

Novartis AG

Novartis Environmental Sustainability and Occupational Health and Safety Data Supplement 2020

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Section 1

Introduction

The health of our planet has a direct impact on human health. Our commitment to environmental stewardship and occupational health and safety as a global healthcare company is directly aligned with our purpose to reimagine medicine to improve and extend people’s lives.

Our ambition is to be a leader in environmental sustainability, and occupational health and safety driving positive change through our own operations and across our value chain.

Climate

- 2025
 - Only renewable energy used (carbon-neutral own operations) – Scope 1 and 2
 - Environmental criteria in all supplier contracts

- 2030
 - Carbon neutral – Scope 1, 2 and 3

Waste

- 2025
 - Eliminate polyvinyl chloride (PVC) in packaging (secondary and tertiary packaging, primary packaging when feasible)
 - Waste disposal reduced by half (vs. 2016)

- 2030
 - Plastic neutral
 - All new products meet sustainable design principles

Water

- 2025
 - Water consumption reduced by half in our operations (vs. 2016)
 - No water quality impacts from manufacturing effluents

- 2030
 - Water neutral in all areas
 - Enhance water quality wherever we operate

In September 2020, we announced a bold new target to achieve carbon neutrality across our value chain (Scope 1, 2 and 3) by 2030, replacing our existing target for a 50% reduction in emissions. We also created the position of Chief Sustainability Officer to lead the strategy and the execution of environmental sustainability across Novartis, and our value chain.

Achieving these targets will enable Novartis to become a leader in environmental sustainability by becoming carbon neutral, plastic neutral and water sustainable by 2030. We understand that these targets will be challenging to achieve and that they will require close collaboration with our customers, partners and suppliers.

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.

Our mission to reimagine medicine goes hand in hand with maintaining a healthy, safe and environmentally friendly workplace for our associates, contractors, vendors and visitors.

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**

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

Section 2

Novartis GRI content index

Disclosure number	Disclosure title	UNGC principle	UN SDG	Page
300 – Environment				
302-1	Energy consumption within the organization	7, 8, 9	7, 8, 12, 13	9
302-2	Energy consumption outside of the organization	8	7, 8, 12, 13	9
302-3	Energy intensity	8	7, 8, 12, 13	10
302-4	Reduction of energy consumption	7, 8, 9	7, 8, 12, 13	10
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303-1	Water withdrawal by source	7, 8	6, 12	12
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303-3	Water recycled and reused	7, 8, 9	6, 12	13
305-1	Direct (Scope 1) GHG emissions	7, 8	3, 12, 13, 14, 15	14
305-2	Energy indirect (Scope 2) GHG emissions	7, 8	3, 12, 13, 14, 15	15
305-3	Other indirect (Scope 3) GHG emissions	7, 8	3, 12, 13, 14, 15	16
305-4	GHG emissions intensity	8	13, 14, 15	16
305-5	Reduction of GHG emissions	7, 8, 9	13, 14, 15	16
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306-1	Water discharge by quality and destination	7, 8, 9	3, 6, 12, 14	19
306-2	Waste by type and disposal method	7, 8	3, 6, 12	19
400 – Social				
403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities		3, 8	22
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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 related topics. Novartis reports its performance following Global Reporting Initiative (GRI) guidelines for sustainability reporting.

This report covers all regions and operations from January 1, 2020 to December 31, 2020 and the progress we have made 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 2020 environmental data published in the [Annual Report 2020](#) and in the [Novartis in Society ESG Report 2020](#) is based on nine-month actual data (January to September 2020) plus three-month estimates. This report has been updated with actual data for the full year 2020 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 2020 responses to CDP Climate Change and CDP Water Security can be found [here](#).

How we report

Performance of our operating units is monitored on a monthly and quarterly basis. Most data are 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 targets and to take corrective actions as necessary to ensure we remain on track.

2020 data were 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 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 Data Workbook provides definitions, requirements, explanations and examples that staff must take into account to perform their ES and H&S 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 Data Supplement represent a fair and balanced picture of the company's ES and H&S performance. Performance indicators follow GRI requirements for core environmental and social indicators, and for selected additional indicators that were deemed 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 $\pm 5\%$ (Scope 1 and Scope 2 carbon footprint measured as tCO₂e). When a change in the Scope 1 and Scope 2 carbon footprint baseline is triggered, the 2016 baseline for Scope 3 carbon footprint is not adjusted because we have the goal to achieve carbon neutrality by 2030 which is not dependent on the baseline.

