steering committee for sustainable development, including water. 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 – including those related to water topics.
Director on board	Another Board member chairs BASF's Corporate Sustainability Board (CSB), which is BASF's central steering committee for sustainable development, including water. It is comprised of the heads of business, corporate and functional units as well as of the regions. The head of BASF's Environment, Health and Safety Division, which has oversight for all water-related topics in BASF, is also a member of the CSB. The CSB monitors the implementation of the sustainability strategy and cross-divisional initiatives, defines sustainability goals and approves corporate position papers on sustainability topics.

**W6.2b**

**(W6.2b) Provide further details on the board's oversight of water-related issues.**

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - some meetings	Monitoring implementation and performance Overseeing acquisitions and divestiture Overseeing major capital expenditures Reviewing and guiding annual budgets Reviewing and guiding business plans Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Reviewing and guiding corporate responsibility strategy Reviewing innovation/R&D priorities Setting performance objectives	How Board oversight is constituted: Our Management Board reviews at least annually major water-related topics like, for instance: - Water-related risks and opportunities - Target performance - Budgets for functions and business units involved in water-related topics - Progress on specific measures supporting BASF's sustainability strategy In addition, depending on need, the following topics are addressed: - Investment decisions - Requests for approval of specific action plans, e.g. new R&D initiatives This range of topics ensures that oversight over water issues are covered from both an operational and a market-driven perspective, that the appropriate strategic decisions are made and that BASF meets its own commitments. Example of how selected mechanisms contribute to the board's oversight of water issues: Through the monitoring of implementation and performance against water-related targets like the establishment of EWS standards at all Verbund sites and sites in water stress areas (monitored in regular environmental audits), the Management Board can keep track of the progress of water stewardship efforts, and thus the company's efforts to tackle water-related challenges. In case of a clear underperformance, the Board is then able to initiate corrective measures or re-align operational priorities. Who briefs the Board: A Board member, responsible for Environment, Health and Safety, has the overall responsibility for water topics. Another Board member chairs BASF's Corporate Sustainability Board (CSB), which is BASF's central steering committee for sustainable development, including water topics. 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.

W6.3

**(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).**

**Name of the position(s) and/or committee(s)**

President

**Responsibility**

Both assessing and managing water-related risks and opportunities

**Frequency of reporting to the board on water-related issues**

Quarterly

**Please explain**

The President of the Functional Division Environment, Health and Safety (EHS) has the highest overall governance responsibility for water topics below Board of Directors (BoD), reports directly to a member of the BoD and is a member of the Corporate Sustainability Board (CSB - BASF's central steering committee for sustainable development, including water topics, led by another BoD member). Meetings of CSB and direct meetings/jour fixes with these BoD members ensure a regular reporting to Board level. Presidents and BoD meet every 4-6 weeks. Water issues are addressed regularly in the context of immediate relevance, strategic implications and investment projects. The EHS Division led by the President defines requirements for the Responsible Care Management System (in agreement with BoD), oversees monitoring process, and integrates major global functions in preparing decisions of the CSB on water topics, such as corporate environmental goal setting, controlling and reporting, etc.

W-FB6.4/W-CH6.4/W-EU6.4/W-OG6.4/W-MM6.4

**(W-FB6.4/W-CH6.4/W-EU6.4/W-OG6.4/W-MM6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?**

Yes

W-FB6.4a/W-CH6.4a/W-EU6.4a/W-OG6.4a/W-MM6.4a

**(W-FB6.4a/W-CH6.4a/W-EU6.4a/W-OG6.4a/W-MM6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues (do not include the names of individuals)?**

	Who is entitled to benefit from these incentives?	Indicator for incentivized performance	Please explain
Monetary reward	No one is entitled to these incentives	<Not Applicable>	
Recognition (non-monetary)	Corporate executive team	<Not Applicable>	Details on the indicator chosen: Our corporate target is to introduce sustainable water management at 100% of our production sites in water stress areas and at all Verbund sites by 2025. We pursue this by applying the European Water Stewardship (EWS) standard. Rationale for the indicator chosen/threshold of success: In total, around 23% of our production sites were located in water stress areas in 2018. To avoid any negative impacts and secure the future operations of our sites, we chose to implement a comprehensive water management following the EWS standard at 100% of these sites, plus our Verbund sites. BASF executives at all involved levels, including the production sites managers, are expected to contribute to this publicly announced target.
Other non-monetary reward	No one is entitled to these incentives	<Not Applicable>	

## W6.5

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### **(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?**

- Yes, direct engagement with policy makers
- Yes, trade associations

## W6.5a

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### **(W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?**

The Board of Directors decides on BASF's sustainability strategies, taking thorough analysis by experts and practitioners at working level into account. The Head of the Functional Division EHS coordinates reports to the Board of Directors and has the key position to ensure consistency of actions resulting from the decisions.

