ENVIRONMENT

In this section

Our ambitions

Our contribution to SDGs

OUR AMBITION

Before 2050, we will be a climate-positive business based on scope 1, 2 and 3 emissions according to the greenhouse gas (GHG) protocol.

Focus area	Targets	Status 2021	Actions and measures	
Emissions	OPERATIONS: Our operations' carbon emissions (scope 1+2) will be cut by **70% before 2030** and will be **climate positive before 2040** (baseline 2015)	-31%	• Setting an internal carbon price • Fixing site environmental targets and assessments • Switching to renewable energy sources	• Signing the UN pledge 'Business Ambition for 1.5°C' • Promoting energy efficiency
	SUPPLY CHAIN: Our supply chain emissions (scope 3) will be cut by **20% before 2030** and will be **climate positive before 2050** (baseline 2015)	-4%	• Sourcing ingredients responsibly • Developing low-carbon creations • Driving circularity and upcycling	• Optimising packaging, logistics, transport of goods, business travel and employee commuting
Electricity	**100%** of our sites will be powered with renewable electricity **by 2025**	84%	• Committing to RE100 since 2015 • Setting site renewable electricity targets	• Generating on site renewable electricity

We act as a role model in water stewardship, working to protect water-dependent ecosystems and encouraging the sustainable use of resources.

Focus area	Targets	Status 2021	Actions and measures	
Water	Improve water efficiency by **25%** on sites facing water stress **by 2030** (baseline 2020) We will continuously improve water efficiency on all other sites	-4% flat	• Driving continuous improvement using the 3R approach: 'reduce, reuse and recycle'	• Implementing our wastewater standard • Carrying out water risk assessments • Tracking site water quantity and quality
	100% of our wastewater discharge will meet or exceed regulatory and industry standards **by 2030**	In progress	• Identifying shared water challenges and local stakeholder priorities in the watershed	• Exploring water stewardship activity opportunities

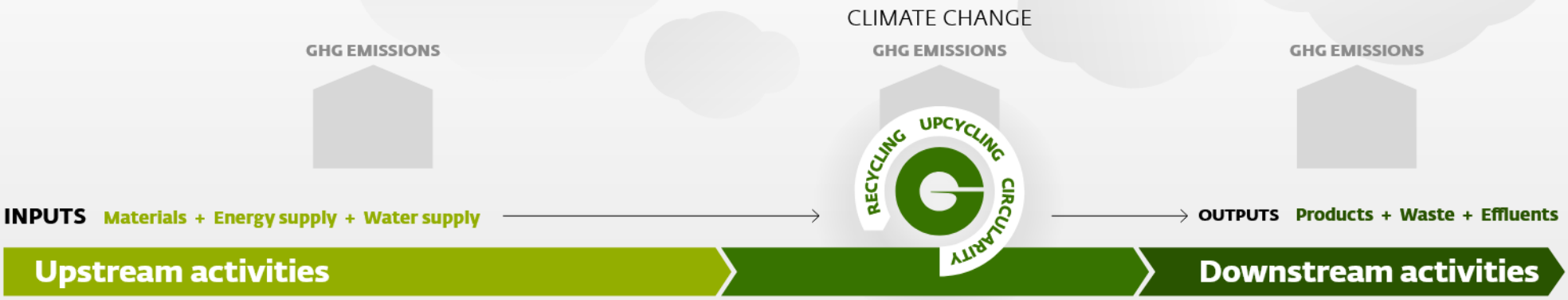
OUR AMBITION

Before 2030, we will replace single-use plastics with eco-friendly alternatives across our sites and operations.

Focus area	Targets	Status 2021	Actions and measures	
Plastics	**100%** plastics circularity **by 2030**	In progress	• Becoming members of the advisory board of the Renewable Carbon Initiative (RCI) • Reducing our plastic usage and consumption	• Co-leading a WBCSD plastic and packaging workgroup defining a transition for B2B chemical products
Waste	Reduce waste by **4%** per tonne of product, year-on-year average (baseline 2015 – acquisitions not included)	-2%[1]	• Applying circular principles in product design, sourcing, manufacturing and packaging	• Upcycling to reuse materials normally disposed of • Acting on the principle of 'no waste by design'

1. Absolute reduction since 2015

Givaudan's environmental footprint



IMPACTS / FOOTPRINTS

GHG EMISSIONS – Approx. 2,300,000 tonnes

SCOPE 3 Other indirect GHG Emissions — 90%
Purchased goods and services **82%**
Capital goods **2%**
Fuel and energy related activities **2%**
Upstream transportation and distribution **2%**
Waste generated in operations **1%**
Business travel **<1%**
Employee commuting **<1%**

SCOPE 1 Direct GHG Emissions — 6%
Operations

SCOPE 2 Energy indirect GHG Emissions — 1%
Energy supply

SCOPE 3 Other indirect GHG Emissions — 3%
Downstream transportation and distribution

WATER CONSUMPTION – Based on 2018 Corporate water footprint

Raw material — 97%

Onsite direct water use and energy — 2%

Logistics and packaging — 1%

Climate change

Material topic definition

Climate change

Mitigating effects on climate change by reducing GHG emissions and supporting adaptation and actions along Givaudan's value chain (for example, by ensuring sustainable use of land to address deforestation).

Purpose pillars

CREATIONS **NATURE** **PEOPLE** COMMUNITIES

Disclosure 103 – 1

EXPLANATION OF THE MATERIAL TOPIC AND ITS BOUNDARY

Climate change and related shifts in weather patterns and sea levels are disrupting people, business operations and economies around the world. The direct consequences of man-made climate change, that is, an increase in the concentration of greenhouse gases in the atmosphere, include rising temperatures, rising sea levels, higher ocean temperatures, an increase in heavy precipitation and floods, a decrease of precipitation, shrinking glaciers and thawing permafrost. Indirect consequences are wide-ranging, spanning from an increase in hunger, water crises, poverty and political unrest, to loss of biodiversity.

Risk

As such, climate change is a driver for a number of effects that may in turn affect Givaudan's ability to operate. A continued build-up of GHG emissions is expected to lead to changed weather patterns and an even greater threat to supplies of natural raw materials. This may translate into disruptions in the supply of natural raw materials or to operations because of a water supply shortage, for example. It therefore poses significant risks to our operations and supply chain: our business depends on these natural resources and continuity of supply is critical.

Impact

We generate GHG emissions through energy use (combustion in our own processes as well as the use or purchase of electricity and steam) and activities in our supply chain. Specifically, Scope 1 emissions are direct emissions from sources we own or control, including, for instance, fuel combustion in our factories. Scope 2 emissions are indirect emissions related to the use of purchased energy (electricity or steam). Scope 3 emissions are all indirect emissions that occur in our value chain. In terms of synthetic ingredients, we must consider the energy needed to create them, and whether they are made from fossil feedstock. With naturals, we need to consider land use change, deforestation, agricultural practices and animal-derived products.

These are all major components of climate change and we must ensure that our raw materials are produced sustainably. Our efforts in these areas necessarily extend beyond Givaudan to include the supply chain. Details on how we encourage suppliers to observe our rigorous standards are described in the chapter on Responsible Sourcing & Traceability.

Boundary

- Givaudan
- Suppliers

Disclosure 103 – 2, 103 – 3

MANAGEMENT APPROACH

The latest climate science says that temperature increase must not exceed 1.5°C compared to pre-industrial levels if we are to avoid the most catastrophic effects of climate change. Reaching this goal requires that emissions fall by half by 2030 and that we reach net-zero emissions no later than 2050. There is therefore limited time for action and the private sector has a crucial role to play.

Living our purpose and showing our love for nature in everything we do also means protecting our precious natural environment and the resources it provides. There is an urgent need to accelerate action in many areas of our business and we have adopted global standards and ambitious goals. We wish to be accountable for our climate action and support global efforts such as the UN's Sustainable Development Goal 13 on climate action.

SBTi's Net-Zero Standard

We were among the companies taking part in the 2021 road test of the SBTi's Net-Zero Standard. The world-first common framework recognises the urgency of the climate crisis and the need for businesses to respond robustly and credibly, aligning action across industries and geographies. We strive to deliver on purpose and sustainability ambitions, knowing that no one business can tackle the issue alone. Action depends on a collective effort and shared commitment to creating a future we can be positive about.

Climate change

We are committed to becoming climate positive – removing more greenhouse gases from the atmosphere than we put in – before 2050 as part of our purpose. One element of this is that Givaudan will cut GHG emissions from operations (scope 1 and 2) by 70% between 2015 and 2030 and is working towards operations becoming climate positive by 2040. The Science Based Targets initiative (SBTi) has approved Givaudan's scope 1 and 2 GHG reduction target as being in line with 1.5° C. We also aim to achieve our RE100 commitment to convert our entire electricity supply to fully renewable sources by 2025. The Company's value chain emission target (scope 3), aiming for a reduction of 20% over the same period, also meets the SBTi's criteria and is in line with current best practice.

In 2019, we signed the UN Pledge Business Ambition for 1.5°C, which was proposed by the United Nations to aim for net-zero value chain emissions by 2050. Helping to validate our climate positive ambition, our engagement means we commit to having net-zero targets in line with the new SBTi net-zero standard, introduced in October 2021 and road tested by companies including Givaudan. In September 2020, we signed the CLG Europe CEO letter to the EU on 2030 GHG emissions targets. The letter is designed, at a critical policy moment, to send a clear signal to policymakers and other businesses that it is essential to ramp up climate ambition. We have also signed the Business for Nature 'Nature is everyone's business' call-to-action. The call-to-action brings together more than 500 companies with combined revenue of USD 4 trillion and urges governments to adopt policies now to reverse nature loss in this decade.

We constantly assess and mitigate the risks posed by climate change and drive adaptation and remediation in our own operations and across our supply chain, from the raw material suppliers to indirect materials and service providers. We expect all of our suppliers to support our efforts by working collaboratively to provide data and information about their carbon footprint when required, and to work to reduce their overall impact over time.

Our overall roadmap focuses first on reduction and then on balancing remaining/unavoidable emissions with neutralisation/compensation measures.

Our operations (scope 1 and 2)

In our operations, we are primarily focused on renewable energy sources and increasing energy efficiency to reach our goals.

Energy efficiency

Here, our primary focus is on reducing consumption and we are leading significant energy consumption reduction projects across operations. Energy site assessments, for example, help us identify opportunities to improve efficiency and identify conservation measures. In 2021, we conducted four such assessments. Other investments and efforts in terms of energy efficiency plans and targeted projects have also allowed us to make improvements.

Ambitious GHG emission reduction is not possible without an evolution of the technologies we use. We seek opportunities to partner with experts from diverse fields in finding new ways to improve our environmental performance. In particular, we look at energy-intensive steps in our processes, for example, cooling and refrigeration needs, and seek opportunities to use alternative technologies to achieve the same performance and jointly reduce our GHG emissions. We have found that solar energy, for instance, offers an energy-efficient way to power industry's needs for cooling and refrigeration. The opportunity is in developing the technology that will be able to efficiently and reliably respond to variable needs across a range of processes and sites.

HYCOOL

Solar heat for cool innovation

Our site in Sant Celoni, Spain hosts a pilot for HyCool, a groundbreaking technology for industrial cooling systems. Funded by the European Union, the aim of the innovative energy technology project is to develop cost-effective solutions using solar heat for industrial purposes. Installation started in summer 2021 and, once completed, and at full scale, is expected to reduce site GHG emissions by 3%, reduce electricity and gas consumption, and deliver refrigeration with 25% greater efficiency. This will help us deliver on our goals to reduce our Scope 1 and 2 GHG emissions and lessen our overall carbon footprint through the use of high innovation technologies. If it proves cost effective, we will be able to use it in countries with even more favourable weather conditions such as Mexico, South Africa or Singapore.

Climate change

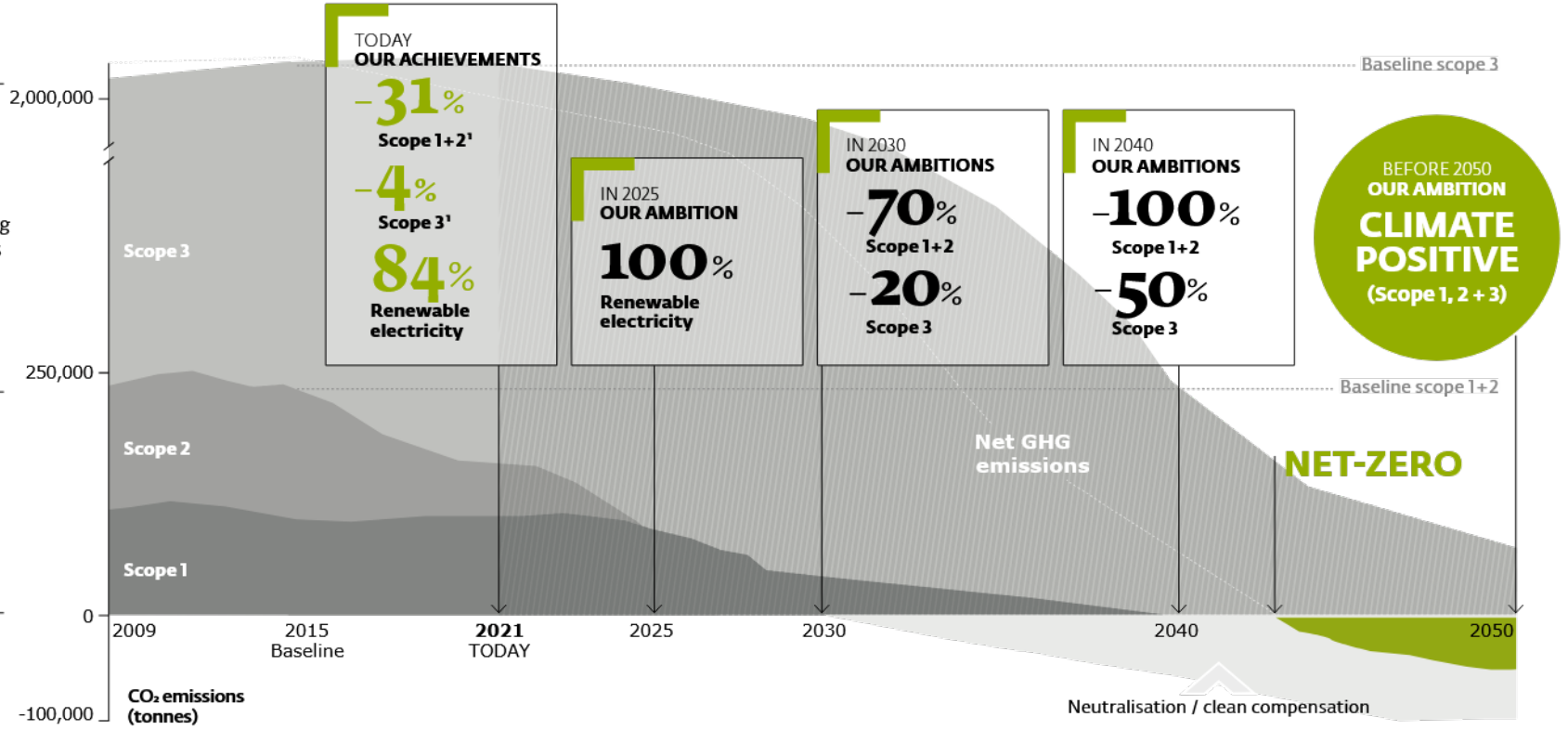
Our roadmap to becoming
CLIMATE POSITIVE

OUR ACTIONS TO REACH OUR AMBITIONS

Scope 3
- Sustainable procurement of ingredients
- Low-carbon creations
- Driving circularity and upcycling
- Optimising packaging, logistics and transport of goods
- Optimising business travel and employee commuting

Our operation (scope 1 + 2)
- Renewable energy sources
- Energy efficiency

Neutralisation / compensation
- Carbon capture technology
- Natural climate solutions



Enablers to reach our ambitions
- Supplier engagement
- Budget and financial mechanisms
- Advocacy and promotion
- Partnership and governance

1. Compared to baseline year 2015.

Climate change

Renewable energy sources

Innovative sourcing strategies are an important part of reaching our targets. In 2020, we set a new renewable electricity strategy prioritising first on-site generation, then off-site generation and finally the purchase of Electricity Attribute Certificates (EACs). Our stringent procurement strategy helps add more renewable electricity to the grid. In 2021, we purchased electricity that accounted for 32% of the total energy used across the Company but which equated to 15% of our total CO_2 emissions.

