FORLIANCE

GROWING CLIMATE ACTION

CORPORATE CARBON FOOTPRINT 2021

RAMPA GmbH & Co. KG

September 2022

SUMMARY

The subject of this report is the Corporate Carbon Footprint of RAMPA GmbH & Co. KG.

Object of consideration and methodology

The assessment covers the year 2021. The complete GmbH & Co. KG was defined as the object of this assessment. To create a holistic assessment of all emissions, all relevant emissions of scopes 1, 2 and 3 were recorded. Beyond direct emissions, the company's upstream and downstream value chain was, therefore, also considered.

The methodological basis for the analysis performed is the "Greenhouse Gas Protocol Corporate Accounting and Reporting Standard" (GHG Protocol).

Results 2021

The total greenhouse gas emissions caused by RAMPA GmbH & Co. KG in the year 2021 amounts to 1,596.269 t CO_2e (*market-based approach*).

Of this total, 12.41 % can be attributed to emission sources that the company either owns or directly controls (scope 1), and87.59 % to all other emission sources that arise as a result of the company's activities but are under the ownership or control of a third party (scope 3, e.g., business trips, employee commuting). In scope 2, no emissions are generated through the use of green electricity.

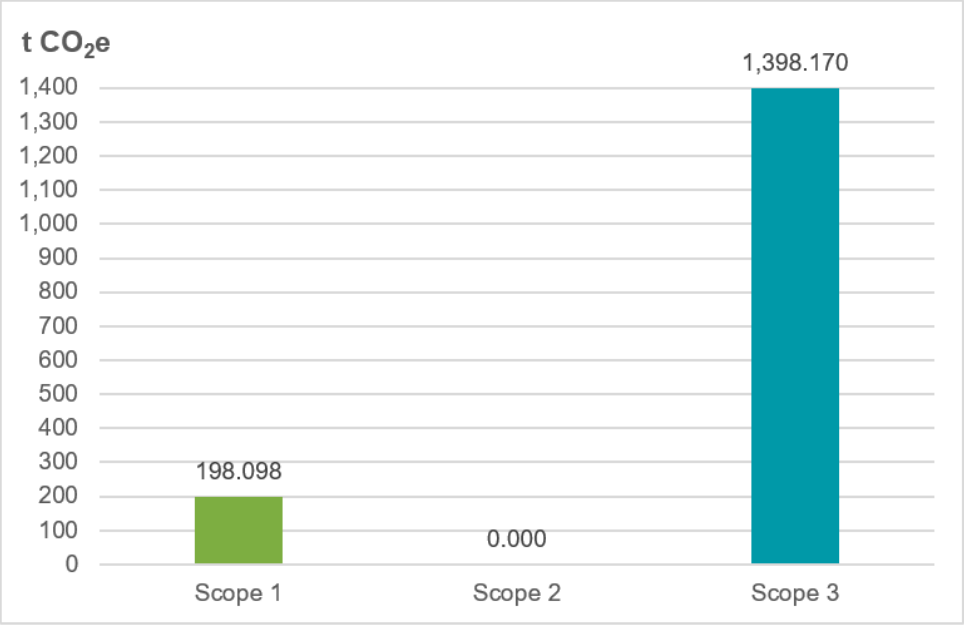

Figure 1: CO_2e emissions by scope (year 2021)

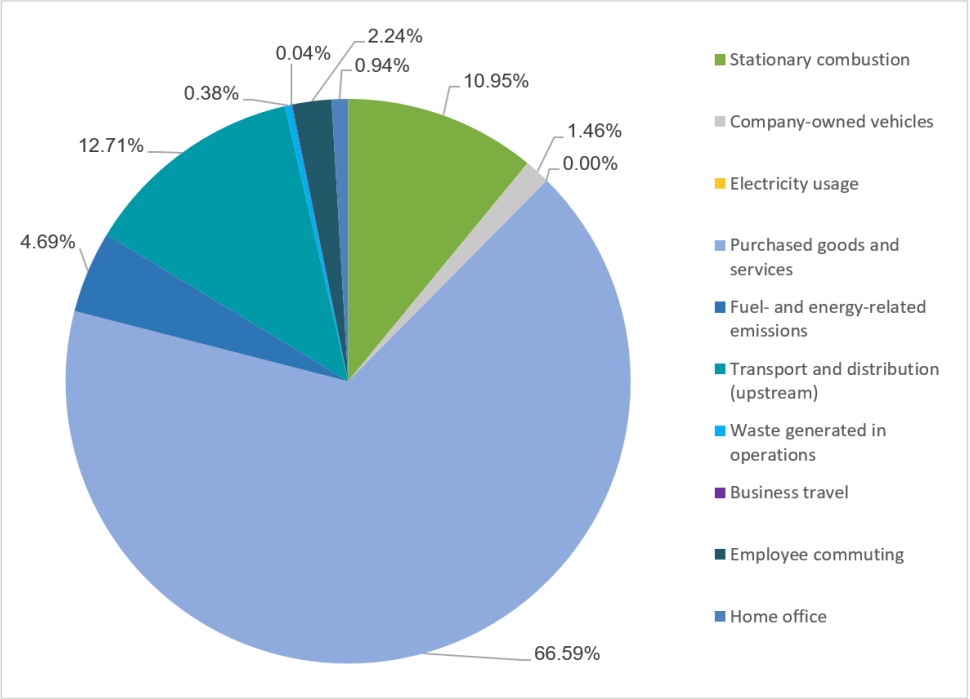

Figure 2: CO_2e emissions by category (year 2021)

Emission hotspots

The emission hotspots are depicted in figure 2. The three identified emission hotspots account for 90.25 % of the total emissions.

1. Purchased goods and services (1,063.035 t CO_2e; 66.59 %)
2. Transport and distribution (upstream) (202.832 t CO_2e; 12.71 %)
3. Stationary combustion (174.769 t CO_2e; 10.95 %)

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Glossary

BEIS	Department for Business, Energy and Industrial Strategy
CCF	Corporate Carbon Footprint
CDP	Carbon Disclosure Project
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
DNK	Deutscher Nachhaltigkeits Kodex (The Sustainability Code)
GHG	Greenhouse Gas
GRI	Global Reporting Initiative
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
UBA	Umweltbundesamt (German Environment Agency)
UNFCCC	United Nations Framework Convention on Climate Change
WBCSD	World Business Council for Sustainable Development
WRI	World Resources Institute

1 INTRODUCTION

About RAMPA GmbH & Co. KG

RAMPA is a professional partner for connecting technology, where quality comes first. The high-quality inserts provide the required stability and long-term load-bearing capacity for structures in wood, metal and plastic. As a C-component supplier, RAMPA provides its costumers with a reliable supply of connecting and fixing elements for wood applications such as threaded sleeves, threaded inserts, screw-in nuts and pan-head screws. Connections that are extremely strong and can also be undone several times can be created with these RAMPA elements (RAMPA 2021).

