



# Klimato

# SCOPE 1, 2 & 3

# ASSESSMENT

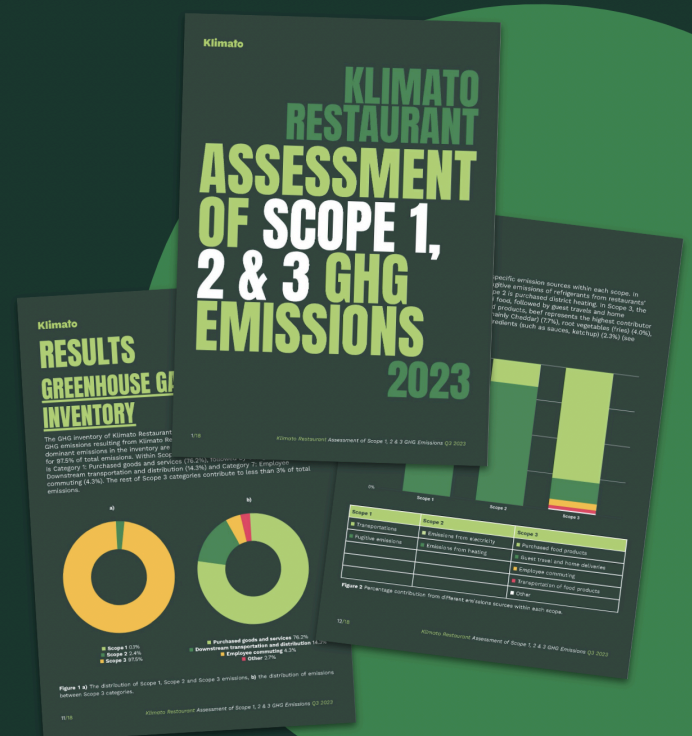
# METHODOLOGY

# REPORT





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# INTRODUCTION

Klimato is actively working with companies operating within the food sector helping them assess, report and reduce their climate impact. For this purpose, Klimato applies a structured methodology to guide the companies throughout the data collection process and calculate and report their Scope 1, 2, 3 emissions (for definitions see Box 1).

## BOX 1 - GHG Protocol emission scopes

**Scope 1:** Emissions classified as Scope 1 are direct GHG emissions from operations that are owned or controlled by the reporting company.

**Scope 2:** Emissions classified as Scope 2 are indirect GHG emissions related to the generation of energy (electricity, heat, cooling or steam) purchased or acquired by the reporting company.

**Scope 3:** Emissions classified as Scope 3 are all indirect GHG emissions (not included in Scope 2) that occur in upstream and downstream activities of the value chain of the reporting company. Scope 3 emissions are categorised into the following 15 distinct categories.

Scope 3 upstream categories	Scope 3 downstream categories
<b>Category 1:</b> Purchased goods and services	<b>Category 9:</b> Downstream transportation and distrib.
<b>Category 2:</b> Capital goods	<b>Category 10:</b> Processing of sold products
<b>Category 3:</b> Fuel- and energy-related activities	<b>Category 11:</b> Use of sold products
<b>Category 4:</b> Upstream transportation and distrib.	<b>Category 12:</b> End-of-life treatment of sold products
<b>Category 5:</b> Waste generated in operations	<b>Category 13:</b> Downstream leased assets
<b>Category 6:</b> Business travel	<b>Category 14:</b> Franchises
<b>Category 7:</b> Employee commuting	<b>Category 15:</b> Investments
<b>Category 8:</b> Upstream leased assets	

# FOUNDATIONS

Klimato’s methodology builds upon existing accounting and reporting standards and guidelines from the Greenhouse Gas Protocol Initiative (GHG Protocol), as well as reporting standards from GRI. Moreover, the methodology enables the reporting company to report its GHG emissions with reference to the GRI Standards (see Box 2).



