

**Module: Introduction****Page: W0. Introduction****W0.1****Introduction**

**Please give a general description and introduction to your organization.**

The Novartis Mission:

We want to discover, develop and successfully market innovative products to prevent and cure diseases, to ease suffering and to enhance the quality of life. We also want to provide a shareholder return that reflects outstanding performance and to adequately reward those who invest ideas and work in our company.

The Novartis Healthcare Portfolio:

We believe our portfolio best meets the varied and often complex needs of patients and societies. Novartis is positioned to lead in innovation, partner with others and offer solutions to patients across a broad healthcare spectrum. In addition, a diverse portfolio reduces financial risk, bringing greater value to those who invest in our company. Our unique portfolio focuses on science-based healthcare sectors that are growing rapidly, reward innovation, and enhance the lives of patients.

Novartis is the only company with leading positions in each of these key areas:

- Pharmaceuticals: innovative patent-protected medicines
- Alcon: global leader in eye care with surgical, ophthalmology and consumer products
- Sandoz: affordable, high-quality generic medicines and biosimilars

Since Novartis was created in 1996 - when only 45% of net sales came from healthcare - the company has shifted focus to fast-growing areas of healthcare. Our strategy is to provide healthcare solutions that address the evolving needs of patients and societies worldwide.

Novartis People:

Novartis Group companies employ approximately 119,000 full-time-equivalent associates. Novartis products are available in more than 180 countries around the world. Novartis associates share a vision of a better today and tomorrow for patients – a vision that drives our growth and success. The greatest job satisfaction for our associates is the knowledge that they improve the quality of life for patients with increasing precision and efficiency through breakthrough science and innovation. Our performance-oriented culture and responsible approach attract top experts in all areas – research and development, marketing and sales, finance and administration. Our talented associates have made us a global leader in healthcare. Novartis is committed to rewarding the people who invest ideas and work in our company.

Environmental and Social Sustainability:

Novartis believes that careful stewardship of natural resources, particularly tight control of greenhouse gas emissions and energy efficiency, is not only important for the Group but critical for society and future generations.

Social and environmental sustainability is an integral part of our strategy. Novartis strives to make efficient use of natural resources and to minimize the environmental impacts of its activities and products over their entire life cycle. Health, safety and environmental impacts are assessed to ensure that the benefits of

new products, processes and technologies outweigh remaining risks.

---

**W0.2****Reporting year**

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

Period for which data is reported
Thu 01 Jan 2015 - Thu 31 Dec 2015

---

**W0.3****Reporting boundary**

**Please indicate the category that describes the reporting boundary for companies, entities, or groups for which water-related impacts are reported.**

Companies, entities or groups over which operational control is exercised

---

**W0.4****Exclusions**

**Are there any geographies, facilities or types of water inputs/outputs within this boundary which are not included in your disclosure?**

No

---

W0.4a

**Exclusions**

Please report the exclusions in the following table

Exclusion	Please explain why you have made the exclusion

---

**Further Information**

**Module: Current State**

**Page: W1. Context**

---

W1.1

Please rate the importance (current and future) of water quality and water quantity to the success of your organization

Water quality and quantity	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital for operations	Important	While pharmaceutical manufacturing is not very water intensive, access to good quality freshwater is vital for production processes. Where not sufficient, water is additionally purified or even sterilized depending on the required use in the process or in liquid products, such as injectables or eye care products. A number of Novartis sites (e.g. in Switzerland, Austria, India or the US) use large quantities of water to cool their production processes, their data centers or for comfort cooling. At these sites quantity and temperature of the water is crucial rather than quality. If not sufficiently available, mechanical chilling could replace water cooling, however, would increase energy costs &

Water quality and quantity	Direct use importance rating	Indirect use importance rating	Please explain
			GHG emissions. Access to clean water is also important at all our sites for the health of our workforce who use sanitary water for their hygiene. Availability of freshwater along the supply chain is also important to ensure the quality of materials and availability of energy.
Sufficient amounts of recycled, brackish and/or produced water available for use	Important	Important	Recycled or reclaimed water is used at several Novartis sites located in areas of water scarcity, such as at our Vision Care site in Johns Creek, Georgia, US or our pharmaceutical production sites in Navi Mumbai, India. Overall water recycling is 24.2% compared to total water used. An assessment of the direct materials supply chain has been conducted with respect to water footprint for 2014 and 2015 to determine the importance of water on the materials supply chain. This showed that the energy supply chain in particular is water intensive. Materials suppliers in countries like India or China may be located in water scarce areas and are more dependent on the availability of water than Novartis operations.

## W1.2

**For your total operations, please detail which of the following water aspects are regularly measured and monitored and provide an explanation as to why or why not**

Water aspect	% of sites/facilities/operations	Please explain
Water withdrawals- total volumes	76-100	Total water input volumes and volumes by sources are reported on a quarterly basis by all production, research & development and major administration facilities under Novartis operational control. Percentage coverage is 100%.
Water withdrawals- volume by sources	76-100	The following water input by source indicators (where relevant) are reported quarterly, together with the total volumes as stated above: - Water purchased from external suppliers - Water drawn from aquatic environment - Water collected from rain - Water input as ingredient of raw materials - Water input from other sources. Percentage coverage is 100%.
Water discharges- total	76-100	Total water output (discharge) volumes and volumes by destination are reported on a quarterly basis

Water aspect	% of sites/facilities/operations	Please explain
volumes		by all production, research & development and major administration facilities under Novartis operational control. Percentage coverage is 100%.
Water discharges- volume by destination	76-100	The following water output (discharge) by source indicators (where relevant) are reported quarterly, together with the total volumes as stated above: - Water returned, released directly to aquatic environment - Water returned, discharged via treatment - Water lost, evaporated from cooling / heating systems - Water output as product ingredient - Water output to other destination. Percentage coverage is 100%.
Water discharges- volume by treatment method	76-100	Water discharge by treatment method indicators, in addition to the ones listed in the previous line, are not collected and reported on a global level. These are only considered at local level where relevant. Percentage coverage is 100%.
Water discharge quality data- quality by standard effluent parameters	76-100	Water quality data is reported on a yearly basis by all production and research & development facilities under Novartis operational control. Water quality data is not collected from administration sites as this data is considered not relevant compared to the data from our manufacturing and R&D sites. The following water quality indicators are reported (where relevant): - Total Suspended Solids (TSS) Load - Chemical Oxygen Demand (COD) Load - Nitrogen Load - Phosphate Load. All manufacturing facilities also assess effluent load of active pharmaceutical ingredients (APIs) in their water streams, using a risk-based approach based primarily on mass balance methods (or where necessary include analytical methods) and respective eco-toxicity parameters of individual drug substances. Percentage coverage is 100%.
Water consumption- total volume	76-100	Total volume of water consumption is reported on a quarterly basis by all production, research & development and major administration facilities under Novartis operational control. The following water use indicators are reported (where relevant): - Water used for cooling (Cooling Water) - Water used for other non-contact purposes - Water used in processes and for washing - Water used for sanitary purpose (Sanitary Water) - Water used in boilers - Water used for other purposes - Water re-used / recycled Percentage coverage is 100%.
Facilities providing fully-functioning WASH services for all workers	76-100	Due to the nature of our operations, where cleanliness and sterile working conditions are extremely important, we ensure that fresh water is available for cleaning, washing, and sanitary services and for drinking purposes at all facilities under Novartis operational control. We do not explicitly expect facilities to confirm this within our reporting systems as it is a prerequisite for quality operation. Percentage coverage is 100%.