Subject of the report

The subject of this report is the Corporate Carbon Footprint (CCF) of RAMPA GmbH & Co. KG. A CCF is a core component of any profound climate strategy, as the CCF represents the central metric in terms of status quo, reduction targets, reduction measures, emission scenarios, and efficiency metrics.

The aim of the assessment is to determine the amount of greenhouse gas emissions caused by the company to subsequently develop a strategy for long-term reduction. The knowledge gained will be used to understand the company's impact on the global climate and to demonstrate to employees, partners, and other stakeholders a responsible role in the company's commitment to sustainability.

The assessment covers the year 2021. The complete GmbH & Co. KG was defined as the object of consideration. In terms of a holistic approach, all relevant emissions of scopes 1, 2 and 3 are to be recorded. In addition to the direct emissions, the company's upstream and downstream value chain should also be considered.

The methodological basis for the analysis performed is the "Greenhouse Gas Protocol Corporate Accounting and Reporting Standard" (GHG Protocol). This international accounting standard for corporate greenhouse gas emissions is especially intended to guarantee transparency and enable comparability.

2 METHODOLOGY

With the aim of achieving a high degree of comparability, transparency and traceability of the results obtained, the carbon footprint was calculated according to the methodological specifications of the Greenhouse Gas Protocol (GHG Protocol) standard.

2.1 Greenhouse Gas Protocol

The GHG Protocol, developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), is the most widely used international standard for the accounting and reporting of corporate CO_2 emissions. The GHG Protocol Standard is internationally considered a best practice standard and is also recommended in the context of national and international CSR reporting. Both the Global Reporting Initiative (GRI) and the German Sustainability Code (DNK) explicitly mention the GHG Protocol as an accounting standard. According to the GHG Protocol, 92% of Fortune 500 companies reporting to the CDP reported in accordance with the GHG Protocol in 2016.

The addition of the "Corporate Value Chain (scope 3) Accounting and Reporting Standard" to the "Greenhouse Gas Protocol Corporate Accounting and Reporting Standard" provides practical guidelines for the accounting and reporting of emission sources in scopes 1-3.

2.2 Greenhouse Gas Emissions and Global Warming Potential

This Corporate Carbon Footprint includes the greenhouse gases carbon dioxide, methane, nitrous oxide, perfluorocarbon, chlorofluorocarbons, sulphur hexafluoride and nitrogen trifluoride (GHG Protocol), which are taken into account by the UNFCCC and the Kyoto Protocol. Since their respective Global Warming Potentials (GWP) differ considerably, they are converted to CO_2 equivalents (CO_2e) for the sake of better comparability. Table 1 lists the greenhouse gases with their respective global warming potential in CO_2e over a period of 100 years.

Greenhouse gas	GWP
Carbon dioxide (CO_2)	1
Methane (CH_4)	27.9
Nitrous oxide (N_2O)	273
Perfluorcarbon (PCFs)	7,430 – 12,400
Chlorofluorcarbons (HFCs)	4.84 – 14,600
Nitrogen trifluoride (NF_3)	17,400
Sulphur hexafluoride (SF_6)	25,200

Table 1: Greenhouse gases and their global warming potential according to UNFCCC/Kyoto-Protocol

The aim of taking all greenhouse gases into account is to provide a meaningful representation of the company's impact on anthropogenic climate change.

2.3 Accounting principles

Generally, a carbon footprint is made up of two central components. One part is generally described as activity data or consumption data. This includes, for example, data such as kilometers traveled per means of transport, electricity usage, heating fuel consumption, or quantities of goods consumed.

On the other hand, there are emission factors. Emission factors enable the conversion of activity data into reliable emission values. As there is usually no on-site measurement of the emissions caused (primary data), secondary data (activity/consumption data) must be multiplied by emission factors. Emission factors represent the amount of greenhouse gas emissions caused in relation to a specific unit (e.g., per kilometer, per kWh, per kg). The activity data combined with the emissions factors enable the calculation of the total greenhouse gas emissions emitted.

Activity data x emission factor = total amount of GHG emissions

Example: 10,000 kilometers by car x 0.163 kg CO_2e/passenger kilometer = 1,630 kg CO_2e

If direct data on the emissions caused are available, these are to be preferred. In the ideal case, all market participants report their directly measured emissions and make this information (publicly) available. In this way, one would be able to calculate highly precise and complete corporate carbon footprints.

3 PROCESS

3.1 Preparation of the assessment

The accounting process was built on the experience of the initial assessment for the reporting year 2020 and further discussions.

3.2 Organizational boundaries

The organizational boundaries have not been changed compared to the base year.

The **operational control approach** continues to be applied:

> *„A company has operational control over an operation if the former or one of its subsidiaries […] has the full authority to introduce and implement its operating policies at the operation. This criterion is consistent with the current accounting and reporting practice of many companies that report on emissions from facilities, which they operate (i.e., for which they hold the operating license). It is expected that except in very rare circumstances, if the company or one of its subsidiaries is the operator of a facility, it will have the full authority to introduce and implement its operating policies and thus has operational control. Under the operational control approach, a company accounts for 100% of emissions from operations over which it or one of its subsidiaries has operational control.* " (GHG Protocol Corporate Standard: S. 18)

The setting of these organizational accounting boundaries subsequently has an impact on the allocation of emissions to different emission scopes and thus responsibility. By choosing this accounting approach, direct emissions from energy consumption in rental properties, for example, are assigned to the scope 1 and 2 emission areas and not to the scope 3 area (more details on scopes see section 3.3).

3.3 Operational boundaries

Within the described organizational boundaries, emissions of scopes 1, 2 and 3 are to be covered. The aim is to take full account of all emission sources, if these can be determined in accordance with the principles of relevance, completeness, consistency, transparency, and accuracy.

The principle of scopes is based on the distinction between direct and indirect emission sources:

- **Direct emissions:** Emissions from sources that the company either owns or directly controls.
- **Indirect emissions: E**missions that arise from activities of the company but occur at sources owned or controlled by another company.

Based on this, a distinction is made between three scopes. According to the GHG Protocol, all emissions from scope 1 and 2 must be included in the calculation and accounting of a CCF, while the inclusion of scope 3 emissions is voluntary but recommended.

- **Scope 1:** All emissions that occur directly within the company. In other words, emissions from sources that the company either owns or directly controls.

- **Scope 2:** All indirect emissions generated for the company's energy supply. In other words, emissions from purchased electricity and thermal energy.
- **Scope 3:** Any other emissions that arise as a result of the company's activities but are owned or controlled by a third party**.**

Figure 3 clearly illustrates the distinction between scopes 1-3 and shows examples of emission sources from the respective scopes.