A baseline change will not be triggered when there is a $\pm 5\%$ 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 reflect the continuing operations for Novartis.

Health, Safety and Environmental management system

We take our responsibility for environmental impacts seriously, and we 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 environmental, social and governance (ESG) topics, 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 decision-making 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 ISO 45001) 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 2020:

- 35% of our workers at manufacturing sites (excluding R&D) were covered by an externally certified Health and Safety management system (OSHA 18001 or ISO 45001 certifications)¹
- 46% were operating on sites with a certified environmental management system (ISO 14001 or Eco-Management and Audit Scheme (EMAS) certification)¹
- 18% were operating on sites with a certified energy management system (ISO 50001)¹

Novartis 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 to legal standards and compliance to Novartis HSE standards, which are updated every 3 to 5 years.

¹ Percentage of FTEs working at our manufacturing sites

Recognition

In 2020, Novartis was one of 106 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. Furthermore, 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 ES and H&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 our 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)
- The Climate Group (RE100 and EV 100)
- CEO Water Mandate
- Ellen MacArthur Foundation
- Business Ambition for 1.5° C – Science Based Targets

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 neutral – Scope 1, 2 and 3

2020 Achievements

15% reduction

in total energy consumption **vs. 2019**

20% reduction

in total energy consumption **vs. 2016 baseline** (2.72 million GJ reduction)

See “Emissions” section

Highlights 2020



- Heat recovery technology has been implemented at key sites.
- Partnerships with third parties have been developed to accelerate implementation of low carbon technology based on the “Building Efficiency as a Service” model where performance and savings are guaranteed over the contract term.
- Heating, Ventilation and Air Conditioning systems (HVAC) have been optimized by switching to more efficient filters which have a lower pressure drop that saves energy.

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 (photo-voltaic, 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 2020 response](#).

Unit: Gigajoules (GJ)	2016	2017	2018	2019 ¹	2020
On-site generated energy	5 879 104	5 841 794	5 748 647	6 198 647	4 970 978
Renewable energy sources	22 602	19 526	23 740	22 871	4 955
Wood or other biomass fuels	142 822	147 800	157 515	70 799	45 154
Gas fuels	5 434 000	5 410 215	5 313 481	5 872 506	4 679 323
Oil fuel	136 681	134 965	124 467	84 071	77 600
Fossil waste fuel	143 000	129 287	129 444	148 400	163 947
Purchased energy	7 804 009	7 677 935	7 408 718	6 678 087	5 990 476
Purchased renewable electricity	1 969 554	2 012 201	2 430 340	2 062 149	2 772 212
Purchased non-renewable electricity	4 283 636	4 179 878	3 575 818	3 275 440	2 074 215
Purchased steam	1 279 078	1 247 707	1 181 183	1 102 959	921 549
Other purchased energy	271 740	238 150	221 377	237 538	222 500
Energy sold	117 533	128 598	121 017	125 872	112 505
Sold electricity	11 227	9 424	17 700	17 084	2 511
Sold steam & heat	106 306	119 174	103 317	108 788	109 994
Energy consumption	13 565 581	13 391 131	13 036 348	12 750 862	10 848 949

¹ In 2019 we started operating a Combined Heat and Power plant, leading to an increased use of gas fuel but reduced electricity consumption. This plant left the network in 2020.

302-2 Energy consumption outside of the organization

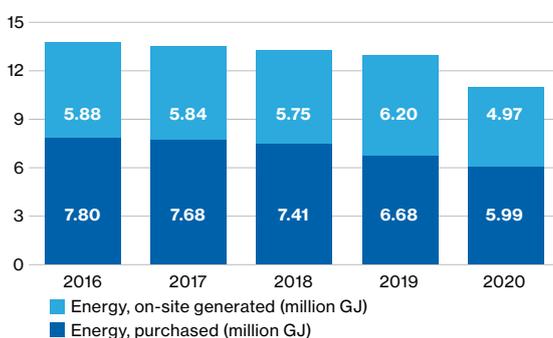
We do not collect information on energy consumption for areas outside the organization (upstream and downstream). For the materials supply chain, we assess the carbon footprint and report this as Scope 3 GHG emissions. We

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 useful indicator to support site energy managers and local management to evaluate progress made against targets and to help them identify energy efficiency opportunities. We measure energy consumption in relation to sales, number of associates and in-

