Emissions calculation methodologies

Givaudan

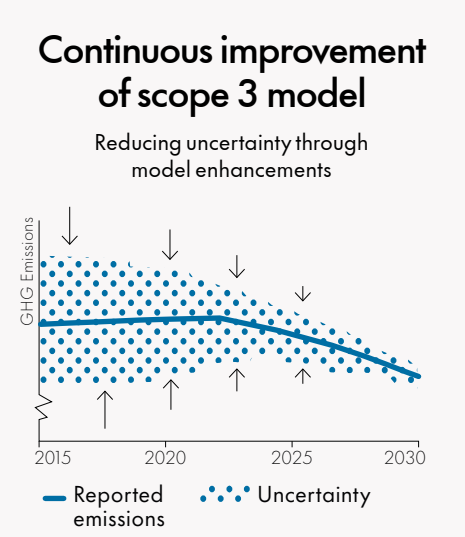
Human by nature

Emissions calculation methodologies

Scope 3 model enhancement

The modelling of scope 3 GHG emissions is an iterative process based on science that is still evolving. We continue working on enhancements with a continuous improvement approach mindset to make sure that our scope 3 model is ever more accurate and robust over the years. We started our efforts in 2017 with our first full scope 3 inventory based on financial activity data (input/output model) using the so-called ESHER model, which has since gone through several evolutionary steps. For raw materials, which is the biggest category of our scope 3 emissions, we have begun modelling with a process-based approach that applies the best available proxy data from verified generic databases. Focus has now been on replacing proxy data with primary vendor material-specific data and an important acceleration in this direction has taken place in the last few years. We also reviewed and updated the emission factors for the categories Indirect material and services, Capital goods, Fuel- and energy-related activities (not included in scope 1 or 2), Upstream and downstream transportation and distribution, and Waste generated in operations. All emissions calculations have been rebaselined accordingly.

The raw material model remains the focal point of our improvement efforts because this category represents the majority of our scope 3 emissions. The portfolio of ingredients that we purchase is extremely diverse, and we need to understand the GHG emissions of our direct suppliers, but also of all the upstream emissions in the value chain. This data is not always readily available in generic databases such as EcoInvent or the WFLDB, and furthermore, these databases remain generic and thus contain an inherent uncertainty that extends into our corporate footprint. Although the use of these databases remains the standard across the industry, we work year on year to improve the quality and representativeness of our datasets. This qualitative improvement is important because it is not possible to reflect the impact of our reduction projects through purely generic data.



In 2024, we made important improvements by creating robust datasets to model certain key raw materials with better granularity. We have also started a PCF collection campaign with our suppliers, leveraging SiGreen (see scope 3 story). 2024 marks the first year we have tracked FLAG and non-FLAG emissions separately. This gives us better visibility on different GHG contributors in our supply chain and allows us to target relevant reduction levers for each. We actively advocate for more transparency and alignment in this area by participating in several relevant initiatives. We also participated in an IOFI project to define standardised emission factors for the industry and improve other scope 3 categories.

All modifications allow for a considerable decrease in the uncertainty of the model, but they also imply a potential increase or decrease in the results 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.

Purchased goods and services

Raw materials (RM)

The scope 3.1 RM model computes the overall emissions of our purchased portfolio using the RM PCF (Product Carbon Footprint) of each purchased material and the corresponding weight (kg) purchased during the reporting period. This calculation is done for the current 2024, 2023 and our 2015 baseline and this allows us to compute current performance. For naturals and synthetics raw materials, RM PCF are estimated according to process-based modelling using individual datasets per material purchased; as explained above, these figures come from verified generic databases, from self-built datasets or even primary data from our vendors. Each model simulates the production process of the material from cradle to our gate and includes all physical inputs (energy, fertilisers, commodities, etc.) that result in GHG emissions. Mapping of a RM PCF to each raw material purchased is done by hand and reviewed in a continuous improvement process with our internal experts. The accuracy of the mapping is qualified by a Matching Grade (MG) which gives internal visibility on the match. Proxies initially assigned to a material can be improved with vendor data or self-built datasets, which results in the improvement of the matching grade. These improvements are duly rebaselined when needed. Through vendor data collection and internal review

campaigns, we prioritise the highest volume purchased for RM PCF improvement. Given the diversity of raw materials we purchase, however, many still remain mapped with proxies.

