Novartis AG

Novartis Environmental Sustainability and Occupational Health and Safety Data Supplement 2019

NOVARTIS | Reimagining Medicine

Novartis Environmental Sustainability and Occupational Health and Safety Data Supplement 2019

Section 1

Introduction

Environmental sustainability is important to the sustainability of our business. Our continued investment in our planet supports our purpose to improve and extend people's lives and is a way to give back to society.

We want to be a catalyst for change and a leader in environmental sustainability. We drive sustainability through our own operations and across our value chain, which accounts for 80% of our overall environmental footprint. Underpinned by ambitious targets, our strategy focuses on climate, waste and water from a 2016 baseline.

Climate

2025

- Only renewable energy used (carbon-neutral own operations) – Scope 1 and 2
- Environmental criteria in all supplier contracts

2030

- Carbon footprint reduced by half – Scope 1, 2 and 3

Waste

2025

- Eliminate PVC in packaging
- Waste disposal reduced by half

2030

- Plastic neutral
- All new products meet sustainable design principles

Water

2025

- Water consumption reduced by half in our operations
- No water quality impacts from manufacturing effluents

2030

- Water neutral in all areas
- Enhance water quality wherever we operate

Achieving these targets will enable Novartis to become carbon neutral as well as energy and climate resilient. We will also become water sustainable by ensuring sufficient and safe water, and being a good water steward wherever we operate. Further becoming plastic-neutral, minimizing waste and increasing material efficiency will support the creation of a circular economy.

Employee health and safety is an integral part of our responsibility as an employer. Novartis is committed to providing all associates and those working for the company with safe workplaces.

We have used the United Nations' Sustainable Development Goals (SDGs) to inform our strategy. The SDGs are a set of 17 goals for the period 2015 to 2030 to end poverty, protect the planet and ensure prosperity for all. Achieving these goals will require a concerted effort and Novartis is keen to play its part. As a healthcare company, we have prioritized 9 SDGs where we feel we can make the biggest contribution through our environmental sustainability strategy and our focus on occupational health and safety:

SDG 3 **Good health and well-being**

SDG 6 **Clean water and sanitation**

SDG 7 **Affordable and clean energy**

SDG 8 **Decent work and economic growth**

SDG 12 **Responsible consumption and production**

SDG 13 **Climate action**

SDG 14 **Life below water**

SDG 15 **Life on land**

SDG 16 **Peace, justice and strong institutions**

This document provides information on our strategy, management approach and the progress we have made against our targets.

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Section 3

Management approach

About this report

This document aims to meet the needs and expectations of Environmental Sustainability (ES) and Health and Safety (H&S) professional audiences by offering easy access to our performance on HSE topics. Novartis reports its performance following Global Reporting Initiative (GRI) guidelines for sustainability reporting.

This report covers all regions and operations from January 1, 2019 to December 31, 2019 and progress against our 2016 baseline. All information reflects the continuing operations of the Novartis Group, including the various changes in the Group's portfolio of activities in prior years.

The 2019 environmental data published in the Annual Report 2019 and in the Novartis in Society ESG Report 2019 is based on nine-month actual data (January to September 2019) plus three-month estimates. This report has been updated with actual data for the full year 2019 and the information is summarized in the HSE data factsheet on our website.

In addition, Novartis has been reporting comprehensive energy, greenhouse gas (GHG) and water data via the CDP program since 2003. Our 2019 responses to CDP Climate Change and CDP Water Security can be found here.

How we report

Performance of operating units is monitored on a monthly and quarterly basis. Data is collected, validated and consolidated in the Novartis HSE Data Management System (DMS). This system provides the company with the information needed to monitor progress against our strategy and to take corrective actions as necessary to ensure we remain on track.

2019 data was collected from more than 160 reporting units owned and managed by Novartis. This covers all sites with relevant impacts – including all production, formulation and research and development sites, as well as major headquarters offices. Our H&S data reporting covers all workers: Novartis associates, third-party personnel and contractors, i.e. staff who regularly work on a Novartis site, such as cleaning, catering, security, engineering and maintenance personnel.

Our HSE workbook provides definitions, requirements, explanations and examples that HSE staff need to take into account in order to perform their HSE reporting and performance management functions within Novartis. De minimis criteria have been established for reporting units that do not contribute to more than 0.10% of the Novartis total. These eligible sites report H&S data but are not subject to mandatory reporting of environmental data – for these sites, water, energy and waste data is estimated based on associate numbers (Novartis associates and third-party personnel) and average assumed consumption per person and per day (averages calculated from comparable Novartis locations).

Novartis believes the performance data presented in this HSE Data Supplement represents a fair and balanced picture of the company's HSE performance. Performance indicators follow GRI requirements for core environmental and social indicators, and for selected additional indicators that were deem material following a materiality assessment performed in 2017 when our strategy was developed.

Managing changes to the Novartis environmental baseline

Ambitious targets for climate, water and waste reduction have been set for 2025 and 2030, against a 2016 baseline year. We adjust our baseline when the impact of an acquisition or divestment on our 2016 climate baseline is ± 5% (Scope 1 and Scope 2 carbon footprint measured as tCO_2e). When a change in the Scope 1 and Scope 2 carbon footprint baseline is triggered, the 2016 baseline for Scope 3 carbon footprint, water and waste is adjusted at the same time.

A baseline change will not be triggered when there is a ± 5% change to water or waste emissions. This is because the environmental significance of water depends on location and the environmental significance of waste depends on its characteristics rather than the volume or amount produced.

Accordingly, all HSE performance data prior to 2019 presented in this report have been restated to take into account the spin-off of the Alcon division, and to reflect continuing operations for Novartis.

Health, Safety and Environmental management system

We take our responsibility for environmental impacts seriously, and we plan to continue to do what we can to reduce or mitigate our environmental impacts through our ambitious environmental sustainability strategy and our climate targets, which have been approved by the Science Based Targets initiative. The Novartis Trust and Reputation Committee oversees the company's strategy and governance on corporate responsibility, which includes climate-related issues.