Direct water-related corporate activities are stipulated & performed by following corporate groups:

Sustainability Strategy

Global Support Environmental Protection

Representatives of the groups have regular meetings with relevant colleagues to exchange about ongoing activities & to align positions to ensure consistency with BASF's strategy.

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.

Example: An Ad-hoc network is used to inform and align BASF positions & prepare feedback, e.g. regarding BASF involvement in drafting the German micro-pollutant strategy.

The management level of the corporate groups supported by Corporate Communications and Government Relations supervises consistency of positioning and actions under the strategy through receiving regular updates from the reporting lines and giving guidance on major topics. Additionally, alignment of BASF membership in associations is ensured by this function.

## W6.6

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### **(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?**

- Yes (you may attach the report - this is optional)  
BASF\_Report\_2018.pdf

## W7. Business strategy

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### W7.1

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**(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?**

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	> 30	Water issues integrated: Enable access to clean water for people, securing and reducing water requirements for food production and industry etc, reduce and avoid water contamination, preserve ecosystems and biodiversity on land and under water. How they are integrated: Our strategy provides direction for how we further develop BASF. At the core is our corporate purpose: "We create chemistry for a sustainable future." We are well aware of the needs of the fast-growing global population. More and more people need access to food and water, energy, raw materials, housing and healthcare. At the same time, the Earth's resources are limited. Our products and services contribute to reconciling the needs with the limitations. We are also committed to the Sustainable Development Goals. Explanation of chosen time horizon: Our corporate purpose "We create chemistry for a sustainable future." indicates the long-term perspective that BASF takes on matters surrounding sustainability, also in relation to our core businesses. This commitment is not limited to a defined time horizon, but involves the livelihoods and well-being of all future generations, as well as the preservation of ecosystems in the long term. Strategies also cover investment into assets and sites which have >40+ year time horizon in the Chemical Industry.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	11-15	Issues integrated: Water use/stewardship and avoidance of pollution within our own operations; water-related impacts of our products regarding water efficiency, possible contaminations (product stewardship); reduction of emissions to water and reduced impact on water scarcity within supply chain. How they are integrated: We have defined sustainability focus areas within our corporate strategy. These formulate the commitments with which BASF positions itself in the market and how it aims to meet the growing challenges along the value chain: – We source responsibly – We produce safely for people and the environment – We produce efficiently – We value people and treat them with respect – We drive sustainable products and solutions Relevant topics resulting from these commitments -such as supply chain responsibility, responsible production, resource efficiency, energy & climate protection, water, product stewardship, employment&employability, and portfolio management- form focal points of our reporting. We also integrate these into our long-term steering processes to ensure societal acceptance & realize business opportunities. Time horizon: We chose the time horizon of >10 years as it exceeds usual operational planning horizons within BASF, thus giving strategic orientation on our goal and commitment to enhancing sustainability within our operations, the supply chain & industries and sectors we serve, and also to contributing to the SDGs; with a time horizon of up to 2030.
Financial planning	Yes, water-related issues are integrated	11-15	Water issues integrated: Revenue targets for products with a particular contribution to sustainability, as for instance enabling higher resource efficiency and water conservation / water resource protection in the value chain. How they are integrated: We have segmented our portfolio regarding the contribution of our more than 60,000 specific product applications to sustainability (including reduction of water use), using the Sustainable Solution Steering® method. Products with a substantial sustainability contribution in the value chain are classified as Accelerators. We aim to increase proportion of sales generated by Accelerator products to 28% by 2020, from a baseline of 26.2% in 2015. In various business segments, detailed planning exists regarding the development of innovative products. For example, our well-stocked innovation pipeline in the Agricultural Solutions segment comprises products with a launch date between 2017 and 2027. With a peak sales potential of €3.5 billion, the pipeline includes innovations from all business areas. Many of these are directed towards water conservation. Explanation of chosen time horizon: We chose the time horizon of >10 years as it exceeds usual operational planning horizons within BASF, thus giving strategic orientation on our goal and commitment to enhancing sustainability within the industries and sectors we serve. Also, as shown above, strategic planning on segment level usually encompasses the mentioned time horizons.