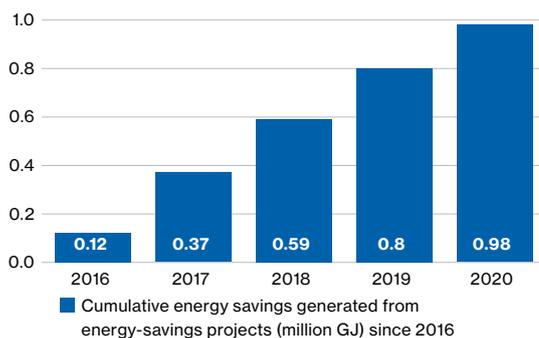
door areas conditioned for specified types of operations. These parameters may vary widely depending of the type and portfolio of products manufactured in a certain operation, the type of application of a particular building and the climate zone where the operating unit is located.



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 because 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 to identify potential opportunities for improvement.

Since 2016, Novartis has saved 2 700 000 GJ of energy, from energy-saving projects which amounts to a reduction of more than 7.2%.



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

2020 Achievements

25% reduction

in total water consumption (water discharged to treatment and water lost) **vs. 2019**

36% reduction

in total water consumption (water discharged to treatment and water lost) **vs. 2016 baseline** (4.6 million m³ reduction)

75%

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 completed our first community rainwater harvesting project in India and have continued to work on our first pilot on integrated watershed management to create a water-neutral location in India. This project is expected to generate 50 000 m³ of harvested rainwater and will benefit at least 1 000 families.

Novartis is a member of the [AMR Industry Alliance](#). We are collaborating with other organizations to provide sustainable solutions to curb anti-microbial resistance. This includes work to better understand the environmental impact of antibiotic medicines and taking action to minimize their release.

Highlights 2020

- We joined the CEO Water Mandate. The CEO Water Mandate is a UN Global Compact initiative that mobilizes business leaders on water, sanitation, and the Sustainable Development Goals.
- We joined the Innovative Medicine Initiative (IMI) project Prioritization and Risk Evaluation of Medicines in the Environment (PREMIER) which is an EU public-private partnership which supports the development of sustainable medicines.
- We installed a new water recycling plant at one of our sites in Singapore. This plant uses reverse osmosis technology to treat water so it can be reused on site.
- In Germany, a water reuse project saved 18 000m³ of water.
- In Slovenia, a condensate recovery return project saved 12 500m³ of water.

303-1 Total water withdrawal by sources

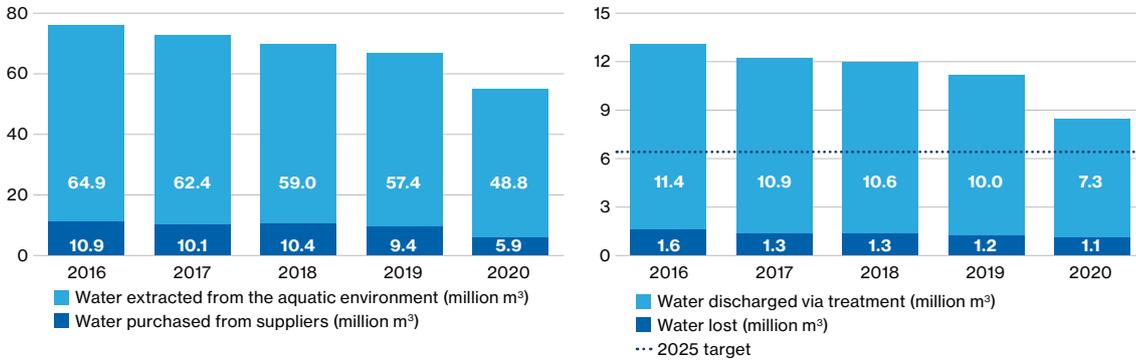
Novartis makes every effort to ensure water is used efficiently and that any water released from our sites meets regulatory limits and our internal quality standards to protect the environment. To support these efforts we have created water balances for our sites by monitoring all water inputs by source and all discharges to the receiving environment. This methodology ensures we have an accurate picture of how we use and manage water.