We have established an HSE management system defining clear roles and responsibilities within the company. Function, business unit and site leadership owns and is accountable for environmental sustainability as well as occupational health and safety performance within their operation(s) and location(s). Management demonstrates visible leadership by role-modeling HSE behaviors, appropriately prioritizing HSE programs and activities, integrating HSE considerations into strategic and operational decisionmaking and by providing compelling HSE objectives. This includes supporting strategies and plans, clearly defining roles and responsibilities, allocating appropriate resources, holding responsible individuals accountable for results and actively engaging in program implementation.

Our internal HSE management system covers all workers (Novartis associates, third-party personnel and contractors). It aligns with relevant international management system standards (e.g., ISO 14001 and OHSAS 18001) and industry guidance to drive good practice and regulatory compliance across our sites. This allows us to plan for certification, which we encourage our sites to pursue to improve transparency with stakeholders. In 2019:

- 52% of our workers at manufacturing sites worked on sites externally certified for their H&S management system (OSHA 18001 or ISO 45001 certifications)
- 62% worked on sites with a certified environmental management system (ISO 14001 or Eco-Management and Audit Scheme (EMAS) certification)
- 27% worked on sites with a certified energy management system (ISO 50001)

Novartis HSE maintains a robust HSE audit program comprising assessment of compliance with legal requirements and conformance with company HSE standards. The audit program also includes topic-specific assessments (e.g., process safety, industrial hygiene, contractor safety, etc.) which evaluate the effectiveness of business processes. All Novartis sites are risk-assessed to determine the audit frequency. The frequency varies between 2 and 5 years based on the outcome of the risk assessment, which considers prior audit results, emerging regulations and overall operational changes. In general, all manufacturing and laboratory sites are audited every 2 or 3 years. Additionally, HSE systems and processes are reviewed by third parties, in addition to internal audits and HSE inspections, to ensure compliance with legal and Novartis HSE standards, which are updated every 3 to 5 years.

Recognition

In 2019, Novartis was one of 72 companies worldwide to be included in CDP's Water Security A List. We also maintained an A-rating for Climate and are recognized as a leader in the healthcare sector. Further, Novartis has been recognized by CDP as a global leader for the way in which we engage with our suppliers on climate change. Novartis was also included in the Dow Jones Sustainability World Index and the DJSI Europe Index.

We are proud of our performance and we believe that increased transparency through the public disclosure of environmental and OH&S data is essential to build trust with society.

Memberships

We believe that HSE performance can be enhanced through effective collaboration. This is particularly important to achieve our 2030 environmental sustainability targets, as they will require us to drive change across our value chain. Examples of current partnerships include:

- Pharmaceutical Supply Chain Initiative (PSCI)
- World Business Council for Sustainability Development (WBCSD)
- AMR (Antimicrobial Resistance) Industry Alliance
- European Federation of Pharmaceutical Industries and Associations (EFPIA)

Section 4

Energy

Targets

2025

- Only renewable energy used (carbon-neutral own operations) – Scope 1 and 2
- Environmental criteria in all supplier contracts

2030

- Carbon footprint reduced by half – Scope 1, 2 and 3

2019 Achievements

2.5% reduction
in total energy consumption **vs. 2018**

6.0%
reduction in total energy consumption **vs. 2016 baseline** (811 173 GJ)

see “Emissions” section

Highlights 2019

- Active energy management systems – using data and digital to identify and implement energy efficiency opportunities – have been further embedded at key sites.
- Heating, Ventilation and Air Conditioning systems (HVAC) have been optimized across the network.
- Several waste heat recovery opportunities have been implemented.
- Sustainability assessments were conducted at a number of sites to drive immediate changes in operational procedures and long-term investments that will reduce emissions.
- A competitive bid process was started for a power purchase agreement to decarbonize all the electricity Novartis procures in Europe.
- Novartis proactively engaged in legislator education sessions at the state and national level in the US to advocate for carbon pricing, adoption of renewable energy and of zero emissions vehicles.

302-1 Energy consumption within the organization

Novartis has a longstanding, comprehensive energy program aimed at improving energy efficiency for all industrial and commercial operations as well as using renewable energy sources where available and feasible.

Energy consumption is reported at least quarterly at all Novartis sites. We monitor the purchase and use of all types of energy sources and fuels. On-site generated energy data is separated into energy generated from fossil sources (natural gas, light oil and fossil waste), biomass fuels and renewable sources (photovoltaic, thermal solar, hydroelectric, etc.). The use of purchased energy, including electricity, steam and hot water, is calculated from the net value of all energy acquired from external sources. Energy that is generated on site but sold to other organizations is deducted from our total energy consumption. Conversion and transformation factors for fuels and for purchased energy are based on standards used by the International Energy Agency (IEA). More details are available in our CDP 2019 response.

Unit: Gigajoule (GJ)	2016	2017	2018	2019[1]
On-site generated energy	**5 879 104**	**5 841 794**	**5 748 647**	**6 191 408**
Renewable energy sources	22 602	19 526	23 740	22 871
Wood or other biomass fuels	142 822	147 800	157 515	70 799
Gas fuels	5 434 000	5 410 215	5 313 481	5 865 267
Oil fuel	136 681	134 965	124 467	84 071
Fossil waste fuel	143 000	129 287	129 444	148 400
Purchased energy	**7 802 927**	**7 641 257**	**7 448 989**	**6 687 789**
Purchased renewable electricity	1 969 554	2 008 533	2 434 367	2 160 680
Purchased non-renewable electricity	4 282 554	4 146 867	3 612 062	3 224 928
Purchased steam	1 279 078	1 247 707	1 181 183	1 089 031
Other purchased energy	271 740	238 150	221 377	213 150
Energy sold	**117 533**	**128 598**	**121 017**	**125 872**
Sold electricity	11 227	9 424	17 700	17 084
Sold steam & heat	106 306	119 174	103 317	108 788
Energy consumption	**13 564 499**	**13 354 452**	**13 076 619**	**12 753 326**