**W1.2a**

**Water withdrawals: for the reporting year, please provide total water withdrawal data by source, across your operations**

Source	Quantity (megaliters/year)	How does total water withdrawals for this source compare to the last reporting year?	Comment
Fresh surface water	0	Not applicable	Novartis reports the quantities of water abstracted from the aquatic environment, but not distinguish between surface water and groundwater. The majority of water abstracted from the environment is from groundwater sources or from river side-beds.
Brackish surface water/seawater	0	Not applicable	Novartis does not collect data for this specific source.
Rainwater	57	Lower	Rainwater is collected and stored for e.g. irrigation or use of lower requirements such as sanitary flushing.
Groundwater - renewable	64637	About the same	Novartis reports the quantities of water abstracted from the aquatic environment, but not distinguish between surface water and groundwater. The majority of water abstracted from the environment is from groundwater sources or from river side-beds. Novartis does not differentiate between renewable and non-renewable groundwater sources.
Groundwater - non-renewable	0	Not applicable	Novartis reports the quantities of water abstracted from the aquatic environment, but not distinguish between surface water and groundwater. The majority of water abstracted from the environment is from groundwater sources or from river side-beds. We do not differentiate between renewable and non-renewable groundwater sources.
Produced/process water	54	Lower	Includes purchased process water and water from "other sources"
Municipal supply	26863	Lower	At many places, in particular at all small administrative sites, Novartis does not operate own wells, but uses water from municipal supply.
Wastewater from another organization	0	Not applicable	Novartis does not collect data for this specific source.
Total	91612	Lower	Cooling water (primarily freshwater from groundwater sources or river-beds) can be withdrawn in large quantities and is returned in similar volumes to its original source nearby with negligible losses or variation in quality.

**W1.2b**

**Water discharges: for the reporting year, please provide total water discharge data by destination, across your operations**

Destination	Quantity (megaliters/year)	How does total water discharged to this destination compare to the last reporting year?	Comment
Fresh surface water	74273	Lower	Novartis reports the quantities of water discharged to the aquatic environment, but not the exact destination. While some quantities may be discharged back to groundwater sources, it is assumed that the majority of non-contaminated cooling water is discharged to fresh surface water bodies.
Brackish surface water/seawater	0	Not applicable	Novartis does not collect data for this specific destination.
Groundwater	0	Not applicable	Novartis reports the quantities of water discharged to the aquatic environment, but not the exact destination. While some quantities may be discharged back to groundwater sources, it is assumed that the majority of non-contaminated cooling water is discharged to fresh surface water bodies.
Municipal/industrial wastewater treatment plant	15048	Higher	At many places, in particular at all small administrative sites, Novartis does not operate own treatment plants, but uses municipal plants for waste water treatment.
Wastewater for another organization	0	Not applicable	Novartis does not collect data for this specific destination.
Total	89321	Lower	The total quantity of water discharges does not include additional water losses from Novartis facilities due to evaporation from heating and cooling systems (1182ML), water in products (89ML) and irrigation (923ML).

**W1.2c**

**Water consumption: for the reporting year, please provide total water consumption data, across your operations**

Consumption (megaliters/year)	How does this consumption figure compare to the last reporting year?	Comment
17242	Lower	The quantity reported here includes the total volume of water sent to treatment (15048ML) and additional water losses from Novartis facilities due to evaporation from heating and cooling systems (1182ML), water in products (89ML) and irrigation (923ML). The vast majority of water used at Novartis is for cooling purposes (74273ML) and is returned untouched back to the aquatic environment.

### W1.3

**Do you request your suppliers to report on their water use, risks and/or management?**

Yes

### W1.3a

**Please provide the proportion of suppliers you request to report on their water use, risks and/or management and the proportion of your procurement spend this represents**

Proportion of suppliers %	Total procurement spend %	Rationale for this coverage
Less than 1%	1-25	Information from Suppliers audited on HSE risks: Water-related risks (scarcity and water treatment / effluent risks) are a regular part of HSE audits conducted at supplier sites. The supplier survey and audit concept that Novartis is using as part of its Responsible Procurement program follows a risk-based approach, focusing on high risk countries (i.e. India, China, Latin America) and high risk sectors (i.e. chemicals, active ingredients, packaging materials). In the course of supplier surveys and again as part



Proportion of suppliers %	Total procurement spend %	Rationale for this coverage
		of the audits, suppliers are required to provide information on their water consumption, for their practice of water treatment and for effluent characteristics. Their incentive to report this information is a better HSE performance and thus positive for the business relationship. Even though proportion of suppliers and procurement spend covered by the system are small, risks are captured by a much higher degree, as we focus on categories and countries with potentially higher risks. Overall impact assessment: In parallel since 2014 we annually conduct an input/output study to determine the carbon and water consumption and water risk footprint of the entire material supply chain. This enables us to better identify impact hotspots and continue actions on these to reduce impacts and risks. With respect to water it is confirmed that water consumption and scarcity risks are highest in chemical suppliers in Asia (e.g. India).

**W1.3b**

Please choose the option that best explains why you do not request your suppliers to report on their water use, risks and/or management

Primary reason	Please explain
----------------	----------------

**W1.4**

Has your organization experienced any detrimental impacts related to water in the reporting year?

Yes

**W1.4a**

Please describe the detrimental impacts experienced by your organization related to water in the reporting year

Country	River basin	Impact indicator	Impact	Description of impact	Length of impact	Overall financial impact	Response strategy	Description of response strategy
United States of America	Other: local creek in coastal California	Phys-Flooding	Plant/production disruption leading to reduced output	Following local heavy rain events, the local creek running by the site regularly flooded into the property impacting operations and destroying property.	several times, for several days	USD 230000 remediation cost; Loss due to production delay not assessed	Engagement with community Infrastructure investment Infrastructure maintenance Strengthen links with local community	The site cooperated with the local authority to install protection measures, increase space for the creek and improve flow-off conditions.

W1.4b

Please choose the option below that best explains why you do not know if your organization experienced any detrimental impacts related to water in the reporting year and any plans you have to investigate this in the future

Primary reason	Future plans
----------------	--------------

Further Information

**Module: Risk Assessment**

W2.1

Does your organization undertake a water-related risk assessment?

Water risks are assessed

W2.2

Please select the options that best describe your procedures with regard to assessing water risks

Risk assessment procedure	Coverage	Scale	Please explain
Comprehensive company-wide risk assessment	Direct operations and supply chain	All facilities and suppliers	Direct Operations: Novartis evaluates water usage at all sites each year using the WBCSD Global Water Tool. The focus of our evaluation is primarily on water availability rather than water quality, as the majority of our manufacturing sites have water purification equipment to address water quality issues. The top-ten sites located in areas of future potential water scarcity or extreme scarcity by water usage were required in 2013 to undertake a water audit, determine their water flows, evaluated water saving opportunities, and to issue a water reduction target. In addition, access to water must be incorporated into the sites risk portfolio if relevant. In 2015 the top-20 water scarce sites have reported water savings above 20% after having been audited and having applied water saving measures. Suppliers: An Input/Output analysis is conducted since 2014 on the entire materials supply chain, covering carbon and water consumption and water risks related to water scarcity. Results show that highest impacts are allocated in the chemical sector and to the energy supply chain and that water scarcity in our supply chain is highest in Asian countries such as India and China. Data on water consumption, water treatment and water effluents is also obtained from selected chemical suppliers.