The standards and guidelines followed are:

- A Corporate Accounting and Reporting Standard (revised edition)<sup>1</sup>
- GHG Protocol Scope 2 Guidance - An amendment to the GHG Protocol Corporate Standard (WRI, 2015)<sup>2</sup>
- Corporate Value Chain (Scope 3) Accounting and Reporting Standard - Supplement to the GHG Protocol Corporate Accounting and Reporting Standard<sup>3</sup>
- Technical Guidance for Calculating Scope 3 Emissions (version 1.0) - Supplement to the Corporate Value Chain (Scope 3) Accounting & Reporting Standard<sup>4</sup>
- GRI 1: Foundation 2021 standard<sup>5</sup>
- GRI 305: Emissions 2016 standard<sup>6</sup>.

## BOX 2 - Global Reporting Initiative (GRI)

**Klimato is a licensed software and tools partner of GRI** and reports information on the reporting company's GHG emissions with reference to the GRI Standards.

GRI is an independent international organisation that helps businesses, governments and other organisations understand and communicate their sustainability impacts.

**GRI is the 'first and foremost' global standard, used by 78% of the 250 biggest companies by revenue.** Reporting with reference to the GRI Standards allows companies to increase consistency of the disclosed information over time. GRI Standards aim at enabling any organization – large or small, private or public – to understand and report on their impacts on the economy, environment and people in a comparable and credible way. They are the cornerstone of GRI's vision for the future, in which reporting on impacts is common practice by all organizations around the world.

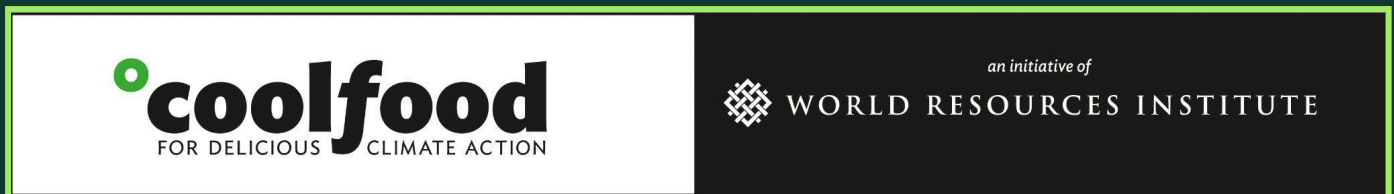
Companies subjected to the EU Corporate Sustainability Reporting Directive (**CSRD**) will have to report according to the European Sustainability Reporting Standards (ESRS). Reporting Scope 1, 2, 3 emissions with Klimato could help the reporting company prepare reports that comply with the CSRD as there is **interoperability** between the GRI Standards and the ESRS.





To support the application of the methodology Klimato has developed three fit-for-purpose tools. The first one is a structured Data Collection System (DCS) that enables a step-by-step process for identifying emission sources among a company's activities and collecting quantitative data. The second one is a GHG emissions Calculator that builds on GHG Protocol-compliant calculation methods and incorporates extensive and up-to-date databases of emission factors, including the Klimato Database. The third one is a standardised report template that is aligned to requirements for reporting with reference to the GRI Standards.

