Schlötter

Corporate Carbon Footprint

Annual Report for 2024

Last update: December 15, 2025

Schlötter

CORPORATE CARBON FOOTPRINT

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I. General information about the report

a. Calculating emissions

The Umberto 11 software has been used to calculate emissions. All raw materials and activities are entered as so called “Entries”. If no direct data from supplier is available, entries are mapped using the Ecoinvent database (method is described in chapter I.b). For the purposes of this report, Ecoinvent version 3.9.1 and Umberto version 11.15.2 was used. The used evaluation method is IPCC 2021.

b. Method of mapping datasets

The following procedure was used to obtain reliable data:
Suppliers were contacted and asked for emission factors for their products (primary data, last updated in 2023). If data was unavailable, datasets from the Ecoinvent database (secondary data) were used. The data reliability was evaluated in cases where multiple datasets for one product exist. Datasets including supply chain emissions (“market”) are preferred (datasets for “production“ do not include supply chain emissions). Datasets also have differences due to geographical reasons. The dataset with the higher emission factor was used if the origin of the product is unknown (worst-case-scenario).

Rules:

primary data	>	secondary data
market dataset	>	production dataset
higher emission factor	>	lower emission factor

Datasets are not available for every product. In these instances, similar datasets or summarized categories datasets were used.
In 2023, all suppliers were once again asked to provide emission factors for their products. Of all the suppliers contacted, we received responses from 34%, but only 9% provided emission factors.

II. Glossary

CO_2e	Carbon Dioxide equivalents
COD	Chemical Oxygen Demand
GHG	Greenhouse Gas
GWP	Global Warming Potential
HDPE	High Density Polyethylene
IBC	Intermediate Bulk Container
PCF	Product Carbon Footprint
TOC	Total Organic Carbon
TtW	Tank-to-Wheel
WBCSD	World Business Council on Sustainable Development
WtT	Well-to-Tank
WtW	Well-to-Wheel
WRI	World Resources Institute

1 Organization Goals and Inventory Objectives

The Earth is surrounded by greenhouse gases (GHG). They have the capability to absorb and trap Infra Red radiation on its way to space. This has an important effect on the Earth's climate. However, this greenhouse gas effect is amplified by humans, who have emitted more greenhouse gases since the industrial revolution. Climate change or global warming related to this anthropogenic source has been termed the GHG effect.
Companies can use the knowledge of their Corporate Carbon Footprint as a basis for assessing their contribution to climate protection.

About Dr.-Ing. Max Schlötter GmbH & Co. KG

Dr.-Ing. Max Schlötter GmbH & Co. KG is one of Germany's leading specialists for electroplating. In 1912 the company was founded by Max Schlötter in Leipzig, originally called "Elektrochemisches Laboratorium", which can be translated as electrochemical laboratory. The company is currently led by the fourth generation of the family with locations in Geislingen (Germany), Pershore (UK), Naas (Ireland), Norrköping (Sweden), Singapore, Wuxi and Dongguan (China).

Schlötter has over 100 years' experience in research and development of electroplating additives and plants. For sustainable success we provide integrated solutions for electroplating chemistry, plants, and service. We work closely with our customers to fully understand their requirements and create innovative and effective surfaces.

Since the beginning, innovation is a core focus of our work. Our understanding of innovation includes the development of ecological solutions, to contribute to climate protection and for the world we care about. We are enthusiastic about taking innovative and courageous steps going forward to ensure a liveable world for the future generations.
With the passion and innovation of our founder Max Schlötter we intend to progress through strategies which will ensure satisfied workers, successful customers, and a healthy environment.

About the report

This report includes the carbon emissions calculation of the company Dr.-Ing. Max Schlötter GmbH & Co. KG for calendar year 2024; an annual report will follow. The calculated emissions for this year are compared to the reported emissions of 2021 which forms the basis of the report and to the emissions of the previous year. This report is written by the climate change officer of Schlötter (Dr. Theresa Knobloch) with support of different departments for collecting data.

The report of GHG emissions is based on DIN EN ISO 14064-1:2018 (Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals), while the division of emissions is based on the better-known Greenhouse Gas Protocol (developed by World Resources Institute (WRI) and World Business Council on Sustainable Development (WBCSD)). ISO 14064-1:2018 specifies principles for the quantification of greenhouse gas emissions of organizations. Requirements for the design, development, management, reporting, and verification are characterized. This report is written in accordance (with the best of knowledge and belief) with the principals of relevance, completeness, consistency, accuracy, and transparency.
All included emissions in this report are shown in Table 1.

Table 1: Overview of included activities.

Scope 1		• stationary combustion, Combined heat and power plant (electricity and gas), photovoltaic system, solar thermal • mobile combustion (company cars) • refrigerant • wastewater treatment
Scope 2		• electricity
Scope 3	**Upstream Activities**	
1.	Purchased Goods and Services	• raw materials - chemistry • packaging • cafeteria packages • paper
4.	Upstream Transportation and Distribution	• raw materials - chemistry
5.	Waste generated in Operations	
6.	Business Travel	
7.	Employee Commuting	
Scope 3	**Downstream Activities**	
9.	Downstream Transportation and Distribution	

This report is intended to be used internally and externally. External use provides data for our customers. Internally the report will be used to define reduction targets.

A verification of this report is not foreseen; to show progress, all three to five years the report should be verified.

2 Organizational Boundaries

Dr.-Ing. Max Schlötter GmbH & Co. KG has a worldwide presence, including locations in Geislingen (Germany), Pershore (UK), Naas (Ireland), Norrköping (Sweden), Singapore, Wuxi, and Dongguan (China). The location Salzburg in Austria is still listed in Table 2 to show all locations from the year 2022. The connections within the Schloetter Group are shown in Table 2.

Table 2: Overview of Schloetter Group.

Schlötter Group / Location	Legal Structure	Equity Share	Operational Control	Financial Control
Germany, Geislingen/Steige		100 %	100 %	100 %
UK, Pershore	Sister Company	0 %	0 %	0 %
Ireland, Naas	Sister Company	0 %	0 %	0 %
Sweden, Norrköping	Sister Company	0 %	0 %	0 %
Singapore	Sister Company	0 %	0 %	0 %
China, Wuxi	Subsidiary	100 %	0 %	0 %
China, Dongguan	Sister Company	0 %	0 %	0 %

Reporting about all locations within the Schlötter group has been given due consideration, but it is not yet known when that can be completed. The emissions of locations in Geislingen are included in this report. Although the equity share of Wuxi is 100 % this location is not a part of the reported emissions.

The defined organizational scope is based on our financial report.