W2.3

**Please state how frequently you undertake water risk assessments, what geographical scale and how far into the future you consider risks for each assessment**

Frequency	Geographic scale	How far into the future are risks considered?	Comment
Annually	River basin	>6 years	Using the water WRI scarcity indicator on "water availability per capita in 2025" to assess each facilities level of water scarcity considers future developments for the water shed in which these facilities are located.
Annually	River basin	>6 years	Access to water is included in the annually updated risk portfolios of sites located in water scarce or extreme scarce areas.

#### W2.4

**Have you evaluated how water risks could affect the success (viability, constraints) of your organization's growth strategy?**

Yes, evaluated over the next 10 years

#### W2.4a

**Please explain how your organization evaluated the effects of water risks on the success (viability, constraints) of your organization's growth strategy?**

Water risks from water scarcity was not considered a material risk on the success of Novartis' growth strategy, due to the fact that respective consequences are limited to few individual sites located in water scare areas, the currently still very low financial implications related to water risks and the possibilities to avoid/mitigate these risks by alternative ways (e.g. cooling by mechanical chilling instead of water cooling).

Following case example of successful water management may demonstrate this:

Comfort Cooling with ambient water at the Novartis Campus in Basel:

Situation: Water from nearby readily available surface of groundwater sources is used to condition indoor air. This practice helps to reduce electricity consumption, which otherwise would be necessary for mechanical chilling. As long as such water sources are sufficiently cold and temperatures are not overly increased, the

impact on the natural source is very limited.

Task: At its headquarters in Basel (Switzerland) Novartis uses water from the nearby river Rhein for comfort cooling of office and research buildings. In recently more frequent hot summer periods, the temperature of the river exceeds 25°C, which limits the use of water from the river for cooling. In order to be able to continue with its growth strategy at the headquarters location in Basel, and avoiding energy intensive mechanical chilling, Novartis decided to use seasonal heat storage technology for new buildings at the site.

Action: With a pilot application of a heat storage system for the new top management building inaugurated in 2014, seasonal heat storage was tested and proven effective. Two new buildings inaugurated in 2015 use the same technology.

Result: The wider application of the new technology allow Novartis to keep the dependence on the cold water source low, help develop and further spread new heating/cooling techniques and continue its excellent electricity savings performance at the Basel Campus.

#### W2.4b

What is the main reason for not having evaluated how water risks could affect the success (viability, constraints) of your organization's growth strategy, and are there any plans in place to do so in the future?

Main reason	Current plans	Timeframe until evaluation	Comment

#### W2.5

Please state the methods used to assess water risks

Method	Please explain how these methods are used in your risk assessment
WBCSD Global Water Tool WRI water stress definition Other: Natural Capital Protocol; Input/Output Tool; Novartis Risk Portfolio	Input/Output Tool: Since 2014 Novartis conduct annually a study on the carbon and water footprint of the direct Material Supply Chain. With this, carbon and water consumption footprint can be specifically assessed per business, per supply category and per country. The water footprint is specific for levels of water scarcity. The results are analyzed to identify impact hot spots in the supply chain and to address groups of suppliers or individual suppliers in view of determining actions. Natural Capital Protocol: In 2015 we further used the Natural Capital Protocol (NPC) in a pilot application guided by The Natural capital Coalition,

Method	Please explain how these methods are used in your risk assessment
	Cambridge University and WBCSD) to monetize environmental profit & loss for Novartis, using environmental impact prices for a variety of levels of water scarcity. Novartis Risk Portfolio: Access to water is additionally included in the annually updated risk portfolios of sites located in water scarce or extreme scarce locations. WBCSD Global Water tool and WRI Scarcity Indicators: To assess its risks related to water scarcity Novartis is using the WBCSD Global Water Tool on a yearly basis. Using the water WRI scarcity indicator on "water availability per capita in 2025" to assess water risks at individual sites allows to consider future developments.

**W2.6**

**Which of the following contextual issues are always factored into your organization's water risk assessments?**

Issues	Choose option	Please explain
Current water availability and quality parameters at a local level	Relevant, included	At Novartis we determine the level of water stress based on the WRI water stress definition. Access to water is included in our risk portfolio procedure, requiring an annual listing and update of all HSE risks, in which sites located in water scarce or extreme scarce locations determine their risk related to water scarcity.
Current water regulatory frameworks and tariffs at a local level	Relevant, included	Regulatory frameworks are considered in the risk portfolios of Novartis sites which are located in water scarce or extreme scarce locations, as well as on additional sites where our water intake is high or where water resources are managed with due care. For example, the regulatory limitation of using water from the river Rhine in Basel for comfort cooling if temperatures exceed 25°C was considered to expanding the site's concept of cooling alternatives with seasonal heat/cold storage in the bedrock underneath buildings. Other examples also demonstrate that regulatory frameworks or water tariffs have a limited effect, despite water scarcity is critical. Water cost at our production facility in Beijing China, are, due to very low tariffs, not a relevant factor to influence decisions for water savings. If social costs of water impacts were considered, as determined in our impact monetization project, the situation is a different one.
Current stakeholder conflicts concerning water resources at a local level	Relevant, included	Stakeholder conflicts, if any, are considered in the risk portfolios of sites located in water scarce or extreme scarce locations. Novartis, in 2015, was not faced to any stakeholder conflict on water at its operations.
Current implications of water on your	Relevant,	A supply chain analysis on water footprint is conducted by Novartis corporate HSE and Procurement