**W7.2**

**(W7.2) What is the trend in your organization’s water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?**

Row 1

Water-related CAPEX (+/- % change)

Anticipated forward trend for CAPEX (+/- % change)

Water-related OPEX (+/- % change)

Anticipated forward trend for OPEX (+/- % change)

Please explain

We are not disclosing water-related CAPEX/OPEX

**W7.3**

**(W7.3) Does your organization use climate-related scenario analysis to inform its business strategy?**

	Use of climate-related scenario analysis	Comment
Row 1	Yes	Circular economy will become a key contributor to a low-carbon economy, transforming value chains and decoupling growth and resource consumption. The aim of the scenario analysis was to evaluate the impact in more detail. The level of impact was assessed in three scenarios, for which the level of international policy response and action on circular economy, driven by climate change, is the central differentiator: The scenarios were applied to three major customer industries of BASF. For each scenario, key drivers of change were identified and underpinned by a set of assumptions about direction and magnitude of change. Considering the findings regarding the potential impact of circular economy on BASF business, we promoted the establishment of strategic partnerships in this area in 2017. To this end, we joined the "Circular Economy 100" and the "New Plastic Economy" programs. We also kicked off an internal scouting project to investigate selected business opportunities.

**W7.3a**

**(W7.3a) Has your organization identified any water-related outcomes from your climate-related scenario analysis?**

Yes

**W7.3b**

**(W7.3b) What water-related outcomes were identified from the use of climate-related scenario analysis, and what was your organization's response?**

	Climate-related scenario(s)	Description of possible water-related outcomes	Company response to possible water-related outcomes
Row 1	RCP 2.6 Other, please specify (Internal climate-related scenarios) <i>The level of impact was assessed in three scenarios, for which the level of international policy response and action on circular economy, driven by climate change, is the central differentiator: (a) Base = business as usual, no change of regulation, (b) Moderate = known or expected changes of regulation lead to higher circularity, (c) Progressive = assuming more stringent regulation will force a much higher level of circularity.</i>	Circular economy will become a key contributor to a low-carbon economy, transforming value chains and decoupling growth and resource consumption. Customer industries of BASF will be affected by this trend to a variable extent, and consequently the impact on BASF's value generation will also vary. The aim of the scenario analysis was to evaluate the impact in more detail. The topic of resource consumption covers a range of resources, including water use. Water demand from primary production may be reduced due to higher circularity. Also, increased circular use of water may be a direct outcome. Scenario results: Total BASF sales show significant upside potential in the moderate as well as in the progressive scenario. Construction trends have the strongest impact on BASF sales in the moderate scenario, whereas automotive trends have the strongest impact on sales in the progressive scenario.	Reporting of results: Results were shared internally with representatives from operating divisions, which manage the SBUs, and relevant corporate units in the context of regular group meetings dedicated to sustainability topics. Reporting was limited to internal stakeholders. Integration of results into business objectives / strategy: Results informed the next steps of the internal process for developing a BASF position and strategy regarding circular economy. The strategic approach, including the findings from the scenario analysis, was finally presented to and approved by the Board of Directors. Example of how the results have directly influenced business objectives / strategy: Considering the findings regarding the potential impact of circular economy on BASF business, we promoted the establishment of strategic partnerships in this area in 2017. To this end, we joined the "Circular Economy 100" program and the "New Plastic Economy" program of the Ellen MacArthur Foundation. We also kicked off an internal scouting project to investigate selected business opportunities in more detail.

**W7.4**

**(W7.4) Does your company use an internal price on water?**

**Row 1**

**Does your company use an internal price on water?**

Yes

**Please explain**

Internal valuation/cost allocation: There is a site specific BASF internal price for provision of water as well as disposal of waste water depending on local conditions. Cost calculation for new investments: We have integrated a price for water as well as for waste water into our processes for investment decisions. The price is depending on current and future local situation. Valuation of external costs: BASF assesses its Value to Society in monetary terms using PwC's TIMM method. The scope includes supply chain (tier 1 to n), own operations and customer industries. With regard to water, emissions and consumption are integrated. To quantify and value the costs to society caused by emissions to water, inorganic and organic pollutants and nutrient discharges to water are taken into account. The calculated environmental impact depends on water consumption using volume of corporate water consumption and respective local water stress level based on a water stress index (WSI).