We are proud to be a member of RE100, a collaborative, global initiative organised by the Climate Group in partnership with CDP. It unites more than 300 influential businesses committed to 100% renewable electricity and is part of our strategy to fully convert our electricity supply.

Replacing our fossil-based energy with renewable fuels like biofuels is also part of the strategy to reduce emissions, particularly those related to the production of heat.

Energy – Progress 2021

Though we do not have a formal target in terms of energy intensity – the quantity of energy required per tonne of product – we have recorded a decrease of 0,7% for 2021 vs. 2020.

We have also made considerable progress in terms of renewable electricity supply (scope 2 GHG emissions) and are on track to meet our target of converting our entire electricity supply to fully renewable sources by 2025. We attained 84% renewable electricity supply in 2021 and 45 production sites were powered 100% by electricity from renewable sources by the end of the reporting year.

We also reduced the GHG emission load per purchased KWh of electricity by 45% for 2021 vs. 2020.

Disclosure 302 – 1, 302 – 4
Energy consumption and reduction within the organisation

	2020 (restated)[1]	**2021[2]**	Change to 2020 in %
Direct energy: from primary sources (GJ)			
Natural Gas	2,121,738	2,166,714	2%
Town Gas	172	257	49%
LP Gas	10,119	10,827	7%
Light fuel oil	34,381	40,592	18%
Heavy fuel oil	91,367	93,664	3%
Biofuel	217	397	83%
Biogas	0	76	
Biomass	23,776	22,626	(5%)
Steam sold from steam produced on site	25,294	30,735	22%
Geothermal	6,294	8,107	29%
Waste used as energy	181,324	199,330	10%
Total direct energy	**2,444,093**	**2,511,855**	**3%**
Indirect energy: purchased electricity and steam (GJ)			
Electricity purchased	1,231,837	1,217,506	(1%)
Electricity purchased covered by Energy Attribute Certificates	–	1,026,918	
Electricity sold	4,499	7,487	66%
Electricity self-produced from renewable sources	5,135	8,528	66%
Electricity self-produced from non-renewable sources	44,236	60,343	36%
Steam purchased	75,053	80,838	8%
Total indirect energy	**1,307,527**	**1,299,385**	**(1%)**
Total energy	**3,751,620**	**3,811,240**	**2%**

1. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites. These latter figures have been included in the reported values, but have not been assured by the third-party auditor. See the "Restatements of information" section for restatements.
2. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.

Disclosure 302 – 3
Energy intensity

	2015 (restated)[1]	2020 (restated)[2]	**2021[3]**
Energy intensity			
(GJ per tonne of product)	6.98	6.57	6.52

1. Assured 2015 full-year figures.
   These values are excluding the acquisitions done of Naturex, Vika and drom sites.
2. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites. These latter figures have not been assured by the third-party auditor.
   See the "Restatements of information" section for restatements.
3. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.

Scope 1 and 2 emissions progress 2021

We made good progress towards our targets in 2021 with absolute total direct (scope 1) and indirect (scope 2) GHG emissions decreasing by 75,600 tonnes. The evolution of absolute total scope 1 and 2 GHG emissions in 2021 vs. the 2015 baseline was –31%.

Our scope 1 and 2 GHG emissions intensity (GHG emissions/ tonne of product) decreased by 11% in 2021 vs 2020.

Climate action leadership recognised by CDP

Demonstrating our industry leadership in climate action and the transition to a low-carbon economy, we once again participated in the annual Climate Change CDP questionnaire for investors as well as in the Climate Change Supply Chain questionnaire at the request of a number of customers. This allows us to showcase our efforts to reduce GHG emissions and also provides a basis of comparison against other companies. Our CDP score was this year an A (on a scale of A to D, with A being the highest) for Climate, at the leadership level once again.

Climate change

Givaudan has already been recognised as a world leader in supplier engagement on climate change, earning a position on the Supplier Engagement Leaderboard by CDP for 2020 (2021 score published at end of Feb. 2022), the non-profit global environmental disclosure platform, in recognition of our actions and strategies to reduce emissions and lower climate-related risk across our supply chain. In 2021, just 2% of companies that participated and were scored in CDP's questionnaire for investors made the A List.

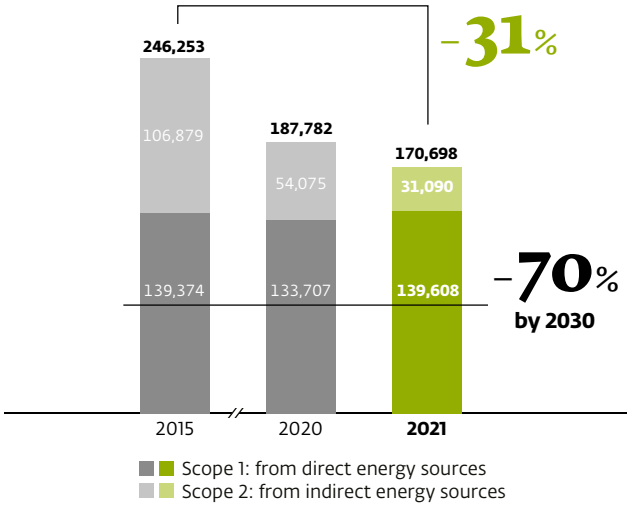
Scope 2

One project, at our Taste & Wellbeing site at Pune in India, involved fitting more than 2,000 solar photovoltaic panels to rooftops, ground mounts and carports to significantly cut reliance on fossil fuels. The installation, which dedicated about 5,300 square metres to the solar panels, resulted in electricity generation of about 971,520 KWh and represents a 20% cut in the use of fossil fuels and a carbon footprint reduction of 1,000 tonnes.

Brazil example

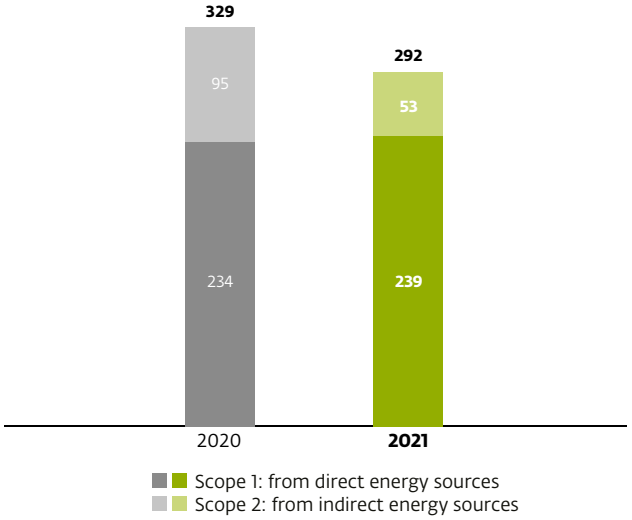
In Brazil, we aimed to migrate to 100% renewable electricity on our sites by 2025. Our Brazil teams migrated our Jaguare and Botucatu sites to renewable electricity generated by wind. Migration was achieved in just 6 months, five years ahead of the 2025 target. No additional investment was needed and we anticipate we will deliver CHF 750,000 in savings over five years.

Disclosure 305 – 1, 305 – 2, 305 – 5
Direct and energy indirect GHG emissions[1]
GHG emissions (tonnes)



1. Compared to baseline year 2015. Excluding biogenic emissions. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.

Disclosure 305 – 4
GHG emissions intensity
GHG emissions (kg) per tonne of product



Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.

Climate change

Scope 3

Scope 3 emissions are those that come from the value chain activities outside of our operations. We include a wide range of activities related to our business, from commuting to business travel, transportation or waste treatment. The biggest impact comes from the sourcing of goods and services, especially the production of raw materials. We consider the direct impact of our own operations but also see ourselves as responsible for all activities related to our business throughout our whole value chain. We therefore pursue a range of activities with respect to scope 3 emissions to help us reach our ambitions. An assessment of our overall carbon footprint shows that most impacts come from upstream activities, which are related to suppliers. Collaboration with suppliers is therefore crucial to tackling reduction of our scope 3 emissions.

Sustainable procurement of ingredients

One of our main focus areas in our approach to decreasing scope 3 emissions is the sustainable procurement of ingredients. There are many facets to this, including pursuing a zero-deforestation policy, targeting regenerative agriculture, supporting renewable energy sources in the supply chain and promoting supplier innovation.

Direct or indirect deforestation increases the amount of CO_2 in the atmosphere by removing carbon sink and carbon ecosystems from the Earth's surface. We expect our suppliers to avoid deforestation and land conversion for agriculture and ask them to commit to the "No Deforestation, No Peat, No Exploitation (NDPE)" principles as part of our Responsible Sourcing Policy, supporting us in our aim to source products that are deforestation and conversion free. Our involvement in standards such as the Roundtable on Sustainable Palm Oil (RSPO) helps us to move our supply chain to deforestation-free sourcing.

Regenerative agriculture

Regenerative agriculture practices aim to regenerate soils, increase biodiversity, optimise the water cycle and improve the provision of ecosystem services. All of these aspects have a direct and indirect impact on farm carbon cycles. Specifically, implementing regenerative agriculture practices allows us to drastically reduce carbon emissions in the whole agriculture supply chain and to improve carbon sequestration in soils to potentially become climate positive. We partner with and support local communities through a variety of social and environmental projects, including climate-related projects and working with farmers on regenerative agricultural practices. We have the unique opportunity to train farmers/smallholders on good and sustainable agriculture practices in order for them to adapt to fast-changing weather patterns and their impact on crop yield, drought and water management. It is beneficial to Givaudan to support farmers/smallholders and these are long-term agreements with mutual benefits, helping us to secure the supply chain for our iconic substances. Our agronomic team is currently working on supply chain prioritisation to select those where we can directly implement regenerative practices and test their impacts. This regenerative approach is holistic by nature: it brings benefits in terms of GHG reduction but also generates a positive impact on biodiversity and on the livelihoods of stakeholders.

Renewable energy sources in the supply chain have a direct reduction impact on GHG emissions. We are collaborating with our main suppliers to encourage them to increase their use of renewable electricity or fuels. This allows them to reduce their scope 1 and 2 emissions and us to reduce scope 3. As an example, in 2021 we benefited from a collaboration with a supplier who allocated 100% renewable electricity to the product we purchased. This led to a 5% reduction in CO_2e emissions for this product.

Sustainable procurement is also driven by the Procurement team, who looks to engage suppliers and foster supplier innovation. Our dedicated programme "Connect to Win" encompasses key sustainability aspects by scouting and identifying key suppliers who can be integrated into our innovation portfolio, helping us to reduce our carbon footprint, among other goals. The programme falls under the procurement innovation pillar of our Global Procurement strategy.

Low-carbon creations

Low-carbon creations are another approach to lowering our scope 3 emissions. Our Science and Technology and formulation teams consider GHG emission factors in how they design processes and formulations. We do this either by working on new technology for ingredient production (i.e., biotechnologies) or by selecting ingredients that are less carbon-intense by nature. In this way, we innovate to create the ingredients of the future.

As an example, Givaudan's Fragrance Compaction programme looks at ways to design more highly concentrated fragrances for all product categories. Using higher impact, higher value-added ingredients to deliver fragrance performance allows us to offer an increased value proposition to customers while reducing emissions. Fragrance contribution is divided 34 times from standard design, with a positive impact in every step – from RM processing to manufacturing and distribution – where fragrance is involved. Givaudan is well-positioned to take advantage of preferences for low-carbon products because of our responsible sourcing and sustainable innovation initiatives including reuse and recovery of process side streams and waste. As our customers become more environmentally aware, Givaudan has the opportunity to differentiate itself from competition by staying ahead in terms of eco-design and ensuring that our marketing and sales reflect the progress we make in eco-efficiency.

Climate change

Scope 3 model evolution

The modelling of scope 3 GHG emissions is an iterative process based on science that is still evolving. We started our efforts here in 2017 with our first full scope 3 inventory based on financial activity data (input/output model) using the so-called ESHER model. The model has since gone through several evolutionary steps. We have begun modelling our raw material with a process-based approach that applies the best available proxy data from verified generic databases. We add granularity and accuracy through the inclusion of additional packaging categories and new classes of business travel. These modifications imply potentially important increases or decreases in the data and modelling of our scope 3 emissions. This is a necessary part of the journey and we will recalculate our baseline accordingly, as required by GHG protocol to ensure progress is diligently reported. We actively advocate for more transparency and alignment in this area by participating in several relevant initiatives.

Renewable carbon is all carbon sources that avoid or substitute the use of any additional fossil carbon from the geosphere. Plants do this naturally and some technologies are now able to do so as well. By increasing the use of renewable carbon, we drastically reduce the extraction of carbon from the ground and limit the increase of CO_2 concentration in the atmosphere. This is well aligned with our journey towards nature-conscious creations.

We employ green chemistry principles for efficient carbon use, meaning that all carbon atoms in the bio-based starting material end up in the final product, resulting in zero carbon waste and thus limiting carbon emissions.

Biotechnology also holds enormous potential for carving out a more sustainable future for perfumery and for our planet. At Givaudan, it has already led to some extraordinary innovations. For example, we can now use green chemistry including a biotransformation step to produce the biodegradable ingredient Ambrofix®, an iconic molecule in perfumery, from sustainably sourced sugar. This results in 100% renewable carbon, in line with our FiveCarbon Path™, the new Givaudan sustainability ambition for molecules, and uses 100 times less land compared to the traditional production method starting from the clary sage plant.