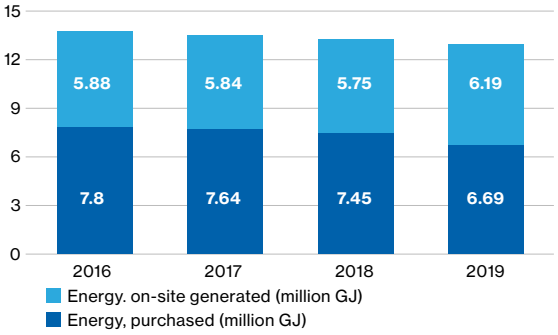
[1] In 2019 we started operating a Combined Heat and Power plant, leading to an increased gas fuel use but reduced electricity consumption

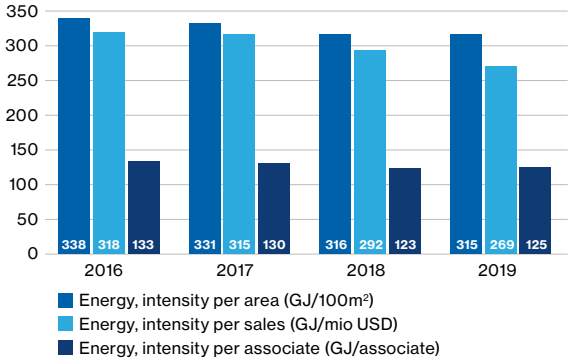
302-2 Energy consumption outside of the organization

We do not collect information on energy consumption for areas outside the organization (upstream and downstream). For the materials supply chain, we assess the carbon footprint and report this as Scope 3 GHG emissions. We believe that climate (GHG) impact is the most relevant aspect related to energy consumption and is therefore more important to report than energy alone.

302-3 Energy intensity

Energy intensity is a valid indicator to support site energy managers and local management in evaluating progress made against targets and considering further measures toward higher energy efficiency. We measure energy consumption in relation to sales, number of associates and indoor areas conditioned for specified types of operations. These parameters may vary widely depending of the type and portfolio of products manufactured in a certain operation, the type of application of a particular building and the climate zone where the operating unit is located.

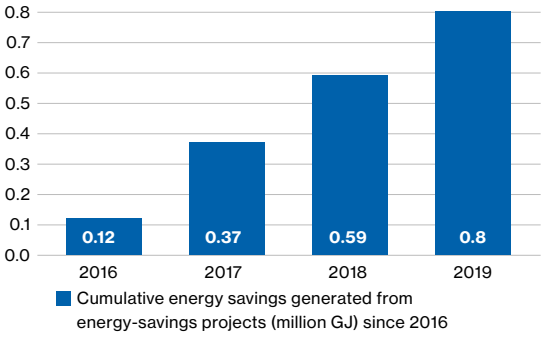




302-4 Reduction of energy consumption

In an effort to further increase energy efficiency and reduce GHG emissions, Novartis has established a comprehensive energy management program to ensure all energy considerations are given appropriate attention in investment projects. Energy efficiency, renewable energy, updating our manufacturing technology, and greener infrastructure are all key elements of our energy strategy. New projects are a major focus for energy savings, as it is more effective to build in efficiency from the start than to redesign an existing system. In addition, all our major sites have been audited to assess energy systems and identify potential for improvement.

Since 2016, Novartis has saved 800 000 GJ of energy, which amounts to a 5.9% reduction.



302-5 Reduction in energy requirements of products and services

In general, pharmaceutical and medical products do not require energy during use; therefore, we do not consider reduction in energy requirements of products and services relevant for our business.

Section 5

Water

Targets

2025

- Water consumption reduced by half in our operations
- No water quality impacts from manufacturing effluents

2030

- Water neutral in all areas
- Enhance water quality wherever we operate

2019 Achievements

6.8% reduction
in total water consumption (water discharged to treatment and water lost) **vs. 2018**

15.0% reduction
in total water consumption (water discharged to treatment and water lost) **vs. 2016 baseline** (1 995 469 m^3)

79%
of our own manufacturing sites had no water quality impacts from manufacturing effluents. Our remaining sites and our key suppliers are working to meet this target before the end of 2025.

We initiated a first pilot on integrated watershed management to create a water-neutral location in India. The project will focus on capability-building and establishing community-based organizations to develop and maintain technical interventions that help to secure water availability, e.g., collecting rainwater and recharging natural reservoirs for farmers.

We collaborated with World Resources Institute (WRI), Valuing Nature and Quantis to develop a method to assess the benefits of water stewardship activities (Volumetric Water Benefit Accounting).

Highlights 2019

- We remain on track to meet our 2025 water reduction target despite increased production at our biotech plants, which is driving increased water consumption.
- Environmental sustainability assessments at key sites have identified significant water-saving opportunities, which are now being implemented.
- We have published science-based targets for antibiotics from manufacturing operations in a peer reviewed journal.
- A water quality maturity tool has been piloted and rolled out at our factories and manufacturing suppliers in high-risk regions. This enables us to identify the manufacturers that require support to meet Novartis water quality standards.
- Supplier water quality expectations have been outlined in the new Novartis Third Party Code and in new contract templates.

303-1 Total water withdrawal by sources

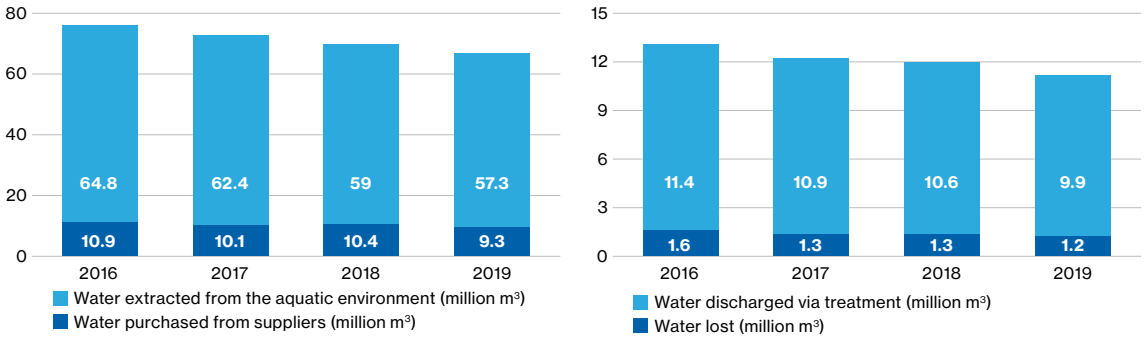
Novartis makes every effort to ensure water is used efficiently and that any water released from our sites meets regulatory limits and our internal quality standards in order to protect the environment. We create a water balance for our sites by monitoring all water inputs by source and discharge by receiving environment. This methodology ensures we have an accurate picture of how we use and manage water.