**The Klimato Database has been certified by Coolfood, a World Resources Institute (WRI) initiative.**



## A ROBUST METHODOLOGY

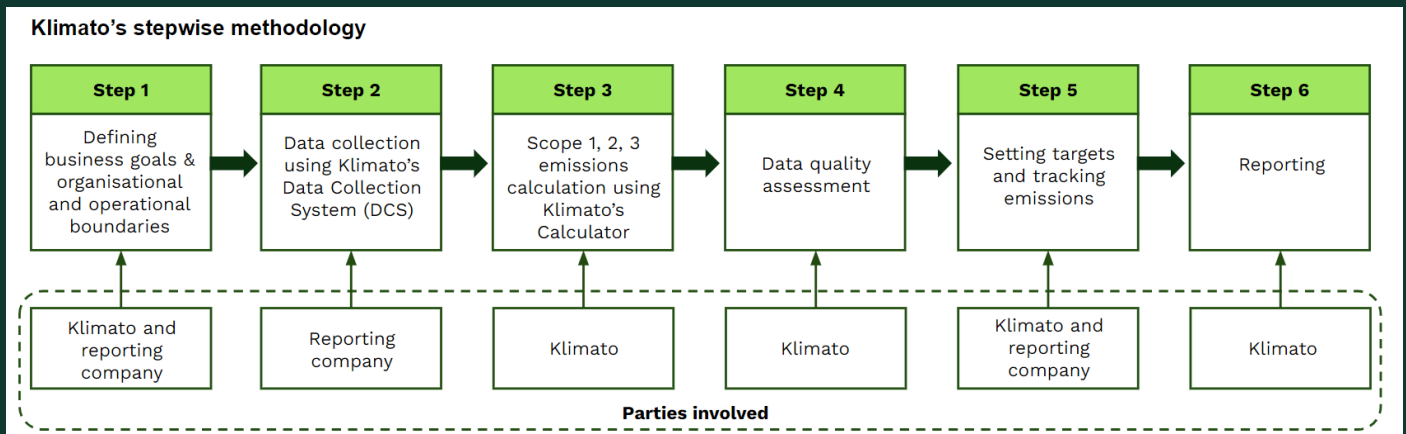
A key strength of Klimato's methodology is that it is underpinned by a robust calculation methodology. More specifically, Klimato's Calculator is built on **GHG Protocol-compliant calculation** methods that use data on physical quantities (e.g., volume, mass, distances), instead of spend-based data. A significant advantage of calculation methods that use data on physical quantities, referred to as **volume-based methods**, is that they can provide more accurate results than spend-based methods, which are inherently more uncertain, as they require more assumptions (e.g., on prices, inflation). Moreover, using volume-based methods can offer a granular level of detail when assessing Scope 1, 2, 3 emissions, thus helping to identify emissions "hotspots" (i.e., the biggest emission sources) within a company's value chain. Thus, it is no surprise that the **GHG Protocol prioritises the use of volume-based methods** and recommends to use spend-based methods only for screening purposes<sup>4</sup>.

Another significant strength of Klimato's methodology is that it offers the possibility of **reporting information** on the company's GHG emissions **with reference to the GRI Standards**. This enables Klimato to produce reports that disclose information about the reporting company's climate impacts in a structured and credible manner and, most importantly, that are compliant with requirements for environmental, social and governance (ESG) reporting. This, in turn, could help the reporting company prepare reports that comply with the upcoming EU Corporate Sustainability Reporting Directive (CSRD).



# A STEPWISE PROCESS

Klimato’s methodology comprises six main steps (see Figure 1). In the first step, the reporting company, in consultation with Klimato, defines the business goals, and the organisational and operational boundaries of the GHG emissions inventory. In the second step, the company collects data using the DCS. In the third step, Klimato performs the calculation of the Scope 1, 2 and 3 emissions using the collected data and the Calculator. In the fourth step, Klimato performs a data quality assessment. The fifth step is optional. In this step the company, in collaboration with Klimato, sets climate targets and defines the approach to track emissions over time. Finally, in the sixth step, Klimato prepares the report on behalf of the reporting company. The following sections of the report provide more information on each step.



**Table 1.** Klimato’s stepwise methodological approach



## STEP 1:

# DEFINING GOALS & BOUNDARIES

In the first step, the reporting company defines, in consultation with Klimato, the **business goals**, **organisational** and **operational boundaries**.

## BUSINESS GOALS

Initially, the company defines the **business goals** that will be served by the GHG inventory. Potential goals that a GHG inventory can serve include:

- Managing GHG risks and identifying reduction opportunities
- Public reporting and participation in voluntary GHG programs
- Participating in mandatory reporting programs
- Participating in GHG markets
- Recognition for early voluntary action.

Note that the list is not exhaustive and can be expanded with additional business goals that align with the reporting company's needs and priorities.

## ORGANISATIONAL BOUNDARIES

After setting the business goals, the company sets the **organisational boundaries** for the purpose of accounting and reporting GHG emissions. The company can select between the equity share and the (operational or financial) control approach to consolidate its GHG emissions. The chosen approach is then applied consistently to all levels of the organisation.