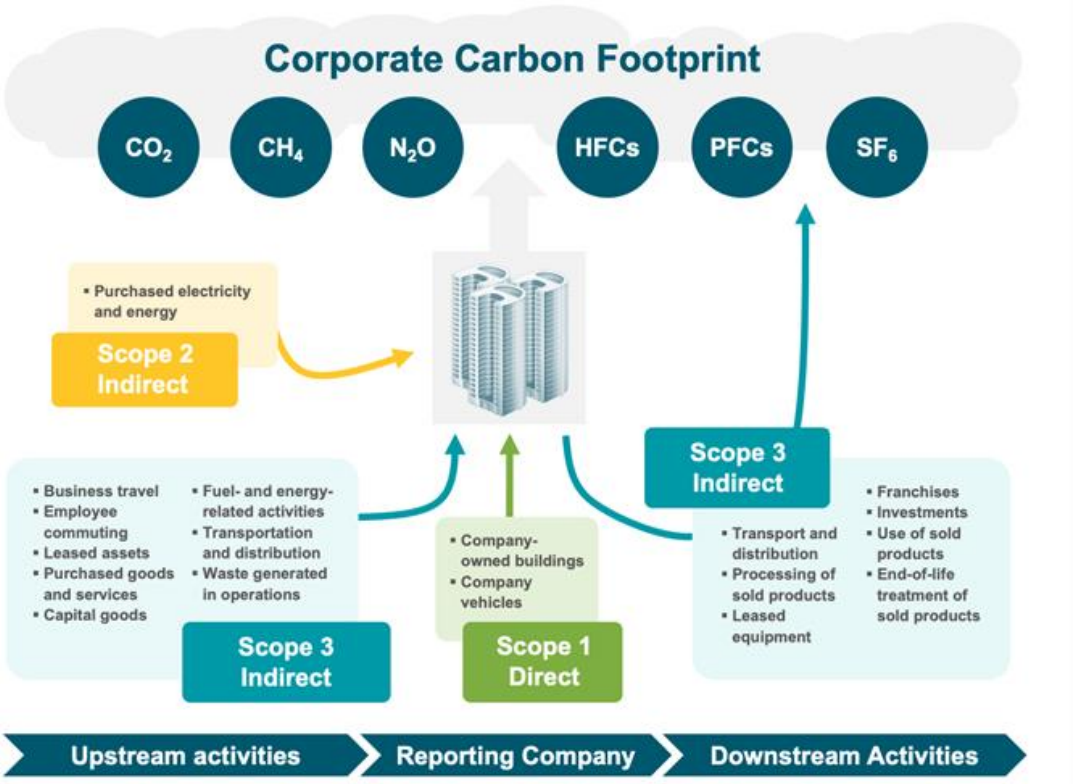

Figure 3: Overview of scopes and emission sources according to the methodology of the GHG Protocol (Source: based on GHG Protocol)

3.4 Emission sources RAMPA GmbH & Co. KG

The following emission sources were determined for RAMPA GmbH & Co. KG (see table 2):

Scope	Category		Emission source	Relevant?	Emission source – specific example
1			Stationary combustion	Yes	▪ Heating agent, fuel e.g., for generators
1			Company-owned vehicles	Yes	▪ Vehicle fleet (incl. leased vehicles)
2			Electricity usage	Yes	▪ Electricity usage
3	.1	Upstream	Purchased goods and services	Yes	▪ Raw materials ▪ Trade goods ▪ Packaging ▪ Oil
3	.2		Capital goods	No	

3	.3		Fuel- and energy-related activities	Yes	▪ Indirect (upstream) emissions
3	.4		Transport and distribution	Yes	▪ Logistics service providers (upstream and downstream)
3	.5		Waste generated in operations	Yes	▪ Water ▪ Waste
3	.6		Business travel	Yes	▪ Air travel ▪ Car ▪ Railroad ▪ Overnight stays
3	.7		Employee commuting	Yes	▪ Emissions from employee commuting
3	.8		Upstream leased assets	No	
3	.9	Downstream	Downstream transportation and distribution	No	
3	.10		Processing of sold products	No	
3	.11		Use of sold products	No	
3	.12		End-of-life treatment of sold products	No	
3	.13		Downstream leased assets	No	
3	.14		Franchises	No	
3	.15		Investments	No	

Table 2: Considered emission sources RAMPA GmbH & Co. KG

The relevance analysis and thus the decision to include emission sources in the accounting process was made in exchange with RAMPA and was based on the experience of FORLIANCE. Omitted emission sources are discussed under 4.2.

3.5 Reporting period

The reporting period refers to the year 2021.

3.6 Data collection process

The data collection was carried out by RAMPA. The corresponding data collection sheets were set up by FORLIANCE based on the data collection of the previous year. The data on employee mobility was queried and collected by RAMPA. Review and verification of the collected data was done by FORLIANCE. Throughout the data collection period, there was a regular exchange between RAMPA and FORLIANCE. Data was collected, processed, and improved over several feedback rounds.

4 ACTIVITY DATA

As described, data was collected through individualized data collection sheets and submitted according to the previous year to allow for comparison.

4.1 Data format

The necessary data was submitted, with some data points converted/edited to reflect the appropriate pendant to the respective emission factor. As an example, the waste volume can be mentioned. The data was submitted in units of liters and was converted to kilograms based on an average density per type of waste.

4.2 Omitted emission sources

The following emission sources were not considered:

- Purchased goods and services, except for raw materials and trade goods, including packaging (e.g., office equipment).
- Downstream emissions

The same extent of assessment was followed to allow comparability of results. Capital goods were not acquired in 2021. In addition, the footprint was focused on sources that can be affected by RAMPA and are thus eligible for future reduction measures

4.3 Data consolidation

The provided data was reviewed and verified for plausibility by FORLIANCE and refined in consultation with RAMPA.

4.4 Data quality

The overall process of data collection has resulted in an extensive data catalog. Since data quality has a significant impact on the accuracy of the result, the data collected are qualitatively assessed by FORLIANCE in the following. The following categorization of activity data uses the following categories:

- High level of data accuracy (+); based on e.g., billings & real consumption data
- Moderate level of data accuracy (O); based on e.g., data extrapolation
- High level of data inaccuracy (-); based on e.g., estimates

The categorization is based on FORLIANCE's many years of experience.

SCOPE 1			
Emission source	**Quality**	**Original source**	**Comments**
Company-owned vehicles	+	Real consumption data	The kilometers driven were transmitted accurately. The data quality can be classified as high.

Stationary combustion	+	Real consumption data	The data was submitted as total kWh consumed. No conversion was necessary. Therefore, the data quality is rated as high.

SCOPE 2			
Emission source	**Quality**	**Original source**	**Comments**
Electricity usage	+	Real consumption data	The total quantity in kWh was transmitted. A conversion was not necessary. The data quality is rated as high.