The water directly extracted from the environment is used mainly for cooling purposes before being returned to the source. This water is primarily used for the cooling of fermentation and other biochemical processes, for the cooling of computer servers in data centers, and for the comfort cooling of offices. Such cooling with water allows us to reduce our energy consumption because we do not need mechanical chillers.

Unit: cubic meter (m^3)	2016	2017	2018	2019
Water drawn from aquatic environment[1]	64 835 666	62 368 789	58 963 662	57 347 696
From aquatic environment, groundwater	-	-	-	48 251 431
From aquatic environment, surface water	-	-	-	9 096 265
Water collected from rain	81 550	72 575	55 276	14 452
Water purchased from external suppliers	10 882 265	10 068 094	10 401 306	9 332 525
Water from other sources	51 326	53 526	45 345	21 332
Water withdrawal	**75 850 807**	**72 562 984**	**69 465 589**	**66 716 006**
Water released directly to aquatic environment	62 438 532	60 837 464	57 897 035	55 511 939
Water discharged via treatment	11 391 471	10 889 791	10 568 927	9 883 821
Water lost (evaporated or to other destination)	1 644 076	1 314 545	1 316 432	1 196 256
Water consumption (treatment & lost)[2]	**13 035 547**	**12 204 337**	**11 885 359**	**11 080 077**
Water recycled and reused	**19 842 575**	**20 997 107**	**16 386 164**	**14 709 381**

[1] In 2019, we started to report water extraction from groundwater and from surface water separately to better understand and map our water use.

[2] Our Group internal definition of "Water Consumption" is the sum of all water discharged via treatment and of all water lost, and as such is different from CDP/GRI definitions, which would correspond to water lost in the above table. This change was made to ensure that we focus on reducing the water we use, which requires treatment before being returned to the environment.



303-2 Water sources significantly affected by withdrawal of water

Novartis has identified short-term and long-term risks related to water scarcity based on the WRI Aqueduct Tool. Locations with higher water risks have been asked to conduct assessments to manage and minimize their dependence on water.

There are no water sources significantly affected by the withdrawal of water from our operations: 14% of our total water withdrawal is supplied by local public water utilities or from other sources. The remaining 86% is drawn from groundwater wells or from surface water bodies and used for cooling before being returned to the source, with negligible losses or variation in quality.

We have reported comprehensive water use and impact data via the CDP water program since 2010 and were scored A for Water Security in 2019. Our 2019 response to CDP Water Security can be found here.

303-3 Water recycled and reused

In 2019, Novartis recycled or reused 14.7 million m^3 of water, which represents 22% of our total water withdrawal.

Section 6

Emissions

Targets

2025

- Only renewable energy used (carbon-neutral own operations) – Scope 1 and 2
- Environmental criteria in all supplier contracts

2030

- Carbon footprint reduced by half – Scope 1, 2 and 3

2019 Achievements

3.9% reduction
in total GHG emissions from energy consumption (Scope 1 and 2) **vs. 2018**

7.7% reduction
in total GHG emissions from energy consumption (Scope 1 and 2) **vs. 2016 baseline** (74 196 tCO_2e)

5.0%
increase in total carbon footprint (GHG emissions from Scope 1, 2 and 3) **vs. 2016 baseline** (321 103 tCO_2e)

Highlights 2019

- Our climate strategy was approved in 2019 by the Science Based Targets initiative, an organization that mobilizes companies to set science-based targets toward a low-carbon economy. Our 2025 climate target is consistent with the reductions required to keep global warming to 1.5°C.

305-1 Direct (Scope 1) GHG emissions

Novartis has reported GHG emissions in accordance with the WRI's and WBCSD's Greenhouse Gas Protocol for all sites under its operational control since 2005.

The reporting structure includes Scope 1 carbon dioxide (CO_2) emissions from stationary combustion installations, production processes and refrigeration systems, as well as Scope 1 CO_2 emissions from company-owned and leased vehicles. GHG emissions are reported on a quarterly basis and calculated in metric tons of CO_2 equivalent using emission factors provided by energy suppliers or factors from the IEA. Novartis uses the global warming potential factors from the 2007 Intergovernmental Panel on Climate Change (IPCC) Report for GHGs other than CO_2.

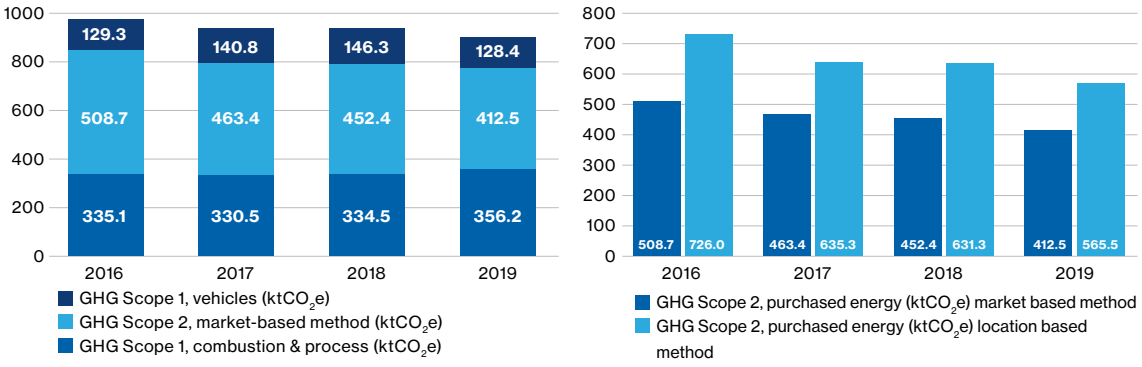
GHG emissions of gases unrelated to combustion (e.g., hydrochlorofluorocarbons) are not included in Scope 1 GHG emissions. The primary source of these emissions is loss from refrigeration equipment. Novartis does not collect data on biogenic CO_2 emissions as the potential quantities are not significant.