Issues	Choose option	Please explain
key commodities/raw materials	included	annually since 2014 to assess key areas of relevance. Social cost of water, in particularly if resources are scarce, are a decisive factor on the total impact of our material supply chain. Application of the Natural Capital Protocol in quantifying own and supply chain environmental footprints in monetary terms show that water is among the most relevant parts of the entire impact. Social costs of the water footprint relate to our direct materials supply chain (including tier 1 to tier 6 suppliers) refers to 18% of the total supply chain footprint.
Current status of ecosystems and habitats at a local level	Relevant, included	Aspects of ecosystems and habitats (e.g. Humber sanctuary for our Chemical Operations site in Grimsby) are considered if relevant.
Current river basin management plans	Relevant, included	Current river basin management plans are considered at those Novartis locations where water is scarce or highly scarce - particularly at those in Southern California, India, Turkey and Spain. Such scarcity information we gain from our application of the WBCSD global water tool, in selecting the top-20 water scarcity locations that have to implement a water savings program.
Current access to fully-functioning WASH services for all employees	Not relevant, explanation provided	Due to the nature of our operations, where cleanliness and sterile working conditions are extremely important, we ensure that fresh water is available for cleaning, washing, sanitary services and for drinking purposes at all facilities under Novartis operational control. We do not explicitly expect facilities to confirm this within our reporting systems.
Estimates of future changes in water availability at a local level	Relevant, included	By using the WRI water scarcity indicator on "water availability per capita in 2025" we consider future developments. We include access to water on the risk portfolios of all sites, which are located in water scarce or extreme scarce locations.
Estimates of future potential regulatory changes at a local level	Relevant, included	Using the WRI water scarcity indicator on "water availability per capita in 2025" considers future developments. Access to water is included on the risk portfolios of sites located in water scarce or extreme scarce locations.
Estimates of future potential stakeholder conflicts at a local level	Relevant, included	Using the water WRI scarcity indicator on "water availability per capita in 2025" considers future developments. Access to water is included on the risk portfolios of sites located in water scarce or extreme scarce locations.
Estimates of future implications of water on your key commodities/raw materials	Relevant, included	A basic supply chain analysis on water footprint was conducted to assess key areas of relevance. However, this can only provide limited information on future developments.
Estimates of future potential changes in the status of ecosystems and habitats at a local level	Not relevant, explanation provided	Aspects of ecosystems and habitats (e.g. for our Grimsby manufacturing site located next to the Humber sanctuary) are considered if relevant. For such sites, this provides valid information on change in conditions, regulatory requirements, trends and future developments.
Scenario analysis of availability of sufficient quantity and quality of water relevant for your operations at a local level	Relevant, included	Local water availability assessments are undertaken at several Novartis facilities. Such assessments are particularly important at anti-infective manufacturing facilities in Austria, Slovenia and Italy where vast quantities of cooling water are used for process cooling, instead of mechanical chilling, in order to save energy. Alpine rivers could seasonally dry out in the future due to the meltdown of alpine glaciers in the second half of the 21st century and water may not be any more sufficiently available in the summer months. Due to the fact that such scenarios are rather long term, and there are so

Issues	Choose option	Please explain
		far no trends visible for dry out of these rivers, the specific risks are not considered material at this point in time.
Scenario analysis of regulatory and/or tariff changes at a local level	Relevant, included	Local water cost assessments are undertaken at several Novartis facilities. Such assessments are particularly important at anti-infective manufacturing facilities where vast quantities of cooling water are used in order to save energy. Due to the quantities of water involved, any increases in water charges could affect the economic viability of the facilities in the future. Typically sites have licenses to pump water from the river side beds and discharge the water back to the river, as the temperature is only slightly increased and environmental impacts on the river biotope are not considered material.
Scenario analysis of stakeholder conflicts concerning water resources at a local level	Relevant, included	Stakeholder conflicts concerning water resources are assessed at a local level at some facilities; particularly the anti-infective manufacturing facilities.
Scenario analysis of implications of water on your key commodities/raw materials	Relevant, not yet included	A basic supply chain analysis on water footprint was conducted to assess key areas of relevance.
Scenario analysis of potential changes in the status of ecosystems and habitats at a local level	Not relevant, explanation provided	Aspects of ecosystems and habitats (e.g. the Humber sanctuary adjacent to our Grimsby manufacturing site in the UK) are considered if relevant. However, this can only provide limited information on future developments.
Other	Not evaluated	

**W2.7**

**Which of the following stakeholders are always factored into your organization's water risk assessments?**

Stakeholder	Choose option	Please explain
Customers	Relevant, included	Novartis informs stakeholders on its water saving activities and related water risks in its annual non-financial reporting (Corporate Responsibility Report) and in local environmental reports. With some selected customers, such as the National Health Service (NHS) in England, hospital pharmacists we build direct contacts on environmental topics, and to Walmart Stores in the US and in Mexico and to Abbott in India we provide climate information with the CDP supplier



Stakeholder	Choose option	Please explain
Employees	Relevant, included	survey. Associates can contribute to water efficiency through their own daily habits (e.g. on the use of sanitary water). Based on our Water Savings program at the top water scarce sites we have developed programs that allow associates to engage in water savings activities. Such programs were implemented e.g. at our sites in Batam, Indonesia; Navi Mumbai; India; Hyderabad, India and La Jolla, California.
Investors	Relevant, included	Novartis informs investors on its water saving activities and related water risks in its annual non-financial reporting (Corporate Responsibility Report) and in local environmental reports. We also respond proactively to information requests of investors. In 2015 (and early 2016) Novartis had provided comprehensive feedback on (among others) water risk of chemical suppliers in India.
Local communities	Relevant, included	Besides CR Reporting on corporate level, Novartis informs local stakeholders on its water saving activities and related water risks in in local environmental or sustainability reports. Such local reports are (among others) issued in Slovenia (for our Sandoz subsidiary Lek, covering all Novartis operations in Slovenia), for the Sandoz facilities in Kundl/Schaftenau in Tyrol, Austria and for the Basel Operations in Switzerland. Additionally, regular contacts are maintained with the Basel authorities and with community groups of the surrounding communities in Huningue, France. For example, Novartis in Basel conducts a voluntary 200 million dollar remediation project in the commune of Huningue, near Basel to protect local groundwater sources from pesticide pollutants, originating from former owners of the site.
NGOs	Relevant, included	In cooperation with The Nature Conservancy (TNC) Novartis conducts a voluntary carbon sink forestry project in Sichuan, China on 4100ha degraded land on mountain sides. The afforestation of these lands will in the long term protect water sources, by reducing soil erosion and the tendency to landslides. 455 of the lands are located in Nature Reserves and the remaining area is located adjacent to these reserves.
Other water users at a local level	Relevant, included	At some of its water-scarce location Novartis provides water from the factory to the local community. This is practiced at some of our production sites in South Asia, e.g. at the Pharmaceutical Operations site of our OTC Joint Venture Company with GSK in Pakistan.
Regulators	Relevant, included	Regulators are included in water risk assessments undertaken at some Novartis manufacturing facilities, where we operate facility owned waste water treatment operations and/or discharge waste water to public sewer treatment facilities. In 2015 our pharmaceutical operations site in Wehr (Germany) in 2015 evaluated various waste water treatment alternatives with the community to find optimal and most effective treatment.
River basin management authorities	Relevant, included	River basin management authorities are factored into water risk assessments undertaken at some Novartis manufacturing facilities. Our water specialists at our manufacturing sites in Stein (CH), Wehr (Germany), Schweizerhalle (CH) and Basel (CH) work closely with the Rhein River Watershed authority to monitor and control water effluent and pollutant parameters of the river. In such close cooperation, that also include the operators of the local public waste water treatment plants, it is ensured that the River Rhein is kept at optimal conditions at all times.
Statutory special interest groups at a local level	Relevant, included	Novartis informs stakeholders on its water savings activities in its annual non-financial reporting (Corporate responsibility Report) and its local environmental reports (e.g. EMAS Reports).
Suppliers	Relevant,	An assessment of the materials supply chain is regularly being conducted by Novartis based on an Input/Output tool to

Stakeholder	Choose option	Please explain
	included	determine the relevance of the water footprint of the materials supply chain. A selected groups of suppliers (e.g. in China) were directly contacted to discuss issues of water related risk and other relevant environmental aspects.
Water utilities/suppliers at a local level	Relevant, included	Novartis informs stakeholders on its water savings activities in its annual non-financial reporting (Corporate Responsibility Report) and its local environmental reports (e.g. EMAS Reports). Water utilities of our Research facility in La Jolla, California cooperated with Novartis in conducting a water audit and developing water savings opportunities.
Other	Not evaluated	

## W2.8

Please choose the option that best explains why your organisation does not undertake a water-related risk assessment

Primary reason	Please explain

## Further Information

**Module: Implications**

**Page: W3. Water Risks**

## W3.1

**Is your organization exposed to water risks, either current and/or future, that could generate a substantive change in your business, operations, revenue or expenditure?**

Yes, direct operations and supply chain

---

### W3.2

**Please provide details as to how your organization defines substantive change in your business, operations, revenue or expenditure from water risk**

Direct operations:

Large quantities of water are used at several Novartis sites in Europe to cool production processes and/or buildings. Novartis encourages the use of water for cooling at these sites where water is abundant, no contamination is possible and water can be returned to the aquatic environment without treatment, because it saves significant quantities of energy and associated GHG emissions.