Driving circularity and upcycling

Upcycled materials are in essence low-carbon materials because they are considered to be valorised waste streams. With an allocation system based on value, the waste streams are almost carbon-neutral materials and valorising them into new products is beneficial: it both reduces the carbon footprint of our products and increases circularity in our supply chain and reduces waste. This well-known practice has been applied for years in the industry because the same principle applies to reducing costs and lowering stress on scarce resources or unstable supply chains. In designing innovative processes, we also look at how we can reuse and recover process & waste side streams (upcycling).

One excellent example is that of previously discarded solvents and oils that are now being reused in future production stages. The project had an impressive impact, upcycling 200,000 kg of solvent/oil in a 12 -month period, saving costs on raw materials and waste disposal fees and saving 108 metric tonnes of carbon dioxide.

In designing innovative processes, we also look at how we can reuse and recover process side streams. By following green chemistry principles, we ensure ingredients are safe by design and that our processes make efficient use of energy and materials while reducing water consumption and waste. As an example, our latest sustainable ingredient is KoffeeUp™, a beauty oil crafted from upcycled Arabica coffee. KoffeeUp™ has been called the "new argan oil" in the beauty industry because of its natural, eco-conscious and effective properties, which bring facial skin care benefits such as hydration, protection and anti-aging to customers. The product was developed in collaboration with Danish company Kaffe Bueno, a biotech start-up at MassChallenge Switzerland. This groundbreaking 'upcycling' approach helps us to reduce waste and minimise our environmental impact.

Optimising packaging, logistics and transport of goods

Packaging is a focus for many companies, including Givaudan, and we work to reduce the impact of packaging on our CO_2e footprint through several approaches. We plan to bring more circularity in our packaging, to use more renewable solutions, to work on making packaging lighter and optimising it for transport solutions, and to investigate reusable and recyclable solutions, all while keeping safety and regulatory considerations a top priority.

Climate change

The subject of packaging must be seen in the broader context of our own operations and our active participation in the WBCSD plastics stream supports both our efforts to reduce the overall impact of plastics and the environmental impacts of packaging. We have several local initiatives to valorise packaging after it has been cleaned and this has a direct impact on reducing our footprint and creating additional circular flow.

The optimisation of transportation is a complex topic for companies. We investigate current opportunities in alternative fuels and optimised engines that can result in the reduction of emissions and try to evaluate the impact of these initiatives. We will also work on optimising the network and switching the maximum possible freight from high- (i.e., air) to low-emission (i.e., sea) modes of transport. This will also require a change in our operation processes and the way we manage customer demands to always keep customers highly satisfied.

We are working with suppliers to find collaborative measures or programmes to reduce our common emissions. One example of such a proposal is combining several orders into full container loads to reduce transport emissions. Cascading commitments in the supply chains of suppliers is also a key element to driving action.

Finally, these two topics combine perfectly when packaging is optimised to reduce transport needs. Working on compacting products and making sure that trucks are as full as possible is how logistics efforts can drive reduction in our emissions.

Optimising business travel and employee commuting

The pandemic has drastically reduced the amount of business travel and office-based employee commuting. Having the right technology and digital collaboration tools in place has meant that we have been able to maintain business productivity and keep travel to a minimum. We are continuing to invest in these capabilities, with our travel management team working on better tools to manage and reduce business travel emissions, and it is an essential part of the GBS & IM&T 2025 strategy.

We also foster ideas and propose new commuting solutions directly to employees via our Green Team network. This tool raises awareness and drives new ideas and solutions for local entities. Over the last few years we have been finding ways to encourage everyone to reduce the GHG emissions of their daily commutes. We continue, for instance, to promote a bike-to-work initiative at our Swiss sites, facilitating a carpool service internally and introducing charging stations at some of our sites to support the transition to electric vehicles.

Scope 3 progress in 2021

In 2021, we saw a slowdown in our scope 3 GHG emissions with a decrease of 4% against the 2015 baseline figure. A detailed explanation on progress per category is given below. For the calculation methodologies please see page 84.

Compared to last year's report, we have integrated some recent acquisitions that have an important impact on the overall performance of the company and have therefore modified our emissions profile. We also have to consider the impact of the COVID-19 pandemic situation in the analysis: as an example, some 17,000 tCO_2e of the reduction are related to a decrease in business travel and employee commuting, despite the growth of the company. While in this instance the effects of the pandemic helped reduce emissions, in some other cases, such as distribution and logistics, it rather contributed to an increase in emissions.

Purchased goods and services

For the raw materials category, the 2021 figure decreased by 0.8% in absolute terms compared with our 2015 baseline and remained stable compared to the previous year. This good performance is the result of a global change in portfolio content, with fewer carbon-intensive substances such as dairy products, and a decoupling of business growth and carbon emissions in that category. This number has to be considered with caution as the modelling is very sensitive to changes and potential developments in the field of carbon accounting and modelling. We nonetheless continue engaging internal stakeholders in the scope 3 journey, aligning internal governance and building scenarios for quantifying benefits. Raw materials are a prioritised category for carbon emission reduction as they represent about 78% of our scope 3 emissions.

For example, RSPO certification from our palm oil sourcing ensures that the sustainability claim at the end of the supply chain is credible. It also includes a beneficial impact on carbon emissions because RSPO-certified Palm Oil Production has a reduced carbon intensity of approximately 36% in $kgCO_2e$ per kg of palm oil. As Givaudan covers part of its supply chain with certified palm oil, it also impacts our scope 3 inventory. In 2020, we were able to reduce the average CO_2e emission per kg of palm oil and palm oil derivatives by 5% compared to 2015 and our efforts continued throughout 2021.

For packaging, despite business growth, the estimated 2021 footprint is 92,000 tCO_2e, with a decrease of 0.1% compared with the 2020 footprint. This stabilisation reflects both a more efficient use of packaging and the reuse of some packaging items that then do not need to be purchased. It is also linked to a reduction in certain product volumes in some factories: this enabled us to reduce the amount of packaging, which offsets Givaudan business growth and the related increased demand for packaging. We are assessing ways of reducing our footprint, for example, by reducing the weight of our packaging and using alternative packaging with more sustainable and renewable materials content.

Climate change

For "other indirect materials and services," emissions decreased by 9% compared to 2015, representing a decrease of spend in this category. With a spend-based model on secondary data, it is not yet possible to reflect specific supplier performances in this category.

Supply chain

Our ambition is to drive action through supply chain engagement and to collaborate across the industry. The CDP Supply Chain Programme is one of the tools Givaudan uses to engage with suppliers on climate action and gain understanding of its supply chain: all the data collected through the CDP Supply Chain Programme contributes to this.

The level of the impact of engagement varies depending on the level of maturity of our suppliers in terms of climate action. With suppliers already leading and managing carbon-related issues, we seek to create partnerships to put in place collaborative measures or programmes to reduce our common emissions and cascade action further down the supply chain. For suppliers starting their climate action journey, we work towards a shift in behaviour and provide support and guidance. This is aligned with and contributes to our delivering on our science-based target for scope 3 emissions.

This year we went further and already engaged in collaborations regarding potential reductions with our most advanced suppliers. The key topics are biosourced raw materials, renewable energy in the supply chain and the valorisation of by-products (upcycling). These collaborations take time to implement, and we will continue to collaborate with our suppliers on these topics in the years to come.

We measure the success of our engagement with suppliers through the CDP Supply Chain Programme via different key performance indicators (KPIs):

1. Supplier response rate: In 2021, our supplier response rate rose by 17% to 83% compared to 66% in 2020. This is an excellent outcome, considering that we also increased the number of suppliers by 38 in 2021.

   Below, points 2, 3 and 4 are a means of measuring how many suppliers are more advanced in their climate action journeys. These are the suppliers with whom we are working to find collaborative measures or programmes, for example, combining several orders into full container loads to reduce transport emissions, to reduce our common emissions. Encouraging suppliers to cascade commitments in their own supply chain is another key element of driving action.

2. Percentage of suppliers with a leadership (A or A-) or management (B or B-) score: 51% of our responding suppliers, compared with 29% last year. This is a significant gain and is the effect both of supplier improvement and an increase in the number of suppliers involved.

3. Percentage of suppliers reporting active targets: 78% vs. 80% last year. The decrease is due to the important increase in the number of suppliers involved and is not interpreted as a negative development.

4. Percentage of suppliers engaging their own suppliers: 82% vs. 66% last year.

Givaudan's leading work on climate change and water security has once again been recognised with a CDP double A rating.

ULTIMO measures, monitors utilities consumption in real time

The ULTIMO platform, installed at our Vernier site, measures and monitors the consumption of utilities in real time, allowing operations to proactively address anomalies and focus efficiency improving efforts with qualitative data. This has allowed our Distillation team to identify ways of reducing water consumption in the cleaning process; another unit is using it to monitor temperatures while testing the idea of using heat blankets to keep various products warm, a move that would reduce the heating load on the heating room. An external company has used data to conduct a Steam and Boiler insulation study to confirm insulation savings and energy reduction benefits. ULTIMO has allowed us to realise savings of CHF 106,000 through Q3 2021 and will be rolled out to our major production sites as part of our 2025 Strategy.

Climate change

Capital goods

Capital goods figures increased by 8% in 2021 compared to the base year 2015 despite an important reduction of 23% between 2020 and 2021. This reflects changes in the amount of capital expenditure modelled. With a spend-based model on secondary data, it is not yet possible to reflect specific supplier performances in this category.

Fuel- and energy-related activities (not included in scope 1 or 2)

In fuel- and energy-related activities, we have made good progress since 2015 with an absolute reduction of 66% due to the increase in the supply of renewable electricity. This is excellent progress, and we are continuing efforts to reach 100% renewable energy sources, which will again reduce our scope 3 in this category. We can also mention that the reduction of intensive electricity energy sources like coal supports the reduction of scope 3 emissions and is aligned with our overall climate journey.

Upstream and downstream transportation and distribution

In 2021, we increased the total absolute emissions for transport by 25% compared to 2015. An important increase of 7% took place between 2020 and 2021. This is related to the COVID-19 pandemic and the logistics situation, which required the use of carbon-intensive modes of transport to mitigate potential disruption in supply. With about 5% of our total scope 3 emissions coming from transport, this is a topic we integrate into our carbon reduction management approach.

We are assessing ways to reduce our footprint through, for example, consolidation and distribution network design. We are also assessing opportunities to switch modes of transport, but such changes impact the whole value chain and operation strategy. Time and careful assessment are needed to make sure improvements are implemented to last and show long-term reduction. The challenge is to integrate these actions into

Disclosure 305 – 3
Other indirect (scope 3) GHG emissions

GHG emissions (tonnes)	2015 (restated)	2020 (restated)	**2021**
Purchased good and services	1,917,037	1,901,374	1,902,794
Raw materials	1,691,701	1,676,242	1,677,400
Other Indirect materials & services categories (excluding existing categories)[1]	146,856	132,686	133,055
Packaging	78,480	92,446	92,339
Capital goods[1]	51,722	72,797	56,003
Fuel and energy related activities	105,744	68,001	36,349
Upstream transportation and distribution	29,674	42,320	39,990
Waste generated in operations	19,321	22,644	24,084
Business travel	24,461	12,587	1,794
Employee commuting	21,516	20,454	13,277
Downstream transportation and distribution	54,615	56,099	65,297
Outbound product to customers	39,503	38,172	42,343
Outbound intercompany deliveries	15,112	17,927	22,954
Total	**2,224,090**	**2,196,276**	**2,139,587**

1. These two categories do not include data for the recent acquisitions of Naturex, Vika and drom.

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

	2020 (restated in 2021)[1]	**2021[2]**
CFC inventory (kg)	7,639	3,881
CFC 11 equivalent inventory (kg)	783	574
CFC loss-replacement (kg)	765	526
CFC 11 equivalent loss/ replacement (kg)	42.08	28.91

1. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites. These latter figures have been included in the reported values, but have not been assured by the third-party auditor.
   See the "Restatements of information" section for restatements.
2. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.

Disclosure 305 – 7
Nitrogen oxides (NOX), sulphur oxides (SO_2), and other significant air emissions

	2020 (restated in 2021)[1]	**2021[2]**
Nitrogen oxides – NO_x (tonnes)[3]	66.71	69.28
Sulphur dioxide – SO_2 (tonnes)[3]	96.84	98.37
Volatile organic compounds (tonnes)	1,018	1,069

1. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites. These latter figures have been included in the reported values, but have not been assured by the third-party auditor.
   See the "Restatements of information" section for restatements.
2. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.
3. Quantity is calculated by multiplying the annual fuel consumption by the corresponding emission factor for fuel type.

Climate change

our scope 3 calculation models. Emissions related to transport continue to grow as Givaudan's business grows. The decoupling of this activity is complex and requires important changes in the design of the entire supply chain. The COVID-19 pandemic has also complicated transport activity in general, and this was not beneficial to our footprint.

Waste generated in operations

This figure increased by 25% between 2015 and 2021. This increase is partially due to a reclassification of waste streams, which led to an increase of total GHG emissions related to waste of 6% between 2020 and 2021, for example. We also identify an increase due to product mix evolution as well as particular liquid discharges being separated from wastewater flows and being treated separately, accounting for waste in the reporting. We have confidence in the future performance of waste emissions in scope 3: our waste reduction strategy and scope 3 emissions reduction are perfectly aligned. We continue to focus our attention on reducing waste production and evaluating valorisation streams instead of disposal.

Business travel

COVID-19 and associated travel bans and restrictions contributed to a drop of more than 93% in business travel in 2021. The challenge here is to organise a post-pandemic strategy to travel less and more efficiently.

Employee commuting

During 2021, we carried out an employee commuting survey to collect data and better understand the impact of our various initiatives in this category. With 7,000 employees participating, we learned that our emissions are decreasing: without taking COVID-19 and associated working-from-home measures into account, we reduced our output of CO_2e/employee per year to 1.15 tCO_2e from 2.0 tCO_2e in 2015. If we take working from home due to the pandemic situation into account, the figure drops to 0.87 CO_2e/employee per year. Givaudan actively encourages its employees to reduce the GHG emissions of their daily commute by supporting a range of schemes including a bike-to-work initiative at our Swiss sites, the facilitation of carpooling through our intranet platform, and the provision of recharge stations to support the transition to electric cars at some sites.

Neutralisation / compensation

Though our Climate Strategy prioritises the reduction of emissions, we also look to neutralise or compensate residual emissions that cannot be reduced. Carbon removal solutions are an essential element to going beyond net zero and achieving our climate positive target. The journey in front of us is long and the results will take time. This is why we are starting now.

Natural Climate Solutions

Our approach is now focused on Natural Climate Solutions (NCS), which aim at the better management, protection and restoration of ecosystems. They target a reduction of GHG emissions related to land use and changes in land use, the capture and storage of additional CO_2 from the atmosphere and, finally, the improvement of ecosystem resilience, thereby helping communities adapt to the increases in flooding and dry spells associated with climate change.