## OPERATIONAL BOUNDARIES

Next, the company defines the **operational boundaries** with respect to direct and indirect emissions. This involves identifying GHG emissions associated with the reporting company's activities and determining which scope (Scope 1, Scope 2, Scope 3)



and category they belong to. As required by the GHG Protocol, the emissions that are included in the assessment offered by Klimato are the seven GHGs covered by the Kyoto Protocol and the United Nations Framework Convention on Climate Change: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>) and nitrogen trifluoride (NF<sub>3</sub>).

## STEPS 2 & 3: DATA & CALCULATIONS

The data collection process is performed by the reporting company using the DCS. The DCS includes guiding questions, instructions and structured tables to facilitate the user in identifying emission sources within a company's activities and collecting quantitative data for these activities (activity data). The collected data function as input data to the Calculator, which was developed based on GHG Protocol-compliant calculation methods, and incorporates extensive and up-to-date databases of emission factors, including the Klimato Food Carbon Footprint Database. The output of the Calculator is the inventory of GHG emissions. The following subsections provide information about the required input data and the methods and emission factors used in the Calculator.

### SCOPE 1 EMISSIONS

Scope 1 emissions are divided into 3 main types: emissions from stationary combustion, emissions from transportation of goods or employees by vehicles owned or controlled by the company, and fugitive emissions resulting from the use of refrigerants.

For emission from stationary combustion, the default calculation method in the Calculator is the fuel-based method (see Table 2). The input data is either the quantities of purchased fuels or the amount spent for purchasing the fuels. In the latter case, the spent data is converted into quantities using fuel prices.

For emissions from transportation (mobile combustion of fuels), the default calculation method is also the fuel-based method (see Table 2). The input data is quantities of fuel used by fuels. If such data is not available, the company can either provide distances travelled by vehicles, or amount of money spent for fuels, which are converted into quantities using the fuel efficiency of vehicles or prices of fuels, respectively.

For fugitive emissions of refrigerants (HFCs and PFCs) from the installation, operation and disposal of refrigeration and air-conditioning equipment, the screening method (Emission Factor Based Approach) is initially applied to examine the significance of these emissions. For this method, the required input data is the number of new,





operational and disposed units. If the screening method indicates that the emissions of refrigerants constitute a significant contributor to the company’s total emissions, the Simplified Material Balance Method is used (see Table 2).

**Table 2** Input data and applied methods and emission factors for the calculation of Scope 1 emissions.

Emissions	Methods used	Activity data	Emission factors and other parameters
Emission from stationary combustion	- Fuel-based method	- Quantities of purchased fuels - Amount spent on fuel	- Combustion emission factors - Average fuel prices
Emissions from transportation of employees and goods	- Fuel-based method	- Quantities of purchased fuels - Distances travelled - Amounts spent on fuel	- Combustion emission factors - Vehicles fuel efficiency - Average fuel prices
Emissions from fugitive refrigerants	- Emission Factor Based Approach for screening	- Number of new, operational and disposed refrigeration & air-conditioning units	- Default emission factors for refrigeration/AC equipment
	- Simplified material balance method	- Quantities of purchased and recovered refrigerants, capacities of equipment	n/a

## SCOPE 2 EMISSIONS

In line with the GHG Protocol, Klimato applies two methods to calculate Scope 2 emissions: the location-based and the market-based methods. The former represents the average emissions intensity of grids on which energy consumption occurs. The latter represents emissions from electricity that the company has purposefully chosen (e.g. from a renewable electricity provider). The following subsections describe how Klimato applies these methods.

### LOCATION-BASED APPROACH

The activity data needed for the location-based approach is the total energy (electricity, heat, cooling and steam) consumption of the reporting company (see Table 3). For the calculation of the emissions, the Calculator includes in its database combustion emission factors for energy generation in multiple countries. The emission factors were either identified in available databases or calculated by Klimato following IEA’s methodology (IEA, 2022) and using energy balance data.