3 Reporting Boundaries

3.1 Division of Emissions according to GHG Protocol and ISO 14064-1

Division according to GHG Protocol

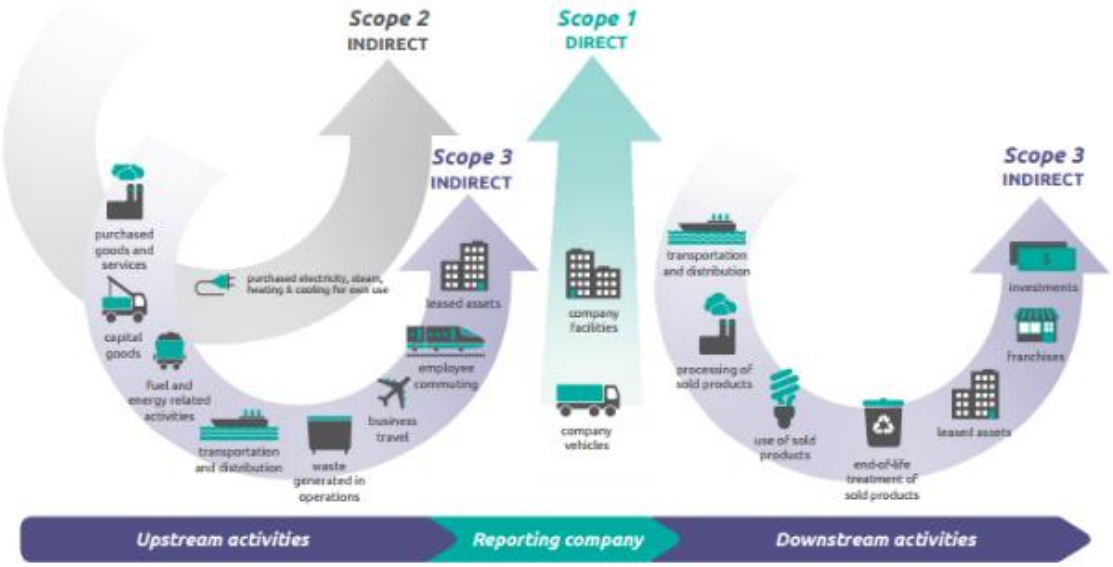

Figure 1: Division according to GHG Protocol; Source: http://ghgprotocol.org/sites/default/files/ghgp/tools/GHGP%20Scopes.

The GHG Protocol distinguishes between direct emissions (scope 1), indirect emission from purchased energy (scope 2) and indirect emissions from upstream and downstream activities (scope 3). Scope 3 emissions are subdivided in 15 fields, as shown in Table 3

Table 3: Subdivision of scope 3 activities according to GHG Protocol.

	Upstream Activities		**Downstream Activities**
1.	Purchased Goods and Services	9.	Transportation and Distribution downstream
2.	Capital Goods	10.	Processing of sold Products
3.	Fuel and Energy related Activities	11.	Use of sold Products
4.	Transportation and Distribution upstream	12.	End-of-Life Treatment of sold Products
5.	Waste	13.	Leased Assets downstream
6.	Business Travel	14.	Franchises
7.	Employee Commuting	15.	Investments
8.	Leased Assets upstream		

Division according to ISO 14064-1

Category 1: Direct GHG Emissions and Removals.

Category 2: Indirect GHG Emissions from imported Energy.

Category 3: Indirect GHG Emissions from Transportation.

- Emissions from upstream Transport and Distribution for Goods
- Emissions from downstream Transport and Distribution of Goods
- Emissions from Employee Commuting includes Emissions.
- Emissions from Client and Visitor Transport
- Emissions from Business Travel

Category 4: Indirect GHG Emissions from Products used by Organization.

- Emissions from Purchased Goods
- Emissions from Capital Goods
- Emissions from the Disposal of solid and liquid Waste
- Emissions from the use of Assets

Category 5: Indirect GHG Emissions associated with the Use of Products from the Organization.

- Emissions or Removals from the Use Stage of the Product
- Emissions from downstream leased Assets
- Emissions from end of life Stage of the Product
- Emissions from Investments

Category 6: Indirect GHG Emission from other Sources.

As shown above, both standards ISO14064-1:2018 and GHG protocol subdivide scope 3 emissions. In the GHG Protocol it is subdivided in 15 groups, while upstream and downstream emission are distinguished, although the subdivision is different in the ISO, the six groups of the ISO include the same emissions.

In this report the division has been done according to the better known GHG Protocol.

3.2 Setting Report Boundaries

Our Corporate Carbon Footprint calculation includes scope 1 (direct CO_2-emissions), scope 2 (indirect CO_2-emission from energy) and scope 3 (indirect CO_2-emissions from other activities). No biogenic emissions have to be reported within these reporting boundaries.

Not all scope 3 emissions can be included. Figure 2 shows the method for the materiality assessment, which is used to determine important emission sources. Therefore, quantities, our cost distribution, and possibility of influence are considered.

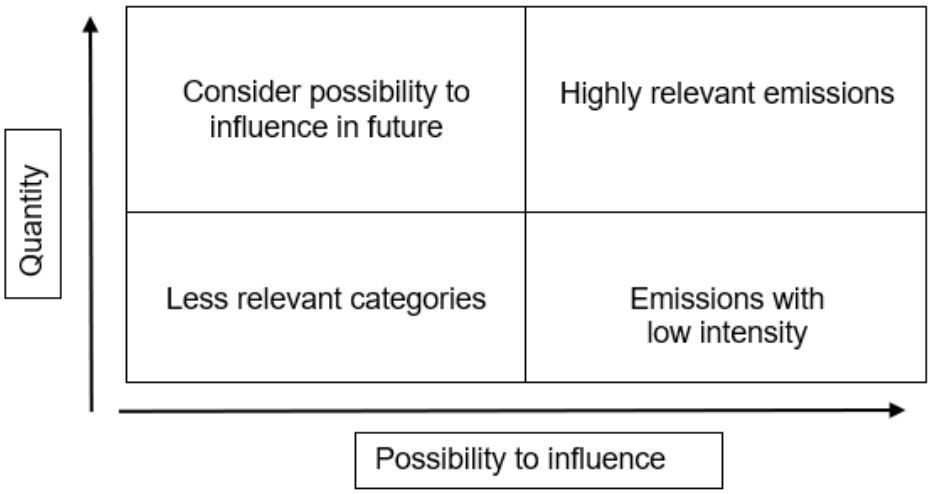

Figure 2: Materiality assessment matrix based on quantity and influence.

Costs without emissions and costs from services of a third party have been excluded. Emissions with a high quantity and high possibility to influence (highly relevant emissions) as well as low quantity but high possibility to influence (direct emissions, low intensity) are included emission sources in this report. Only emissions with available data are included.
The next chapters show the materiality method and reasons why emissions are or are not included.

3.3 Reporting Boundaries for Scope 1

Scope 1 includes all direct emissions.