Carbon capture technology

Insetting, that is, the neutralisation of our emissions through a carbon capture and storage project within our value chain, is highly relevant for Givaudan because we have a direct footprint in natural supply chains located in countries where the environment is under pressure. For us, insetting means natural solutions in the supply chains, with the producing communities. It is not the easiest approach because it involves land availability and long-term commitment, traceability and auditing. It is the most credible, relevant approach to Givaudan and in line with our SBTi engagements. It will also benefit our communities socially.

The three most relevant insetting solutions for Givaudan are reforestation, improved plantations (for example, firewood plantation for distillation) and improved agricultural practices.

Enablers

Our efforts to become climate positive also include a number of transversal enablers. They are not linked to a specific annual timeframe but are rather meant to support our climate journey over the next 30 years. The approaches include innovation, supplier engagement, budget and financial mechanisms, advocacy and promotion as well as partnership and governance.

Innovation

Ambitious GHG emission reduction is not possible without innovation and an evolution of our technologies. We seek opportunities to partner with experts from diverse fields in finding new ways to improve our environmental performance. Givaudan invests substantially in R&D – it's part of our DNA. For climate action in particular, we look at energy-intensive activities of our processes, for example, our cooling and refrigeration needs, and seek opportunities to use alternative technologies to achieve the same performance and jointly reduce our GHG emissions. We have found that solar heat offers an energy-efficient way to power industry's needs for cooling and refrigeration. The opportunity is about developing the technology that will be able to efficiently and reliably respond to variable needs across a range of processes and sites.

As discussed in the section on low-carbon creations above, biotechnology also holds potential for carving out a more sustainable future for perfumery and for our planet. At Givaudan, it has already led to some extraordinary innovations. Akigalawood®, a novel material that has a profile similar to that of patchouli, is another example of a raw material now produced through biotechnology and a groundbreaking, environmentally friendly process.

Climate change

Budget and financial mechanisms

Budget and financial mechanisms are also important enablers, and we have a dedicated budget for energy efficiency. Accordingly, and compared to the standard, extra capital is allocated to the design and construction of new greenfield facilities with higher energy-saving design standards.

We have also identified and agreed on an internal price of carbon mechanism to employ for our scope 1 and 2 emissions reduction projects. We are currently running proof of concepts with representative real projects before rolling out the process globally.

Advocacy and promotion

Givaudan's involvement in numerous engagement activities demonstrates our ambition to help mitigate climate change and our desire to work in a broad global partnership of proactive companies dedicated to making a positive difference.

Examples include our membership of the International Fragrance Association (IFRA) and the International Organization of the Flavor Industry (IOFI); RE100, an initiative uniting more than 100 influential businesses committed to 100% renewable electricity; Business ambition 1.5°, an urgent call to action from a global coalition of UN agencies, business and industry leaders; the UN Global Compact, a strategic policy initiative for businesses committed to aligning their operations and strategies with 10 universally accepted principles in the areas of human rights, labour, environment and anti-corruption and, finally, the Renewable Carbon Initiative.

Partnership and governance

In terms of governance, the Executive Committee leads Givaudan's overall strategic direction and is accountable for our purpose and Sustainability ambitions, including those on climate. The Sustainability Leadership Team, led by the Global Head of Sustainability, is made up of internal experts on topics linked to purpose / sustainability.

Still, we know that we cannot achieve this alone. Externally, we seek to partner with our suppliers, customers and communities. For example, we work together with local communities on projects and causes that benefit the communities where we work. We define local communities as persons or groups of people living and/or working in any areas that are economically, socially or environmentally impacted (positively or negatively) by Givaudan's operations. The local community can range from people living adjacent to operations to isolated settlements at a distance from operations that may experience the impacts of these operations. On most sites, formal relationships have been established with local authorities and with significant organisations representing neighbours, or working on specific environmental and social issues.

We built partnerships with non-profit organisations and support these local communities through a variety of social and environmental projects. This includes climate-related projects, from working with farmers on reforestation in Indonesia to supporting schools in Madagascar, Laos, the Comoros islands and Haiti.

Internally, we are getting organised with cross-functional teams delivering training on specific topics related to carbon management, CO_2e emission modelling or supplier engagement to internal stakeholders.

In addition, Givaudan joined the Together for Sustainability organisation this year and, more specifically, engaged in their scope 3 workstream, which is developing partnerships between chemical companies on scope 3 management and modelling. We also contributed to the WBCSD Value Chain Carbon Transparency Pathfinder initiative dedicated to enabling standardised exchange of information or carbon emissions data between companies.

Waste management & circular principles

Material topic definitions

This chapter addresses our following two material topics:

Waste management & circular principles

Pursuing a culture of waste elimination by adequately managing all Givaudan's waste streams, from product design and manufacturing processes to packaging and use.

Purpose pillars

CREATIONS **NATURE** PEOPLE COMMUNITIES

Raw materials availability

Ensuring a stable supply of raw materials used in Givaudan's products by strengthening partnerships with strategic suppliers and diversifying our portfolio through new technologies (for example, upcycling, or innovation to create alternative ingredients) and sources of supply.

Purpose pillars

CREATIONS **NATURE** PEOPLE **COMMUNITIES**

Disclosure 103 – 1

EXPLANATION OF THE MATERIAL TOPIC AND ITS BOUNDARY

Waste management and circular principles that support us in minimising the extraction of natural resources and the generation of waste, in fostering waste prevention and optimising environmental, material and economic values throughout the life cycles of our products are critical elements to living our purpose and showing our love for nature in everything we do.

Pursuing a culture of waste elimination by adequately managing all of Givaudan's waste streams through, for example, recycling and reuse or ensuring recovery or disposal in an environmentally sustainable way, helps us limit our impact on the environment; reducing waste also allows us to lower the costs of production. Making better choices about what natural resources to use in the manufacturing and packaging of our products helps us protect the precious natural environment and not squander the resources it provides.

We have set a waste management target to reduce incinerated and landfilled waste production per tonne of product by an average of 4% year on year. We are currently working on a new target.

Careful waste management and the application of circular principles also help us meet stakeholder expectations. As an example, plastic waste is a topic that has drawn considerable public attention in recent years. Applying the principles of a circular economy here is no longer seen as a mere trend, but rather as an essential activity and we are committed to 100% plastic circularity by 2030. We also see plastic as a business opportunity, an enabler to grow and show our leadership in sustainability. We are convinced by the value of renewable carbon, whether it comes from recycled, bio- or GHG-based sources: the carbon that can be recuperated serves as the building blocks of new renewable materials. Givaudan is supporting this concept through its involvement with the Renewable Carbon Initiative, which aims to speed up the transformation from fossil fuel carbon to renewable carbon.

Our efforts in all of these areas extend beyond Givaudan to include the supply chain, as detailed in the chapter on Responsible Sourcing & Traceability.

Boundary

- Givaudan
- Suppliers

Disclosure 103 – 2, 103 – 3, 306 – 1, 306 – 2

MANAGEMENT APPROACH

Protecting the environment means acting on waste and our goal is to continually reduce the waste generated by our business activities including product and process development, manufacturing, formulation, packaging, marketing and distribution. Our decisions about what materials to use also have consequences in terms of waste and we strive to reuse or recycle materials where possible.

We work hard to limit the amount of waste we produce through a three-pronged process based on the key concepts of 'rethink,' 'reduce,' and 'recycle'. We are rethinking how processes are done currently and challenging our ways of working. We are reducing the amount of waste we create as a by-product of our processes; then we reuse where possible and recycle in an effort to move away from disposal in landfill or incineration. Where waste is incinerated, we make sure energy is recovered.

One of the ways we are getting closer to our waste management targets is by putting more emphasis on notions ingrained in the idea of the circular economy, a generic term for an industrial economy where waste should not exist anymore, and closed loop uses are favoured. We apply circular principles in sourcing, product design, manufacturing and packaging.

Another important element of our approach is our new commitment to replacing all single-use plastics across sites

Waste management & circular principles

and operations with eco-friendly alternatives before 2030. For Givaudan it means concretely moving towards 100% plastic circularity.

More generally, we approach waste management in the following ways:

Procurement

In procurement, we give preference to options that avoid hazardous waste, result in reduced quantities of waste or in increased recycling. We prefer to use raw materials of higher quality or with less impurity when this leads to reduced amounts of unwanted by-products. We favour reusable packaging and transport systems. If reusable packaging is not feasible, we prefer to select packaging materials that are recyclable and for which a recycling option exists. We give preference to equipment with an extended lifetime, that is, which offers features such as robust construction, upgradeability, repair friendliness, and with a reduced need for auxiliary material such as filters and oils. Please see the chapter on Responsible Sourcing & Traceability for more information.

Products and processes and packaging

In the research and development of products and processes, we prioritise solutions that avoid waste, result in reduced waste quantities or in increased recycling. We seek an increase of yield or in material productivity, a reduction of material input/consumption, in-process recycling and possibilities for the segregation of hazardous components from waste streams. We give preference to raw materials with a reduced environmental footprint, for example those that are less hazardous or that have a lower environmental impact in their production, and to those that come from renewable sources. Finally, we take into consideration the different possible direct and indirect pathways of the products (including disposal of unused products) into various waste streams at the end of their lives already during product development.

Optimising our approach to packaging in respect to ecological and economic criteria also helps us reduce our impact. For example, in India we have turned to local sources for glass sampling bottles instead of continuing to import them from Europe. This has helped us reduce costs, lead times as well as our carbon footprint as the bottles are no longer being imported. At our Vernier, Switzerland site we have replaced some metallic drums, generally used once, with cardboard boxes for uses including shipping. This new packaging is six times less expensive than the drum and much lighter, reducing our carbon footprint even more. We should be able to use these cartons with about 70% of the annual volume. The other 30% is made up of products that can only be shipped by drums. More generally, reusability and recyclability are other important factors to consider when looking to minimise waste in new product and transport packaging concepts.

Production and operations

In terms of production and operations, we develop and guarantee a safe and environmentally sound waste management approach before new processes and activities are started. This is managed through each site's obligatory waste management system, which is uniformly applied throughout the site or organisational unit. The system must ensure that there is an unbroken chain of responsibility and documentation for all waste from generation to final disposal (cradle to grave) and that we comply with applicable national and local legislation on waste. Various relevant responsibilities are covered, respectively, by the site manager, the waste producer, the site EHS manager, the Product and Process Development function, the Corporate and Site Procurement function and Divisional Management.

Production planning must consider all options of preparation for reuse and recycling (e.g., of solvents) to increase material productivity and to minimise waste streams. Waste optimisation opportunities that result from technical innovation and/or availability of recycling options are to be evaluated on a regular basis as a part of the environmental programme of each site. We are also tackling single-use plastics across our sites and operations with an ambition to replace them with eco-friendly alternatives before 2030.

Upcycling

We look to minimise waste by using recycled materials and incorporating elements of the circular economy, reusing the by-products of our processes to create additional products when we can. Upcycling, or creative reuse, guides us in

EAST HANOVER, USA

Upcycling discarded solvents

Our site at East Hanover, USA produces both liquids and naturals and our aim was to reduce both waste and greenhouse gas emissions. For liquids, the team created a process that recovers and reuses oils from washed extracts so that the discarded citrus oils can be reused for future products. In naturals, the team identified how solvents such as alcohol and ethyl acetate can be recovered and reused. These modifications resulted in 190,000 kgs of upcycled solvent/oil in a 12-month period, saving $30,000 on waste disposal fees and $616,000 on raw materials. This also saved us 108 metric tons of carbon dioxide.

Waste management & circular principles

continuing to innovate and improve our ingredients portfolio to reduce the negative impact of our products. Externally, we engage with customers to develop new products and technologies that are more sustainable in this way.

For example, in 2021 we introduced Omegablue®, a cosmetic ingredient created from upcycled wild bilberries. Traditionally used in the food industry for their juice and sugar, bilberries are also an excellent source of anthocyanidins, which are extracted from the pulp and fruit skin for the supplement and pharmaceutical industries. The tiny seeds of the berries contain up to 20% of linoleic acid (omega-6) and α-linolenic acid (omega-3) in an optimal ratio. Both are known for their capabilities to improve hydration and skin barrier functionality.

Our plastics strategy

This gave us the idea to upcycle the seeds into a natural ingredient to address skin dryness, irritation, and desquamation caused by lipid barrier damage.

Rethinking plastics – plastic circularity

We are determined to manage our use of plastics in a responsible, sustainable way. While we believe that plastic is a useful and necessary material that presents many advantages, we are concerned about its end of life and are determined to improve it. Though we intend to use plastics in our operations for the foreseeable future, we need to ensure that our approach is sustainable. Our long-term vision for sustainable plastics involves applying the principles of the circular economy and focusing on the key principles of Rethink, Reduce, Recycle.

We are committed to replacing all single-use plastics across sites and operations with eco-friendly alternatives before 2030. For our business, this means moving towards 100% plastic circularity. This requires us to be innovative in terms of plastics type, processes and technologies, as well as to rethink our business models.

When talking about plastics, we are small in quantity and high in complexity compared to the packaging industry. Our main challenges are that our plastics are complex due to their required functionality and that the products they contain may make them difficult to recycle in conventional ways. In addition, there are few relevant sources of food-grade recycled plastics available for our applications.

There is a sense of urgency in solving environmental issues, especially the ones in relation with plastics, and urgent solutions are required, but achieving 100% plastic circularity will be a long-term journey. The way forward will require business agility and the anticipation of trends. It may also require investments. This is why it is important to remain positive and resilient on the topic.

76% of all our waste in 2021 was diverted from disposal.

Anticipation is key to doing good things in a good way and we will be guided by a strategy that supports our long-term vision for sustainable plastics. This strategy is articulated around three main axes: designing our packaging to be more circular, increasing the renewable materials content and improving the system for the end-of-life of our plastics. The first step, which is integrated into each axis, is to reduce plastic usage and consumption in all our actions. Our partnerships and system tools will also be powerful enablers. We will use plastic circularity to engage employees and also as a common platform for speaking with customers.

Progress in 2021

Waste

During the course of 2021, the amount of waste sent for incineration with and without energy recovery and landfill per tonne of product increased by 9% compared to last year's figure. This is mostly due to an evolution in the product mix as well as to specific liquid discharges being separated from the wastewater flows and being treated separately. If we compare 2021 waste for disposal (waste sent for incineration with and without energy recovery and landfill) per tonne of product vs. the 2015 figure, we see a reduction of 2%. If we were to compare the same metrics in 2021 and 2015 with a like-for-like approach, performance would be even better with a reduction of 6%.

In total, we diverted 76% of all our waste from disposal in 2021. The amount of waste diverted from disposal per tonne of product has increased by 44% since 2015. The reduction of landfill is also a priority and half of our sites (31 out of 62) are without landfill waste.