The water directly abstracted 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: thousands of cubic meters (m ³)	2016	2017	2018	2019	2020
Water drawn from aquatic environment ¹	64 836	62 369	58 964	57 348	48 718
From aquatic environment, groundwater	-	-	-	48 251	41 672
From aquatic environment, surface water	-	-	-	9 096	7 046
Water collected from rain	82	73	55	14	43
Water purchased from external suppliers	10 882	10 068	10 401	9 386	5 937
Water from other sources	51	54	45	21	3
Water withdrawal	75 851	72 563	69 466	66 769	54 701
Water released directly to the aquatic environment	62 439	60 837	57 897	55 512	46 088
Water discharged via treatment	11 391	10 890	10 572	10 031	7 278
Water lost (evaporated or to other destination)	1 644	1 315	1 316	1 200	1 115
Water consumption (treatment and lost)²	13 036	12 204	11 888	11 231	8 393
Water recycled and reused	19 843	20 997	16 386	14 709	8 633

¹ In 2019, we started to report water abstraction 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 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 by using the [Water Risk Filter](#). Locations with physical water risks equal or greater than 3 are required to take actions to minimize their dependence on water.

There are no water sources significantly affected by the withdrawal of water from our operations: 11% of our total water withdrawal is supplied by local public water utilities or from other sources.

The remaining 89% 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 2020. Our 2020 response to CDP Water Security can be found [here](#).

303-3 Water recycled and reused

In 2020, Novartis recycled or reused 8.6 million m³ of water, which represents 16% 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 neutral – Scope 1, 2 and 3

2020 Achievements

21% reduction

in total GHG emissions from energy consumption (Scope 1 and 2) **vs. 2019**

27% reduction

in total GHG emissions from energy consumption (Scope 1 and 2) **vs. 2016 baseline** (263 000 tCO₂e)

16% increase

in total carbon footprint (GHG emissions from Scope 1, 2 and 3) **vs. 2016 baseline** (1 064 000 tCO₂e)

Highlights 2020

- We signed 5 power virtual power purchase agreements (VPPAs) for 6 projects which will support our goal to obtain 100% renewable electricity for our European operations. The VPPAs will collectively add over 275 MW of clean power to the electrical grid and be in place before the end of 2023.
- Solar panels have been installed at our sites in Turkey which will save around 1 050 tonnes of CO₂e per year.

305-1 Direct (Scope 1) GHG emissions

Novartis has reported GHG emissions in accordance with the [Greenhouse Gas Protocol](#) for all sites under its operational control since 2005.

The reporting structure includes Scope 1 carbon dioxide (CO₂) emissions from stationary combustion installations, production processes and refrigeration systems, as well as Scope 1 CO₂ emissions from company-owned and leased vehicles. GHG emissions are reported on a quarterly basis and calculated in metric tons of CO₂ equivalent using emission factors provided by energy suppliers or factors from the International

Energy Agency (IEA). Novartis uses the global warming potential factors from the 2007 Intergovernmental Panel on Climate Change (IPCC) Report for GHGs other than CO₂.

GHG emissions of gases unrelated to combustion (e.g., hydrochlorofluorocarbons) are not included in the scope of our 2025 climate target. The primary source of these emissions is loss from refrigeration equipment. Novartis does not collect data on biogenic CO₂ 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

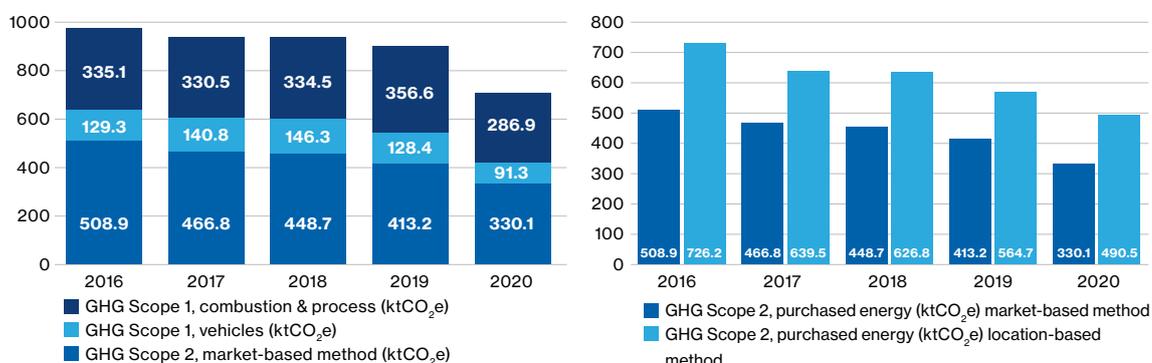
Guidance, reflecting the emissions from the electricity that a company is purchasing compared to the electricity that is generated locally.