305-2 Energy indirect (Scope 2) GHG emissions

The reporting structure includes Scope 2 GHG emissions from purchased energy sources such as electricity, steam and other purchased energy sources. We calculate Scope 2 GHG emissions following the location and market-based methods in accordance with the GHG Protocol Scope 2 guidance, reflecting the emissions from the electricity that a company is purchasing compared to the electricity that is generated locally.

Market-based Scope 2 GHG emissions, used in the context of our climate strategy, are calculated using emission factors derived from energy attributes certificates or from contractual instruments with energy suppliers. Location-based Scope 2 emissions are calculated using standard emission factors published by the IEA. Both are reported on a quarterly basis in metric tons of CO_2 equivalent. In the absence of contractual agreements for the market-based method, we use location-based emission factors. This approach supports our strategy to increase our proportion of renewable-based electricity worldwide to reduce our Scope 2 GHG emissions.

Unit: metric ton of CO_2 emissions equivalent (tCO_2e)	2016	2017	2018	2019
GHG Scope 1 Emissions, from vehicles	129 323	140 788	146 297	128 351
GHG Scope 1 Emissions, from stationary combustion installations	320 413	318 429	321 737	343 406
GHG Scope 1 Emissions, from process sources	14 732	12 082	12 789	12 772
GHG Scope 1 Emissions	**464 468**	**471 299**	**480 823**	**484 529**
GHG Scope 2 Emissions, market-based	508 715	463 419	452 359	412 498
GHG Scope 2 Emissions, location-based	725 968	635 321	631 305	565 460
GHG forestry offsets	65 682	71 832	54 881	29 791
Total GHG Scope 1 and Scope 2 emissions (market-based)	**973 182**	**934 718**	**933 182**	**897 027**
Total GHG Scope 1 and Scope 2 emissions (market-based) from energy consumption	**958 451**	**922 636**	**920 393**	**884 255**
GHG Scope 3, Purchased goods and services	4 058 116	4 192 521	4 040 112	4 527 169
GHG Scope 3, Capital goods	566 749	434 212	390 419	418 073
GHG Scope 3, Fuel and energy related activities	274 155	270 500	265 702	247 674
GHG Scope 3, Upstream transportation and distribution	272 572	261 103	266 288	315 557
GHG Scope 3, Waste generated in operations	40 240	34 117	33 666	23 894
GHG Scope 3, Business travel	125 478	199 992	211 723	191 293
GHG Scope 3, Employee commute	149 137	150 338	155 690	148 472
GHG Scope 3, Upstream leased assets	N/A	N/A	N/A	N/A
GHG Scope 3, Downstream transportation and distribution	42 843	40 956	40 779	35 993
GHG Scope 3, Processing of sold products	N/A	N/A	N/A	N/A
GHG Scope 3, Use of sold products	124 326	111 260	134 850	142 494
GHG Scope 3, End-of-life treatment of sold products	N/A	N/A	N/A	N/A
GHG Scope 3, Downstream leased assets	N/A	N/A	N/A	N/A
GHG Scope 3, Franchises	N/A	N/A	N/A	N/A
GHG Scope 3, Investments	N/A	N/A	N/A	N/A
Total GHG Scope 3 emissions	**5 653 616**	**5 694 999**	**5 539 229**	**6 050 619**
Total GHG Scope 1, Scope 2 and Scope 3 emissions	**6 626 543**	**6 629 717**	**6 472 411**	**6 947 646**



305-3 Other indirect (Scope 3) GHG emissions

Scope 3 GHG emissions are estimated using an Environmental Extended Input Output Analysis.

Based on this analysis, the most significant sources of Scope 3 emissions for Novartis are "purchased goods and services" (75% of our Scope 3 emissions) and "upstream transportation and distribution" (about 5% of our Scope 3 emissions). These are the most significant categories for Novartis in terms of size, reduction opportunities and potential to influence. "Capital goods" is another important category (about 7% of our Scope 3 emissions); however, the reduction opportunities and the potential to influence are limited as more than 90% of the emissions in this category are from suppliers who do not have a direct relationship with Novartis (e.g. Tier 2 suppliers or beyond).

For more details on our Scope 3 emissions (methods, approach and assumptions), please refer to our 2019 CDP response here.

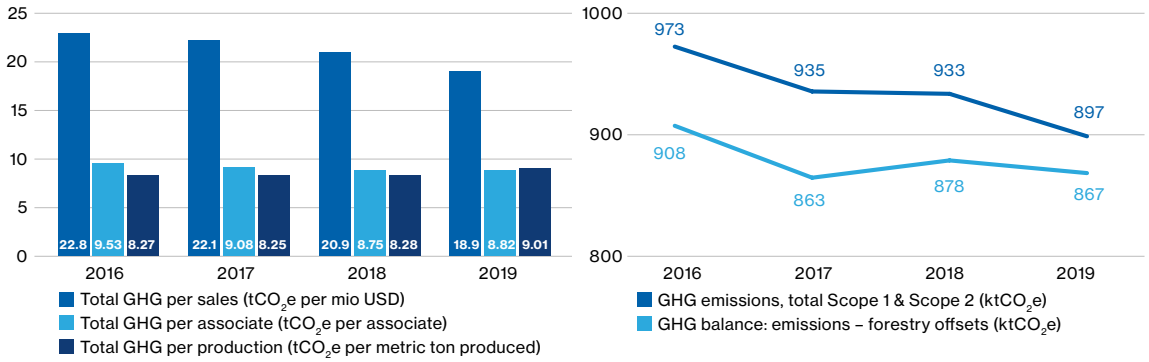
305-4 GHG emissions intensity

We monitor GHG emissions intensity in relation to sales, production quantity and number of associates for specified types of operations. These parameters may vary widely depending of the type and portfolio of products manufactured in a certain operation, the type of application of a particular building and the climate zone where the operating unit is located.