Indirect material and services

The figures are calculated using a new model implemented in 2023 and updated this year for both the current year (2024) and the calculation of figures for past years.

The model then incorporates emission factors per sector from the EPA's US Environmentally-Extended Input-Output (USEEIO) Model. Additionally, various impacts stemming from inflation (U.S. Bureau of Labor Statistics), technological improvements (ICOS Integrated Carbon Observation System), the efficiency gap between the US and CHF (Our World in Data and OECD), and currency exchange rates are factored in to achieve a more precise analysis over time. To address entities for which we did not have data in our ERP system, we employed a production tonnage proxy to extrapolate their impacts.

Capital goods

The figures are calculated using a new model implemented in 2023 for both the current year (2024) and the calculation of figures for past years.

The model then incorporates emission factors per sector from the EPA's US Environmentally-Extended Input-Output (USEEIO) model.

Additionally, various impacts stemming from inflation (U.S. Bureau of Labor Statistics), technological improvements (ICOS Integrated Carbon Observation System), the efficiency gap between the US and CHF (Our World in Data and OECD), and currency exchange rates are factored in to achieve a more precise analysis over time. To address entities for which we did not have data in our ERP system, we employed a production tonnage proxy to extrapolate their impacts.

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, as well as the technology standards in the countries of the respective sites for the purchased electricity. For this latter category, emissions related to the delivery of electricity (including infrastructure, grid losses, and direct emissions) have also been accounted for. The data basis for the life cycle inventory of this category is the ecoinvent database 3.10.

Upstream and downstream 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 ERP 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 ecoinvent database 3.10 guideline. To address entities for which we did not have data in our ERP system, we employed a production tonnage proxy to extrapolate their impacts.

Waste generated in operations

Emission factors on a per tonne waste basis (coming from ecoinvent database 3.10 and as per GHG Protocol convention) have been multiplied by the total weight of waste generated at our manufacturing locations. The scope of the calculation covers waste to disposal (landfill and incineration) as well as waste to recovery (recycling). To address entities for which we did not have data in our reporting system, we employed a production tonnage proxy to extrapolate their impacts.

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 2023 Department for Environment, Food and Rural Affairs (Defra, UK) definition. We use the Emission factor including the RF effect. To address entities for which we did not have data in our travel agencies' databases, we employed a number of employee proxies to extrapolate the emissions within this category.

Employee commuting

The reported 2024 figure is based on our latest 2024 employee commuting survey. The survey was sent to all of our sites, with a total number of valid responses of almost 7,000, which is equal to 41% of the company's employees.

To calculate the GHG footprint, emission factors per means of commuting are used according to the 2022 UK Government GHG Conversion Factors for Company Reporting definition.

To address entities for which we did not have full data from our internal survey, we employed a number of employee proxies to extrapolate the emissions within this category.

Restatements of information

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 and waste targets have a baseline of 2020.

In this report, the baseline recalculation is done for all environmental metrics as per specific baseline year.

In addition to the baseline recalculation, the values for past years included between the baseline year at stake and the current year are also recalculated accordingly if a baseline year recalculation is performed.

Reasons for change

The majority of the changes for operations-related data are due to the impact of integrating information from recently acquired companies – DDW The Color House, Albert Vieille, Golden Frog and Ungerer – into our baseline and past-year data. We also restate data in case of portfolio divestments (pectin to the H&F group) and 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.

In 2024, 'Indirect material and services' and 'Capital goods' were restated to ensure alignment between the sites included in scope 1+2 disclosure and the ones included in scope 3 disclosure. This was already the case for all other remaining scope 3 categories.

In addition to this, all scope 3 categories were restated as per improvements on emission factors and on scope 3 models. This ensures a like-for-like analysis and proper comparison between 2015, 2020, 2023 and 2024.