SCOPE 3			
Emission source	**Quality**	**Original source**	**Comments**
Purchased Goods and Services	+	Real consumption data	The raw material, trade goods as well as packaging were completely transmitted. The total quantity was given in kg. This made the data ideal for processing. The data quality is therefore rated as high.
Fuel-and energy-related activities	+	Real consumption data	See scope 1 and 2
Waste generated in operations – water/waste	O	Real consumption data	Data was submitted as total liters of waste and m^3 of water consumed. A conversion was necessary. Therefore, the data quality is rated as medium.
Business travel	+	Real consumption data	The data was supplied very accurately, and no conversions had to be made. The data quality can be classified as high.
Employee commuting	+	Survey results	By means of a survey, data was collected on the mobility of employees in terms of distance to work, the means of transport used and the number of working days. The data quality can be classified as high.
Home office	+	Survey results	The data for home office hours was submitted by RAMPA on a country-specific basis. As a result, the data quality can be classified as high.

Table 3: Data quality

Data Quality – Conclusion

Overall, the data quality can be described as very good. Nevertheless, an improvement could be made in the case of waste generated in operations. Weight data would be more meaningful than volume data because the conversion from volume to weight would be eliminated.

Nevertheless, the submitted and processed data in combination with the emission factors (see section emission factors) allow for a reliable calculation of the total emissions as well as on the emission hotspots. Thus, this emission accounting process represents a good basis for the next steps within the framework of a climate protection strategy.

5 EMISSION FACTORS

In addition to the activity data, the assessment of greenhouse gas emissions requires emission factors that enable the conversion of the activity data into emissions. For this purpose, the selection of the correct factor for each data item is of great importance. Therefore, emission factors were reviewed, evaluated, and selected in the analysis based on different criteria. These include:

- Technology: Is the correct technology depicted?
- Time: Is the correct time period represented?
- Geography: Is the correct geographic reference represented?
- Completeness: Is the value representative?
- Reliability: Are the sources and methods reliable and verified?

If it was necessary for the selection and evaluation of the emission factor, further qualitative information was requested in addition to the activity data (composition, origin, age, etc.). These criteria also lead to the following categorization:

- High accuracy (+)
- Medium accuracy (O)
- High inaccuracy (-)

The categorization is based on FORLIANCE's many years of experience.

Main sources

The main database sources for this assessment are the following:

- **Department for Business, Energy & Industrial Strategy (BEIS)**. UK Government GHG Conversion Factors for Company Reporting. 2021.
- **Ecoinvent 3.8** (https://ecoinvent.org/).
- **Umweltbundesamt (UBA)** – several research papers and reports.

All sources are of high quality, are internationally recognized, and are maintained by public agencies as well as not-for-profit organizations. Nevertheless, these factors must also be partially converted and adjusted to form a matching counterpart to the corresponding activity data point.

5.1 Emission factor quality

The following table presents the quality of the emission factors (see table 4).

SCOPE 1			
Emission source	**Quality**	**Original source**	**Comments**
Company-owned vehicles	+	BEIS	The factors represent the direct emissions from vehicle use. Further life cycles are not taken into account. The quality of the factors is rated as high.
Stationary combustion	+	BEIS	The activity data allowed an accurate assessment of emissions. Specific emission factors could be used. The quality of the factors can be rated as high.

SCOPE 2			
Emission source	**Quality**	**Original source**	**Comments**
Electricity usage	+	Electricity supplier	RAMPA provided the emission factors directly. The emission factors are based on the measurement data of the electricity supplier. The quality is therefore classified as high.

SCOPE 3			
Emission source	**Quality**	**Original source**	**Comments**
Purchased Goods and Services	+/O	BEIS, Ecoinvent 3.8	For a large part of the data, a precise selection of emission factors was possible. Therefore, specific emission factors could be used. The quality of the factors can be rated as medium.
Fuel-and energy-related activities	+	BEIS, UBA	A precise selection of emission factors was possible. Therefore, specific emission factors could be used. The quality of the factors can be rated as high.
Waste generated in operations – water/waste	+	BEIS, Ecoinvent 3.8	A precise selection of emission factors was possible. Therefore, specific emission factors could be used. The quality of the factors can be classified as high.
Business travel	+	BEIS	A precise selection of emission factors was possible. Therefore, specific emission factors could be used. As a result, the quality of the factors can be rated as high.
Employee commuting	+	BEIS, UBA, EEA,	The activity data enabled an accurate assessment of emissions according to vehicle size and fuel type. Specific differentiations could also be made for other modes of transport. Therefore, specific emission factors could be used. The quality of the factors can be classified as high.
Home office	O	BEIS, UBA, EEA	Country-specific electricity data was used. The emission factors for electricity and heating consumption were calculated by FORLIANCE, based on UBA reports. Therefore, the quality of the factors can be classified as medium.

Table 4: Emission factor quality

Conclusion on emission factor quality

Overall, the quality of the emission factors can be rated positively. In general, it was possible to rely on high-quality emission factors. It should be noted that the selection of emission factors is always indirectly related to the available activity data.

If emission factors are adjusted in the course of subsequent assessments, these adjustments should also be implemented retroactively for the current assessment. Consistency should be maintained here.

6 RESULTS

The results presented hereinafter refer to RAMPA GmbH & Co. KG. The scope and time period of the assessment were described. The results of the Corporate Carbon Footprint for RAMPA are presented below according to the scopes (see section 3.3).

6.1 Total emissions RAMPA GmbH & Co. KG

According to the requirements of the GHG Protocol, a distinction should be made between the *market-based approach* and the *location-based approach* (see excursus: GHG Protocol Scope 2 Reporting). RAMPA submitted supplier-specific emission values for the reporting year 2021, thus emissions have been accounted for according to the contractually guaranteed electricity mix. This method is known as the *market-based approach*. The process of distinguishing between the two approaches was only possible in the second assessment. For the first assessment, CCF 2020, no supplier-specific emission values were available; therefore, the results were reported using the *location-based approach*.

Market-based approach

According to the ***market-based approach***, total GHG emissions for RAMPA for the year 2021 amount to

1,596.269 t CO_2e.

Location-based approach

According to the ***location-based approach***, total GHG emissions for RAMPA for the year 2021 amount to

1,913.409 t CO_2e.

Classification

A classification of the amount of greenhouse gas emissions caused is difficult. Above all, comparison with other companies is fundamentally difficult due to insufficient comparative data and reference values (intensity values). If the assessed emissions are put in relation to the emissions of an average German citizen in 2021 (11.17 t CO_2e per year; Statista 2022), the emissions caused correspond to the amount of greenhouse gas emissions caused by 143 German citizens within one year.

Excursus: GHG Protocol Scope 2-Reporting

The GHG Protocol requires dual reporting for scope 2 emissions with respect to purchased electricity and clear documentation of the accounting method used. Two reporting methods are to be used for purchased electricity:

1. *Market-based approach*: Emissions are accounted for according to the contractually agreed electricity mix.

2. *Location-based approach*: Emissions are accounted for according to the local average emissions of the respective electricity mix (e.g., German electricity mix)

6.2 Emissions by scope

Further analysis of the results follows the ***market-based approach***. In the first step, the results are presented according to the principle of scopes (see figure 4).