In the rather unlikely event in a longer term future when the fermentation plants in Italy, Slovenia, Spain and Austria could no longer abstract cooling water from the aquatic environment due to a meltdown of Alpine glaciers, the use of mechanical chillers would be required to cool the production processes, which would result in significantly higher operating costs (estimated between 10 and 20%) through increased energy usage and significantly higher GHG emissions (also between 10 and 20%). This would be considered a substantive change to the organization.

The unavailability of water at a site located in a water stressed or scarce area would be less substantive as production could be relatively easily shifted to another Novartis site located in an area of water abundance (e.g. from Spain or Italy to Austria) in the course of restructuring production capacities.

Supply Chain:

Water consumption in the supply chain (primarily at tier 2 or tier 3 suppliers), where water intensive processes are included in the preparation of natural (pulp, fibre, agricultural products) or fossil raw materials (chemicals) may generate water risks, in particular when these suppliers are located in water scarce regions such as e.g. in India. The water consumption related risks and environmental footprint of the supply chain is being assessed by Novartis with an Input/Output tool on an annual basis since 2014. The various environmental footprints, including water risks had been quantified and monetized in the course of an assessment of Environmental P&L. Water related impacts of the supply chain constitute 18% of the total environmental externalities.

---

### W3.2a

**Please provide the number of facilities\* per river basin exposed to water risks that could generate a substantive change in your business, operations, revenue or expenditure and the proportion this represents of total operations company-wide**

Country	River basin	Number of facilities exposed to water risk	Proportion of total operations (%)	Comment
Switzerland	Rhine	1	Less than 1%	Water of the river Rhine is used for comfort cooling of office and research buildings at our headquarters site in Basel. It is a non-contact one-time-through use of the water, given back to the river with very small temperature increase. There is a limitation to use the river water, at times when the water exceeds a temperature of 25°C, which so far once happened in summer 2003. Novartis took measures to reduce dependency on the river water for cooling in installing systems for new buildings that allow seasonal heat storage in the bedrock underneath the building.
Austria	Danube	1	1-5	Fermentation processes at our Sandoz facility in Kundl, Tyrol, Austria use water for cooling from the riverbed of the river Inn, a side river to the Danube river. The water is given back to the river after a non-contact, one time through application of water for process cooling. It is not expected that within the next 50 years that the river Inn would not have sufficient water for cooling and that the use of water could be limited.

### W3.2b

Please provide the proportion of financial value that could be affected at river basin level associated with the facilities listed in W3.2a

Country	River basin	Financial reporting metric	Proportion of chosen metric that could be affected within the river basin	Comment
Switzerland	Rhine	% cost of goods sold	Less than 1%	Operating costs for some buildings at the site will very little increase due to higher electricity consumption for mechanical chilling, when river water for comfort cooling would not be available anymore at certain time periods of the year.
Austria	Danube	% cost of goods sold	Less than 1%	Operating costs for fermentation processes at the site will somewhat increase due to higher electricity consumption for mechanical chilling, when river water for process cooling would not be available anymore at certain time periods of the year.

W3.2c

Please list the inherent water risks that could generate a substantive change in your business, operations, revenue or expenditure, the potential impact to your direct operations and the strategies to mitigate them

Country	River basin	Risk driver	Potential impact	Description of impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
Switzerland	Rhine	Physical-Climate change Physical-Rationing of municipal water supply Physical-Seasonal supply variability/Inter annual variability Regulatory-Increased difficulty in obtaining withdrawals/operations permit	Higher operating costs	The impact to the site is considered relatively small. If less ambient water is available for comfort cooling, mechanical chillers would be required to cool the buildings in summer months, which would result in some higher operating costs (estimated less than 1%) through increased	4-6 years	Probable	Low	Alignment of public policy positions with water stewardship goals Engagement with public policy makers Infrastructure investment Increased capital expenditure Increased investment in new technology Promote best practice and awareness	Projects were implemented to make the site less dependent on cooling water. The cost of to develop the response strategy is marginal. The costs for implementation include the project costs: So far projects were implemented for 3 buildings, in total USD 5-6 mio.	Projects for seasonal heat storage of new buildings were implemented in 2014 and 2015. Costs of such projects are in the range of USD 1.5-2 mio each.

Country	River basin	Risk driver	Potential impact	Description of impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
				energy usage and higher GHG emissions.						
Austria	Danube	Physical-Ecosystem vulnerability Physical-Projected water stress Physical-Seasonal supply variability/Inter annual variability Regulatory-Increased difficulty in obtaining withdrawals/operations permit	Higher operating costs	In the rather unlikely event in a longer term future when the fermentation plant Austria could no longer abstract cooling water from the aquatic environment due to a meltdown of Alpine glaciers, the use of mechanical chillers would be required to cool the production processes, which would result in significantly	>6 years	Unlikely	Medium	Engagement with community Infrastructure investment Increased investment in new technology	Cooling technology would need to be changed from water cooling to mechanical chilling. Costs for the implementation of such strategy will include new equipment for mechanical chilling, estimated to USD 10 mio over 5-10 years plus the annual increase in energy costs of USD 1.5 - 2.5 mio p.a.	Mechanical chilling would increase the site's energy consumption by estimated 10-20%, i.e. USD 1.5 - 2.5 mio p.a.

Country	River basin	Risk driver	Potential impact	Description of impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
				higher operating costs (estimated between 10 and 20%) through increased energy usage and significantly higher GHG emissions (also between 10 and 20%). This would be considered a substantive change to the organization.						

W3.2d

Please list the inherent water risks that could generate a substantive change in your business operations, revenue or expenditure, the potential impact to your supply chain and the strategies to mitigate them

Country	River basin	Risk driver	Potential impact	Description of impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
China	Huang He (Yellow River)	Physical-Climate change Physical-Drought Physical-Ecosystem vulnerability Physical-Increased water scarcity Physical-Projected water scarcity	Supply chain disruption	An assessment of the water consumption and risk footprint of the materials supply chain and monetization of environmental externalities show us that that such impacts are highest in the material supply chain. Most relevant countries include China and India. With the study undertaken in 2015 we quantified the water footprint of our materials supply chain in China to be 41.8Mm3, relating to a estimated external cost of USD63mio.	4-6 years	Highly probable	Medium-high	Engagement with suppliers	If all externalities were included, water costs would grow in the amount of the current externalities, i.e. USD63mio for China, however, water efficiency measures will allow to reduce these by about 30-40% or even turn to be a benefit, if suppliers are early adopters and proactively react on the internalization of external costs by becoming more water efficient.	Our response strategy in managing environmental externalities of the materials supply chain includes to actively manage the selection of suppliers and to influence their environmental footprint by a more close cooperation. The dialogue with suppliers in China has just commenced, by direct engagement with selected suppliers to discuss possible actions to minimize environmental impacts and related risks. Costs of such a strategy would