Stationary Combustion

The supplier provides the amount of gas used based on received invoices and a yearly overview for all gas meters. They also provided the emission factor for gas which also includes supply chain emissions. The emission factor received refers to the lower calorific value while invoices give the higher calorific value. To calculate the lower calorific value the higher calorific value is divided by 1.1 (source: BAFA, https://www.bafa.de/SharedDocs/Downloads/DE/Energie/ea_ermittlung_gesamtenergieverbrauch.pdf?__blob=publicationFile&v=4). This value is used as direct emission; therefore, it is not listed in category scope 3 “Fuel and Energy related Activities”.
For completeness, the energy we produce by photovoltaic and solar thermal panels is included in Scope 1 emissions although no emissions occur.

Mobile Combustion

Emissions from company cars are assigned to the mobile combustion category; although company cars are also used for business travel, they are included in Scope 1 because the company is in control of the cars. The consumption of fuel is accurately documented by invoices for refuelling. For this calculation a dataset has to be used. To use data from a single database only, a dataset for the driven distance is used. The quantity of fuel is calculated based on an average consumption of 7 litre per 100 km. The electricity consumption of electric company cars can be accurately recorded through the billing of charging cards and on-site charging stations. Both datasets contain emissions from supply chain, so it is not listed in category scope 3 “Fuel and Energy related Activities”.
There are no emissions from the internal fleet because it consists of electrical forklifts only.
Petrol is needed for maintenance, the volumes used are converted into an energy value. The calorific value for 1 litre of petrol is 32.49 MJ (source: (bdbe.de), viewed at 01.03.2023). The emission factor used includes emission from supply chain, so it is not listed in category scope 3 “Fuel and Energy related Activities”.

Air Conditioner

Air conditioner with the refrigerant R410A and R32 are used for our server room. Based on received invoices, the refilled amount of refrigerant is known. According to “Bundesfachschule Kälte-Klima-Technik” the emission factor of R410A is 2088 kg CO_2e/kg, the emission factor of R32 is 675 kg CO_2e (source: Kältemittelgrenzen-2 (bfs-kaelte-klima.de).

Processes – Wastewater Treatment

Our wastewater contains inorganic and organic compounds, which must be treated before being released to drain.

All wastewaters are collected in the company and treated chemically. Through this process organic compounds are oxidized and released as CO_2. Inorganic compounds are precipitated and separated from the liquid phase.

Organic compounds are oxidized with Fenton reagent and CO_2 is formed. Before the treatment of a batch the chemical oxygen demand (COD) is determined to use an optimal quantity of Fenton Reagent. For this calculation the COD is not suitable. Therefore, to calculate CO_2-emissions from the process the value for Total Organic Carbon (TOC) is needed. TOC shows the concentration of organic carbon in a sample. Therefore, the value for COD needs to be converted to TOC. However, the factor is dependent on the components. To get an average factor, four measurements for COD and TOC were done before and after treatment. These measurements result in the average factor to convert the annual quantity from COD to TOC. The quantity of TOC before and after treatment leads to the quantity of oxidized carbon during the process. Finally, to calculate the amount of carbon dioxide released, the annual TOC value is multiplied by 3.67, to change the mass of carbon into the mass of carbon dioxide.

3.4 Reporting Boundaries for Scope 2

Scope 2 emissions describe all emissions from purchased energy.

The purchased quantity of electricity can be quantified exactly from invoices. Suppliers must also confirm the emission factor for the purchased mix of electricity. Therefore, our emissions can be accurately set to 519 g/kWh, shown in Figure 3.

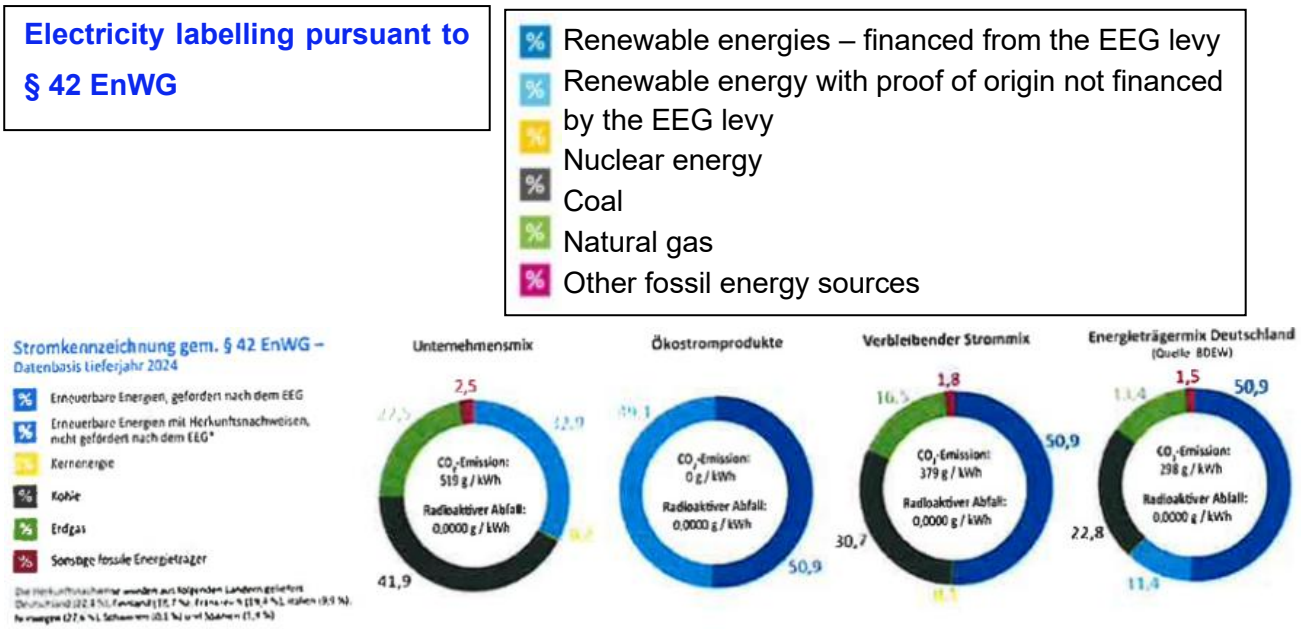

Figure 3: Energy mix and their emission values in 2024 from the supplier Albwerk.

This value includes emissions from supply chain. Therefore, it is not listed in category scope 3 “Fuel and Energy related Activities”.

3.5 Reporting Boundaries for Scope 3

3.5.1 General Method

All costs for the year were taken into consideration so as to include all possible emissions. High costs were given equal consideration to high emissions and their materiality was assessed in two steps: For the materiality assessment all costs of the year 2021 are regarded to incorporate all emissions. This means, high costs are treated equal to significant emissions.