**W8. Targets**

**W8.1**

**(W8.1) Describe your approach to setting and monitoring water-related targets and/or goals.**

	Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
Row 1	Company-wide targets and goals Site/facility specific targets and/or goals Brand/product specific targets and/or goals	Targets are monitored at the corporate level Goals are monitored at the corporate level	Company-wide goals are proposed and elaborated by interdisciplinary working groups, and decided upon by the BASF Board of Management. Monitoring of water-related goals and targets is carried out via an established reporting process within our Responsible Care Management System. The progress for all company-wide targets and goals is reported in the BASF Annual Report. Facility-level targets and goals regarding water (e.g. incident avoidance) are agreed upon by the relevant corporate functions and monitored via the company-wide Responsible Care Management System and/or HSE audits on facility level. Monitoring results are reported to the respective corporate functions and escalated up to the executive or board level, if required. Product level targets and goals related to water (for example product performance or product characteristics) are defined by the business units as a response to internal agendas and/or external requirements. They are monitored via business-level reporting. Important achievements are reported also to the Board of Management, and /or included in BASF corporate communications, e.g. the annual report.

**W8.1a**

**(W8.1a) Provide details of your water targets that are monitored at the corporate level, and the progress made.**

**Target reference number**

Target 1

**Category of target**

Other, please specify (Assessing and implementing sustainable Water management)

*Other: Assessing and implementing sustainable Water management*

**Level**

Company-wide

**Primary motivation**

Water stewardship

**Description of target**

We want to introduce sustainable water management at 100% of our production sites in water stress areas and at all Verbund sites by 2025. This covers all production sites in water stress areas and all large integrated sites company-wide. We pursue this by applying the European Water Stewardship (EWS) standard. In total, ~ 23% of our production sites were located in water stress

areas in 2018. We introduced the standard at our European sites in 2013 and are furthering its implementation in China and North/South America. The Standard rests on 4 principles: sustainable water abstraction, maintaining good water quality, preserving conservation areas, ensuring continuous improvement processes. Implementation of the standard contributes to achieving water security, as it takes into account local conditions and aims to prevent and counter negative impacts on stakeholders and ecosystems (like increased water scarcity), by requesting detailed risk assessment and mandating appropriate responses.

#### Quantitative metric

Other, please specify (% of production sites implementing EWS)

#### Baseline year

2010

#### Start year

2011

#### Target year

2025

#### % achieved

50

#### Please explain

By 2018, we have established the standard at 50.0% of our relevant locations (as compared to 0% in the base year). That means we are on track for reaching the target by 2025. In 2018, BASF introduced sustainable water management at five additional sites.

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#### Target reference number

Target 2

#### Category of target

Product use-phase

#### Level

Company-wide

#### Primary motivation

Commitment to the UN Sustainable Development Goals

#### Description of target

A significant lever for steering of BASF's product portfolio is the Sustainable Solution Steering® method. BASF has conducted sustainability assessments and ratings for 97.5 % of its company-wide product portfolio. We consider the products application in various markets and industries. Our so-called Accelerator products make a particular contribution to sustainability, as for instance enabling higher resource efficiency and water conservation / water resource protection in the value chain (and thus contributing to the overarching goal of achieving water security). We therefore aim to increase proportion of sales generated by Accelerator products to 28% by 2020, from a baseline of 26.2% in 2015.

#### Quantitative metric

% increase in revenue from products designed for use-phase resource efficiency

#### Baseline year

2015

#### Start year

2016

#### Target year

2020

#### % achieved

83

#### Please explain

In 2018 the overall share of sales generated by Accelerator products increased to 27.7 % of total sales. This means we have reached 61% of the targeted increase (target value 28%), based on the base year value of 26.2%. Calculation of target completion:  $(27.7\% - 26.2\%) / (28\% - 26.2\%) = 0.83$  This means we are on track for reaching the target by 2020.