305-5 Reduction of GHG emissions

Our ambition is to be carbon-neutral in our own operations and energy and climate-resilient by 2025. Our priorities are to reduce our energy demand by investing in efficiency and to increase our share of renewable energy. For example, all climate emissions from the electricity we use in Novartis offices and R&D facilities in the USA are now being compensated, thanks to the renewable energy credits generated by our Santa Rita East wind farm, developed with Invenergy in Texas in 2019.

In addition, we are using carbon sequestration projects to further reduce our carbon footprint by compensating part of the GHG emissions generated by our use of fossil fuels. Our four forestry projects in Argentina, Mali, China and Colombia provide long-term benefits to the environment and to local communities. These benefits range from conserving or enhancing biodiversity to building capacity, generating employment and local revenues. These forestry projects are implemented in accordance with certification schemes such as the United National Clean Development Mechanism (CDM) for the Columbia and Argentina projects.



305-6 Emissions of ozone-depleting substances (ODS)

For the past several years, Novartis has reduced its use of ODS. For example, chlorofluorocarbon refrigerants and halons have been completely phased out of all Novartis operations. Additionally, hydrochlorofluorocarbons are currently being replaced with chlorine-free hydrofluorocarbons or with natural refrigerants. For this reason, emissions from ODSs are not considered material for Novartis and further reduction targets have not been included in our ES strategy.

305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions

Novartis monitors halogenated and non-halogenated Volatile Organic Compounds (VOCs), sulfur dioxide (SO_2) and nitrogen oxide (NOx) inorganic pollutants and particulates. VOCs mainly originate from the use of halogenated and non-halogenated solvents in various production processes and are measured or calculated using mass-balance equations. Inorganic pollutants and particulates arise primarily from the combustion of fuels for steam generation and heating and are measured or calculated using standard emission factors from the IEA. These emissions are not considered to be material and have not been included as part of our ES strategy.

	2016	2017	2018	2019
Halogenated Volatile Organic Compounds (metric tons)	43.59	75.58	78.98	26.59
Non-Hal. Volatile Organic Compounds (metric tons)	445.97	457.22	503.27	406.82
Sulfur Dioxides (SO_2) emissions (metric tons)	15.04	15.40	13.62	4.56
Nitrogen Oxides (NOx) emissions (metric tons)	230.67	231.14	236.59	236.32
Particulates emissions (metric tons)	54.55	58.42	58.26	12.91
Ozone-depleting substances (ODS) emissions caused by losses (metric tons of R11 equivalent)	0.056	0.045	0.063	0.008
SO_2, Intensity per sales (t/mio USD)	0.000317	0.000325	0.000287	0.000096
NOx, Intensity per sales (t/mio USD)	0.004928	0.004862	0.004987	0.004981
Particulates, Intensity per sales (t/mio USD)	0.001150	0.001231	0.001228	0.000272

Section 7

Waste and materials

Targets

2025

- Eliminate polyvinyl chloride (PVC) in packaging
- Waste disposal reduced by half

2030

- Plastic neutral
- All new products meet sustainable design principles

2019 Achievements

9.6% reduction
in total waste disposal (not recycled) **vs. 2018**

19.7% reduction
in total waste disposal (not recycled) **vs. 2016 baseline** (13 301 metric tons)

We used about 31 000 metric tons of plastic for primary and secondary packaging for our products. We are currently developing a strategy to ensure we minimize our use of plastic and that the weight of any plastic packaging disposed is approximately the same as the weight recovered from recycling

Highlights 2019

- One additional Novartis site eliminated PVC in secondary and tertiary packaging leaving eight sites still using PVC.
- The optimization of in-house waste treatment technology (e.g., incinerators) has enabled Novartis to reduce the amount of waste sent off-site for disposal.
- Novartis launched a program to eliminate 17 types of single-use plastic across the organization.

306-1 Water discharge by quality and destination

Novartis monitors water consumption by source and water discharge by destination on a quarterly basis. With regards to the quality of water discharged, Novartis reports total effluent load using the standard chemical oxygen demand (COD) and total suspended solids (TSS) parameters, as well as nitrogen and phosphate loads. These releases are not considered to be material and have not been included as part of our ES Strategy.

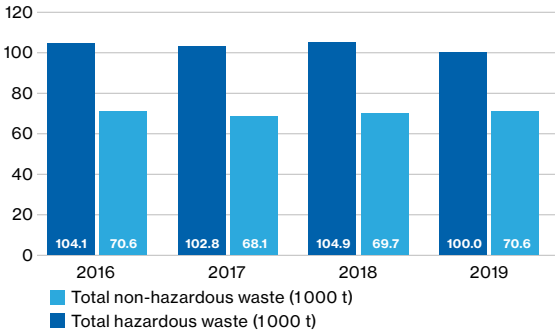
The amounts reported in the table are the pollutant loads that finally reach surface water bodies. In cases where discharged wastewater is treated off-site, for example in public wastewater treatment plants, the specific removal efficiency of such treatment is considered for the amounts reported.