The materiality is assessed in two steps:

1st Assess the significance with regards to GHG emissions
- A Costs without emissions are excluded
- B Costs originating from services are excluded (low quantity and influence, no data available)
- C Costs originating from scope 1 and scope 2 emissions are excluded

2nd Assess the significance with regards to the quantity of emissions
- A Low percentage of costs are excluded (low quantity)
- B Exception: low percentage of costs with high influence are included

3.5.2 First Step of Materiality Assessment

All categories from accounting are reviewed regarding their relevance to GHG emissions. Not all high costs result in high emissions. If a category, e.g. personnel cost, causes no emissions or emissions through a third party (services), it is excluded.

Category: Purchase Plant Construction

The purchases of plant construction are excluded in this year's report. Although the costs are high, the influence on emissions is low.

Materials to build the plant are not included because all plants are built at the customer directly. At the moment it is not possible to include emissions from these materials to our CCF because there are hundreds of different parts, specifically manufactured, for one plant and data is not available.

Due to an organizational restructuring, by the end of 2024 our plant construction will provide only service and will not build new plants. Therefore, the purchase of plant construction will not be included in the next years reports.

Table 4 shows the distribution after this first analysis.

Table 4: Cost distributions after the first step of materiality assessment.

Purchase Chemistry	82.4	%	**Vehicle Costs**	0.1	%
Freight	9.5	%	**Disposal- and Building Costs**	1.4	%
Office/IT/Telecommunications	0.7	%	**Other Personnel / Educational Costs**	0.3	%
R&D/Patents/Licenses	0.7	%	**Advertising- / Marketing-Costs**	0.4	%
Production Overheads	1.9	%	**Travel / Hospitality Costs**	0.6	%
Repair/Maintenance without B	1.4	%	**Other Costs / Earnings**	0.5	%

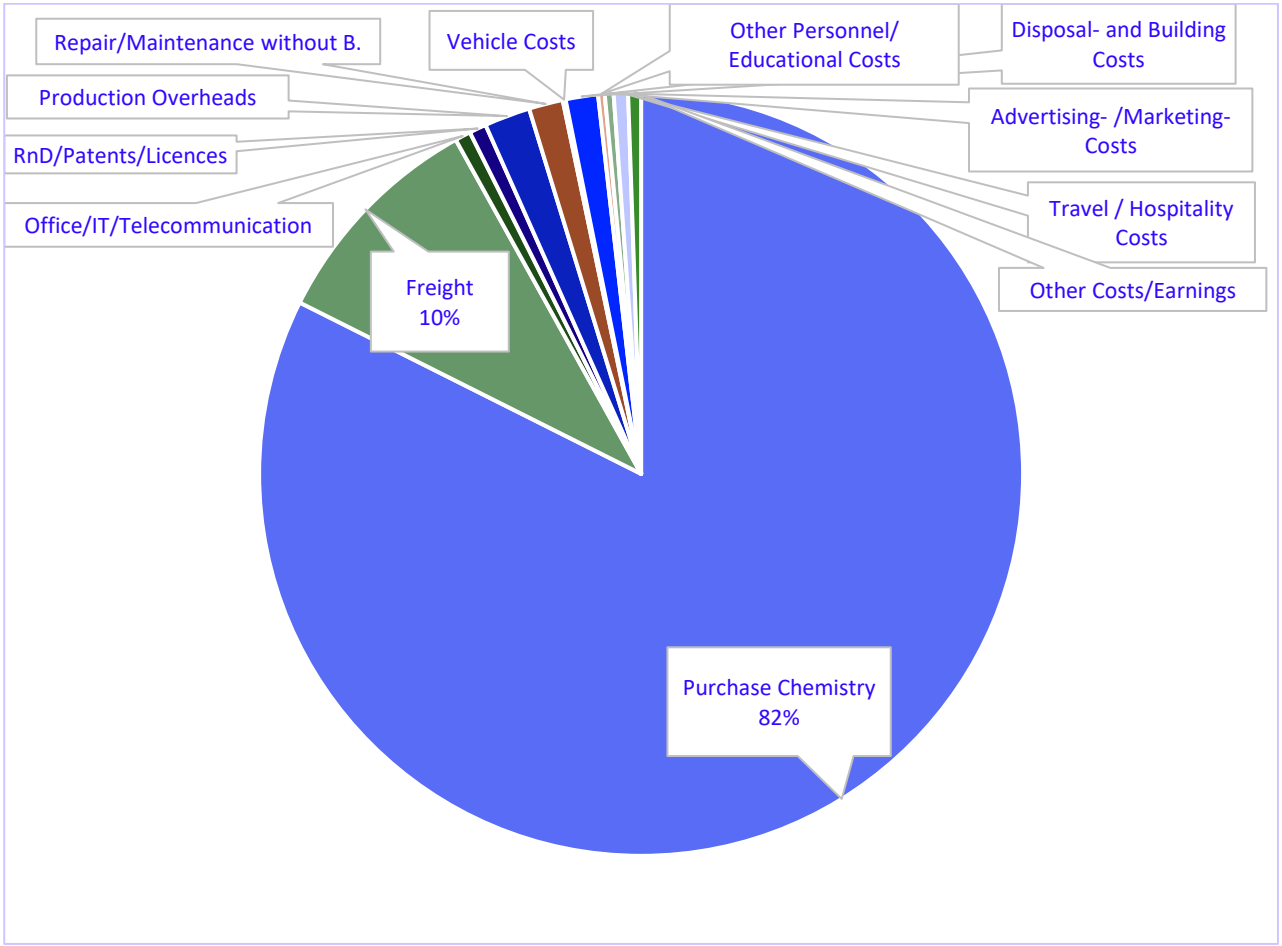

Figure 4: Pie Chart of the cost distribution after the first step of materiality assessment.

3.5.3 Second Step of Materiality Assessment

Our cost distribution has several subcategories. These are reviewed in more detail and assigned to categories of scope 3 emissions. All subcategories with high quantity and high possibility to influence should be considered. This review also takes into consideration data availability and an effort to determine this data against quantity ratio.

Detailed information about the review and the methods used for every category is described in the following chapters.

3.5.3.1 Purchased Goods and Services

Purchased Chemistry

The quantity and supplier of each purchased raw material is confirmed through invoices. Every supplier is asked to share the Product Carbon Footprint (PCF) of purchased raw materials. If the supplier has no available data, raw materials are mapped using data from a database. Chapter I part b describes the detailed method as to how raw materials are mapped with entries from database.
For additives with known composition, the contents are mapped proportionally; for unknown compositions a general dataset is used for mapping. To estimate the dataset reliability, data is divided in categories, shown in Table 5. For a uniform estimation, the categories are adjusted to the categories from the estimation of all datasets (s. Chapter 4.4).

Table 5: Categories and their numbers for records.

	Description	Number of datasets	Percentage
Category 1	Data from supplier	24	6.3 %
Category 2	Data from database	67	17.7 %
Category 2A	Calculated data from database	71	18.8 %
Category 3	Data of classes or similar compounds from database	216	57.1 %

Packages

Costs for packages are included in costs for purchased chemistry.
Currently there are no records for used packages like drums or IBCs. Therefore, records of raw packaging materials (HDPE) are used. This means package production processes (injection moulding) are not included.