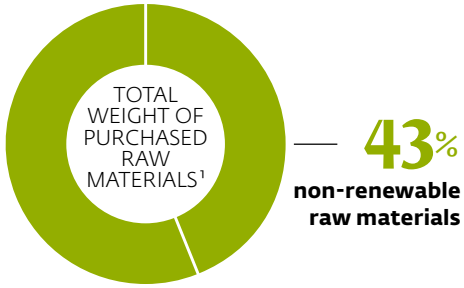
Waste management & circular principles

Plastics

Now at the beginning of our journey to 100% plastic circularity, we have a strategy and a roadmap for replacing all single-use plastics by eco-friendly alternatives by 2030. We have appointed a Global Head of Plastic Circularity, set up a cross-functional team and have drawn up new governance to facilitate the implementation of solutions in our operations. During 2021, this enabled us to develop guidelines to help our teams on the ground. We are also developing educational tools to share knowledge, learnings and information.

One of the first things we did was to increase the plastic knowledge of our teams and equip them on the topic of understanding plastics, how they are produced, used and managed at the end of the life cycle. In June 2021, at our headquarters in Switzerland, we organised a booth on plastics to spread knowledge and support teams on the best way to act at every level. With our sites worldwide, we are now preparing a toolkit on plastic that will help them to share important information on the matter. A detailed 'Plastic Book' is being prepared to better understand our detailed plastic footprint: this is essential for setting priorities, being ready for new regulations or compliance schemes, and following our progress. External partnerships can also play a role in speeding up transformation and generating benefits.

Disclosure 301 – 1
Materials used by weight or volume



1. The figures refer only to the volume of ingredients from the Cardex and the Palette used for fragrance and flavour products as shown in 2021 table below.

Weight of purchased raw materials (tonnes)	2020	**2021**
Total	**568,554**	**591,088**

Weight of purchased packaging (tonnes)[1]	2020	**2021**
Plastic	8,734	9,253
Steel/Metal	15,347	14,613
Fibre	627	226
Paper/Board	2,986	2,985
Wood	8,906	10,438
Total	**36,600**	**37,515**

1. Those figures do not include Naturex, Vika and drom.

READ MORE
2021 integrated report ▸ Our purpose commitment to responsible sourcing ▸ **pages 101–103**

Disclosure 306 – 3
Waste generated

Waste (tonnes)	2015[1]	2020 (restated)[2]	**2021[3]**
Hazardous waste	26,219	34,085	43,026
Non-hazardous waste	36,758	69,152	81,021
One-off waste[4]	2,219	2,509	2,354
Total waste	65,197	105,746	126,401

1. Assured 2015 full-year figures. These values exclude the acquisitions of Naturex, Vika and drom sites.
2. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites. These latter figures have been included in the reported values, but have not been assured by the third-party auditor.
   See the "Restatements of information" section for the restatements.
3. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.
4. This indicator measures the total quantity of waste that is not directly related to the daily operations, but is categorised as one-off waste.
   Examples of waste in this category are waste materials coming from demolition or remediation activities or waste or raw materials following an unusual incident, e.g., a fire.

Waste management & circular principles

Disclosure 306 – 4
Waste diverted from disposal

In tonnes	2015[1]	2020 (restated)[2]	2021[3]
Hazardous waste			
Preparation for reuse[4]		–	12,495
Onsite		–	3,003
Offsite		–	9,492
Recycling		–	9,150
Onsite		–	36
Offsite		–	9,114
Other recovery operations[4]		–	7,103
Total hazardous waste	**15,152**	**20,969**	**28,748**
Non-hazardous waste			
Preparation for reuse[4]		–	1,621
Onsite		–	19
Offsite		–	1,601
Recycling		–	63,814
Onsite		–	1,101
Offsite		–	19,315
Composted (offsite)[4]		–	16,420
Biogas production (offsite)[4]		–	26,978
Other recovery operations[4]		–	487
Total non-hazardous waste	**28,117**	**55,863**	**65,921**

1. Assured 2015 full-year figures. These values exclude the acquisitions of Naturex, Vika and drom sites.
2. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites. These latter figures have been included in the reported values, but have not been assured by the third-party auditor.
   See the "Restatements of information" section for restatements.
3. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.
4. This data was not collected in 2015. We started to include this category in our reporting in 2020. In the past, this treatment was included in the recycling processes.

Disclosure 306 – 5
Waste directed to disposal

In tonnes	2015[1]	2020 (restated)[2]	2021[3]
Hazardous waste			
Incinerated without energy recovery offsite	4,412	5,853	5,917
Incinerated with energy recovery	6,337	7,042	8,225
Onsite	–	–	1,529
Offsite	–	–	6,695
Landfilled (offsite)	318	221	137
Total hazardous waste	**11,067**	**13,116**	**14,279**
Non-hazardous waste			
Incinerated without energy recovery (offsite)	1,153	1,318	1,256
Incinerated with energy recovery	1,076	2,336	3,610
Onsite	–	–	0.02
Offsite	–	–	3,610
Landfilled	6,412	9,635	10,233
Total non-hazardous waste	**8,642**	**13,289**	**15,099**
Total waste	**19,709**	**26,405**	**29,378**

1. Assured 2015 full-year figures. These values exclude the acquisitions of Naturex, Vika and drom sites.
2. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites. These latter figures have been included in the reported values, but have not been assured by the third-party auditor.
   See the "Restatements of information" section for restatements.
3. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.

Water stewardship

Material topic definition

Water stewardship

Optimising the use of intake water and ensuring the quality of discharged water. Assessing and addressing water risks at owned operations and in our supply chain to minimise impact on the environment and society in the areas where we source and operate.

Purpose pillars

CREATIONS **NATURE** PEOPLE **COMMUNITIES**

Disclosure 103 – 1

EXPLANATION OF THE MATERIAL TOPIC AND ITS BOUNDARY

Shared water challenges associated with climate change and extreme weather events are likely to increase in frequency and intensity in the coming decades. Declining water quality, long-lasting droughts and increased water stress are all elements identified as material water risks faced by some of our operations and supply chains. We need to work collaboratively with our neighbours - including suppliers, local partners and communities - to address challenges at the watershed level so we can regenerate stressed watersheds and mitigate water risks.

Water is essential to our production activities and to our entire value chain. In operations, we use water primarily for hygiene and cleaning, cooling and processing. Additionally, our use of water generates wastewater, and we need to ensure that it is treated appropriately before being discharged to the environment. In our supply chain, water use is related to the raw materials that rely on agricultural irrigation and to the synthetic raw materials that require water in production.

We also recognise that access to fresh water and sanitation services are an essential human right. Therefore, we strive to protect water resources and promote global access to Water, Sanitation and Hygiene (WASH) principles, seeking to guarantee access to water to all our employees and to vulnerable communities in the areas where we source and operate.

We are confident that managing water as a precious resource and reusing it as much as possible will allow us to mitigate watershed challenges and to improve the lives of everyone along our value chain.

Driven by our purpose, we must lead the way by delivering on our own ambitious commitments while harnessing the power of collaboration across sectors to drive change. Givaudan is striving to be an industry leader in conservation and stewardship, and we look to use water in a socially equitable, environmentally sustainable and economically beneficial manner.

Boundary

- Givaudan
- Suppliers

Disclosure 103 – 2, 103 – 3, 303 – 1, 303 – 2

MANAGEMENT APPROACH

Responsible use of water is essential to the company's leadership and we believe that our business model must be fully aligned with, and contribute to, sustainable water management in the key water basins where we source and operate, particularly in high water-risk basins. We intend to champion water stewardship, working to protect water-dependent ecosystems and encouraging the sustainable use of water resources.

Our overall strategy for monitoring and reducing water consumption is embodied in our Water Policy, an approach based on the UN Global Compact's CEO Water Mandate and driven by our Purpose. The policy emphasises our commitment to water stewardship: we strive to drive a positive impact in watersheds where we source and operate. In our operations, we are looking to secure water supply and optimise water use and continuously improve how we manage effluent discharge. In our supply chain and in our communities, we are mitigating water risk and improving water quality management aspects. We look to foster sustainable water use at the watershed level and improve access to water, sanitation and hygiene, thus supporting communities to thrive. The policy is also used to guide our growth strategy in terms of location, technology and procedures. We put emphasis on places where water stress is expected, carrying out detailed risk assessments to develop water mitigation action plans, including efficiency improvements and water reuse opportunities.

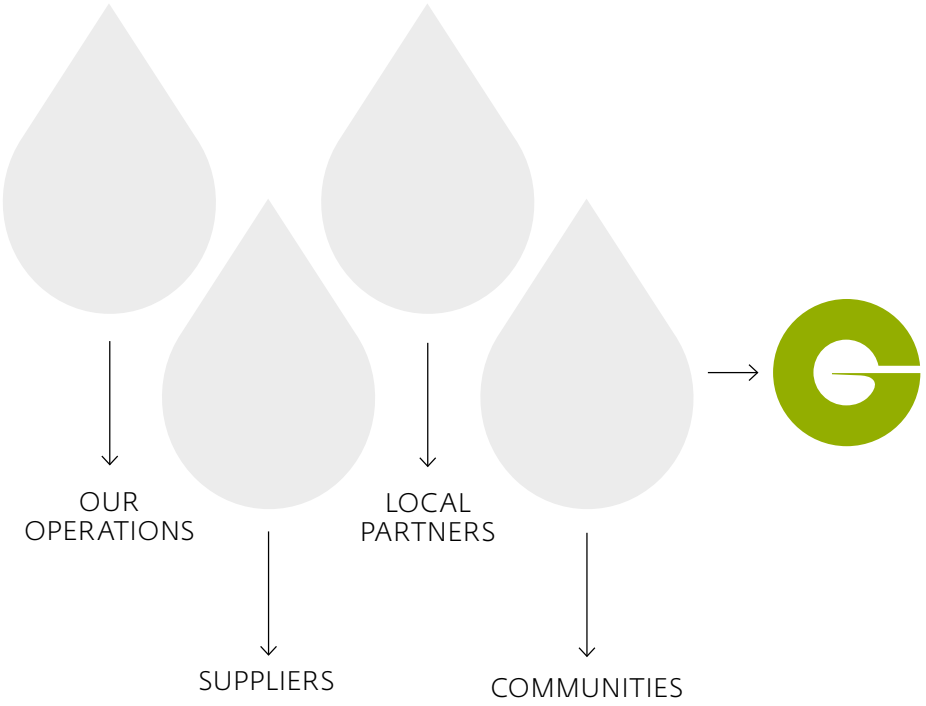
Specifically, we act as a role model in water stewardship, working to protect water-dependent ecosystems and encouraging the sustainable use of resources. In our operations, our targets are, by 2030, to improve water efficiency by 25% on sites facing water stress - defined as the ability, or lack thereof, to meet human and ecological demand for fresh water - compared to 2020 levels and continuously improve water efficiency on all other sites. A full 100% of our wastewater discharge will meet or exceed regulatory and industry standards by 2030. In our supply chain and in our communities, our goals are to improve and protect water quality and quantity in our priority natural supply chains and improve access to water, sanitation and hygiene (WASH) in vulnerable communities where we source and operate. These latter goals contribute towards the Communities goals of our purpose.

Water is a local issue and needs to be addressed locally.

Our response to increasing water challenges

SHARED WATER CHALLENGES

Droughts / Water stress / Declining water quality / WASH



Water is a precious natural resource that we are committed to protecting.

OUR OPERATIONS

Targets

- We will improve water efficiency by **25%** on sites facing water stress compared to 2020 levels
- We will continuously improve water efficiency on all other sites
- **100%** of our wastewater discharge will meet or exceed regulatory and industry standards

Means

- Drive continuous improvement to site water use by applying the 3R approach: Reduce, reuse, recycle
- Implement wastewater standard in addition to the regulatory requirements
- Conduct annual contextual water risk assessment using the Aqueduct Water Risk Atlas
- Track site water quantity and quality KPIs within our operations both for water withdrawal and water effluents

SUPPLY CHAIN AND COMMUNITIES[1]

Goals

- We will improve and protect water quality and quantity in our priority natural supply chains
- We will improve access to water, sanitation and hygiene (WASH) in vulnerable communities where we source and operate

Means

- Work in partnerships with experts and communities
- Assure all manufacturing facilities provide adequate WASH services
- Engaging with suppliers regarding their employees' access to WASH services through our Responsible Sourcing programme, Sourcing4Good and promote the use of CDP Supply chain programme to share water stewardship data and monitor suppliers' performances
- Promote regenerative agricultural practices and better use of irrigation

1. These goals contribute towards the Communities ambition of our purpose.

Water stewardship

Our targets and goals are aligned with the United Nations Sustainable Development Goals, and we focus our attention specifically on activities related and contributing to SDG 6 (Clean water and sanitation) and SDG 12 (Responsible consumption and production) to ensure we contribute to safer and more sustainable company development. Our policy also follows best practices from the UN Global Compact's CEO Water Mandate, which we endorsed in 2020.

We carry out periodic corporate risk assessments that include both water- and climate-related risks as we recognise the strong link between the two topics. This allows us to identify relevant exposures and perform analyses that are specifically related to the watershed-level context.

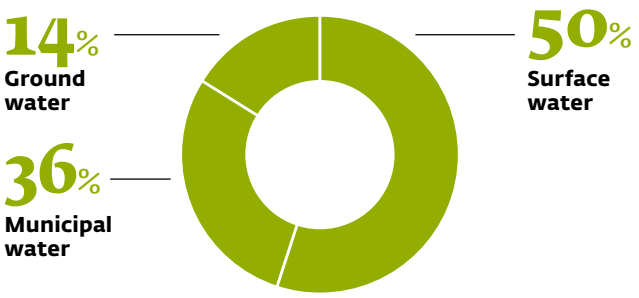
We report annually to the CDP Water Security questionnaire and strive for continuous improvement as part of our water resources management and stewardship commitments.

Water use

Our water footprint indicates that 97% of our water use can be accounted for by consumption in the supply chain. This is primarily linked to the agricultural irrigation of the natural raw materials we source. The availability and quality of water is then highly important to our sourcing as it has an impact on the quality and the availability of certain raw materials. In order to manage this impact, we leverage our engagement beyond our own operations and address the issue in our supply chains.

Onsite direct water use and energy accounts for an additional 2% of our consumption, while the final 1% is linked to logistics and packaging. The diagram below shows the distribution of our global water footprint.

Source of water withdrawal in our operations



~ 1 million m³ Water consumed

~ 10 million m³ Water withdrawed

~ 9 million m³ Water discharged

Givaudan's water consumption

Based on 2018 Corporate water footprint

Upstream activities | **Downstream activities**

Raw material	Onsite direct water use and energy	Logistics and packaging
97%	2%	1%

Operations

In our operations, we want to set clear objectives to optimise water efficiency, with a focus on water stressed areas and wastewater treatment. Our business operations are fully aligned with and contribute to the sustainable management of water in the key watershed basins in which we work. We intend to be a role model in water stewardship by working to protect water-dependent ecosystems and encouraging the sustainable use of water resources. The majority of the water withdrawal in our operations is taken from surface water; other sources are municipal supplies and groundwater.