Country	River basin	Risk driver	Potential impact	Description of impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
										potentially be significant, however in the long-term, economic benefits would be bigger than costs.
India	Ganges-Brahmaputra	Physical-Climate change Physical-Drought Physical-Ecosystem vulnerability Physical-Increased water scarcity Physical-Projected water scarcity	Supply chain disruption	An assessment of the water consumption and risk footprint of the materials supply chain and monetization of environmental externalities show us that that such impacts are highest in the material supply chain. Most relevant countries include China and India. With the study undertaken in 2015 we quantified the water footprint	4-6 years	Highly probable	Medium-high	Engagement with suppliers	Costs of such a strategy would potentially be significant, however in the long-term, economic benefits would be bigger than costs. If all externalities were included, water costs would grow in the amount of the current externalities, i.e. USD40mio for India, however, water efficiency measures will allow to reduce these by about 30-40%.	Our response strategy in managing environmental externalities of the materials supply chain includes to actively manage the selection of suppliers and to influence their environmental footprint by a more close cooperation. The dialogue with suppliers in India has just commenced, by direct engagement with supplier groups to discuss

Country	River basin	Risk driver	Potential impact	Description of impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
				of our materials supply chain in India to be 41.7Mm3, relating to a estimated external cost of USD40mio.						possible actions to minimize environmental impacts and related risks. Costs of such a strategy would potentially be significant, however in the long-term, economic benefits would be bigger than costs.

W3.2e

Please choose the option that best explains why you do not consider your organization to be exposed to water risks in your direct operations that could generate a substantive change in your business, operations, revenue or expenditure

Primary reason	Please explain
----------------	----------------

W3.2f

Please choose the option that best explains why you do not consider your organization to be exposed to water risks in your supply chain that could generate a substantive change in your business, operations, revenue or expenditure

Primary reason	Please explain
----------------	----------------

---

W3.2g

Please choose the option that best explains why you do not know if your organization is exposed to water risks that could generate a substantive change in your business operations, revenue or expenditure and discuss any future plans you have to assess this

Primary reason	Future plans
----------------	--------------

---

**Further Information**

**Page: W4. Water Opportunities**

---

W4.1

**Does water present strategic, operational or market opportunities that substantively benefit/have the potential to benefit your organization?**

Yes

---

W4.1a

Please describe the opportunities water presents to your organization and your strategies to realize them

Country or region	Opportunity	Strategy to realize opportunity	Estimated timeframe	Please explain
India	Cost savings Improved community relations Improved water efficiency Social licence to operate	Water savings program at Novartis sites in India: Situation: Novartis-Sandoz manufacturing sites in Navi Mumbai, India are located in a water scarce area and thus are obliged to save water where possible to maintain their good reputation and license to operate. Rain water harvesting and water recycling are therefore part of the sustainability programs of the respective sites. Task: Actions: Since 2006, between 2500 and 4500 m3 of rainwater were collected every year during monsoon seasons at our production facilities in Navi Mumbai, India, representing between 3% and 8% of the sites' total water consumption. Additionally, the sites recycle between 17% and 28% of its on-site treated water effluents for gardening. The water savings program, including water audit, water flowchart, setting a water savings target and implementing water saving projects was implemented since 2006. Additional measures were taken in 2015 and additional steps are considered in future years.	1-3 years	Results: By implementing these measures, the sites in India achieved savings of 25-30% of their total water annual usage representing 185,000 cubic meters. Respective water costs savings achieved in 2015 alone amount to USD9300 or 5% of the total water cost.
Turkey	Cost savings Improved water efficiency Social licence to operate	Potable water savings in Gebze, Turkey: Situation: The metropolitan area of Istanbul in Turkey is rated as a water scarce area. Task: For this reason the Novartis sites located in the Istanbul area are part of our global water savings program. Action: Potable water used at the Sandoz Final Dosage Form (FDF) production site Gebze 2 in Turkey is pre-treated using an ozone sanitization system. In an effort to save water, the site facility team is now collecting drains from its reverse osmosis system, backwashing and sampling waters in a separate tank and bringing them back for reuse to the potable water pre-treatment process.	1-3 years	Results: The project saves 7 800 cubic meters or 12% of the total amount of water used at the site annually, totalling USD 35 000 in savings.
United States of America	Climate change adaptation	Water savings in Emeryville, CA, USA: Situation: Water is increasingly scarce on the US west coast and Novartis takes active measures to reduce water use at its most	1-3 years	Results: By implementing these measures, the site are saving annually 2,700 cubic meters of water, i.e. USD 6300 savings on water cost.

Country or region	Opportunity	Strategy to realize opportunity	Estimated timeframe	Please explain
	Cost savings Improved water efficiency Social licence to operate	scarce locations. Task: The Novartis research facility implements a water saving program. Action: A measure successfully taken in 2015 in Emeryville is retrofitting its irrigation system by exchanging irrigation nozzles and converting areas from turf to mulch. The facility management team changed the spray system for irrigation and mulching garden beds to limit evaporation (at a surface of 1400 square meters).		
Company-wide	Increased brand value Improved community relations Increased shareholder value Improved water efficiency Social licence to operate	Potential business opportunities are reduced water and energy costs, improved risk management strategies for managing water usage, easier compliance with potentially stricter water legislation, increasing investments from environmentally conscious investors and increased appreciation from current and future Novartis personnel on environmental achievements at Novartis.	4-6 years	Novartis strives to be among the most admired companies in all aspects of our operations. The Novartis Annual Report and Corporate Responsibility Report are two means by which we inform internal and external stakeholders of our water strategy and performance. In addition, local sustainability reports containing details of local water management initiatives are also produced at many sites or organizational units. Novartis also provides additional data directly to the sustainable investment community via yearly surveys.

W4.1b

Please choose the option that best explains why water does not present your organization with any opportunities that have the potential to provide substantive benefit

Primary reason	Please explain
----------------	----------------

W4.1c

Please choose the option that best explains why you do not know if water presents your organization with any opportunities that have the potential to provide substantive benefit

Primary reason	Please explain
----------------	----------------

Further Information

Module: Accounting

Page: W5. Facility Level Water Accounting (I)

W5.1

Water withdrawals: for the reporting year, please complete the table below with water accounting data for all facilities included in your answer to W3.2a

Facility reference number	Country	River basin	Facility name	Total water withdrawals (megaliters/year) at this facility	How does the total water withdrawals at this facility compare to the last reporting year?	Please explain
Facility 1	Switzerland	Rhine	Basel	15878	Much lower	Total water abstraction for the Basel headquarters site primarily used for comfort cooling, was considerably (12.0%) reduced from 2014 to 2015. This is mainly due to the

Facility reference number	Country	River basin	Facility name	Total water withdrawals (megaliters/year) at this facility	How does the total water withdrawals at this facility compare to the last reporting year?	Please explain
						increase in the use of seasonal heat storage by a growing number of buildings.
Facility 2	Austria	Danube	Kundl	33642	Higher	Total water abstraction for the Kundl Anti-Infectives production site, primarily used for process cooling slightly increased (2.2%) between 2014 and 2015. This is primarily due to increased production volumes of 5.7% in the same period.