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**(W8.1b) Provide details of your water goal(s) that are monitored at the corporate level and the progress made.**

**Goal**

Promotion of sustainable agriculture practices

**Level**

Business

**Motivation**

Recommended sector best practice

**Description of goal**

Description and implementation: In order to help preserve biodiversity and natural resources using modern agriculture, BASF established a European farm network. In this network, we are developing biodiversity promotion measures together with farmers with experts from science and nature conservation organizations. The goal is to grow the farm network into a global network by 2020. Rationale for level chosen: This goal tackles issues touched by our Agricultural Solutions business segment, across all countries and activities within this segment. Importance for BASF: Biodiversity is the foundation for numerous ecosystem services, for example air quality, climate, pollination, water purification & soil formation. We as a chemical company depend on ecosystem services like water availability and quality (see W1.1) and have an impact on them. Protecting biodiversity is an important issue also addressed in the UN Sustainable Development Goals (SDGs). BASF contributes to achieving the SDGs and actively supports and implements projects to encourage protection of biodiversity at local level. Consequently, in 2016 we signed the Business and Biodiversity Pledge: We commit to deliver solutions for the conservation of biodiversity, its sustainable use, and the fair & equitable sharing of benefits from resources. That includes promoting awareness about values of biodiversity, acting as ambassadors for responsible stewardship of biodiversity, and regularly reporting on actions.

**Baseline year**

2008

**Start year**

2010

**End year**

2020

**Progress**

Progress: Currently, there are more than 15 farms in the Farm Network, located in Germany, France, the UK, Italy, Poland and the Czech Republic showing how modern farming throughout Europe can help protect ecosystems and resources. Also, the network now includes more than 30 partner organizations in six countries (indicator to assess progress). Independent experts evaluate the progress of each farm in the Farm Network. Data tracked includes the number of birds, pollinators, and other beneficial insects living on the farm. Water management measures and sustainable soil treatments are also carefully monitored. A different model with the same objectives is currently being pursued with farmers in USA ("living acres"). A cooperation is being perused with IRRRI on the Philippines to look at biodiversity in sustainable rice production. Threshold for success: We see every new member of the Farm Network as a success for the promotion of sustainable agriculture. The achievement of our goal to establish a global network will be marked by extension of our activities to other continents outside of Europe. On the individual farm level, we hope to see clear improvements on the indicators mentioned above. The unique conditions at each location contradicts the establishment of uniform thresholds.

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**Goal**

Engagement with suppliers to help them improve water stewardship

**Level**

Company-wide

**Motivation**

Recommended sector best practice

**Description of goal**

Description of goal and implementation: Our goal is to evaluate relevant suppliers (company-wide) regarding sustainability practices, including water management, and develop action plans for any necessary improvements. The evaluation process is based on third-party online assessments and/or on-site audits. If we discover a need for improvement, we support our suppliers in the development of measures that fulfill our standards. We then check again according to a defined timeframe based on the sustainability risk measured. Rationale for level chosen: Our suppliers are evaluated based on risk due to the size and scale of our supplier portfolio. We define relevant suppliers as those showing an elevated sustainability risk potential as identified by our risk matrices and our purchasers' assessments. This process covers all suppliers worldwide, company-wide. Importance: As shown in W1.1, water availability and quality play an important role in our supply chain. Hence, the BASF Supplier Code of Conduct expects suppliers, inter alia, to use resources efficiently, apply energy-efficient, environmentally friendly technologies, reduce emissions to



water, and minimize impacts on biodiversity and water scarcity. Our sustainability-oriented supply chain management also contributes to risk management by clarifying our expectations and standards for our suppliers, and by supporting them in carrying out our requirements.

#### Baseline year

2011

#### Start year

2015

#### End year

2020

#### Progress

Indicator to assess progress/threshold for success: We track the coverage of our sustainability evaluations. By 2020, we aim to evaluate the sustainability performance of 70% of the BASF Group's relevant suppliers. Progress: The proportion of relevant suppliers evaluated by the end of 2018 in accordance with our new risk approach was 60%, compared to 56% in 2017. This percentage represents a considerable progress in our journey towards reaching our 2020 goal. (In 2017, we reviewed our evaluation methods for high-risk suppliers in order to focus even more closely on relevant issues. For example, we increased the weighting of industry- and country-specific risks in the evaluation to avoid the ambiguities in the previous system. One of these ambiguities was that our former risk approach did not provide enough risk differentiation). As part of the updated corporate strategy, we have expanded our sustainability evaluations of relevant suppliers and integrated these into a new goal to improve our sustainability performance in procurement: By 2025, we aim to have conducted sustainability evaluations for 90 % of BASF Group's relevant spend and will develop action plans where improvement is necessary. We will work towards having 80 % of suppliers improve their sustainability performance upon re-evaluation.