Photovoltaic System

A photovoltaic system with a capacity of 110.8 kWp was installed. To calculate the emissions from manufacturing of the PV system, data from the ProBas- database is used. The dataset is for a PV

system with a capacity of 165 Wp, an area of 1.25 m² and a weight of 17.4 kg with a functional unit of 1 kg. The capacity is used to calculate the weight of our purchased system:

$$17{,}4\ kg * 9{,}63\ {}^{kgCO2e}/_{kg} = 167{,}56\ kg\ CO2e$$

That corresponds to a system with 165 Wp. The manufacturing of our photovoltaic system with 110.8 kWp results in emissions of 112.5 t CO_2e.

Production Overheads

Only the emissions of one subcategory are included, chemistry used in R&D. An overview provided by the supplier shows the raw material and quantity. Because some chemicals are only purchased in a small quantity, they are summarized in classes of compounds, e.g., “inorganic chemistry” or “organic chemistry”. Other goods from this category are excluded due to low quantity.

Office / IT / Telecommunication

This category includes the consumption of paper from photocopying stations. It is known how much paper is used through invoices. In our calculation every printed page is equal to one sheet of paper. A small excess of sheets (sheets printed on both sides are calculated as two pages) should cancel out paper consumption of other printers.

Advertising- / Marketing-Costs

Advertising and marketing costs cover only 0.4 % of costs. Due to their low cost and small possibility to influence emissions they are excluded completely.

Other Personnel / Educational Costs

Other personnel and educational costs cover only 0.3 % of costs. Due to their low cost and small possibility to influence emissions they are excluded completely.

Other Costs / Earnings

The category “other costs and earnings” has a small quantity (0.5 %) and could be excluded.

Repair and Maintenance without Buildings

Costs for repair and maintenance amounts to 1.4 %. Due to the low quantity of costs and the small possibility to influence emissions the whole category is excluded. In addition, no data is available currently.

3.5.3.2 *Capital Goods*

No capital goods were purchased in the reported year.

3.5.3.3 *Fuel and Energy related Activities*

Emissions in this category are not listed separately. Emissions from supply chain are included in respective energy activity and therefore included in scope 1 and scope 2 emissions.

3.5.3.4 *Upstream Transport and Distribution*

The exact route for upstream transports and distributions are unknown. Therefore, the location of supplier is set as the starting point of the transport route. Suppliers are sorted by countries and each country's average distance to Geislingen is calculated. Transported quantities are known and for solutions an average density of 1 g/cm³ is assumed (1 kg = 1 l). All transport is carried out by trucks except from China and India; these distances are calculated as transport by ship.

3.5.3.5 *Waste*

All waste is summarized in our annual waste report. The waste report of 2023 is used as the basis and all kinds of waste are included. Some categories must be summarized because of limited data.

Liquid waste is treated in our wastewater treatment plant. All resulting emissions are included in categories of scope 1, scope 2, and purchased raw materials.

3.5.3.6 *Business Travel*

Business Travel is divided in three categories, travel by car, by train and by airplane. Emissions from business travel by company cars are counted in Scope 1 because the company is in control of the cars.

Car

The distance of a business trip using a private car is declared in invoices. All data is summarized and mapped with a dataset of an average car (petrol).

Train and Public Transport

Trains are differentiated in high-speed trains, regional trains and buses. For every train ride, the start and end station are known. Distances are measured by "Trassenfinder" from Deutsche Bahn (Trassenfinder). For day or week tickets average distances within the relevant zone are assumed.

Flight

To measure distances of flights CO_2-calculators are used (ICAO Carbon Emissions Calculator and Flug kompensieren – CO2-Rechner Flug – myclimate.org). Flights are differentiated into long-haul (>4000 km), medium-haul (1500 – 4000 km), short-haul (800-1500 km), and very short-haul (<800 km). These different distances are mapped with corresponding datasets.

3.5.3.7 *Employee Commuting*

All employees were asked to participate in a survey where they can provide information on how, how often, and what distance they travel to commute to work.

Every transportation possibility is assigned different emission factors from the Ecoinvent database. With a participation of 48 %, there is a good basis for extrapolating the data from the survey to all employees.

3.5.3.8 *Leased Assets upstream*

This category includes emissions from leased assets like company cars, photocopying stations and other machinery. It is excluded completely because there is little or no data available. On the other hand, emissions from their use are assumed to be higher and these emissions are included in other categories, e.g., electricity (scope 2) or company cars (scope 1).

3.5.3.9 *Downstream Transport and Distribution*

General Method for Emissions of Transports

Transports emissions are divided into supply chain emissions and use of the vehicle emissions, shown in Figure 5. The provision of energy is called Well-to-Tank (WtT), the use is called Tank-to-Wheel (TtW) and the complete cycle is called Well-to-Wheel (WtW).

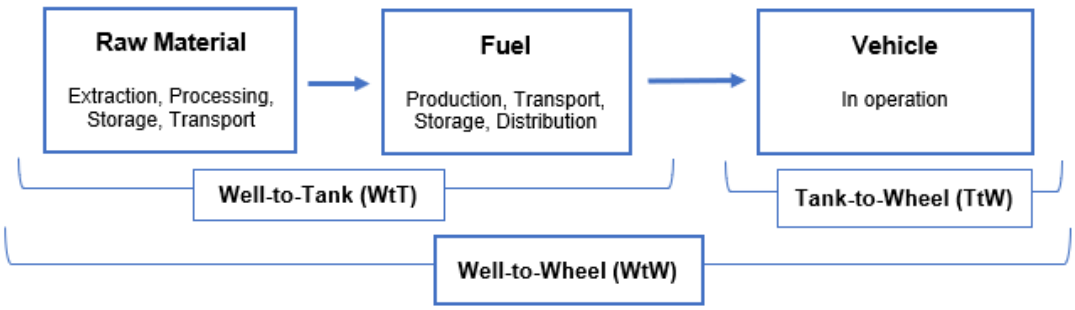

Figure 5: Transport divisions overview.

Freights

74 % of our downstream freights are carried out by one company. Divided between transport within Germany and exports, Dachser transports 96 % and 43 % respectively.