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 CO₂ 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: thousands of metric tons of CO ₂ equivalent	2016	2017	2018	2019	2020	2020 Methodology Review ¹
GHG Scope 1 Emissions, from owned and leased vehicles	129	141	146	128	91	91
GHG Scope 1 Emissions, from stationary combustion installations	320	318	322	344	274	274
GHG Scope 1 Emissions, from process sources including refrigerant losses	15	12	14	13	13	13
GHG Scope 1 Emissions	465	471	482	485	378	378
GHG Scope 2 Emissions, market-based	509	467	449	413	330	330
Total GHG Scope 1 and Scope 2 emissions (market-based)	974	938	930	898	708	708
Total GHG Scope 1 and Scope 2 emissions (market-based) from energy consumption	959	926	917	885	695	695
GHG Scope 2 Emissions, location-based	726	639	627	565	491	491
GHG forestry offsets	66	72	55	30	34	34
GHG Scope 3, Purchased goods and services	4 058	4 193	4 040	4 527	4 085	5 754
GHG Scope 3, Capital goods	567	434	390	418	382	279
GHG Scope 3, Fuel and energy related activities	274	271	266	248	217	282
GHG Scope 3, Upstream transportation and distribution	273	261	266	316	320	320
GHG Scope 3, Waste generated in operations	40	34	34	24	14	28
GHG Scope 3, Business travel	125	200	212	191	22	22
GHG Scope 3, Employee commute	149	150	156	148	146	99
GHG Scope 3, Upstream leased assets						Not applicable
GHG Scope 3, Downstream transportation and distribution	43	41	41	36	30	30
GHG Scope 3, Processing of sold products						Not applicable
GHG Scope 3, Use of sold products	124	111	135	142	170	170
GHG Scope 3, End-of-life treatment of sold products						Not calculated
GHG Scope 3, Downstream leased assets						Not applicable
GHG Scope 3, Franchises						Not applicable
GHG Scope 3, Investments						Not applicable
Total GHG Scope 3 emissions	5 654	5 695	5 539	6 051	5 386	6 984
Total GHG Scope 1, Scope 2 and Scope 3 emissions	6 628	6 633	6 469	6 949	6 094	7 692

¹The methodology used to calculate the Novartis Scope 3 emissions in 2016 was aligned with Science Based Targets validation criteria which required targets to cover at least 2/3 of total mandatory scope 3 emissions as defined in Table 5.4 of the GHG Protocol Scope 3 standard. In 2020, Novartis decided to further improve completeness, transparency and accuracy to cover more than 90% of overall scope 3 emissions.



305-3 Other indirect (Scope 3) GHG emissions

In 2020, we reviewed the methodology we use to calculate our Scope 3 GHG emissions across all categories. In particular although the emissions associated with “purchased goods and services” are

still calculated using an Environmental Extended Input Output model the scope of this analysis has been adjusted to capture all commercial, manufacturing and research and development operations.

Scope 3 Category	2019	2020
1 Purchased goods and services	Global Environmentally Extended Input-Output (EEIO) EnScan (WifOR) model covering key manufacturing and commercial goods and services ¹	EnScan (WifOR) model. This category now covers all business activities not specifically falling under the other categories (scope extended to include e.g. Scientific and Clinical Services, Contingent Labor, Lab Suppliers)
2 Capital goods	Composite emission factor based on ESCHER (PwC) model ²	Global Environmentally Extended Input-Output (EEIO) EnScan (WifOR) model. This category now covers all business activities ¹ CapEx not specifically falling under the other categories
3 Fuel and energy related activities	Upstream lifecycle emissions calculated using the 2018 UK Government’s greenhouse gas conversion factors, IEA statistics for transmission and distribution (T&D) losses and IPCC guidelines for emission factors	Upstream lifecycle emissions calculated using ELCD European Reference Life Cycle Database 2.0, IPCC guidelines for emission factors, and IEA statistics for T&D losses. The emissions now also cover the fuel for vehicles, and the full lifecycle emissions for T&D losses
4 Upstream transportation and distribution	EnScan (WifOR) model	The same methodology used for 2019 data has been followed
5 Waste generated in operations	Waste output route-based emission factors	The same methodology used for 2019 data was followed but an error in the calculation has been remedied
6 Business travel	Calculated by our business travel solutions partner based on the guidelines provided by DEFRA/ DECC’s GHG conversion factors, including factoring of actual distance flown, uplift-factor and class of flight	The same methodology used for 2019 data has been followed