Water stewardship

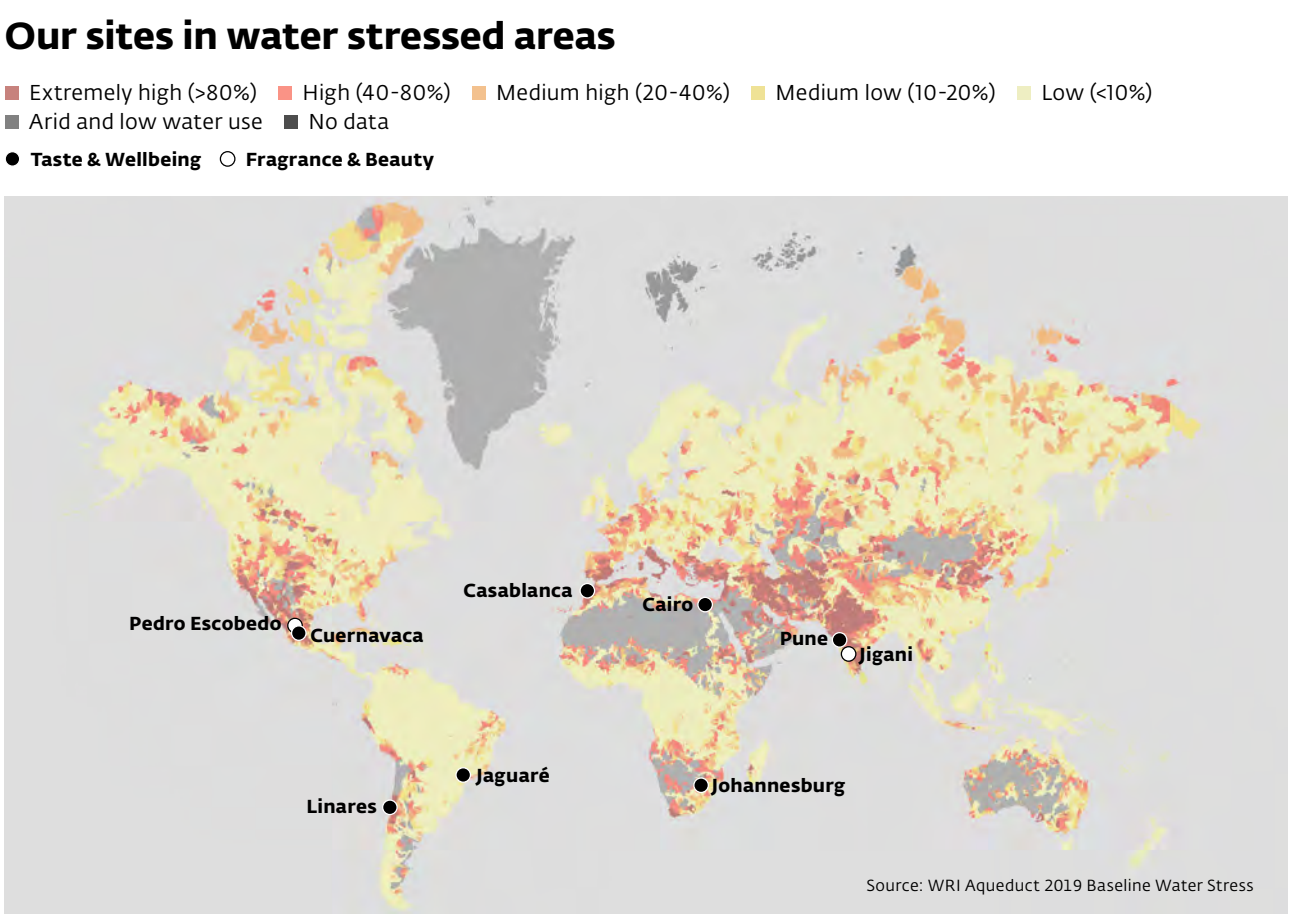
Our use of water generates wastewater, and we ensure that this water is treated appropriately before being discharged to the environment. Such treatment can range from full primary and/or secondary on-site treatment before discharge to the environment, to partial primary and/or secondary pretreatment before the wastewater is sent to third-party sewage, to direct discharge into the environment because of its flawless quality, etc. We ensure that our wastewater meets or exceeds regulatory and industry standards by monitoring parameters such as pH, chemical oxygen demand (COD), biochemical oxygen demand (BOD), fat, oil and grease (FOG), total nitrogen, total phosphorus, total organic carbon, temperature, heavy metals, etc., at least as frequently as requested by local legislation and industry standards.

On sites that are not deemed to face particular water stress, we will in any case drive continuous improvement to site water use through the 3R approach.

On all sites, we will implement our wastewater standard, highlighting requirements to be fulfilled by all sites in addition to regulatory requirements. We will also conduct annual contextual water risk assessments using the Aqueduct Water Risk Atlas developed by the World Resources Institute, and review and update the list of sites in water stress areas accordingly. We will also track site water quantity and quality KPIs within our operations for both water withdrawal and water effluents.

Our sites continually review hotspots and introduce technical improvements that drive our water efficiency strategy. We put a special focus on places facing water stress to develop mitigation action plans that include efficiency improvements and water reuse opportunities. In terms of improvements in efficiency, we first focus on the basics, looking to avoid any leakages and ensuring preventive maintenance. The next step is to look at the production processes such as CIP, overall cleanings and utilities-related consumption including water treatment, steam and cooling that use water. Once all continuous improvement opportunities have been tackled, the next move involves a step change, moving towards semi-closed or closed loops wherein the discharged water is cleaned and reintroduced as water inputs whenever possible in terms of quality, safety and cost. Our new water strategy has identified 9 sites as being in water-stressed areas.

Our sites in water stressed areas



Water stewardship

HUMA

Water management improvement

In Hungary, we first used statistical data analysis and a detailed study of the on-site water network to identify where water use was highest. The local team then implemented specific projects to optimise existing technologies in the washing process and reduce water consumption, allowing us to improve the cleaning process of equipment on site, all while using less water. By the end of the third quarter of 2021, this water consumption translated to an estimated 6.2 m³/ton, a further 6.6% reduction in specific water volume compared to the 6.6 m³/ton in 2020.

Operations water risk management

In addition to updated water risk assessments for sites located in water stress areas and the review of wastewater discharge compliance to regulatory and industry standards, we manage water risk in our operations through periodic corporate risk assessments. They allow us to identify relevant exposures and perform analyses at the watershed level. Assessments include all Givaudan production facilities and consider indicators covering aspects related to physical scarcity, quality, reputation, regulation and flooding risk. We use internal knowledge as well as criteria linked to production volume and risks in terms of water withdrawal to prioritise the facilities.

In our sites facing water stress, we drive continuous improvement in water use through a number of measures. This includes applying the 3R, or reduce, reuse and recycle approach; assessing opportunities and implementing projects to reduce our water withdrawal; applying water circularity principles in and around our production sites as well as implementing new technologies to reuse and recycle water in our operations.

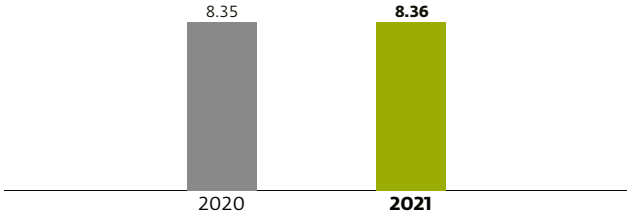
Our actions and progress

Some practical approaches to improving site water use have included switching processes that currently use municipal water to our existing cooling tower loop, meaning we were able to reduce the amount of municipal water required for cooling. Another is the installation of automatic valves to manage water needed for purging product dust from recirculating scrubber water. There are many water-saving initiatives ongoing at Givaudan sites worldwide, from on-site biological treatment of wastewater and subsequent reuse in the Netherlands to rainwater harvesting in India.

We continue to work to ensure that the wastewater from our operations is disposed of responsibly and to monitor its quality, especially through Chemical Oxygen Demand (COD) analysis, an indicator of water quality or pollution. The total quantity of COD discharged was measured at 245 tonnes in 2021, a 14% decrease over 2020.

In 2021, Givaudan's overall water intensity (municipal and ground water/tonne of product) remained flat against 2020. Focusing on the key sites located in water-stressed areas, there was important improvement with a decrease of 4% since 2020 for the same indicator.

Water efficiency[1]
In m³ per tonne of production



1. Includes third-party water (municipal supplies / purchased water) and groundwater.

In 2021, CDP again recognised our leadership in water security by giving Givaudan the highest 'A' score for the third year in a row. This recognition follows a leadership score for climate action and places the Company in the double 'A' category of best performing businesses in terms of mitigating environmental impact.

Water stewardship

Disclosure 303 – 3
Water withdrawal

Water intake (m³)[1]	2020 (restated)[2]	2021[3]
Surface water	4,923,265	5,088,104
Fresh water[4]	–	5,088,104
Other water[4]	–	0
Groundwater	1,561,661	1,390,612
Fresh water[5]	–	1,353,985
Other water[5]	–	36,627
Seawater	–	547
Third-party water – purchased water	3,205,348	3,495,105
Rainwater collected directly and stored by the reporting organization	13,200	14,099
Third-party water – wastewater from another organisation	275,828	248,004
Total water[2]	**9,979,302**	**10,236,472**

1. Assured 2015 full-year figures. These values exclude the acquisitions of Naturex, Vika and drom sites.
2. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites. These latter figures have been included in the reported values, but have not been assured by the third-party auditor.
   See the "Restatements of information" section for restatements.
3. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.
4. This data was not collected in 2015. We started to include this category in our reporting in 2020. In the past, this category was included in the surface water category.
5. This data was not collected in 2015. We started to include this category in our reporting in 2020. In the past, this category was included in the groundwater category.

Disclosure 303 – 4
Water discharge

Water discharge (m³)	2020 (restated in 2021)[1]	2021[2]
To the environment w/o biological treatment	3,832,499	4,414,878
Surface water	–	4,368,133
Fresh water	–	3,853,411
Other water	–	514,722
Groundwater	–	33,126
Fresh water	–	33,126
Other water	–	0
Seawater	–	13,619
Fresh water	–	13,619
Other water	–	0
To the environment after biological treatment	2,131,546	2,076,603
Surface water	–	1,623,716
Fresh water	–	301,124
Other water	–	1,322,592
Groundwater	–	45,127
Fresh water	–	45,127
Other water	–	0
Seawater	–	407,761
Fresh water	–	406,578
Other water	–	1,183
To external treatment facility w/o pre-treatment	790,277	751,256
Fresh water	–	551,127
Other water	–	200,128
To external treatment facility with pre-treatment	1,881,652	1,987,000
Fresh water	–	1,321,521
Other water	–	665,479
Total discharged water	**8,635,974**	**9,229,737**

1. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites. These latter figures have been included in the reported values, but have not been assured by the third-party auditor.
   See the "Restatements of information" section for restatements.
2. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.

We cannot report data on water discharge per destination because we do not currently measure it this way, but rather by treatment method and by distinguishing between what is discharged to the environment and what is sent to an external treatment facility.

Disclosure 303 – 5
Water consumption

In m³	2020 (restated in 2021)[1]	2021[2]
Water consumption[3]	1,343,328	1,006,734

1. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites.
   These latter figures have been included in the reported values, but have not been assured by the third-party auditor.
   See the "Restatements of information" section for restatements.
2. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.
3. Includes sanitary, cooling and process water.

Water stewardship

Supply chain and communities

Givaudan is acting as a role model in water stewardship, working to protect water-dependent ecosystems and encouraging the sustainable use of resources. In our communities, we want to set goals that develop watershed strategies and collaborative actions in our priority sourcing areas.

Here, we will work in partnership with experts and communities in our priority natural supply chains – defined by our Responsible Sourcing programme, Sourcing4Good – to improve and protect water quantity and quality by first identifying those that are exposed to water risks. For those identified, we will define shared water challenges and local stakeholder priorities in the watershed; explore water stewardship activity opportunities, including nature-based solutions and potential project partners and then develop an activity implementation roadmap.

We also look to improve access to water, sanitation and hygiene to positively impact the lives of communities where we operate and source through a number of measures. For instance, our EHS policy aims to safeguard adequate access to safe drinking water, sanitation and hygiene for all employees in locations under company control. We also implement our goal of ensuring all our manufacturing facilities provide adequate WASH services, including all those facilities acquired in recent years. We engage suppliers regarding their employees' access to water, sanitation and hygiene via Sourcing4Good. We also engage with communities around company operations to identify those without safe and adequate access to water, sanitation and hygiene and establish local partnerships to provide this access by 2030, including long-term maintenance.

Supply chain water risk management

We will conduct contextual watershed risk assessments using the Aqueduct Water Risk Atlas platform developed by the World Resource Institute. We will promote regenerative agricultural practices and better use of irrigation and include water aspects in our sourcing criteria. We will also engage our suppliers around water stewardship through Sourcing4Good and promote the use of CDP Supply chain programme to collect water stewardship data and monitor supplier performance.

Our supply chain water risk assessment is a metric-based methodology that characterises our corporate water footprint in terms of water risks. This assessment allows us to identify hot spots in our main supply chains and gives us a clear understanding of the risks and impacts encountered. In addition to quantifying the total water consumption of our activities, this study also quantifies the water scarcity footprint along the Givaudan value chain. This data is consolidated with internal expertise from our sourcing team to make sure we integrate specific contextual aspects that can influence the risk level in some specific watersheds. This assessment allows us to set priorities for reducing water use and develop a mitigation plan.

To better understand our supply chain water risk, Givaudan collects primary data information from our main suppliers to be used with the supply chain water risk assessment. We foster an improvement in water management and enhanced water risk identification through the promotion of data reporting in our supply chain. Our Responsible Sourcing policy guides suppliers to comply with local wastewater treatment regulations, urging them to reduce their impact on watersheds where they operate in terms of aspects including water scarcity, quality and stress.

Our actions and progress

We engage with our suppliers to advance the water stewardship journey. We ask for information on their relevant accounting systems, for details on their water management strategy such as governance and targets, and for examples of actions they have taken to reduce their impact. This information can be used by our procurement team to better understand the challenges the suppliers are facing and make sure they implement the appropriate mitigation measures. This can also help less advanced companies identify risks to avoid disruption and these questionnaires indirectly impact their water management. At any level of maturity, we expect the supplier to improve in the following years.

Overall, Givaudan looks to champion best practices across the value chain, leveraging our influence with business partners and suppliers to promote good water management. We want our strategic suppliers to move beyond simply reporting water accounting information and into active management. This is why we work together to help them understand their water impact and then take action to reduce it. We measure the success of our engagement in terms of supplier actions that demonstrate improvement year on year.

For instance, we participated in the CDP Supply Chain programme, using its water security questionnaire to request a variety of information from our key suppliers on relevant risks and opportunities. Our supplier response rate this year was 67% (80/120 responded), up by 16% from 2020. In 2021, an additional 12 suppliers have shown engagement by responding to the programme at our request. In 2021, 95% of our respondents reported having a companywide water policy, but only 6.1% report an active basin level target. This is part of our potential focus for engagement with suppliers along with other information extracted from the CDP Supply Chain programme.