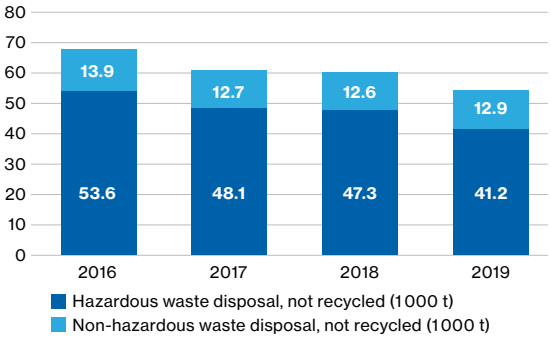
Unit: metric ton (t)	2016	2017	2018	2019
Total Suspended Solids (TSS) load	360.9	358.7	238.5	198.3
Chemical Oxygen Demand (COD) load	2 761.0	2 658.9	2 051.4	1 842.3
Nitrogen load	258.6	246.5	197.0	207.5
Phosphate load	47.9	41.4	40.0	34.7

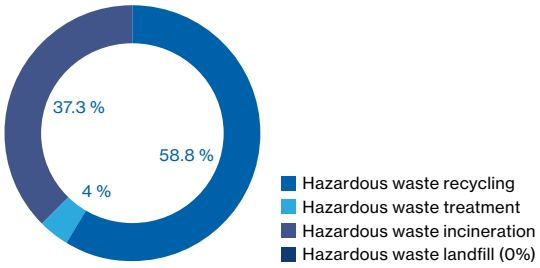
306-2 Waste by type and disposal method

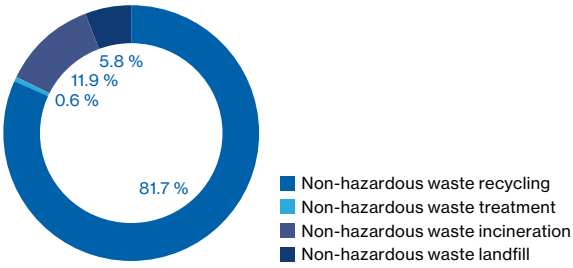
Novartis classifies waste by type and according to the disposal routes: recycling, treatment, incineration with and without energy recovery, and landfill.

Our aim is to use materials as efficiently as possible and to manufacture our products in a way that conserves natural resources. Our waste management approach is based on the principles of prevention, reuse, recycling, and energy recovery as opposed to disposal and landfilling. Ultimately, we aspire to establish closed material loops for our major materials. By reducing the amount of waste we generate and decreasing the associated financial burdens on both site-operating budgets and long-term company liabilities, we will be able to invest more in science and innovation.









Unit: metric ton (t)	2016	2017	2018	2019
Hazardous waste, recycling	50 505	54 711	57 545	58 751
Hazardous waste, treatment	4 366	4 943	4 519	3 985
Hazardous waste, incineration	49 206	43 129	42 789	37 249
Hazardous waste, landfill	0	0	0	0
Recycling percentage hazardous waste	**48.5 %**	**53.2 %**	**54.9 %**	**58.8 %**
Non-hazardous waste, recycling	56 739	55 367	57 167	57 720
Non-hazardous waste, treatment	600	290	226	404
Non-hazardous waste, incineration	9 166	8 686	8 135	8 428
Non-hazardous waste, landfill	4 110	3 742	4 196	4 081
Recycling percentage non-hazardous waste	**80.4 %**	**81.3 %**	**82.0 %**	**81.7 %**
Waste disposal (total waste not recycled)	**67 448**	**60 791**	**59 866**	**54 147**
Waste disposal, intensity per sales (t/mio USD)	**1.58**	**1.44**	**1.34**	**1.14**

306-3 Significant spills

No significant spills (resulting in liabilities) were reported in 2019.

307-1 Non-compliance with environmental laws and regulations

In 2019, no significant environmental fines were reported (less than USD 10 000).

301 Materials

To support our ambition to eliminate PVC in all packaging and reduce waste disposal by 50% (vs. 2016) by 2025, we continue to increase material efficiency. We collect data on our use of raw materials but we do not report on material types, their sources or the percentage of renewable content because several thousands of materials are involved.

We do our best to use recycled materials wherever possible. We favor raw materials with a reduced environmental footprint (i.e. materials that are less hazardous or that generate less environmental impact during production) and favor materials from renewable sources if technically feasible and economically viable. For instance, the majority of the solvents we use are input materials we recycle within our operations for reuse; the rest is recycled by contractors for third-party users.

Section 8

Occupational Health and Safety

Target

2025

- zero SIF (Serious Injury and Fatality) case

2019 Achievements

Sadly, we recorded 1 fatality and 0 serious injuries

Highlights 2019

- We reinforced our management of high-risk activities ensuring our highest potential risk areas are identified, understood and mitigated. A targeted audit program was developed to validate there was a clear understanding of these requirements across our operations. We improved awareness on our "10 lifesaving rules" in trainings and best practice knowledge sharing sessions, covering critical risk areas such as pedestrian safety, working at height, permit to work, handling hazardous materials, etc. by integrating them into our safety and quality culture.
- We focused on driver safety standards in collaboration with peer companies that are members of the Pharmaceutical Safety Group and introduced regional fleet workshops to set HSE vehicles standards and ensure safe driving. We launched the Novartis "Best driver championship" with 395 participants from 34 countries.
- We continued to focus on safe manufacturing operations through the application of the new "HSE by design" standards for major projects, as well as through the conduct of various targeted trainings on root-cause investigation, safe powder handling and process hazard analysis.

403-1 Workers representation in formal joint management-worker health and safety committees

In 2019, 92% of all Novartis associates were represented in formal joint management-worker health and safety committees. These groups meet on a regular basis to monitor and advise on the site occupational health and safety management program and performance. Relevant sites like manufacturing, research and development have 100% coverage; office sites do not routinely have HSE committees and tend to appoint safety coordinators instead.

403-2 Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities

Novartis is committed to providing all workers with a safe workplace. We continuously seek innovative, sustainable strategies and systems to strengthen our commitment to occupational health and safety, and we proactively foster and encourage a culture of safe behavior and on-site health promotion.

Novartis reports work-related injuries and illnesses for company associates, third-party personnel (TPP) and contractors from all our sites and operations around the world. We include associates and TPP cases into two key performance indicators calculated per 200 000 hours worked: Lost-Time Injury and Illness Rate (LTIR) and Total Recordable Case Rate (TRCR). These indicators enable to compare the performance of units and the performance of countries. The TRCR includes work-related injuries with or without lost time, work-related illness with or without lost time, work-related loss of consciousness and work-related fatality. The LTIR only includes work-related cases with lost time.