The scope 1 emissions of RAMPA sum up to 198.098 t CO_2e (12.41 % of total emissions). Scope 3 emissions are significantly higher at 1,398.170 t CO_2e (87.59 % of total emissions). No scope 2 emissions are caused by the purchase of green electricity.

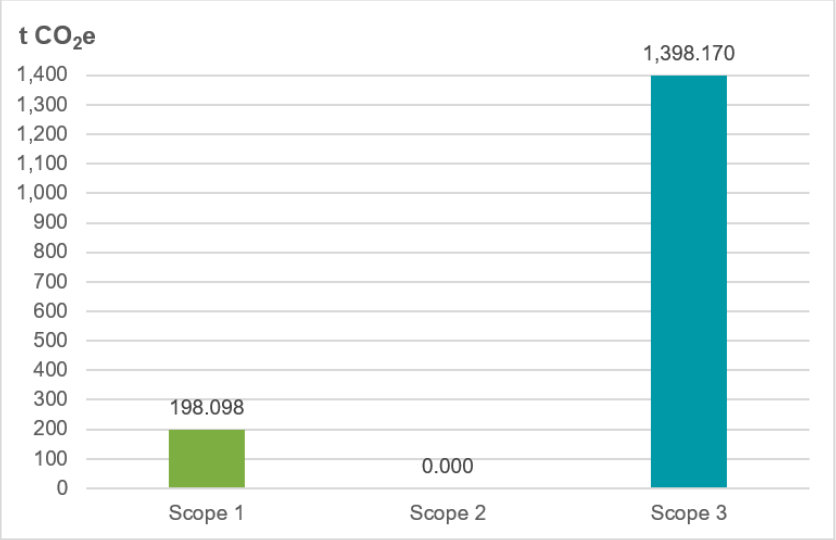

Figure 4: CO_2e emissions by scope (year 2021)

The presentation of emission sources by scopes and their subcategories is based on the methodological requirements of the GHG Protocol and serves the transparency of corporate carbon footprints. For a simplified understanding, the presentation according to emission sources within the scopes is useful. This results in the following categories (see Table 5 and Figure 5):

	Emission sources	**t CO_2e**	**[%]**
Scope 1	Stationary combustion	174.769	10.95%
	Company-owned vehicles	23.329	1.46%
Scope 2	Electricity usage	0.000	0.00%
Scope 3	Purchased goods and services	1,063.035	66.59%
	Fuel- and energy-related activities	74.909	4.69%
	Transport and distribution (upstream)	202.832	12.71%
	Waste generated in operations	6.048	0.38%
	Business travel	0.588	0.04%
	Employee commuting	35.755	2.24%
	Home office	15.004	0.94%

Table 5: Emissions by source

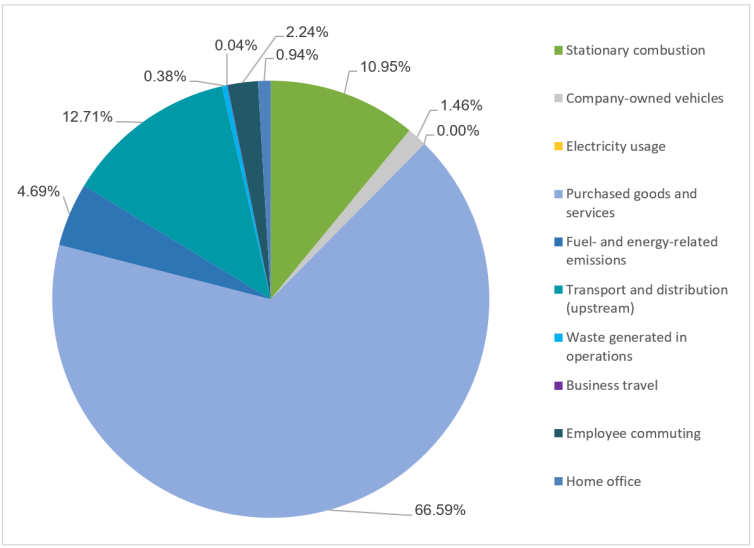

Figure 5: Percentual distribution of emissions by source

Emission hotspots

The three identified emission hotspots add up to 90.25 % of the total emissions and are presented in more detail below.

1. Purchased goods and services (1,063.035 t CO_2e; 66.59 %)
2. Transport and distribution (upstream) (202.832 t CO_2e; 12.71 %)
3. Stationary combustion (174.769 t CO_2e; 10.95 %)

6.3 Detailed examination of the emission hotspots

A client specific breakdown of emissions allows for a detailed overview by location or subcategory. In the following, the emission hotspots are highlighted in more detail.

Differentiation of emissions due to transport and distribution

Emissions from transport and distribution were divided into process-related upstream and downstream transport. That is, in the transport of raw materials from the supplier to RAMPA and in the transport of finished products from RAMPA to the customer.

Methodologically, it should be noted that the GHG Protocol considers upstream and downstream emissions in monetary terms rather than in process terms. The criterion is the purchase and sale of services. Since the transport is not carried out by RAMPA, but service providers were commissioned, all emissions belong to scope 3, upstream.

The upstream and downstream transport processes were subdivided into subsections/transport legs, since individual transport legs were carried out using different means of transport. This specification can also be found in table 6. It is noticeable that within the upstream transport the highest emissions are attributable to trucks. However, it should be noted that the distance traveled via water (sea freight) was highest in the upstream transport. This can be explained by the emission intensity of the mode of transport. Trucks are a more emission-intensive mode of transport than ships, which means that their emissions per ton kilometer (kg CO_2e/tkm) are higher. The distance traveled by trucks is also the largest contributor to emissions in the downstream transport process.

The process-related downstream transport emissions were differentiated according to their delivery conditions to be able to better assign responsibility for emissions generated. RAMPA informed FORLIANCE in this context, that the particular delivery conditions "*ex works" (original: Ab Werk)* refers to the fact that the choice of mode of transport as well as its costs are carried by the customer. With the delivery condition *free delivery* (original: *Frei Haus)* the responsibility, the decision and the costs lie with RAMPA. Therefore, only the emissions for *free delivery* were accounted for with two exceptions (*CIF Denver*) and listed as emissions in the overall result.

It should be noted that part of the downstream transport process is already climate-neutral due to RAMPA´s choice of service providers. Methodologically, the emissions generated are nevertheless part of the assessment, but would no longer have to be compensated. This involves the climate-neutral transport of Kühne & Nagel (0,697 t CO_2e) and GLS (20,220 t CO_2e). Respective certificates were submitted to FORLIANCE.

Classification	**t CO_2e**	**Specification**	**t CO_2e**
Upstream transport (Scope 3, upstream)	139.155	Air freight	38.342
		Sea freight	27.031
		Truck > 12 t	73.782
Downstream transport (Scope 3, upstream)	63.677	Truck > 12 t	42.760
		Sea freight – K&N Shipping (CO_2e compensation)	0.697
		GLS Shipping (CO_2e compensation)	20.220

Table 6: Emissions of transport and distribution

Differentiation of emissions due to purchased goods and services

The purchased goods were grouped and listed in table 7 with the corresponding emissions. It is evident that the raw material occupies the largest emission source. Here, machining steel contributes the most emissions. It should be noted, however, that the emission intensity (kg CO_2e/kg material) of brass is significantly higher than that of machining steel. In the case of trade goods, most of the emissions are caused by the purchased steel.