Information from freight forwarding agency Dachser

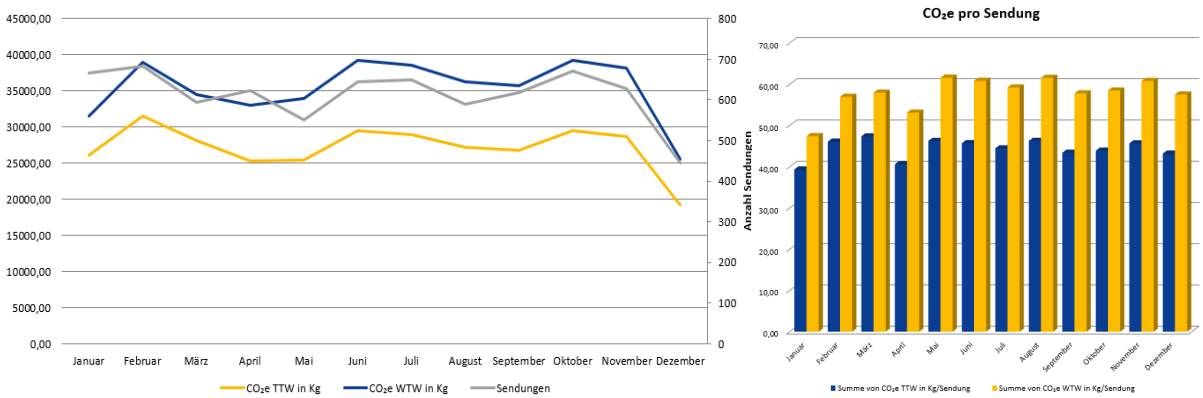

Figure 6: Transport emission Information freighted by Dachser (source. Dachser).

Calculation

All freight is extrapolated using data from Dachser as the basis, shown in Table 6.

Table 6: Extrapolation of data for downstream freights.

Forwarding agency	**Percentage**	**Tons CO_2e**
Dachser	65.7 %	403.2
Others	34.3 %	210.2
In total	100.0 %	613.4

The emissions of downstream transports increased by 30 %. This increase cannot be explained by an increase in the number of shipments. While the number of shipments decreased by 13 %, the emissions per shipment increased by 50 %. Due to a lack of detailed information from the freight forwarding agency, it was not possible to determine the cause of this increase.

3.5.3.10 Other Downstream Activities

All other downstream activities are excluded from this report.

Downstream categories are highly dependent on the customer use. This is the reason why it is not possible to determine emissions for the downstream categories “Processing of sold Products”, “Use of sold Products” and “End-of-Life Treatment of sold Products”.

All other categories, “Leased Assets downstream”, “Franchises” and “Investments” are not relevant for Schlötter.

3.6 Summary of Materiality Assessment

The quantitative impact on emissions is categorised according to various cost centres, as shown in Table 7 below. These cost centres form the reporting boundaries to calculate our Corporate Carbon Footprint.

Table 7: Included categories in Corporate Carbon Footprint.

Scope 1		• Stationary combustion (Combined heat and power plant (electricity and gas), photovoltaic system, solar thermal) • Mobile combustion (company cars) • Refrigerants • Wastewater treatment
Scope 2		• Electricity
Scope 3	**Upstream Activities**	
1.	Purchased goods and services	• Raw materials - chemistry • Packaging • Cafeteria packages • Paper
4.	Upstream transportation and distribution	• Raw materials - chemistry
5.	Waste generated in operations	
6.	Business travel	
7.	Employee commuting	
Scope 3	**Downstream Activities**	
9.	Downstream transportation and distribution	

4 Quantified GHG inventory of emissions

4.1 Greenhouse Gases Calculations

REPORTING COMPANY	**Dr.-Ing. Max Schlötter GmbH & Co. KG**	
Person responsible for the report	Dr. Anna-Theresa Knobloch	
Reporting period covered	from 2024 / 01 / 01	to 2024 / 12 / 31
Organizational boundaries	Refer to Chapter 2	
Reporting boundaries	Refer to Chapter 3	

EMISSIONS	CO_2e [kg/a]	In Total CO_2e [t/a]
1. Scope 1: Direct GHG emissions	906,987	**907.0**
1.1 Direct emissions from stationary combustion	502,101	502.1
1.2 Direct emissions from mobile combustion	377,098	377.1
1.3 Direct process emissions	21,448	21.4
1.4 Direct figitive emissions arise from the release of greenhouse gases in anthropogenic systems	6,340	6.3
2. Scope 2: Indirect GHG emissions from imported energy	355,776	**355.8**
2.1 Indirect emissions from imported electricity (market-based)	355,776	355.8
2.1 Indirect emissions from imported electricity (location-based, mix Germany)	204,280	204.3
3. Scope 3: Indirect GHG emissions from up- and downstream activities	16,070,179	**16,070.2**
3.1 Indirect emissions from purchased goods and services	14,563,179	14,563.9
3.2 Indirect emissions from upstream transport and distribution	460,504	460.5
3.3 Indirect emissions from the disposal of solid and liquid waste	99,265	99.3
3.4 Indirect emissions from business travel	70,708	70.7
3.5 Indirect emissions from employee commuting	230,291	230.3
3.6 Indirect emissions from downstream transport and distribution	645,551	645.6
In Total	17,332,943	**17,332.9**