Scope 3 Category	2019	2020
7 Employee commute	Calculated by using an average-data model prepared by an external consultancy in 2009 based on regional commuting patterns of employees using private and public transportation	The average-data model has been adjusted to reflect the reduction in commuting and switch to home-working while making an allowance for energy consumed by home-working (by the workstation and for heating and cooling of the home office room). Heating and cooling needs were differentiated based on countries and their climate and economic situation using data from IEA, IRENA and Eurostat
8 Upstream leased assets	Not applicable	Not applicable
9 Downstream transportation and distribution	Calculated using a distance-based product transportation model developed by an external consultancy in 2010	The same methodology used for 2019 data has been followed
10 Processing of sold products	Not applicable	Not applicable
11 Use of sold products	IPCC (AR5) emission factors for HFC ³	The same methodology used for 2019 data has been followed
12 End-of-life treatment of sold products	Not calculated	Not calculated
13 Downstream leased assets	Not applicable	Not applicable
14 Franchises	Not applicable	Not applicable
15 Investments	Not applicable	Not applicable

¹ WifOR Institute

² PwC ESCHER (Efficient Supply Chain Emissions Reporting)

³ Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report

The most significant sources of Scope 3 emissions for Novartis remains “purchased goods and services” (82% 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. “Fuel and energy related activities” and “Capital goods” are other important categories. (each about 4% of our Scope 3 emissions). The “fuel and energy related activities” category is expected to decline in line with the achievement of the Novartis 2025 carbon neutral target for scope 1 and 2 emissions. Novartis has less opportunity to directly influence carbon emissions associated with the “capital goods” category because 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). Nevertheless it includes the purchase of technology which we anticipate will drive innovation and will enable Novartis to further reduce its carbon footprint.

For more details on our Scope 3 emissions (methods, approach and assumptions), please refer to our 2020 CDP response [here](#).

305-4 GHG emissions intensity

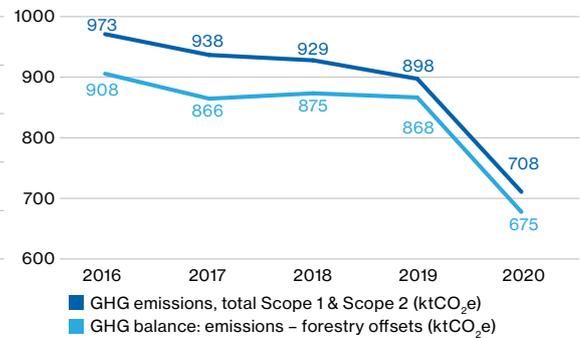
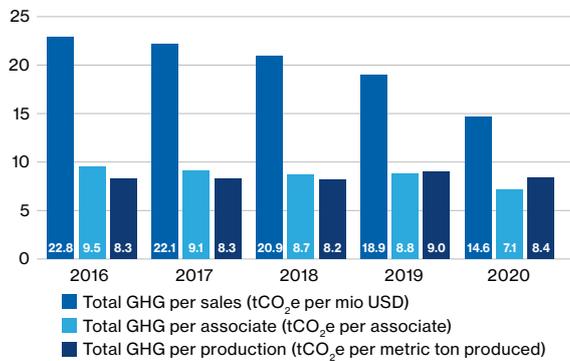
We monitor GHG emissions intensity in relation to sales, production quantity and number of associates for specified types of operations. These parameters may vary widely depending

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 US 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. A similar solution is currently being implemented for our European operations through six new renewable energy projects that will generate wind and solar electricity in Spain.

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 UN-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 (SO₂) 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	2020
Halogenated Volatile Organic Compounds (metric tons)	43.59	75.58	78.98	26.59	11.57
Non-Hal. Volatile Organic Compounds (metric tons)	445.97	457.22	503.27	406.82	443.00
Sulfur Dioxides (SO ₂) emissions (metric tons)	15.04	15.40	13.62	4.56	4.33
Nitrogen Oxides (NOx) emissions (metric tons)	230.67	231.14	236.59	236.32	212.24
Particulates emissions (metric tons)	54.55	58.42	58.26	12.91	11.64
Ozone-depleting substances (ODS) emissions caused by losses (metric tons of R11 equivalent)	0.056	0.045	0.063	0.008	0.0249
SO ₂ , Intensity per sales (t/mio USD)	0.000317	0.000325	0.000287	0.000096	0.000089
NOx, Intensity per sales (t/mio USD)	0.004928	0.004862	0.004987	0.004981	0.004362
Particulates, Intensity per sales (t/mio USD)	0.001150	0.001231	0.001228	0.000272	0.000239