#### Further Information

Novartis collects information on water input, use and output quarterly from all its operations worldwide. The data is used for performance reporting and disclosure to stakeholders. Together with an assessment of local levels of water scarcity water consumption (blue and grey footprint = water lost and water to be treated) determines whether sites are included in a water savings program. Top-20 water footprint sites participate in a water savings program with water audit, water flow characterization, water savings target and water project reporting.

#### Page: W5. Facility Level Water Accounting (II)

##### W5.1a

**Water withdrawals: for the reporting year, please provide withdrawal data, in megaliters per year, for the water sources used for all facilities reported in W5.1**

Facility reference number	Fresh surface water	Brackish surface water/seawater	Rainwater	Groundwater (renewable)	Groundwater (non-renewable)	Produced/process water	Municipal water	Wastewater from another organization	Comment
Facility 1	14967	0	0	0	0	0	991	0	
Facility 2	33642	0	0	0	0	0	0	0	

## W5.2

**Water discharge: for the reporting year, please complete the table below with water accounting data for all facilities included in your answer to W3.2a**

Facility reference number	Total water discharged (megaliters/year) at this facility	How does the total water discharged at this facility compare to the last reporting year?	Please explain
Facility 1	15878	Much lower	Novartis collects information on water input, use and output broken down to subcategories from all its operations worldwide. Partly these flows are measured with flow meters, others are calculated or assessed with feasible assumptions. Water balance criteria need to be fulfilled for data quality and consistency.
Facility 2	33642	Higher	Novartis collects information on water input, use and output broken down to subcategories from all its operations worldwide. Partly these flows are measured with flow meters, others are calculated or assessed with feasible assumptions. Water balance criteria need to be fulfilled for data quality and consistency.

## W5.2a

**Water discharge: for the reporting year, please provide water discharge data, in megaliters per year, by destination for all facilities reported in W5.2**



Facility reference number	Fresh surface water	Municipal/industrial wastewater treatment plant	Seawater	Groundwater	Wastewater for another organization	Comment
Facility 1	15124	754	0	0	0	Over 95% of the water discharged from Basel facility is non-contact cooling water, discharged back to the River Rhine, without contact to any potential contaminants.
Facility 2	31193	2449	0	0	0	About 93% of the water discharged from Kundl facility is non-contact process cooling water, discharged back to the River Inn, without contact to any process components or other potential contaminants.

### W5.3

Water consumption: for the reporting year, please provide water consumption data for all facilities reported in W3.2a

Facility reference number	Consumption (megaliters/year)	How does this compare to the last reporting year?	Please explain
Facility 1	754	Much lower	Water consumption (i.e. water discharged via treatment plus water lost) in Basel is considerably (9.6%) lower in 2015 compared to 2014. This change is due improved water efficiency at the site.
Facility 2	2449	Higher	Water consumption (i.e. water discharged via treatment plus water lost) at Kundl is slightly (1.7%) higher in 2015 compared to 2014. This change is due to a 5.7% production volume increase in the same period.

### W5.4

For all facilities reported in W3.2a what proportion of their water accounting data has been externally verified?

Water aspect	% verification	What standard and methodology was used?
Water withdrawals- total volumes	76-100	Standard: ISAE3000 Methodology: Limited Assurance
Water withdrawals- volume by sources	Not verified	
Water discharges- total volumes	76-100	Standard: ISAE3000 Methodology: Limited Assurance
Water discharges- volume by destination	76-100	Standard: ISAE3000 Methodology: Limited Assurance
Water discharges- volume by treatment method	76-100	Standard: ISAE3000 Methodology: Limited Assurance
Water discharge quality data- quality by standard effluent parameters	Not verified	
Water consumption- total volume	76-100	Standard: ISAE3000 Methodology: Limited Assurance

---

**Further Information**

**Module: Response**

**Page: W6. Governance and Strategy**

---

**W6.1**

**Who has the highest level of direct responsibility for water within your organization and how frequently are they briefed?**

Highest level of direct responsibility for water issues	Frequency of briefings on water issues	Comment
Board of individuals/Sub-set of the Board or other committee appointed by the Board	Scheduled- quarterly	Health, Safety Environment Steering Committee (HSE SteCom) is responsible for authorizing & sponsoring environmental strategy including water. The committee is chaired by the Head of Corporate Responsibility who reports directly to the CEO. HSE SteCom meets 3 times a year and comprises the executive heads Technical Operations of all Novartis Divisions, the head Real Estate and Facility Services and the head Corporate Health Safety Environment (CHSE). The Novartis water strategy is managed by the Head Environment & Energy within CHSE. Performance on environmentally relevant aspects, including water use and savings program are part of management reporting on quarterly basis.

---

**W6.2**

**Is water management integrated into your business strategy?**

No

---

**W6.2a**

Please choose the option(s) below that best explain how water has positively influenced your business strategy

Influence of water on business strategy	Please explain
---	----------------

---

**W6.2b**

Please choose the option(s) below that best explains how water has negatively influenced your business strategy

Influence of water on business strategy	Please explain
---	----------------

W6.2c

Please choose the option that best explains why your organization does not integrate water management into its business strategy and discuss any future plans to do so

Primary reason	Please explain
Water does not pose a substantive risk to the business strategy	Access to water at some sites located in water scarce or extreme scarce areas is a local business risk; however, production or research operation at these sites could relatively easily be transferred to other Novartis locations if necessary. Water costs (USD 53 million for the entire Group or <0.5% of operating costs) are marginal compared to other costs factors. Water consumption and water costs are monitored regularly and are included in the regular reporting to management on HSE issues.

W6.3

Does your organization have a water policy that sets out clear goals and guidelines for action?

Yes

W6.3a

Please select the content that best describes your water policy (tick all that apply)

Content	Please explain why this content is included
Publicly available Company-wide Select facilities only Performance standards for direct operations Performance standards for supplier, procurement and contracting best practice Incorporated within group environmental, sustainability or EHS policy Acknowledges the human right to water, sanitation and hygiene	<p>Publicly available: The efficient use and conservation of water, minimizing emissions to water, and 2020 target on water and micro-pollutant are explicitly mentioned in the Novartis HSE Policy, available to the public: <a href="https://www.novartis.com/about-us/corporate-responsibility/resources/codes-policies-guidelines">https://www.novartis.com/about-us/corporate-responsibility/resources/codes-policies-guidelines</a></p> <p>Company-wide: The Novartis HSE Policy and water target is valid company wide, for all operations. Priority for water savings distinguishes for several levels of water scarcity. The water quality requirements and drug substance effluent target is valid for all manufacturing locations that process drug substances.</p> <p>Select facilities only: We apply specific water policy, targets and program actions from sites in water scarce areas.</p> <p>Performance standards for direct operations: Direct operations have to report comprehensive water data, and depending of water scarcity levels, have to implement water savings programs. Drug substance effluent target and effluent control program is implemented at all sites processing drug substances. Performance standards for suppliers: Responsible Procurement programs, including supplier Code of Conduct, as well as questionnaires, surveys and supplier audits cover water consumption and water effluent parameters. Incorporated within group policy: see above in first paragraph of these explanations</p> <p>Acknowledgement for human rights to water etc.: Our CR Policy and programs implicitly include sanitation and hygiene aspects.</p>

#### W6.4

**How does your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) during the most recent reporting year compare to the previous reporting year?**

Water CAPEX (+/- % change)	Water OPEX (+/- % change)	Motivation for these changes
0	-11.9	Operational costs for water supply and treatment decrease by 11.9% in 2015 compared to 2014. The reduction is a result of many small changes at multiple locations, primarily at the water scarce sites, who have implemented water savings programs. The top-10 water impact sites of Novartis, chosen for the water savings program in 2014 have implemented water saving projects for 22% of their 2010 baseline year water impact. The result might also be impacted by changes in water prices.