## MARKET-BASED APPROACH

For the market based approach, the activity data needed are the amount of energy purchased through different contractual instruments by the reporting company (see Table 3). The emission factors that are applied are combustion GHG emission rates disclosed in energy certificates and energy contracts. To ensure that these data sources meet the Scope 2 Quality Criteria defined by the GHG Protocol an assessment is performed. If a certain amount of energy purchased by the reporting company is not related to any contractual instrument, the applied emission factors are based on the residual mix, which represents the remaining energy production after all contractual instruments have been claimed or retired.

**Table 3** Input data and applied methods and emission factors for the calculation of Scope 2 emissions.

Emissions	Methods used	Activity data	Emission factors and other parameters
Emissions from the production of purchased energy (electricity, heat, cooling and steam) (location-based)	- Location-based method	- Total energy consumption	- Published country-specific (combustion-only) emission factors for energy production or emission factors developed by Klimato following IEA's methodology <sup>7</sup> and energy balance data
Emissions from the production of purchased electricity (market-base)	- Market-based method	- Total electricity consumption - Electricity purchased through contractual instruments	- Emission factors disclosed in contractual instruments - Residual mix emission factors from the Association of issuing bodies <sup>8</sup>

## SCOPE 3 EMISSIONS

Scope 3 includes indirect emissions that occur in upstream and downstream activities in the value chain of a company. They are emissions that are a consequence of the reporting company's operations, but occur at sources owned or controlled by another company. Scope 3 emissions are categorised into 15 distinct categories. The calculation of emissions from these categories is performed based on activity data collected through the DCS and using the Calculator. Detailed information on the methods, activity data and emission factors used by Klimato to calculate emissions for each category are provided in the Appendix.

A particular strength of Klimato's methodology to calculate Scope 3 emissions is that it can provide accurate calculations with a granular level of detail. This is particularly



important for Category 1 emissions, where the use of Klimato’s Calculator with its robust database of emission factors enables detailed calculations of GHG emissions both for non-food and food products (see Table 4). For food products, in particular, the use of the comprehensive Klimato Food Carbon Footprint Database enables a thorough accounting of GHG emissions from different food products. This is paramount for companies operating within the food sector, as it can help them identify the food products that contribute the most to their total emissions.

**Table 4** Input data and applied methods and emission factors for the calculation of upstream Category 1 Scope 3 emissions.

Category	Methods used	Activity data	Emission factors and other parameters
Category 1: Purchased goods and services (food products)	<ul style="list-style-type: none"> <li>- Average-data method (default)</li> <li>- Supplier-specific data is available</li> </ul>	<ul style="list-style-type: none"> <li>- Quantities of purchased food products</li> </ul>	<ul style="list-style-type: none"> <li>- Klimato Food Carbon Footprint Database</li> <li>- Supplier-specific emission factors for purchased products</li> </ul>
Category 1: Purchased goods and services (non-food products)	<ul style="list-style-type: none"> <li>- Average-data method (default)</li> <li>- Supplier-specific data is available</li> </ul>	<ul style="list-style-type: none"> <li>- Quantities or units of purchased non-food products and services</li> </ul>	<ul style="list-style-type: none"> <li>- Cradle-to-gate emission factors</li> <li>- Supplier-specific emission factors for purchased goods and services</li> </ul>

## STEP 4: DATA QUALITY ASSESSMENT

The fourth step involves a **quantitative data quality assessment** of the activity data (input data) used for the compilation of the GHG emissions inventory. The assessment is performed using the approach described in the Corporate Value Chain (Scope 3) Accounting and Reporting Standard<sup>3</sup>. It is based on five data quality indicators (technological representativeness, time representativeness, geographical representativeness, completeness and reliability) and a rating scale from 1 to 4, with 1 indicating very good, 2 good, 3 fair, and 4 poor data quality. The rating scale is used to numerically rank each indicator based on how well the data fits its criteria. In addition, to aggregate the results into a single score, the Data Quality Rating (DQR) is used<sup>9</sup>. The results of the assessment are presented in a format of a table heatmap (see Figure 1) to compare the DQRs of different datasets in a simple and intuitive way.