Section 7

Waste and materials

Targets



2025

- Eliminate polyvinyl chloride (PVC) in packaging (secondary and tertiary packaging and primary packaging when feasible)
- Waste disposal reduced by half

2030

- Plastic neutral
- All new products meet sustainable design principles

2020 Achievements

22% reduction

in total waste disposal (not recycled) **vs. 2019**

38% reduction

in total waste disposal (not recycled) **vs. 2016 baseline** (25 600 metric tons)

We use around 30 000 metric tons of plastic for primary and secondary packaging for our products. Our strategy is 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 2020



- The use of PVC for secondary and tertiary packaging has now been eliminated at 6 Novartis sites. The remaining 4 sites have plans in place to eliminate its use before the end of 2022.
- 68% of the 17 types of single-use plastic which were being used at workplaces across the organization have been eliminated and we remain on track to eliminate this plastic at all Novartis workplaces before the end of 2021.



306-1 Water discharge by quality and destination

At all manufacturing and R&D locations 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.

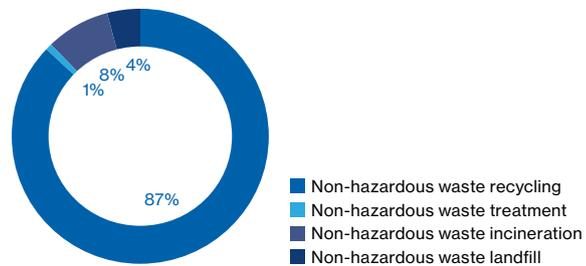
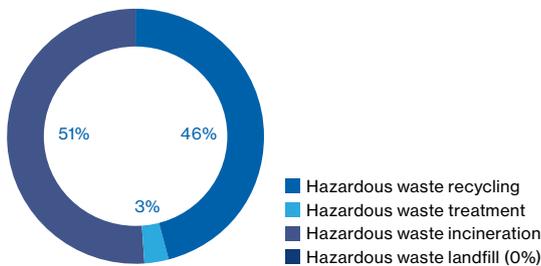
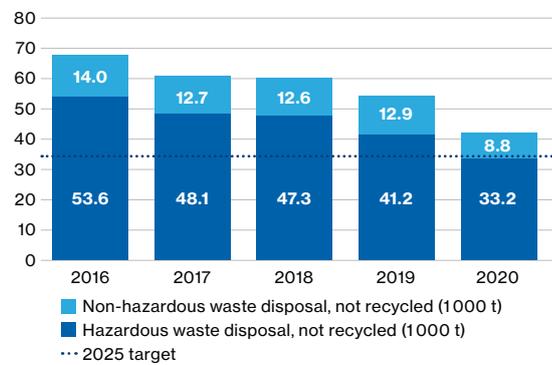
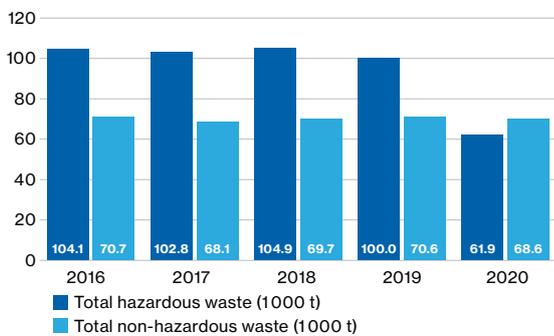
Unit: metric ton (t)	2016	2017	2018	2019	2020
Total Suspended Solids (TSS) load	360.9	358.7	238.5	198.3	215.7
Chemical Oxygen Demand (COD) load	2 761.0	2 658.9	2 051.4	1 842.3	1 606.7
Nitrogen load	258.6	246.5	197.0	207.5	240.6
Phosphate load	47.9	41.4	40.0	34.7	41.2