---

**Further Information****Page: W7. Compliance**

---

**W7.1**

**Was your organization subject to any penalties, fines and/or enforcement orders for breaches of abstraction licenses, discharge consents or other water and wastewater related regulations in the reporting year?**

Yes, not significant

---

**W7.1a**

**Please describe the penalties, fines and/or enforcement orders for breaches of abstraction licenses, discharge consents or other water and wastewater related regulations and your plans for resolving them**

Facility name	Incident	Incident description	Frequency of occurrence in reporting year	Financial impact	Currency	Incident resolution
Changshu, China	Fine	Fine issued by local EPB due to COD being over the limit for discharged waste water.	1	21025	USD(\$)	A similar incident occurred at the site in 2014. Different measures are being implemented to improve equipment reliability and to upgrade pre-treatment systems.
Rovereto, Italy	Fine	Fine issued due to emission levels in the water having exceeded limits, due to a valve malfunction during shut-down and cleaning operations at the waste water treatment plant.	1	6660	USD(\$)	Corrective actions have been taken to prevent recurrence including review of the design and installation of a second safety valve in cascade.

---

**W7.1b**

What proportion of your total facilities/operations are associated with the incidents listed in W7.1a

1.8%

---

**W7.1c**

Please indicate the total financial impacts of all incidents reported in W7.1a as a proportion of total operating expenditure (OPEX) for the reporting year. Please also provide a comparison of this proportion compared to the previous reporting year

Impact as % of OPEX	Comparison to last year
0.0	No change

---

**Further Information**

**Page: W8. Targets and Initiatives**

---

**W8.1**

Do you have any company wide targets (quantitative) or goals (qualitative) related to water?

Yes, targets and goals

---

**W8.1a**

Please complete the following table with information on company wide quantitative targets (ongoing or reached completion during the reporting period) and an indication of progress made

Category of target	Motivation	Description of target	Quantitative unit of measurement	Base-line year	Target year	Proportion of target achieved, % value
Other: Water savings relative to water footprint at top-10 sites with highest water footprint and water scarcity	Water stewardship	Implement water saving programs at the top-10 sites with highest water footprint and water scarcity: Each site has set a min. 10% water saving target.	Other: % Water savings relative to water footprint (water that needs cleaning and water lost)	2010	2015	100%
Other: Apply water management program	Water stewardship	Implement water management measures (water audit, water flowchart, setting savings target and implement water saving projects) at 10 additional water scarce sites.	Other: number of sites who were included in the target	2013	2015	100%

#### W8.1b

Please describe any company wide qualitative goals (ongoing or reached completion during the reporting period) and your progress in achieving these

Goal	Motivation	Description of goal	Progress
Other: Active water management program at water scarce sites	Water stewardship	Conduct water audits, determine water flows, evaluate and implement water saving opportunities	Several sites have implemented water savings and water recycling projects and achieved substantial water savings. (Examples: Alcon Batam, Indonesia reduced water usage by 12%; Sandoz Turbhe in India reduced water usage by 27% and Sandoz Gebze 1 in Turkey reduced water usage by 42% between the years 2010 and 2015).
Sustainable agriculture	Water stewardship	Implement sustainable agro-forestry concept of Jatropha in Mali: The Novartis agro-forestry carbon sink project with	In 2015 the project progressed in involving more farmers in additional villages in Western Mali to the project. Additional



Goal	Motivation	Description of goal	Progress
		Jatropha in Mali allows local farmers to manage their food crop fields under better conditions. The Jatropha bushes protect the fields from wind, provide shade and increase the carbon content and thus fertility of the fields.	415 hectares of Jatropha were planted.

---

W8.1c

Please explain why you do not have any water-related targets or goals and discuss any plans to develop these in the future

---

**Further Information**

**Module: Linkages/Tradeoff**

**Page: W9. Managing trade-offs between water and other environmental issues**

---

W9.1

**Has your organization identified any linkages or trade-offs between water and other environmental issues in its value chain?**

Yes

---

W9.1a

**Please describe the linkages or trade-offs and the related management policy or action**

Environmental issues	Linkage or trade-off	Policy or action
Greenhouse gas emissions	Trade-off	<p>Cooling water usage: Several Novartis sites in Austria, Italy, Spain and Slovenia use large quantities of water from river side banks to cool their production processes and additional sites in e.g. Switzerland use cooling water from a nearby river for comfort cooling of offices and groundwater to cool data centers. At these sites the quantity and temperature of the water is important for the efficiency of cooling rather than the water quality. Mechanical chillers could provide cooling instead of using free cooling with water and thus reduce the use of cooling water; however, this would increase energy use, energy costs and energy-related GHG emissions significantly. We estimate that energy and related GHG emissions would increase be 20-30% at these sites, if water could not be available anymore for cooling. With their approach to use water for cooling instead of electricity, these sites effectively contribute to the Novartis energy efficiency program and to the related GHG targets. The compromise on the water consumption is rated less important; due to the fact that such cooling methodology is applied in areas where fresh water sources are abundant and slight increase in temperature are marginal.</p>
Energy	Linkage	<p>New water treatment technology: In 2015, the new wastewater treatment technology based on fine-bubble diffused aeration that had been introduced in Ireland in 2014, has now also been installed at the chemical synthesis site for Active Pharmaceutical Ingredients (APIs) of Novartis Pharma in Grimsby UK. The new technology is more energy efficient and more effective in the decomposition of pollutants. This has led to significant reductions in the emissions of key pollutant parameters: Total Suspended Solids, Chemical and Biochemical Oxygen Demand and Total Nitrogen were reduced by 62 to 88%. The new technology can be readily retrofitted to other facilities that use an aerobic wastewater treatment process (incorporating activated sludge) and can be scaled in size for multiple plants and various capacities. The new technology also offers the potential to reduce discharges of residual APIs to the environment. Many of these substances adsorb onto activated sludge – more of which is now retained in the wastewater treatment plant to be subsequently removed as a solid for incineration. The new technology helps Novartis to achieve both energy and related climate, as well as water footprint targets. Less water to be cleaned and more effective treatment reduces quantity of water for treatment, water effluent related costs, as well as amounts of pollutants remaining of the effluents of treated water.</p>

**Further Information**

**Module: Sign Off**

**Page: Sign Off**

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

Name	Job title	Corresponding job category
Jürgen Brokatzky-Geiger	Novartis global head Corporate Responsibility	Other: Global head Corporate Responsibility, reporting to the CEO

---

**W10.2**

Please select if your organization would like CDP to transfer your publicly disclosed response strategy from questions W1.4a, W3.2c and W3.2d to the CEO Water Mandate Water Action Hub.

Yes

---

**Further Information**

**CDP**