Classification	**kg**	**t CO_2e**
Raw material		**758.221**
Machining steel	337,490.00	451.224
Stainless steel	23,761.00	98.727
Brass	36,875.00	208.270
Trade goods		**285.741**
Trade goods steel	151,095.98	202.015
Trade goods brass	5,438.82	30.718
Trade goods stainless steel	3,691.52	15.338
Trade goods zinc	12,910.68	35.578
Trade goods plastic	234.11	2.091
Packaging		**8.676**
Packaging cardboard	8,934.47	7.337
Packaging foils	429.60	1.339
Oils	7,420.77	**10.396**

Table 7: Emissions of purchased goods and services

Differentiation of emissions due to electricity usage

The scope 1, scope 2 and scope 3 (energy-related) emissions can be subdivided by location based on the data available. The allocation is depicted in table 8.

Schwarzenbek	**t CO_2e**	**Büchen**	**t CO_2e**
Stationary combustion Schwarzenbek (scope 1)	80.442	Stationary combustion Büchen (scope 1)	94.327
Electricity usage Schwarzenbek (scope 2)	0.000	Electricity usage Büchen (scope 2)	0.000
Energy related emissions Schwarzenbek (scope 3)	33.167	Energy related emissions Büchen (scope 3)	18.412

Table 8: Emissions of electricity usage

7 DEVELOPMENT & ANALYSIS

This chapter serves to compare the initial assessment with the subsequent assessment. The main changes are to be highlighted and examined in greater detail.

7.1 Development of emissions in comparison

In comparison with the initial assessment, total emission increased by 24.39 %. This increase can be explained by the emission increase in scope 1 and 3. Due to higher consumption of natural gas as well as the increase in kilometers traveled with company-owned vehicles, scope 1 emission have increased by 10.93 %. Scope 3 emissions have risen by a total of 51.84 %. This significant rise can be seen in all major categories, including purchased goods as well as in transport. However, scope 2 emissions decreased by 100 %, affecting the overall comparison. Details can be found in table 9 and figure 6.

	2020	2021	Development	
	t CO_2e	t CO_2e	t CO_2e	%
Total	1,283.313	1,596.269	**312.955**	**24.39%**
Scope 1	178.577	198.098	**19.522**	**10.93%**
Stationary combustion	157.520	174.769	17.249	10.95%
Company-owned vehicles	21.056	23.329	2.273	10.79%
Scope 2	183.924	0.000	**-183.924**	**-100.00%**
Electricity usage	183.924	0.000	-183.924	-100.00%
Scope 3	920.813	1,398.170	**477.357**	**51.84%**
Purchased goods and services	649.894	1,063.035	413.141	63.57%
Fuel- and energy-related emissions	54.791	74.909	20.118	36.72%
Transport and distribution (upstream)	134.884	202.832	67.947	50.37%
Waste generated in operations	6.383	6.048	-0.335	-5.25%
Business travel	2.687	0.588	-2.099	-78.12%
Employee commuting	63.399	35.755	-27.644	-43.60%
Home office	8.775	15.004	6.229	70.99%

Table 9: Development of emissions in comparison

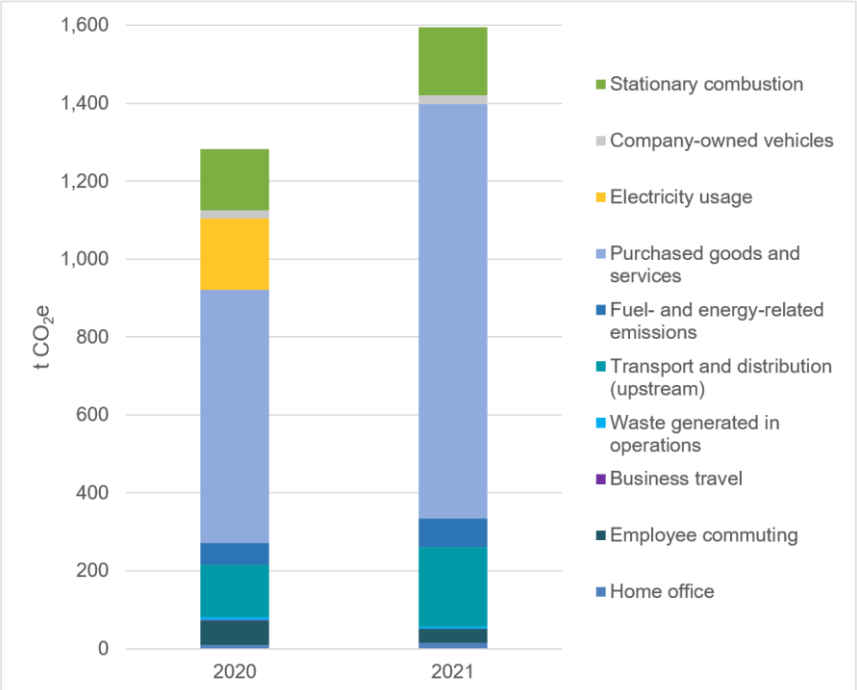

Figure 6: Development of emissions in comparison

7.2 Analysis of the emission development

The following section takes a closer look at the reasons for the significant changes compared to the base year.

Development of energy related emissions

The energy consumption increased in almost all sections. The major factors in this regard are electricity usage in Schwarzenbek (increased by 47.21 %), natural gas consumption in Büchen (increased by 17.79 %) as well as the kilometers traveled with company-owned diesel vehicles (increased by 13.59 %). Considering the development of emissions, it must be stated that the rise in electricity consumption does not cause a direct increase in emissions, since RAMPA switched to green electricity in 2021. Nevertheless, there is a corresponding emissions development in scope 3, energy-related emissions.

	2020	2021	Development		
Differentiation	**Quantity**	**Quantity**	**Quantity**	**%**	**t CO_2e**
Natural gas (Schwarzenbek, kWh)	419,484.00	439,189.00	19,705.00	4.70%	4.29%
Natural gas (Büchen, kWh))	437,210.00	514,999.00	77,789.00	17.79%	17.34%
DE Mix / green electrcity (Schwarzenbek, kWh)	424,895.00	625,470.00	200,575.00	47.21%	-100.00%
DE Mix / green electrcity (Büchen, kWh)	77,629.00	73,100.00	-4,529.00	-5.83%	-100.00%
Vehicle fleet car - medium diesel (vkm)	109,179.00	124,017.00	14,838.00	13.59%	12.63%
Vehicle fleet car - medium gasoline (vkm)	9,743.00	9,060.00	-683.00	-7.01%	-6.38%
Vehicle fleet car - small gasoline (vkm)	7,240.00	7,824.00	584.00	8.07%	8.87%

Table 10: Development of scope 1 and 2 consumptions in comparison

Development of purchased goods and services

The emissions in the category of purchased goods and services increased significantly by 63.57 %. This is attributable to the increase in volume of goods purchased. The main factor here is the quantity of machining steel, which has more than doubled compared to the previous year. But also, stainless steel and brass were purchased considerably more. Trade goods also recorded a significant increase in emissions and purchased goods. Brass, in particular, is outstanding, both in the quantity ratio and in the increase in emissions. In general, the increase in purchased goods and services at RAMPA in 2021 can be traced back to an increased inventory build-up.