4.2 Graphical Presentation

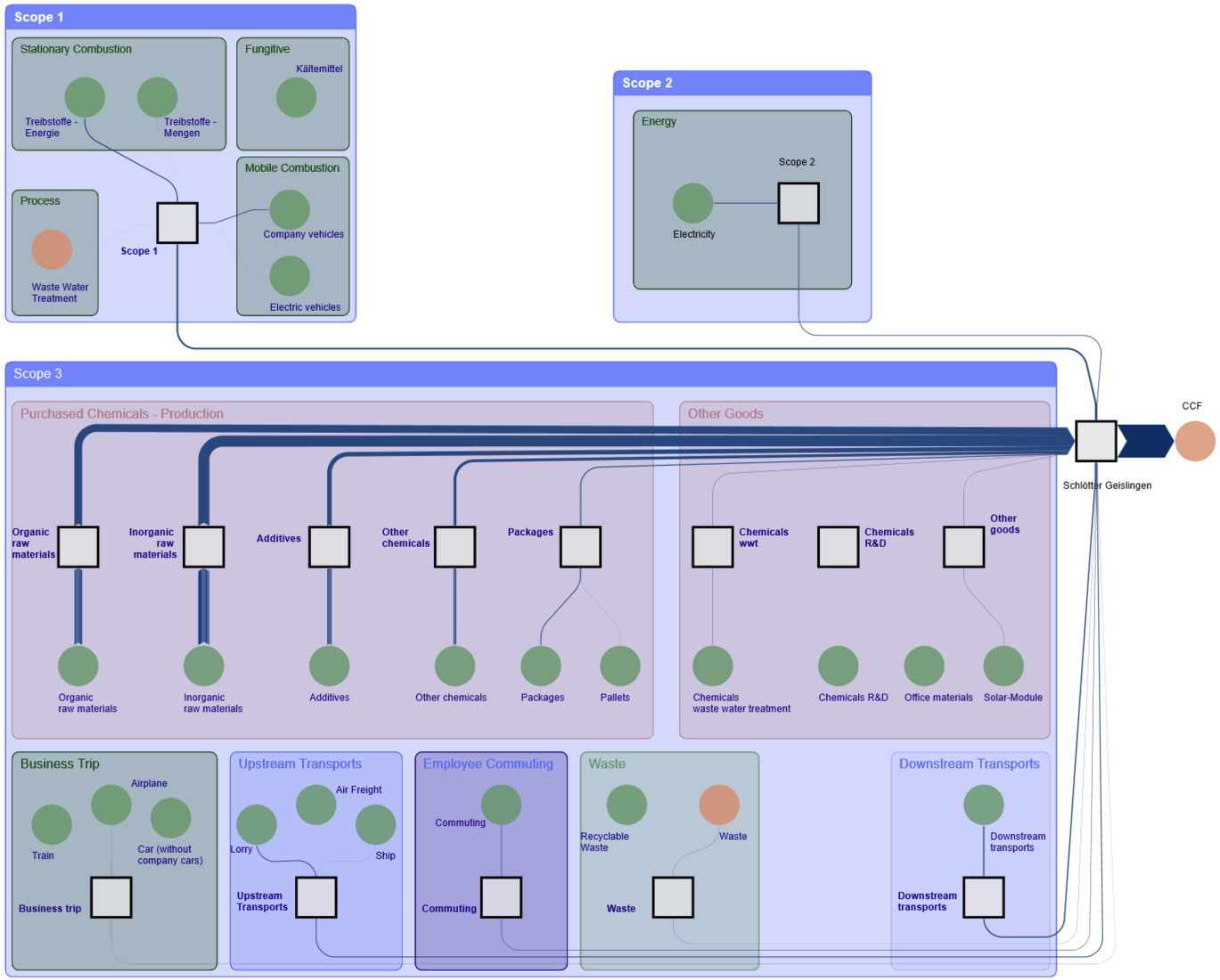

Figure 7: Sankey diagram of the Corporate Carbon Footprint illustrated and calculated with Umberto 11 software.

The pie chart and bar graph in Figure 8 show the quantity of emissions from scope 1, scope 2, and scope 3 for the reported year 2024. Scope 3 emissions account for the majority at 93 %, Scope 2 emissions are 2 %, and Scope 1 emissions are 5 %.

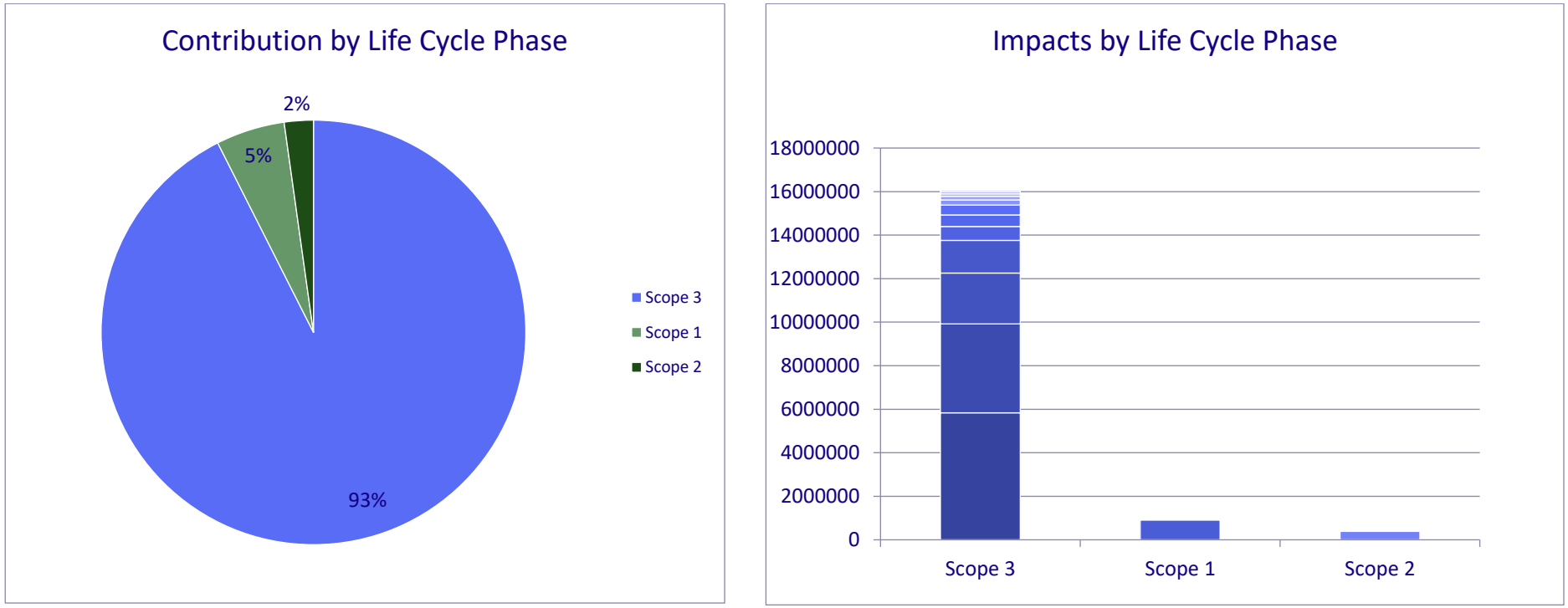

Figure 8: Charts for contribution of different scopes.

4.3 Comparison of Years

Table 8: Comparison of CO_2 emissions for 2024 with the previous year 2023.

EMISSIONS	2023 CO2e [t/a]	2024 CO_2e [t/a]	Comparison previous year [t/a]	Comparison previous year [%]
1. Scope 1: Direct GHG emissions	1,016.6	907.0	109.7	10.8
1.1 Direct emissions from stationary combustion	552.9	502.1	50.8	9.2
1.2 Direct emissions from mobile combustion	431.2	377.8	54.1	12.6
1.3 Direct process emissions	21.8	21.4	0.4	1.6
1.4 Direct figitive emissions arise from the release oh GHG in anthropogenic systems	10.7	6.3	4.4	40.7
2. Scope 2: Indirect GHG emissions from imported energy	306.2	355.8	- 49.6	- 16.2
2.1 Indirect emissions from imported electricity (market-based)	306.2	355.8	- 49.6	- 16.2
2.1 Indirect emissions from imported electricity (location-based, German mix)	177.2	204.3	- 27.1	- 15.3
3. Scope 3: Indirect GHG emissions from up- and downstream activities	14,538.6	16,070.3	- 1,531.7	- 10.5
3.1 Indirect emissions from purchased goods and services	13,240.2	14,563.9	- 1,323.7	- 10.0
3.2 Indirect emissions from upstream transport and distribution	431.0	460.5	- 29.5	- 6.8
3.3 Indirect emissions from the disposal of solid and liquid waste	37.3	99.3	- 62.0	- 166.2
3.4 Indirect emissions from business travel	64.5	70.7	- 6.2	- 9.6
3.5 Indirect emissions from employee commuting	223.7	230.3	- 6.6	-3.0
3.6 Indirect emissions from downstream transport and distribution	541.9	645.6	- 103.7	- 19.1
In Total	**15,861.4**	**17,333.0**	**- 1,471.6**	**- 9.3**

Table 9: Comparison of CO2 emissions for 2024 with the base year 2021.