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#### Goal

Promotion of sustainable agriculture practices

#### Level

Company-wide

#### Motivation

Corporate social responsibility

#### Description of goal

Description of goal and implementation: We aim to ensure that palm oil raw materials come from sustainable, certified sources, and actively support the Roundtable on Sustainable Palm Oil (RSPO). Our goal is to only source RSPO certified palm oil and palm kernel oil by 2020, provided it is available on the market. This goal applies uniformly to all company parts and activities that use palm oil, and is driven by our central purchasing department. By 2025, this voluntary commitment will be expanded to include the most important intermediate products based on palm oil and palm kernel oil; Importance/rationale for coverage: Two of our key renewable raw materials are palm oil and palm kernel oil and their respective derivatives, which we mainly use to produce home and personal care ingredients and, to a lesser extent, food ingredients. Oil palm plantations can contribute significantly to deforestation, loss of biodiversity and climate change from the loss of peatland, and may also affect local water resources. We share the widespread concern about these challenges and are committed to reducing environmental impacts. Consequently, our company-wide BASF Palm Sourcing Policy has requirements for protecting and preserving forests and peatland, along with involvement of local communities in decision-making processes. Sourcing RSPO certified palm oil products significantly reduces these risks. Hence, the described goal contributes to the overarching goal of achieving water security.

#### Baseline year

2011

#### Start year

2015

#### End year

2020

#### Progress

Indicators: We look at the share of RSPO certified products within the total palm and palm kernel oil procurement. Threshold of success: In continuation of our commitment made in 2011, BASF's goal is to source 100% RSPO-certified sustainable palm oil and palm kernel oil by 2020. Progress: In 2017, we published our first progress report – the BASF Palm Progress Report – for greater transparency in the value chain. Based on the voluntary commitment to sustainably source palm oil products that we expanded in 2015, we were able to purchase large volumes of certified palm kernel oil in 2018 despite a difficult market environment. In 2018, we purchased 127,000 metric tons of certified palm kernel oil. Our share of RSPO-certified sustainable palm kernel oil amounted to approximately 70% (2017: 51%). In order to involve smallholder farmers and improve their living conditions, BASF and Henkel have cooperated with the development organization Solidaridad since 2016 to provide training for around 5,500 farmers in Indonesia. To

date, more than 1,800 smallholders have completed a training program as part of the Farmer Field School initiative. BASF also advanced the RSPO supply chain certification of its sites for cosmetic ingredients. In 2018, 22 production sites worldwide were RSPO certified.

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## W9. Linkages and trade-offs

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### W9.1

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**(W9.1) Has your organization identified any linkages or tradeoffs between water and other environmental issues in its direct operations and/or other parts of its value chain?**

Yes

### W9.1a

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## (W9.1a) Describe the linkages or tradeoffs and the related management policy or action.

### Linkage or tradeoff

Linkage

### Type of linkage/tradeoff

Decreased GHG emissions

### Description of linkage/tradeoff

BASF operates several wastewater plants, that emit GHGs directly (from decomposition of organic material and incineration of sludge) and indirectly (energy consumption). For instance, BASF's wastewater treatment plant in Ludwigshafen is one of the largest in Europe and the largest wastewater treatment plant on the Rhine river. In addition, we rely on externally operated plants. Lower amounts of wastewater treated and lower carbon loads mean less GHG emissions. Impact: The emissions of BASF-operated wastewater plants of 238 kt CO<sub>2</sub> in 2018 are accounted for in our Scope 1 and Scope 2 emissions; emissions from non-BASF operated plants of 36 kt CO<sub>2</sub> in Category 5 of Scope 3.

### Policy or action

Action to manage: At several wastewater treatment plants, sewage sludge is incinerated. E.g. at our Ludwigshafen site, steam generated is used to produce electricity and also feeds into district heating network. Thus, we make use of the carbon content of the sludge, lowering local demand for fuel and thus indirectly reducing total BASF CO<sub>2</sub> emissions. Change in impact: emissions of BASF-operated wastewater plants have been reduced from 251 kt CO<sub>2</sub> in 2017 to 238 kt CO<sub>2</sub> in 2018. The emissions of non-BASF-operated wastewater plants have increased from 32 kt CO<sub>2</sub> in 2017 to 36 kt CO<sub>2</sub> in 2018. Integration into company strategy: We are constantly working to optimize our energy consumption and the amount of water we use, and to adapt to the needs of our business and the environment. A core action is the introduction of the global Operational Excellence Program in Ludwigshafen, where individual plants are eligible for funds for the implementation of changes supporting an increase in plant efficiency. These projects are targeting improvements which would not be of primary consideration under usual amortization rules. Improvements in water efficiency are regularly targeted. Examples of this ongoing initiative in individual production units are - Cooling water reduction by automatization of water distribution to different plant units - Upgrade of equipment for efficiency improvement/water savings - Rerouting of cooling water cycles: use of secondary cooling water to save chilled water