	2020	2021	Development		
Differentiation	**kg**	**kg**	**kg**	**%**	**t CO_2e**
Raw material					**71.84%**
Machining steel	165,750.00	337,490.00	171,740.00	103.61%	103.61%
Stainless steel	20,292.50	23,761.00	3,468.50	17.09%	17.09%
Brass	23,959.00	36,875.00	12,916.00	53.91%	53.91%
Trade goods					**53.84%**
Trade goods steel	106,718.92	151,095.98	44,377.06	41.58%	41.58%
Trade goods brass	1,705.24	5,438.82	3,733.58	218.95%	218.95%
Trade goods stainless steel	3,139.36	3,691.52	552.16	17.59%	17.59%
Trade goods zinc	6,962.77	12,910.68	5,947.91	85.42%	85.40%
Trade goods plastic	133.21	234.11	100.90	75.75%	75.75%
Packaging					**92.20%**
Packaging cardboard	6,016.77	8,934.47	2,917.70	48.49%	62.54%
Packaging foils	0.00	429.60	429.60		
Oils	5,634.99	7,420.77	1,785.78	31.69%	**-42.04%**

Table 11: Development of purchased goods and services in comparison

Development of transport and distribution (upstream)

In addition to the increase in emissions through purchased goods, the emissions caused by the transport of goods have also increased significantly, by 50.37 %. This rise can be explained by the quantity transported, the number of deliveries, the distance traveled, and the choice of transport mode. The biggest difference compared to the base year is the significant increase in air freight. In this context, it should be emphasized that the choice of means of transport has a substantial impact. The different modes of transport have varying emission intensity values, with air freight having the highest value (kg CO_2e/tkm). Due to the increase in distance traveled and the choice of aircraft, the emissions in this category rose considerably.

		2020	2021	Development		
		tkm	tkm	tkm	%	t CO_2e
Upstream	Air freight	2,835.710	37,630.370	34,794.660	1227.02%	1,092.52%
	Sea freight	1.687,971.290	2.042,886.070	354,914.780	21.03%	21.04%
	Truck > 12 t tkm	138,928.174	216,285.640	77,357.466	55.68%	43.71%
	Truck 40 t vkm	280.000	410.000	130.000	46.43%	-10.88%
Downstream	Truck > 12 t tkm	115,380.452	125,756.312	10,375.860	8.99%	0.61%
	Sea freight – K&N Shipping (CO_2e compensation)	15,474.282	n/a	n/a	n/a	240.46%
	GLS Shipping (CO_2e compensation)	n/a	n/a	n/a	n/a	33.13%

Table 12: Development of transported tkms and vkms in comparison

Development of business travel

Business travel was noticeably reduced compared to the previous year. This is also reflected in the emission values, so that a reduction in emissions of 78.12 % can be recognized. Travel by minibus, train, cab, and gasoline-powered vehicles was completely discontinued, while travel by diesel vehicles, air travel and overnight hotel stays were also drastically reduced. The main reason is likely to be the general mobility restrictions caused by the pandemic.

	2020	2021	Development		
Differentiation	**Amount**	**Amount**	**Amount**	**%**	**t CO_2e**
Car - Medium Diesel (vkm)	2.080,00	1.041,00	-1.039,00	-49,95%	-50.38%
Car – Medium Gasoline (vkm)	542,00	0,00	-542,00	-100,00%	-100.00%
Car - Small Gasoline (vkm)	18,00	0,00	-18,00	-100,00%	-100.00%
Van - Diesel (vkm)	244,00	0,00	-244,00	-100,00%	-100.00%
Train Local (pkm)	940,00	0,00	-940,00	-100,00%	-100.00%
Train Long distance (pkm)	104,00	0,00	-104,00	-100,00%	-100.00%
Cab (pkm)	10,00	0,00	-10,00	-100,00%	-100.00%
Flight (< 750km per route, pkm)	7.190,00	810,00	-6.380,00	-88,73%	-88.66%
Hotel (N° nights)	16,00	8,00	-8,00	-50.00%	-43.04%

Table 13: Development of traveled pkms and vkms, as well as the number of overnight stays, in comparison

Conclusion Comparison

In conclusion, a significant emission increase is displayed. This can be attributed to an increased build-up of inventory. Increased purchase of goods in this area caused a greater emission load, which in turn caused an increase in emissions in transporting goods. However, the rise in emissions is not only due to the increased goods and transport volume, but also to the energy input to process the goods, even though the switch was made to green electricity.

8 CONCLUSION & OUTLOOK

The aim of RAMPA GmbH & Co. KG was to account for the emissions from the year 2021 and to enable a comparison to the CCF of the reference year 2020.

Following the *market-based approach,* the sum of greenhouse gas emissions caused by the entire company in the year 2021 amounts to **1,596.269 t CO_2e.** This includes scope 1, 2 and 3 emissions. This is a total increase in emissions of 24.39 %. Here, the purchase of goods and the resulting transport are the main contributors to this increase in emissions.

The data collection was carried out by RAMPA. FORLIANCE evaluated and processed the incoming data. The data quality can be classified as good, although there is always potential for improvement. The quality of the emission factors was rated as positive.

Process

RAMPA commissioned the calculation of its Corporate Carbon Footprint for the second time. The reiteration allows a direct comparison of the accounting years and a procedural development. It is important to note that a comprehensive plausibility check could only be carried out in the second assessment. In order to be able to confirm a general trend in the development of emissions, however, further follow-up assessments are required.

Recommendations

To consolidate efforts toward decarbonization, FORLIANCE recommends:

- Comparison of the CCF with other years
  - This allows the forecasting of a general trend
  - The regular review of emissions also enables the rapid identification of emission hotspots and corresponding intervention options
- Verification of the data of significant emission changes
  - Only by comparison with the previous year is a change in emissions visible. Significant changes should be reviewed
- Compensation of non-avoidable emissions
  - This is achieved by investing in high-quality climate protection projects, so that climate neutrality can be achieved in the long term.