EMISSIONS	2021 CO_2e [t/a]	2024 CO_2e [t/a]	Comparison base year [%]
1. Scope 1: Direct GHG emissions	1,221.4	906.9	25.7
1.1 Direct emissions from stationary combustion	821.1	502.1	38.9
1.2 Direct emissions from mobile combustion	369.4	377.1	-2.1
1.3 Direct process emissions	30.9	21.4	30.7
1.4 Direct figitive emissions arise from the release of GHG in anthropogenic systems	-	6.3	-
2. Scope 2: Indirect GHG emissions from imported energy	304.2	355.8	-17.0
2.1 Indirect emissions from imported electricity (market-based)	304.2	355.8	-17.0
2.1 Indirect emissions from imported electricity (location-based, German mix)	257.2	204.3	20.6
3. Scope 3: Indirect GHG emissions from up- and downstream activities	17,000.8	16,070.3	5.5
3.1 Indirect emissions from purchased goods and services	15,551.1	14,563.9	6.3
3.2 Indirect emissions from upstream transport and distribution	551.9	460.5	16.6
3.3 Indirect emissions from the disposal of solid and liquid waste	28.5	99.3	-248.4
3.4 Indirect emissions from business travel	19.8	70.7	-257.1
3.5 Indirect emissions from employee commuting	417.3	230.3	44.8
3.6 Indirect emissions from downstream transport and distribution	432.2	645.6	-49.4
In Total	**18,526.4**	**17,333.0**	**6.4**

Table 8 and Table 9 show a comparison of GHG emissions from the current year 2024 to the previous year and the base year 2021. The overall trend shows a decrease of 6.4 %, but it also shows that emissions have not been reduced compared to the previous year; they have risen by almost 10 %.

Emissions from purchased goods and services are highly dependent on the amount and kind of our raw materials. A part of our suppliers is working on the productions of climate neutral products, but this adjustment will take time within the chemistry branch.
We can also see increasing emissions from up- and downstream transports. In the area of upstream transports, we have a higher amount of raw materials and, through a change in data collection, more precise data. The values for emissions from downstream transports are received from our freight forwarding agency; even upon request, no comprehensible explanation for the increase has been provided to date.

Emission reductions were achieved primarily in Scope 1 emissions through a further reduction in gas consumption and the successive change of company cars to electric vehicles.

4.4 Data Safety

The data accuracy is assessed by two criteria; the accuracy of purchased amount and the accuracy of the emission factors used. Each criterion is rated on a scale 1 – 4 as described in Table 10 below.

Table 10: Description of scoring the data.

	Amount	Emission Factors
1	Exact	Values through supplier
2	Calculated	Values from database
3	Estimated	Calculated values based on database
4	Not known	Values for substance classes or similar substances from database

The total assessment is calculated through the average of scored amount and emission factor.

Table 11: Percentual distribution of scoring.

	Amount	Emission Factors	In Total
1	90.7 %	7.0 %	6.4 %
1,5	-	-	21.0 %
2	8.0 %	24.5 %	19.5 %
2,5	-	-	28.6 %
3	1.2 %	16.5 %	4.3%
3,5	-	-	0.2 %
4	0.0 %	52.1 %	0.0 %

Table 11 shows clearly that used amounts are well known for the calculation, but only a small number of values for emission factors have been received through the suppliers and so values from a database are used instead. The database used was Ecoinvent, which is one of the leading databases for Life-cycle-analysis, wherefore the datasets used are scored with good accuracy. In the case of many special chemicals that are used (more than 50 %), datasets for substance classes or similar chemicals have to be used.

In this scoring all datasets are treated equally. The problem is that the equal weight of data doesn't show the relation to the quantity of emissions.

Therefore, a new evaluation for only entries with high emissions should show the distribution of accuracy of data with high emissions. All entries, their yearly emissions, and their scoring are summarized in a table. All entries with the highest emissions, including their scoring, are summarized to result in 50 %, 70 % and 80 % of the yearly emissions. The distribution is shown in Table 12.

Table 12: Accuracy of data.

	100 %	80 %	70 %	50 %
1	6.4 %	14.9 %	19.4 %	31.3 %
1.5	21.0 %	17.0 %	19.4 %	31.3 %
2	19.5 %	23.4 %	19.4 %	25.0 %
2.5	48.6 %	40.4 %	35.5 %	6.3 %
3	4.3 %	2.1 %	3.2 %	6.3 %
3.5	0.2 %	2.1 %	3.2 %	
4				

Table 12 shows that the quality of data from high emissions has a higher accuracy than the data of all datasets.

Overall, no data is estimated, the majority of the data shows a good to moderate accuracy.

5 GHG Reduction Initiative and Internal Performance Tracking

Since 2020, we have calculated our Corporate Carbon Footprint every year. These calculations enable us to identify our biggest greenhouse gas emissions and to define targeted reduction measures. The position of a climate change officer and our climate team were created to empower our climate protection activities. Our internal and external projects cover both our own processes and our up- and downstream value chain. Internal projects include energy efficiency and the expansion of renewable energies. Measures such as lowering the flow temperature and automatic switching on and off during production have already enabled us to increase our energy efficiency.
A key concern is to actively involve all employees in our climate protection strategy. To this end, information is provided on a regular basis, including via a climate protection newsletter.

Our concepts for adapting to climate change include measures for building renovations and new constructions, in which we specifically respond to future climatic conditions, such as higher temperatures. For example, we rely on efficient heat pump systems for heating and cooling to ensure good working conditions even under changing climatic conditions. In addition, we are involved in research and development projects aimed at climate-friendly innovations, such as the production of green hydrogen and developments in the field of electronics.

By changing our canteen food supplier in the spring, we were able to save around 120 kg of single-use plastic packaging in 2024 and a further 60 kg in 2025. This will save almost 1 ton of CO2e over the two years.
The first photovoltaic system was installed in 2011, new modules with a capacity of 110 kWp were added in 2024, and more are planned for 2025.

Unfortunately, the measures implemented in 2024 are not reflected in our absolute values. The installation of the new PV system was completed somewhat late, in the fall, and our electricity consumption has increased. In addition, our electricity mix has deteriorated in terms of emissions. In the area of Scope 3 emissions, the disposable packaging of our food and the emissions associated with it have been eliminated, but they account for such a small proportion of Scope 3 emissions that this is lost in the annual fluctuations.

Nevertheless, we believe we are well on the way to achieving our interim target for 2026. From January 2026 onwards, we will receive electricity from renewable sources due to a change in our purchased energy tariff. We can achieve our planned reductions through the installation of additional PV systems and heating pumps.