Emissions	Activity data	TE	TI	GE	CO	RE	DQR
Scope 1: Emissions from transportation of employees	Distances travelled	1	1	1	1	2	1.8
Scope 1: Emissions from fugitive refrigerants	Data on refrigeration	2	2	1	4	3	3.5
Scope 2: Emissions from electricity	Electricity consumption	1	1	1	2	1	1.8
Scope 3: Emissions from food products	Quantities and origin of goods	1	1	1	1	2	1.8
Scope 3: Emissions from non-food products	Quantities and origin of goods	2	1	4	1	3	3.4

Fig. 1. An indicative example of a heatmap table visualising the results of the data quality assessment.

# STEP 5: SETTING TARGETS & TRACKING EMISSIONS

In the fifth step, the reporting company, in consultation with Klimato, sets specific **reduction targets** for its Scope 1, 2, 3 emissions, defines the **target base year** and develops a base year emissions **recalculation policy**.

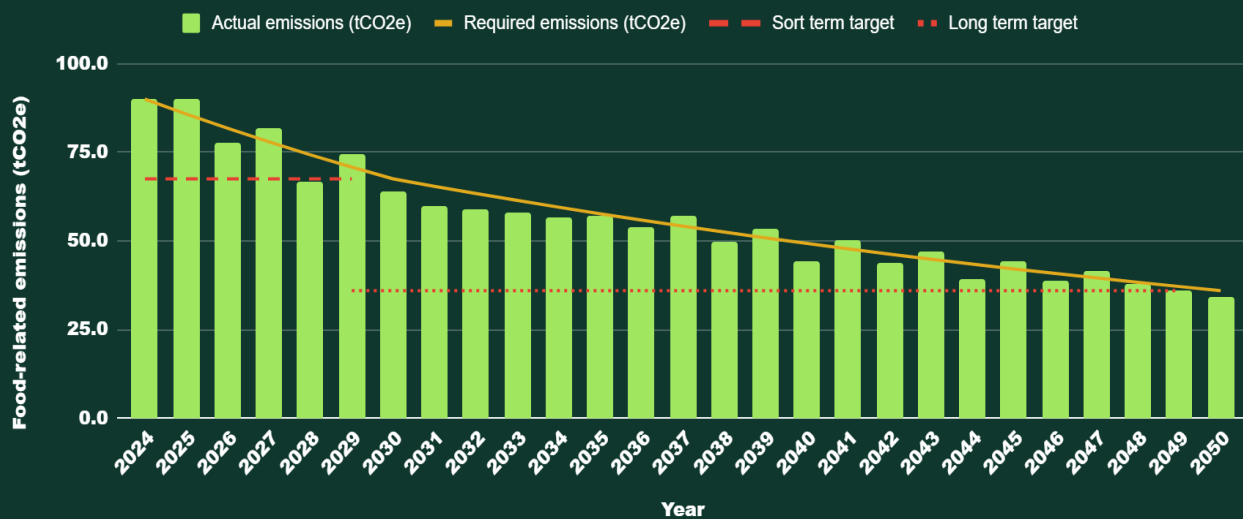


Fig. 2. Example of reduction targets



## SETTING TARGETS

To support this process Klimato has defined specific reductions targets for companies operating within the food sector that are in line with the latest climate science. More specifically, Klimato has defined two types of emission reduction targets: absolute targets and intensity targets. Absolute targets refer to the total amount of GHG emissions. Intensity targets refer to the total amount of GHG emissions relative to a specific metric (e.g., kg of food sold) and thus they can reflect performance and efficiency improvements irrespective of business growth. A company can choose which of these target types are more relevant to its needs and priorities.

In addition to emission reduction targets, Klimato has defined **supporting targets**. These targets can complement the emission reduction targets by helping achieve indirect emission savings through for example reductions in food waste or ruminant meat consumption.