9 ANNEX

Emission details

Scope	Emission source according to GHG Protocol	Own category	Specifics	t CO_2e	%
Scope_1.	Stationary combustion	Natural gas	direct	80.442	5.04%
Scope_1.	Stationary combustion	Natural gas	direct	94.327	5.91%
Scope_1.	Mobility	Car - medium diesel	direct	20.458	1.28%
Scope_1.	Mobility	Car – medium gasoline	direct	1.702	0.11%
Scope_1.	Mobility	Car - small gasoline	direct	1.169	0.07%
Scope_2.	Electricity	Green electricity	direct	0.000	0.00%
Scope_2.	Electricity	Green electricity	direct	0.000	0.00%
Scope_upstream_3.	Purchased goods and services	Machining steel	Raw material	451.224	28.27%
Scope_upstream_3.	Purchased goods and services	Stainless steel	Raw material	98.727	6.18%
Scope_upstream_3.	Purchased goods and services	Brass	Raw material	208.270	13.05%
Scope_upstream_3.	Purchased goods and services	Trade goods steel		202.015	12.66%
Scope_upstream_3.	Purchased goods and services	Trade goods brass		30.718	1.92%
Scope_upstream_3.	Purchased goods and services	Trade goods stainless steel		15.338	0.96%
Scope_upstream_3.	Purchased goods and services	Trade goods zinc		35.578	2.23%
Scope_upstream_3.	Purchased goods and services	Trade goods plastic		2.091	0.13%
Scope_upstream_3.	Purchased goods and services	Packaging cardboard	Cardboard	7.337	0.46%
Scope_upstream_3.	Purchased goods and services	Packaging foils	Plastic	1.339	0.08%
Scope_upstream_3.	Purchased goods and services	Oils	Oil	10.396	0.65%
Scope_upstream_3.	Waste generated in operations	Water consumption		0.140	0.01%
Scope_upstream_3.	Waste generated in operations	Residual waste		3.238	0.20%
Scope_upstream_3.	Waste generated in operations	Paper		0.191	0.01%
Scope_upstream_3.	Waste generated in operations	Plastic		2.479	0.16%
Scope_upstream_3.	Waste generated in operations	Metal scrap	Recycling	0.000	0.00%
Scope_upstream_3.	Waste generated in operations	Brass chips	Recycling	0.000	0.00%
Scope_upstream_3.	Waste generated in operations	Brass core scrap	Recycling	0.000	0.00%
Scope_upstream_3.	Waste generated in operations	Stainless steel chips	Recycling	0.000	0.00%
Scope_upstream_3.	Waste generated in operations	Steel chips	Recycling	0.000	0.00%
Scope_upstream_3.	Business travel	Car – medium diesel		0.172	0.01%
Scope_upstream_3.	Business travel	Flight	< 750km per route	0.199	0.01%
Scope_upstream_3.	Business travel	Overnight stays	3 stars - PL	0.166	0.01%
Scope_upstream_3.	Business travel	Overnight stays	4 stars - DE	0.051	0.00%
Scope_upstream_3.	Employee commuting	Home office – heating medium	DE electricity mix	8.720	0.55%
Scope_upstream_3.	Employee commuting	Home office – heating medium	DE green electricity	3.305	0.21%
Scope_upstream_3.	Employee commuting	Home office – heating medium	AT green electricity	0.634	0.04%
Scope_upstream_3.	Employee commuting	Home office – heating medium	PL electricity mix	0.608	0.04%
Scope_upstream_3.	Employee commuting	Home office – Electricity	DE electricity mix	1.555	0.10%
Scope_upstream_3.	Employee commuting	Home office – electricity	DE green electricity	0.000	0.00%
Scope_upstream_3.	Employee commuting	Home office – electricity	AT green electricity	0.000	0.00%
Scope_upstream_3.	Employee commuting	Home office - electricity	PL electricity mix	0.182	0.01%
Scope_upstream_3.	Employee commuting	By foot		0.000	0.00%
Scope_upstream_3.	Employee commuting	Bike		0.000	0.00%
Scope_upstream_3.	Employee commuting	E-Bike		0.029	0.00%
Scope_upstream_3.	Employee commuting	Motorcycle		0.061	0.00%
Scope_upstream_3.	Employee commuting	Public Transportation	Bus	0.099	0.01%
Scope_upstream_3.	Employee commuting	Train local		0.701	0.04%
Scope_upstream_3.	Employee commuting	Car – small gasoline		1.956	0.12%
Scope_upstream_3.	Employee commuting	Car – small average		0.141	0.01%
Scope_upstream_3.	Employee commuting	Car – medium gasoline		7.210	0.45%
Scope_upstream_3.	Employee commuting	Car - medium diesel		15.006	0.94%
Scope_upstream_3.	Employee commuting	Car - medium average		5.396	0.34%

Scope_upstream_3.	Employee commuting	Car - large gasoline		0.702	0.04%
Scope_upstream_3.	Employee commuting	Car - large diesel		4.453	0.28%
Scope_upstream_3.	Fuel- and energy related activities	Natural gas	indirect	13.769	0.86%
Scope_upstream_3.	Fuel- and energy related activities	Natural gas	indirect	16.145	1.01%
Scope_upstream_3.	Fuel- and energy related activities	Green electricity	indirect	19.399	1.22%
Scope_upstream_3.	Fuel- and energy related activities	Green electricity	indirect	2.267	0.14%
Scope_upstream_3.	Fuel- and energy related activities	Car – medium diesel		20.458	1.28%
Scope_upstream_3.	Fuel- and energy related activities	Car – medium gasoline		1.702	0.11%
Scope_upstream_3.	Fuel- and energy related activities	Car – small gasoline		1.169	0.07%
Scope_upstream_3.	Upstream transportation and distribution	Sea freight tkm	upstream	27.031	1.69%
Scope_upstream_3.	Upstream transportation and distribution	Air freight tkm	upstream	38.342	2.40%
Scope_upstream_3.	Upstream transportation and distribution	Truck tkm	upstream	73.541	4.61%
Scope_upstream_3.	Upstream transportation and distribution	Truck vkm	upstream	0.241	0.02%
Scope_upstream_3.	Upstream transportation and distribution	Truck tkm	downstream	42.760	2.68%
Scope_upstream_3.	Upstream transportation and distribution	Truck vkm	downstream	0.000	0.00%
Scope_upstream_3.	Upstream transportation and distribution	Sea freight – K&N Shipping (CO_2e compensation)	downstream	0.697	0.04%
Scope_upstream_3.	Upstream transportation and distribution	GLS Shipping (CO_2e compensation)	downstream	20.220	1.27%
				1,596.269	**100.00%**

10 REFERENCES

Reporting guidelines

World Resources Institute und World Business Council on Sustainable Development (Revised): *A Corporate Accounting and Reporting Standard*. 2015

World Resources Institute und World Business Council on Sustainable Development: *Corporate Value Chain (Scope 3) Accounting and Reporting Standard*. 2011

Main databases

Department for Business, Energy & Industrial Strategy (BEIS). *UK Government GHG Conversion Factors for Company Reporting*. 2021

Ecoinvent 3.8 (https://ecoinvent.org/)

Statista (https://de.statista.com/)

Umweltbundesamt (UBA) – several research papers and reports.

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