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### Linkage or tradeoff

Tradeoff

### Type of linkage/tradeoff

Increased energy use

### Description of linkage/tradeoff

BASF uses water for cooling purposes and recirculates water as a means to limit water withdrawal. However, higher recirculation rates coincide with increased power consumption of pumps, hence higher GHG emissions from the production of electric energy. The recirculation mode is about 70% more energy intensive than the "once-through"-mode, which translates directly into higher GHG emissions. In 2018, our largest integrated site in Ludwigshafen recirculated a total of 897 million m<sup>3</sup> of water (2017: 819 million m<sup>3</sup>) at the expense of 179 GWh of electrical energy (2017: 164 GWh). 1136 million m<sup>3</sup> (2017: 1291 million m<sup>3</sup>) of cooling water were used in "once-through"-mode and necessitated electrical pumping energy of 136 GWh (2017: 155 GWh).

### Policy or action

Action to manage: The balance of minimizing water withdrawal and GHG emissions is continuously adjusted based on the main factors Rhine river temperature & water level, permitted intake volume, air temperature (i.e. operational efficiency of the cooling towers), cooling demand, pumping capacity and electricity prices. Also, we aim to constantly increase efficiency of water recirculation by modernizing technical infrastructure. Change in impact: In 2018, our Ludwigshafen site recirculated 897 million m<sup>3</sup> water (2017: 819 million m<sup>3</sup>) at the expense of 179 GWh power (2017: 164 GWh). 1136 million m<sup>3</sup> (2017: 1291 million m<sup>3</sup>) water were used in "once-through"-mode, using 136 GWh power (2017: 155 GWh). Recirculation is ~70% more energy intensive, causing higher GHG emissions. Higher recirculation 2018 was necessary due to high river water temperatures/low water levels, limiting "once-through" cooling. Integration into strategy: We constantly optimize energy consumption and water use, to adapt to the needs of our business and the environment. We commit to keep GHG emissions stable for 2030. Core action is the global Operational Excellence Program, where plants are eligible for funds to increase plant efficiency, targeting improvements not considered under usual amortization rules, e.g.: - Cooling water reduction by automatization of water distribution to different plant units - Rerouting of cooling water cycles: use of secondary cooling water to save chilled water

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## W10. Verification

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## W10.1

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**(W10.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1d)?**

Yes

### W10.1a

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**(W10.1a) Which data points within your CDP disclosure have been verified, and which standards were used?**

Disclosure module	Data verified	Verification standard	Please explain
W1. Current state	Company-wide water accounting figures (withdrawals, discharges, consumption)	ISAE3000	Statements and figures pertaining to sustainability in the Management's Report and Consolidated Financial Statements of BASF's Annual Report are audited. The audit with limited assurance was conducted in accordance with ISAE 3000 (Assurance Engagements other than Audits or Reviews of Historical Financial Information) and ISAE 3410 (Assurance Engagements on Greenhouse Gas Statements), the relevant international auditing standards for sustainability reporting.
W8. Targets	Target and status for European Water Stewardship implementation	ISAE3000	Statements and figures pertaining to sustainability in the Management's Report and Consolidated Financial Statements of BASF's Annual Report are audited. The audit with limited assurance was conducted in accordance with ISAE 3000 (Assurance Engagements other than Audits or Reviews of Historical Financial Information) and ISAE 3410 (Assurance Engagements on Greenhouse Gas Statements), the relevant international auditing standards for sustainability reporting.

## W11. Sign off

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### W-FI

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**(W-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.**

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.

### W11.1

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**(W11.1) Provide details for the person that has signed off (approved) your CDP water response.**

	Job title	Corresponding job category
Row 1	Member of the Board of Executive Directors furthermore Site Director of Ludwigshafen	Board/Executive board

### W11.2

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(W11.2) Please indicate whether your organization agrees for CDP to transfer your publicly disclosed data on your impact and risk response strategies to the CEO Water Mandate's Water Action Hub [applies only to W2.1a (response to impacts), W4.2 and W4.2a (response to risks)].

Yes