## TRACKING EMISSIONS

After setting targets, the reporting company defines the **target base year**. During the process, Klimato provides guidance to ensure that the company chooses a base year for which there is availability of complete and verifiable emissions data.

Finally, the reporting company develops a base year emissions **recalculation policy** as required by the GHG Protocol. The purpose of the policy is to determine in which cases recalculation of the base year emissions will be executed to maintain consistency when tracking emissions over time. The recalculation policy includes a “significance threshold” that determines which changes or calculation errors are significant enough to trigger a recalculation of base year emissions.

## **STEP 6:** **REPORTING**

The final step is to prepare the GHG emissions report of the company. For this purpose, Klimato uses GRI 1: Foundation 2021<sup>5</sup> and GRI 305: Emissions 2016<sup>6</sup> Standards to allow reporting information on the company’s GHG emissions, with reference to the GRI Standards (see Box 2).



# REFERENCES

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# Klimato

If you have any questions regarding the GHG emissions assessment method and calculations or the report, contact Klimato at [hello@klimato.com](mailto:hello@klimato.com)



# APPENDIX

Tables A1 and A2 provide information on the methods, activity data and emission factors used by Klimato to calculate emissions from upstream (Categories 1-8) and downstream activities (Categories 9-15), respectively.

**Table A1** Input data and applied methods and emission factors for the calculation of upstream Scope 3 emissions (Categories 1-8).

Category	Methods used	Activity data	Emission factors and other parameters
Category 1: Purchased goods and services (food products)	<ul style="list-style-type: none"> <li>- Average-data method (default)</li> <li>- Supplier-specific data is available</li> </ul>	<ul style="list-style-type: none"> <li>- Quantities of purchased food products</li> </ul>	<ul style="list-style-type: none"> <li>- Klimato Food Carbon Footprint Database</li> <li>- Supplier-specific emission factors for purchased products</li> </ul>
Category 1: Purchased goods and services (non-food products)	<ul style="list-style-type: none"> <li>- Average-data method (default)</li> <li>- Supplier-specific data is available</li> </ul>	<ul style="list-style-type: none"> <li>- Quantities or units of purchased non-food products and services</li> </ul>	<ul style="list-style-type: none"> <li>- Cradle-to-gate emission factors</li> <li>- Supplier-specific emission factors for purchased goods and services</li> </ul>
Category 2: Capital goods	<ul style="list-style-type: none"> <li>- Average-data method (default)</li> <li>- Supplier-specific data is available</li> </ul>	<ul style="list-style-type: none"> <li>- Quantities of purchased capital goods</li> </ul>	<ul style="list-style-type: none"> <li>- Cradle-to-gate emission factors</li> <li>- Supplier-specific emission factors for purchased goods</li> </ul>
Category 3: Fuel- and energy-related activities (purchased fuels)	<ul style="list-style-type: none"> <li>- Average-data method (default)</li> <li>- Supplier-specific method (if data is available)</li> </ul>	<ul style="list-style-type: none"> <li>- Quantities of purchased fuels (same as in Scope 1)</li> </ul>	<ul style="list-style-type: none"> <li>- Average upstream emission factors of fuels</li> <li>- Fuel-provider-specific upstream emission factors</li> </ul>
Category 3: Fuel- and energy-related activities (purchased energy)	<ul style="list-style-type: none"> <li>- Average-data method (default)</li> <li>- Supplier-specific method (if data is available)</li> </ul>	<ul style="list-style-type: none"> <li>- Total energy consumption (same as in Scope 2)</li> </ul>	<ul style="list-style-type: none"> <li>- Published country-specific emission factors or emission factors calculated by Klimato based on upstream emission factors of fuels and energy balance data.</li> <li>- Utility-specific emission factors for fuels.</li> </ul>
Category 3: Fuel- and energy-related activities (transmission and distribution losses)	<ul style="list-style-type: none"> <li>- Average-data method (default)</li> <li>- Supplier-specific method (if data is available)</li> </ul>	<ul style="list-style-type: none"> <li>- Total energy consumption (same as in Scope 2)</li> </ul>	<ul style="list-style-type: none"> <li>- Country average transmission &amp; distribution loss rate (%)</li> <li>- Utility-specific transmission &amp; distribution loss rate (%)</li> </ul>