Biodiversity

Material topic definition

Biodiversity

Contributing to the conservation of biodiversity and the preservation of a rich diversity of natural ingredients (for example, through reforestation programmes) as well as a balanced ecosystem in and around related growing and harvesting communities.

Purpose pillars

CREATIONS **NATURE** PEOPLE COMMUNITIES

Disclosure 103 – 1

EXPLANATION OF THE MATERIAL TOPIC AND ITS BOUNDARY

Biodiversity is essential for the survival of all species and it is the natural heritage we leave as a legacy for future generations. Experts highlight an unprecedented rate of biodiversity loss, noting that a million species of plants and animals are now close to extinction. We are fully aware of this urgency, the direct consequences for humanity and, consequently, our industry. We are actively working to reduce our impact or even nullify it by assessing and monitoring each step of our activity throughout the life cycle of our products.

Givaudan could not exist without a steady supply of more than 11,000 ingredients from across the globe, natural resources used in the creation of our Taste & Wellbeing and Fragrance & Beauty products. Our activities depend on biodiversity, as do the many communities we work with and look to support. A combination of protection, sustainable management and, where necessary, restoration is then needed to ensure the future of a diverse, living planet.

We believe that our activities can have the greatest impact on biodiversity in terms of SDG 15, "Life on Land," SDG 2 "Zero Hunger" and SDG 17, "Partnerships for the Goals." Our efforts in biodiversity help protect, restore and promote sustainable use of terrestrial ecosystems and promote food security and sustainable agriculture. Our partnerships serve to strengthen the means of implementation.

Boundary

- Givaudan
- Raw material suppliers

Disclosure 103 – 2, 103 – 3

MANAGEMENT APPROACH

Givaudan is a purpose-driven company and our approach to the topic of biodiversity is embedded in these guiding principles. Nature is an integral part of our purpose, expressed in the statement "Imagining together that we show our love for nature in everything we do." Moreover, Givaudan has set an ambition to become a certified B Corporation (B Corp), a designation reflecting the highest standards of environmental performance.

Givaudan supports the terms of the Convention of Biological Diversity: the conservation of biological diversity; the sustainable use of the components of biological diversity, and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources. The Nagoya Protocol implements Article 15 of the convention, which covers access to genetic resources – and associated traditional knowledge – and the sharing of monetary and nonmonetary benefits linked to their use. We are identifying the potential implications of the Nagoya Protocol and its access and benefit sharing (ABS) framework on our activities in order to comply with all our obligations. Givaudan has developed comprehensive policies that recognise the need to protect the environment and its natural resources, in particular Givaudan's Principles of Conduct, Givaudan's EHS Policy on Safety and Environmental Protection and Responsible Sourcing.

Biodiversity has therefore been integrated into the company's global approach, is supported by management through the purpose, and is gradually being deployed throughout the organisation. Generally, our approach to biodiversity in our day-to-day work can be summed up in the steps of avoiding negative impacts, or reducing them when this is not possible, regenerating the environment, and inspiring the different stakeholders we work with. We take the global life cycle of our products into account, from sourcing our raw materials responsibly and sustainably, to treating our waste and water and managing our consumption and emissions.

Internally, Environmental sustainability teams, EHS and Green Teams carry out projects that support climate action, water stewardship and waste management all over the world.

Externally, we work with our supply chain through Responsible Sourcing and Procurement actions as well as through the Regulatory Affairs & Product Safety Department. We continually assess the potential impact of biodiversity laws worldwide, including access- and benefit-sharing legal frameworks inspired by the Nagoya protocol principles. We have implemented key programmes to manage the assessment of our procured, manufactured and research & development raw materials activities to ensure we comply with regulations on conservation, sustainable use and fair and equitable sharing of benefits arising from the use of genetic resources. We also discuss aspects of sustainability, including biodiversity, with our customers and surround ourselves with experts particularly well versed in specific issues. Participating in industry platforms and think tanks allows us to act together on certain aspects related to biodiversity.

Biodiversity

It is part of our business, as well as our responsibility, to join forces with local stakeholders to preserve the equilibrium of the landscapes from which we source. This year, we have launched a strengthened responsible sourcing programme, Sourching4Good, which outlines our commitments in favour of promoting biodiversity even more clearly. We look, for example, to "Reduce environmental impacts and promote biodiversity" in areas including land use and soil health, good stewardship and limitation of hazardous substances, water management, waste management and animal welfare. Sourcing4Good requires all suppliers of raw materials to conserve biodiversity.

Approaches to conserving species include verification in the field via third-party audits. They examine the preservation and sustainable use of biodiversity and support best management practices and climate adaptation strategies that can help preserve yield and income as well as sustain the long-term viability of complex or simple value chains of smallholder farmers, big players, traders and transformers. The recent integration of the Agronomy Department into the Origination team will also help us to achieve these goals and promote nature-based solutions, scaling their implementation through selected supply chains.

We can already point however to a transversal tool in the launch of the Naturality platform, meant to help facilitate responsible fragrance design and promote the use of fragrances that are respectful to nature.

Surrounding ourselves with experts, exchanging with our customers on aspects of sustainability and being part of industry platforms, we strive to strengthen our approach and inspire players in the industry.

Disclosure 304 – 1

Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas

Aromasur, one of our extraction and distillation sites, is located in a protected area in the Sierra Norte Natural Park, to the north of Seville, Spain. The production factory, which is approximately 26,000 m² in area, opened in 1974 and was acquired by Albert Vieille in 1991. Aromasur is located within, but on the edge of, a space recognised by several protection figures as sharing geographical boundaries with the following areas (the biosphere reserve is an exception as there is more extensive overlap):

- Sierra Norte de Sevilla "Natural Park" (Andalusian regional network of protected natural areas – RENPA).
- Sierra Norte de Sevilla "Special Area of Conservation" -SACs- (EU Red Natura 2000; under Habitat Directive).
- Sierra Norte de Sevilla "Special Protection Areas" -SPAs (EU Red Natura 2000; under Birds Directive).
- Sierra Norte de Sevilla "Global Geopark" & "European Geopark Network" (UNESCO & EU).
- Dehesas de Sierra Morena "Biosphere Reserve" (UNESCO).

The historical development of regional, national and community environmental policy has established this series of protection categories, which go beyond the criteria defined by the International Union for Conservation of Nature. This protected area constitutes one of the best and most extensive representations of Mediterranean ecosystems in Europe. Forms of agro-livestock and forestry management coexist and the regions are characterised by a high degree of sustainability. There are a multitude of threatened and protected species, especially birds, and forest habitats, from natural forests to the actual "dehesas", agrosilvopastoral systems, where trees, native grasses, crops, and livestock interact positively under management. These forests are subject to an ancestral method of management that makes use of natural resources and diversification of land use compatible, without undermining ecosystem processes and natural values in the broadest sense.

Disclosure 304 – 2

Significant impacts of activities, products, and services on biodiversity

Our significant impacts are likely to be linked to our ingredient supplies and indirectly through our activities.

Water, effluents, waste and GHG

We strive to meet the twin challenges of climate change and biodiversity loss because they are intimately linked. Biodiversity is impacted by the effects of climate change, but can also serve as a means of mitigation and adaptation to its consequences. High biodiversity can help with the capture and storage of greenhouse gases by increasing the productivity of systems over the long term, by regulating air and water quality, soil fertility, fighting against diseases and reducing the impacts of extreme climatic events.

Land use, agricultural and collection practices

The establishment of factory, agricultural plots, cultivation and collection practices are also likely to impact biodiversity. We encourage practices that promote and preserve soil fertility, preserve and enhance soil biodiversity and improve soil water management including sustainable management of hazardous substances. We promote animal welfare as well. Thanks notably to our Agronomy team, we work with our suppliers on these aspects in order to ensure and support them if necessary in the implementation of good practices through various actions as explained in the following paragraphs.

Biodiversity

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Habitats protected or restored

Our best practices approach from field to process has inspired initiatives to preserve biodiversity in different areas and they have resulted in significant improvement. Work with our suppliers on our sourcing policy, appropriate land use and good agricultural, collection and process practices have contributed to this progress as have biodiversity enhancing programmes in specific and prioritised supply chains as detailed below by core topic.

Promoting good agricultural and collection practices

We have dedicated projects in materials such as patchouli, turmeric, guarana and jasmine that include training in good agricultural practices, safe plant protection measures and compost management. Such projects have an impact on several thousand smallholders.

Domestication of wild resources to mitigate our impact

The Agronomy department works on the cultivation of raw materials generally taken from the wild such as rosemary, reducing our impact and ensuring good cultivation practices.

Addressing deforestation and ecosystem conversion

Most biodiversity loss is taking place in tropical forests, including rainforests. We address specific issues of biodiversity preservation such as those related to deforestation through a number of approaches.

1. Forest conservation with tonka bean collectors

The Givaudan Foundation, through an agreement with Conservation International, supports a programme aimed at improving local livelihoods and protecting the forest in the Caura basin in Venezuela. The local communities are part of a conservation agreement by which they receive support and guidance on techniques for the handling and selling of beans. In exchange, they commit to actions preserving the flora and the fauna of their ecosystem. They patrol the 150,000 hectares of the conservation area and control the expansion of the agricultural frontier in the forest. They also survey several animal species such as the American tapir, jaguar, or spectacled caiman because they serve as key indicators of the ecosystem's health.

2. Palm oil position statement

In 2020, we introduced our palm position statement in which, among other things, we emphasise our commitment to non-deforestation, including "No Deforestation, No Peat, No Exploitation (NDPE)" principles. We are also co-funding projects targeting sustainability issues at the beginning of our palm supply chains in Indonesia and Malaysia in collaboration with Earthworm Foundation and other companies.

3. Dairy Working Group

To best cover our cheese and butter supply chains, we are members of the SAI Platform's Dairy Working Group and so collaborate with dairy supply chain actors. This includes Givaudan, as well as some of our suppliers and customers. This year, this group has launched the SDP, which is an approach that buyers will use to ask suppliers to report on their progress in sustainability at farm level. This SDP covers multiple sustainability topics including deforestation.

4. Preserving natural resources through efficient process

We continued work on reducing fuelwood consumption and replanting fuelwood trees in the distillation of key ingredients such as ylang ylang and patchouli.

5. French Alliance pour la Préservation des Forêts

Since 2013, Givaudan has been a member of APF, a food sector initiative that addresses the challenge of deforestation and ecosystem conversion within raw material supply chains. Missions of APF include communicating issues associated with deforestation and development within the concerned sectors; serving as a platform for interaction and collaboration between private players and other stakeholders and, finally, supporting its members in the practical implementation of their commitments by facilitating the pooling of tools and the conciliation of approaches both up- and downstream.

Supporting the conservation of diversity of species

We have been collaborating for about a decade with the University of California, Riverside (UCR) to support the care and preservation of one of the world's most extensive, unique and diverse citrus collections from the impending threat of citrus greening disease, also known as Huanglongbing, or HLB. The collection includes 1,000 varieties of citrus fruits from around the globe.

Environmental performance indicators

	Key performance indicators	2015 (restated in 2021)[1]	2020 (restated in 2021)[2]	2021[3]
Energy				
Energy (GJ)	Direct energy consumption primary sources[4]	1,710,865	2,444,093	2,511,855
	Indirect energy: purchased electricity & steam	977,021	1,307,527	1,299,385
	Total energy	**2,687,886**	**3,751,620**	**3,811,240**
Energy efficiency (GJ/tonne of production)	Direct energy efficiency	4.44	4.28	4.30
	Indirect energy efficiency	2.54	2.29	2.22
	Total energy	**6.98**	**6.57**	**6.52**
Emissions				
GHG emissions (tonnes)				
Scope 1	From direct energy sources[5]	139,374	133,707	139,608
	From biogenic sources[6]	4,700	3,925	3,574
Scope 2	From indirect energy sources[5]	106,879	54,075	31,090
	From biogenic sources[6]	0	1,333	397
	Total scope 1 + 2 GHG emissions direct and indirect	**246,253**	**187,782**	**170,698**
	Total scope 1 + 2 GHG emissions biogenic	4,700	5,257	3,971
Scope 3	Purchased good and services	1,917,037	1,901,374	1,902,794
	Raw materials	1,691,701	1,676,242	1,677,400
	Other Indirect materials & services categories (excluding existing categories)[7]	146,856	132,686	133,055
	Packaging	78,480	92,446	92,339
	Capital goods[7]	51,722	72,797	56,003
	Fuel- and energy-related activities	105,744	68,001	36,349
	Upstream transportation and distribution	29,674	42,320	39,990
	Waste generated in operations	19,321	22,644	24,084
	Business travel	24,461	12,587	1,794
	Employee commuting	21,516	20,454	13,277
	Downstream transportation and distribution	54,615	56,099	65,297
	Outbound product to customers	39,503	38,172	42,343
	Outbound intercompany deliveries	15,112	17,927	22,954
	Total scope 3 GHG emissions	**2,224,090**	**2,196,276**	**2,139,587**
Total GHG emissions (excluding biogenic emissions)		**2,470,343**	**2,384,058**	**2,310,285**
GHG emissions efficiency (tonnes of GHG/tonne of production)[8]	Scope 1: from direct energy sources (excluding biogenic)	–	0.23	0.24
	Scope 2: from indirect energy sources (excluding biogenic)	–	0.09	0.05
	Total GHG emissions	**–**	**0.33**	**0.29**

Environmental performance indicators

	Key performance indicators	2015 (restated in 2021)[1]	2020 (restated in 2021)[2]	2021[3]
Waste				
Hazardous waste (tonnes)	Preparation for reuse[9]	–	–	12,495
	Recycling	–	–	9,150
	Other recovery operations[9]	–	–	7,103
	Total hazardous waste diverted from disposal by recovery operation	**15,152**	**20,969**	**28,748**
	Incinerated without energy recovery offsite	4,412	5,853	5,917
	Incinerated with energy recovery	6,337	7,042	8,225
	Landfilled	318	221	137
	Total hazardous waste directed to disposal by disposal operation	**11,067**	**13,116**	**14,279**
	Total hazardous waste	**26,219**	**34,085**	**43,026**
Non-hazardous waste (tonnes)	Preparation for reuse[9]	–	–	1,621
	Recycling	–	–	63,814
	Recycling	–	–	20,416
	Composted	–	–	16,420
	Biogas production	–	–	26,978
	Other recovery operations[9]	–	–	487
	Total non-hazardous waste diverted from disposal by recovery operation	**28,117**	**55,863**	**65,921**
	Incinerated without energy recovery	1,153	1,318	1,256
	Incinerated with energy recovery	1,076	2,336	3,610.02
	Landfilled	6,412	9,635	10,233
	Total non-hazardous waste directed to disposal by disposal operation	**8,642**	**13,289**	**15,099**
	Total non-hazardous waste	**36,758**	**69,152**	**81,021**
Total incinerated and landfilled waste (HZ and NHZ, tonnes)		**19,709**	**26,405**	**29,378**
Waste efficiency (kg/tonne of production)[10]		**51.2**	**46.2**	**50**
One-off waste (tonnes)[11]		**2,219**	**2,509**	**2,354**
Total waste (tonnes)		**65,197**	**105,746**	**126,401**