Beyond Novartis associates and TPP, we recognize our responsibility to promote the health and safety of contractors. Contractors are individuals employed by companies undertaking work for Novartis within the terms of a service agreement. In contrast with TPP, contractors receive day-to-day work assignments from their companies' management and are hired to complete a job on their own. Novartis only reports health and safety data from contractors who regularly work at a Novartis site, such as cleaning, catering, security, engineering and maintenance personnel. These contractors, known as "fixed" or "nested" contractors, work a minimum of one month per year for Novartis.

	2016	2017	2018	2019
Lost Time Injury and Illness Rate (LTIR, per 200 000 hours worked)[1]	**0.08**	**0.12**	**0.16**	**0.18**
Total Recordable Case Rate (TRCR, per 200 000 hours worked)[1,2]	**0.31**	**0.37**	**0.39**	**0.36**
Associates Serious Injury and Fatality cases	1	1†	2	1†
TPP Serious Injury and Fatality cases	1	0	0	0
Contractors Serious Injury and Fatality cases	2	0	1	0

[1] Data includes Novartis associates and third party personnel managed by Novartis associates
[2] Includes all work-related injury and illness, whether leading to lost time or not
† Indicates a fatal case

In 2017, Novartis HSE discontinued the LTIR and TRCR targets to focus on the prevention of Serious Incidents and Fatalities (SIF) by implementing a comprehensive program that targets high-risk activities and by sharing lessons learned across the organization. A SIF case is defined as a work-related incident that results in a serious injury or even death. Reporting of SIF and SIF potential cases is an integral part of our HSE plan. In 2019, we recorded 0 serious injuries and sadly 1 fatal car accident.

Novartis Associates	2019
LTIR Novartis associates	**0.18**
TRCR Novartis associates	**0.36**
Hours worked by Novartis associates	207 902 534 h
Novartis associates work-related fatalities	1
Number of work-related injuries without lost time	180
Number of work-related injuries with lost time	183
Injury lost time	2 449 d
Number of work-related illnesses without lost time	10
Number of work-related illnesses with lost time	2
Illness lost time	60 d

Third Party Personnel TPP	2019
LTIR TPP	**0.22**
TRCR TPP	**0.35**
Hours worked by TPP	17 947 158 h
TPP work-related injuries without lost time	11
TPP work-related injuries with lost time	20
TPP work-related illnesses without lost time	0
TPP work-related illnesses with lost time	0
TPP work-related fatalities	0

Contractors	2019
LTIR Contractors	**0.34**
TRCR Contractors	**0.49**
Hours worked by Contractors	33 213 418 h
Contractor work-related injuries without lost time	25
Contractor work-related injuries with lost time	56
Contractor work-related illnesses without lost time	0
Contractor work-related illnesses with lost time	0
Contractor work-related fatalities	0

Rigorous technical standards, reinforced by engineering solutions, ensure that workplaces are safe for Novartis associates as well as third-party personnel and contractors. The REEP program (Risk based Evaluation of Exposure Process) is a methodical approach to evaluate, mitigate and document all exposure risks from hazardous substances across our operations. We expect to complete this program by 2020. In addition, our occupational medicine department delivers programs to maintain health, reduce absenteeism, and enhance associates' ability to return to work after injury or illness. A significant number of sites have introduced safety culture initiatives to complement existing measures for continuous improvement of safety management at sites. Local management teams undertake a number of measures to promote safety awareness, including on-site walkthrough inspections by senior managers with a focus on the management of high-risk activities, associated risk exposures and their safety controls.

403-3 Workers with high incidence or high risk of diseases related to their occupation

We take a precautionary approach to minimizing health and safety hazards as well as environmental impacts across our operations. HSE aspects and hazards are identified for relevant operations and activities through targeted analysis, inspections or studies that take into account the business context and the local environment; or are identified through incident and near-miss reporting. HSE risks are assessed taking into accounts credible worst-case impacts and considering potential frequency, severity and the level of risk control. They are managed proactively through appropriate preventive and contingency measures to ensure safe operations.

HSE competence and qualifications for positions with HSE responsibilities are ensured through appropriate recruitment, training and development. We deliver regular HSE training to staff to embed good HSE practices, e.g., with our "10 lifesaving rules" to reinforce our safety and quality culture. Every associate can report an incident or near-miss using our internal reporting platform – all entries are reviewed by an HSE professional to ensure appropriate response and sharing of lessons learned.

We provide our workers with safe working conditions, and strive to protect them from potential health hazards and injuries. Where hazards cannot be completely controlled, Personal protective equipment is provided with appropriate training on its use. Medical surveillance programs are in place when associates are at risk of exposure to certain hazards such as noise. All Novartis associates and third-party personnel are trained and expected to adhere to the health and safety requirements outlined in the Novartis Code of Conduct and the Novartis Global HSE Policy. In addition, contractors are in scope of our Serious Injury and Fatality prevention program. They are selected and evaluated on their safety performance, and we have an operating guideline on contractor safety management which is integrated into selection and contract activities.

403-4 Health and safety topics covered in formal agreements with trade unions

Clinics are established on Novartis sites where there is clear value to do so, focusing on quality, reliability and efficiency of services. Legal requirements, size, headcount, operations and risks (including emergency responses) as well as additional business needs are assessed in the process. They provide convenient medical services to workers and support HSE teams with job hazard analysis and workplace health risk assessments. In addition, they support the reduction of sickness absence and staff turnover, and increase associate satisfaction by contributing to a healthy, safe and attractive work experience.

Our health promotion focus includes healthy living and screening activities, as well as support to associates within our affiliates who suffer from chronic illnesses. Novartis believes it is important to ensure active care management, which includes providing support to associates so they can return to work and perform in an environment that enables them to contribute optimally after an absence due to an illness or injury. In addition, Novartis locations are asked to provide their associates with access to an Employee Assistance Program (EAP) offering psychological, social, legal and financial support services. In many locations – through the EAP or other services – we offer independent counseling services and helplines to support associates in coping with stress, depression and anxiety.