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: thousands of metric tons (t)	2016	2017	2018	2019	2020
Hazardous waste, Recycling	50.5	54.7	57.5	58.8	28.7
Hazardous waste, Treatment	4.4	4.9	4.5	4.0	1.6
Hazardous waste, Incineration	49.2	43.1	42.8	37.2	31.6
Hazardous waste, Landfill	0	0	0	0	0
Recycling percentage hazardous waste	48.5%	53.2%	54.9%	58.8%	46.4%
Non-hazardous waste, Recycling	56.7	55.4	57.2	57.7	59.9
Non-hazardous waste, Treatment	0.6	0.3	0.2	0.4	0.5
Non-hazardous waste, Incineration	9.2	8.7	8.1	8.4	5.3
Non-hazardous waste, Landfill	4.1	3.7	4.2	4.1	3.0
Recycling percentage non-hazardous waste	80.4%	81.3%	82.0%	81.7%	87.2%
Waste disposal (total waste not recycled)	67.4	60.8	59.9	54.1	42.0
Waste disposal, Intensity per sales (t/mio USD)	1.58	1.44	1.34	1.14	0.86

Section 8

Occupational Health and Safety

Target



2025

- zero SIF (Serious Injury and Fatality) case

2020 Achievements

- Increase of 14% in vaccinations provided to associates through wellness programs
- Reduction in both LTIR and TRCR for 2020 as compared to previous year
- Sadly, we recorded 1 fatality and 0 serious injuries

Highlights 2020



- 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 continued the development of our HSE Management System by releasing several new or updated Global Operating Procedures including Change Management, Driver Care, HSE Management of External Service Providers (update to previous Contractor Safety document), Ionizing Radiation Protection, and Waste Management. These documents facilitate the continual improvement of our HSE Management System.
- HSE teams at both global and site level provided support across Novartis during the COVID pandemic in order to ensure the health and safety of our associates and to enable the continued delivery of medicines to our patients. HSE also supported Choice with Responsibility by providing information on ergonomics and other topics to support our associates who were working from home.
- Novartis recognizes our responsibility to promote the health and safety of our employees, contractors and visitors. Contractors are in scope of our Serious Injury and Fatality prevention program: we have a Global Operating Procedure on contractor safety management (included in contracts) and contractors are selected and evaluated on their safety performance. Unfortunately, we recorded 1 fatal contractor injury in 2020 at the Novartis facility in Changshu China.

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

In 2020, 93% 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. Novartis reported a reduction in both LTIR and TRCR in 2020 over the previous year.

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 contract or 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	2020
Lost Time Injury and Illness Rate (LTIR, per 200 000 hours worked) ¹	0.08	0.12	0.16	0.18	0.13
Total Recordable Case Rate (TRCR, per 200 000 hours worked) ^{1,2}	0.31	0.37	0.39	0.36	0.23
Serious Injury and Fatality cases ³	4	1 [†]	3	1 [†]	1 [†]

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

³ Data include Novartis associates, third-party personnel and contractor cases

[†] 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 2020, we recorded 0 serious injury and sadly 1 fatality.

Details for associates, TPP and contractors

	2020
Novartis Associates	
LTIR Novartis associates	0.12
TRCR Novartis associates	0.23
Hours worked by Novartis associates	187 334 761 h
Novartis associates work-related fatalities	0
Number of work-related injuries without lost time	92
Number of work-related injuries with lost time	112
Injury lost time	829 d
Number of work-related illnesses without lost time	4
Number of work-related illnesses with lost time	3
Illness lost time	35 d

	2020
Third-Party Personnel TPP	
LTIR TPP	0.20
TRCR TPP	0.31
Hours worked by TPP	15 740 061 h
TPP work-related injuries without lost time	8
TPP work-related injuries with lost time	16
TPP work-related illnesses without lost time	0
TPP work-related illnesses with lost time	0
TPP work-related fatalities	0

	2020
Contractors	
LTIR Contractors	0.34
TRCR Contractors	0.49
Hours worked by Contractors	61 219 268 h
Contractor work-related injuries without lost time	18
Contractor work-related injuries with lost time	46
Contractor work-related illnesses without lost time	1
Contractor work-related illnesses with lost time	0
Contractor work-related fatalities	1

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 are continuing the monitoring started in previous years to identify opportunities for improvement. 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 account 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

HSE is a fundamental component of our long-term business strategy. We provide our associates with safe working conditions and strive to protect them from potential health hazards and injuries. All Novartis associates are expected to adhere to the health and safety requirements outlined in the Novartis Global HSE Policy, the Novartis Code of Conduct and the Novartis Code of Ethics. We do not collect information globally on whether health and safety topics are covered in formal agreements with trade unions or with Novartis Employee Representative Councils (NERCs).

We consult local trade unions and NERCs to understand the approach to implementing these requirements on a country-by-country basis. For instance, at sites in Basel and the Rhine Valley, Novartis holds consultation processes and sets up commissions with Employee Representative Councils on various HSE topics.