Environmental performance indicators

	Key performance indicators	2015 (restated in 2021)[1]	2020 (restated in 2021)[2]	2021[3]
Water				
Water intake (m³)	Surface water	5,006,361	4,923,265	5,088,104
	Groundwater	1,390,267	1,561,661	1,390,612
	Seawater	–	–	547
	Third-party water - purchased water	2,359,818	3,205,348	3,495,105
	Rainwater collected directly and stored by the reporting organisation	13,249	13,200	14,099
	Third-party water - wastewater from another organisation	259,727	275,828	248,004
	Total water withdrawal[12]	**9,029,422**	**9,979,302**	**10,236,472**
Water efficiency (m³/tonne of production)[13]		**9.74**	**8.35**	**8.36**
Water discharge (m³)	To the environment w/o biological treatment	–	3,832,499	4,414,877.87
	To the environment after biological treatment	–	2,131,546	2,076,603.46
	To external treatment facility w/o pre-treatment	–	790,277	751,255.64
	To external treatment facility with pre-treatment	–	1,881,652	1,987,000.33
	Total water discharge	**–**	**8,635,974**	**9,229,737.30**
Water consumption (m³)	Water consumption	–	1,343,328	1,006,734.44
COD (tonnes)	COD load of water discharged to the environment	–	284.50	245.19
Other data				
	Nitrogen oxides – NO_x (tonnes)[14]	–	66.71	69.28
	Sulphur dioxide – SO_2 (tonnes)[14]	–	96.84	98.37
	Volatile organic compounds (tonnes)	–	1,018.46	1,069.22
	CFC inventory (kg)	–	7,639	3,881.41
	CFC[11] equivalent inventory (kg)	–	783	574.00
	CFC loss-replacement (kg)	–	765	525.62
	CFC[11] equivalent loss/replacement (kg)	–	42	28.91
Production				
	Production quantities (tonnes)	385,189	571,141	584,154.76

1. Assured 2015 full-year figures.
   For Scope 1, 2 and 3 these values include the acquisitions of Naturex, Vika and drom sites.
   See the "Restatements of information" section for restatements.
   For all other figures, these values exclude the acquisitions of Naturex, Vika and drom sites.
2. Assured 12-month rolling figures (Q4 2019 to Q3 2020) for values excluding the acquisitions of Naturex, Vika and drom sites.
   These latter figures have been included in the reported values, but have not been assured by the third-party auditor.
   See the "Restatements of information" section for restatements.
3. Assured 12-month rolling figures (Q4 2020 to Q3 2021) for values including the acquisitions of Naturex, Vika and drom sites.
4. For 2021 includes natural gas (0.0336 GJ/m³), light fuel (39.5904 GJ/m³), heavy fuel (40.1759 GJ/m³), Liquid Petroleum Gas (24.6719 GJ/m³), town gas (0.0254 GJ/m³), waste used as energy source (22.5000 GJ/m³), biofuel (33,1080 GJ/m³), biogas (0,0342 GJ/m³), biomass (0,0116 kg/GJ), geothermal energy (0.0036 GJ/kWh), deducting steam sold (3.0750 GH/tonnes).
5. Including emissions from CH_4 and N_2O from usage of biomass/biofuels.
6. Including emissions from CO_2 from usage of biomass/biofuels.
7. This two categories do not include data for the recent acquisitions of Naturex, Vika and drom.
8. Includes only scope 1 and scope 2.
9. This data was not collected in 2015. We started to include this category in our reporting in 2020.
   In the past this treatment was included in the recycling processes.
10. Includes incinerated with and without energy recovery and landfilled waste (HZ and NHZ).
11. This indicator measures the total quantity of waste which is not directly related to the daily operations, but is categorised as one-off waste.
    Examples of waste in this category are waste materials coming from demolition or remediation activities or waste or raw materials following an unusual incident, for instance a fire.
12. Includes sanitary, cooling and process water.
13. Includes third-party water (municipal supplies / purchased water) and groundwater.
14. Quantity is calculated by multiplying the annual fuel consumption by the corresponding emission factor for fuel type.

Environmental performance indicators

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Restatements of information

Explanation

Over the year we may face changes in data or calculation methods that impact data that has already been published. We therefore restate the data, both to provide a meaningful comparison between years for environmental performance and to monitor key performances indicators.

Baseline recalculation

In order to enable a meaningful comparison of environmental performance over time, Givaudan has established a standard process, based on the GHG Protocol, to recalculate its baseline indicators in case of structural changes such as acquisitions, changes in calculation methodology or inventory boundaries.

This allows us to compare performance on a like-for-like basis over time. The process includes definitions of recalculation triggers and the process of reporting the information. Thanks to this guidance, Givaudan is able to track its environmental performance in a transparent manner and with confidence that the data are accurate despite changes related to business growth.

Baseline years

In this report we use two baseline years to show our performance indicators, 2015 and 2020. The GHG emission science-based targets were set against a 2015 baseline and water targets have a baseline of 2020. Our waste ambition has a baseline of 2020.

In this report, the baseline recalculation applies only to GHG emission numbers as these are the only absolute targets published by the Company. To consider the impact of 2015 and all subsequent acquisitions, we recalculated the 2015 baseline.

Reasons for change

General

The majority of the changes are due to the impact of integrating information from recently acquired companies Vika, Naturex and drom into our baseline and past-year data. We also restate data when we identify corrections that must be reflected in the past performance or when we use a new calculation or measurement methodology for certain indicators. This is done with the aim of keeping the data consistent and comparable over time.

Business travel

This year we recalculated the baseline for Business travel & employee commuting using the number of employees of our acquisitions as a proxy indicator based on the performance in 2015 of CO_2e/employee. We applied the same principles for 2020 data.

Fuel- and energy-related activities

This year, we recalculated the baseline for fuel and energy related activities using the total amount of energy consumed by our recent acquisitions as a proxy indicator based on the performance in 2015 of CO_2e/GJ for the whole category.

Employee commuting

This year we recalculated the baseline and improved our model. We recalculated the baseline using the number of employees of our acquisitions as a proxy indicator based on the performance in 2015 of CO_2e/employee per category. In parallel, we integrated new emission factors from DEFRA data base for 2015, 2020 and 2021 to best reflect the performances of our employees. This new modelling led to minor changes in terms of performance and this category continues to reduce its impact every year.

Packaging & Upstream and downstream transportation

This year we recalculated the 2015 baseline for Packaging & Upstream and downstream transportation using the production tonnage of our acquisitions as a proxy indicator based on the performance in 2015 of CO_2e/production tonnage per category. We applied the same principle for the 2020 data.

Waste treatment

This year we recalculated the 2015 baseline for scope 3 emissions from waste treatment using the production tonnage of our acquisitions as a proxy indicator based on the performance in 2015 of CO_2e/production tonnage for this category.

For 2020, we used the waste data collected directly from the acquisitions and integrated them in the model.

Raw materials

This year we recalculated the baseline for our Raw materials category including all acquisitions since 2015 on our scope 3 calculation model. We used the proportion of raw materials volumes purchased through the acquisitions as a ratio for calculating their impact on the baseline. We specifically applied our average dairy category emission factor for part of our portfolio as it best reflects the nature of the material purchased. We otherwise used the average Givaudan 2015 CO_2e/kg of raw materials. We applied the same principle for the 2020 data.

Direct energy (from primary sources) and Direct energy efficiency

Since 2015, data for primary and indirect energy has been shown without the acquisitions. The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites have also been included.

Environmental performance indicators

Indirect energy (purchased electricity & steam) and Indirect energy efficiency
Since 2015, data for primary and indirect energy has been shown without the acquisitions. The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites have also been included.

GHG emissions (Scope 1) and GHG emissions efficiency (Scope 1)
The change for 2015 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom.

The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites' fuel consumption, which impact the emissions calculation directly, have also been included.

For both years, there has also been a minor change due to the improvement of biogenic vs. non-biogenic emissions reporting. CH_4- and N_20-related emissions are now in the scope of non-biogenic emissions, whereas CO_2 related emissions are included in the biogenic category.

GHG emissions (Scope 2) and GHG emissions efficiency (Scope 2)
The change for 2015 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom.

The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites' fuel consumptions, which impact the emissions calculation directly, have also been included.

For both years, there has also been a minor change due to the improvement of biogenic vs. non-biogenic emissions reporting. CH_4- and N_20-related emissions are now in the scope of non-biogenic emissions, whereas CO_2 related emissions are included in the biogenic category.

Hazardous waste, Total incinerated and landfilled waste and Waste efficiency
The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites have also been included.

Non-hazardous waste (Recycling, Incinerated and Landfilled)
The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites have also been included.

One-off waste
The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites have also been included.

Water intake Third-party water
The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites have also been included.

Water discharge to external treatment facility with and without pre-treatment
The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites have also been included.

NO_x and SO_2
The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites' energy consumption have also been included.

In addition, we have used the NO_x and SO_2 emission factors related to new fuels, updated in 2021, for 2020 to ensure better data comparability.

Volatile organic compounds
The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites have also been included.

CFC inventory and CFC loss-replacement
The change for 2020 is mostly due to the integration of the values from the acquired sites of Naturex, Vika and drom. Some spontaneous corrections of past reported data for Givaudan historical sites have also been included.

Environmental performance indicators

Emission calculation methodologies

Scope 3 model evolution

The modelling of scope 3 carbon emissions is an iterative process based on science that is still evolving. We started our efforts in this area in 2017 with our first full scope 3 inventory based on financial activity data using the so-called ESHER model. This is an extended multi-regional input-output model based on Global Trade and Analysis Project (GTAP) data in addition to internal modelling for categories like business travel, packaging, waste and transport.

Since then, the model has gone through several evolutionary steps. We have begun modelling our raw material with a process-based approach that applies the best available proxy data from verified generic databases like ecoinvent or our own LCA data. We have also added granularity and accuracy through the inclusion of additional packaging categories and new classes of travel for business trips. We are continuing with the evolution of our model by implementing more details on the concentration of our product, integrating allocation principles and taking dedicated proxies for the main processes in our supply chain into account.

These modifications all imply potentially important changes, either increases or decreases, in the data and the modelling of our scope 3 emissions. This is a necessary part of the journey and we will be sure to recalculate our baseline accordingly, as required by the GHG protocol.

We actively advocate for more transparency and alignment in this area, as was done decades ago for financial reporting, by participating in several relevant initiatives such as the WBCSD pathfinder of the TfS (Together for Sustainability) workstream on scope 3 emissions.

Purchased goods and services

Raw materials

For Natural and Synthetic raw materials, figures are estimated according to process-based modelling using individual modelling per substance and considering all physical inputs (energy, fertilisers, etc.). The model allows us to identify the carbon footprint of each substance using its weight (kg) and the most accurate emission factors. Emission factors are based on data from global generic Life Cycle Inventory databases (ecoinvent, World Food LCA Database) and internal primary data. Specific emission factors are used for substances representing the highest volume purchased. Proxies have been extrapolated for others. The model has been applied on purchased data from 2015, 2020 and 2021, which allows us to establish the current performance and the 2015 baseline. The baseline is recalculated for the acquisition according to the GHG protocol standard using the amount of raw material purchased by the acquired entity.

Indirect material and services

For other Indirect materials & services categories (excluding existing categories), figures are calculated through the ESCHER model – an extended multi-regional input-output model based on Global Trade and Analysis Project (GTAP) data – on the basis of financial values of materials purchased during 2015 and the country of origin. The 2021 GHG emission figure was then calculated by using the 2015 ratio between spend and GHG emissions and extrapolating to the 2021 spend figure.

Packaging

For packaging materials, the figure was calculated by extracting the number of units used for each type of packaging used at Givaudan from the Company's ERP database. This number was multiplied by the carbon footprint figure for the type of packaging (as received from suppliers or in publicly available databases). The totals for each type of packaging were consolidated to give a total Givaudan figure.

Capital goods

The figures are calculated through the ESCHER model on the basis of financial values of hardware purchased during 2015. The 2021 GHG emission figure was calculated by using the 2015 ratio between spend and GHG emissions and extrapolating to the 2020 spend figure.

Fuel-and-energy-related activities (not included in scope 1 or 2)

The calculation considered the primary energy carriers for the production of heat, electricity and steam, and the technology standard in the countries of the respective sites. The data basis for the life-cycle inventory is the ecoinvent database 3.6 (method: IPCC 2013, 100 years). The scope 3 emissions were estimated directly through the analysis of the respective ecoinvent datasets by subtracting scope 1 and 2 emissions from overall emissions. Scope 3 emissions for the delivery of electricity (infrastructure, grid losses and direct emissions) have also been accounted for.

Upstream transportation and distribution

We monitor the environmental impact of transportation (air, ship and road) by calculating the associated GHG emissions. We do this through a model that tracks all transport movements through our SAP system (by mode of transport), from delivery to receipt locations of raw materials. To calculate the GHG footprint, we use emission factors per mode of transport according to the Cefic (European Chemical Industry Council) guideline.

We have integrated recent acquisitions for which we did not have data in SAP by using production tonnage proxy to extrapolate their impacts.

Environmental performance indicators

Downstream transportation and distribution

We monitor the environmental impact of transportation (by air, ship and road) by calculating the associated GHG emissions. We do this through a model that tracks all transport movements through our SAP system (by mode of transport), from delivery to receipt locations of intercompany deliveries and deliveries to customers. To calculate the GHG footprint, we use emission factors per mode of transport according to the Cefic guideline.

We have integrated recent acquisitions for which we did not have data in SAP by using production tonnage proxy to extrapolate their impacts.

Waste generated in operations

Emission factors on a per tonne waste basis (as extracted from scope 3 guidance documents from WBCSD + WRI) have been multiplied with the total weight of waste generated at our manufacturing locations. The scope of the calculation covers waste to landfill and to incineration.

Business travel

Data on distance travelled are collected through our global and local travel agencies. To calculate the GHG footprint, emission factors per haul and class are used according to the 2021 Department for Environment, Food and Rural Affairs (Defra, UK) definition. We use the Emission factor including the RF effect.

Employee commuting

The reported 2021 figure is based on our new employee commuting survey/questionnaire, which was conducted for the fourth time. This year we also adapted our model so it includes the Defra emission factors for 2015, 2020 and 2021 for the respective survey. We collected information from about 7000 employees on commuting habits by including mode of transport and distance covered. The GHG emissions related to the category are calculated by multiplying the distance per dedicated mode of transport emission factors (according to Defra's GHG conversion factor). The total emissions are then extrapolated for all employees including the recent acquisitions integrated in the report. In light of the COVID-19 pandemic situation, we included parameters allowing us to collect information on commuting restrictions so we can compare regular performance and include the impact of the pandemic in this category. The next survey is planned for 2024.