**Table 4** (continued)

Category	Methods used	Activity data	Emission factors and other parameters
Category 4: Upstream transportation and distribution (transportation of purchased goods)	- Distance-based method	- Quantities and origin of purchased goods	- Life cycle emission factors per mode of transport
Category 4: Upstream transportation and distribution (third-party transportation services)	- Fuel-based method	- Quantities of purchased fuels - Distances travelled	- Life cycle emission factors per mode of transport - Vehicles fuel efficiency
Category 4: Upstream transportation and distribution (third-party distribution)	- Average-data method (default) - Site-specific method (if data is available)	- Area/volume used for storage - Duration of storage - Site-specific energy use and refrigerant leakage	- Emission factors per m <sup>2</sup> or m <sup>3</sup> stored in facility - Site specific emission factors
Category 5: Waste generated in operations	- Waste-type-specific method (default) - Average-data method (if no data per waste type is available) - Supplier-specific method (if data is available)	- Quantities of waste generated in operations per type of waste - Total mass of waste generated in operations - Emissions data from waste management companies	- Waste type-specific and waste treatment-specific emission factors - Average waste treatment-specific emission factors developed by Klimato.
Category 6: Business travel	- Distance-based method	- Total distances travelled by the company's employees per mode of transport	- Emission factors per mode of transport
Category 7: Employee commuting	- Distance-based method (for commuting) - Average-data method (for teleworking)	- Total distances travelled by the company's employees per mode of transport. - Total hours worked remotely	- Life cycle emission factors per mode of transport - Country specific emission factors for energy consumption
Category 8: Upstream leased assets	- Average-data method (default) - Asset-specific method (if data is available)	- Floor space of leased assets or number of assets by type - Asset-specific scope 1 and scope 2 emissions data	- Average emission factors by floor space - Emission factors by asset type





**Table A2** Input data and applied methods and emission factors for the calculation of downstream Scope 3 emissions (Categories 9-15).

Category	Methods used	Activity data	Emission factors and other parameters
Category 9: Downstream transportation and distribution (transportation of sold products)	- Distance-based method	- Quantities of sold products, transportation mode and transportation distances	- Life cycle emission factors per mode of transport
Category 9: Downstream transportation and distribution (distribution of sold products)	- Average-data method (default) - Site-specific method (if data is available)	- Area/volume used for storage - Duration of storage - Site-specific energy use and refrigerant leakage	- Emission factors per m <sup>2</sup> or m <sup>3</sup> stored in facility - Site specific emission factors
Category 10: Processing of sold products	- Average-data method (default) - Site-specific method (if data is available)	- Quantities of sold products - Information on applied processes - Information needed for allocation - Site-specific data on fuel and energy use and non-combustion emissions	- Average emission factors from the literature or life cycle databases - Site specific emission factors
Category 11: Use of sold products	- Modelling of direct or indirect use phase emissions on a case-by-case basis	- Varying data inputs depending on the case	- Custom emission factors depending on the case
Category 12: End-of-life treatment of sold products	- Waste-type- specific method	- Quantities of sold products - Information about their fate	- Published country-specific emission factors or emission factors calculated by Klimato
Category 13: Downstream leased assets	- Average-data method (default) - Asset-specific method (if data is available)	- Floor space of leased assets or number by type - Asset-specific scope 1 and scope 2 emissions data	- Average emission factors per floor space - Emission factors per asset type
Category 14: Franchises	- Franchise- specific method - Average-data method	- Scope 1, 2, 3 emissions data from franchisees - Floor space of franchises or number of franchises by type	- Average emission factors by floor space - Emission factors by asset type
Category 15: Investments	- Modelling on a case-by-case basis	- Varying data inputs depending on the case	- Custom emission factors depending on the case