natureOffice
Gemeinsam ist es Klimaschutz

CORPORATE CARBON FOOTPRINT

VA-Q-TEC AG

Documentation 2020

PRESENTER

Va-Q-tec AG

Alfred-Nobel-Straße 33

97080 Würzburg

phone: +49 931 35 942 0

web: https://www.va-q-tec.com

CONTACT

Moritz von Wysiecki

mail: Moritz.von.Wysiecki@va-q-tec.com

PUBLISHER

natureOffice GmbH

Steubenhof 1

65207 Wiesbaden

phone: +49 69 173 20 20 0

fax +49 69 173 20 20 99

mail: info@natureOffice.com

web: www.natureoffice.com

May 2021

CONTENTS

1 Preface

1.1 General information

A carbon footprint, also called a CO2 footprint or one-dimensional life cycle assessment, can be created by products, companies or individuals. This allows the total amount emitted over the lifetime of a product, by the activity of a company or the activity of an individual to be stated in CO2 equivalents (CO2e). The Corporate Carbon Footprint (CCF) is the result of a company-wide carbon footprint.
For all companies, not just those already engaged in sustainability activities, the individual corporate carbon footprint is an extremely important and useful tool for assessing their climate impact.
The carbon footprint is a fundamental part of a company's sustainability management, as it can be the basis for formulated reduction targets. This report provides an overview of the results of emission balancing and relates to the company's business activities in 2020.

1.2 Company and project introduction

va-Q-tec AG is a dynamic high-tech company that has been developing, producing and marketing innovative insulation solutions since 2001. The insulation solutions are based on energy-efficient, space-saving and at the same time environmentally friendly vacuum insulation panels. These insulate about 10x better than conventional fiber and foam insulation materials. In addition, va-Q-tec AG manufactures passive thermal packaging systems (containers and boxes) that can typically keep temperatures constant for 4 to 10 days. The company produces in Germany and meets the highest quality standards with its patented control system.
va-Q-tec's products save valuable energy through their efficient technology in areas that are used every day: in the transport of pharmaceutical products, in refrigerators and freezers, in buildings, in technology & industry, and in automobiles and aircraft.[1]

This study documents the evaluation of the corporate greenhouse gas (GHG) emissions of va-Q-tec AG from the balance year 2020. The result of the CO2 balance is, on the one hand, the corporate carbon footprint across all sites, and on the other hand, the CO2 balance as the basis for the creation of product carbon footprints of a defined product range.
The present assessment of the company's CO2 emissions represents a logical and sensible step towards integrating a sound sustainability strategy into the company and forms the first building block of a climate protection strategy. Suitable reduction measures and the option of offsetting greenhouse gas emissions that cannot be reduced in the short term can be implemented on the basis of the company balance sheet and are the declared goal of the company.

[1] *https://va-q-tec.com*

2 Methods of Balancing

2.1 Background

This Corporate Carbon Footprint was determined on behalf of va-Q-tec AG by natureOffice GmbH. The company data provided by va-Q-tec AG was evaluated and documented by natureOffice GmbH. The greenhouse gas (GHG) emissions were determined in the first step for all European locations of the company. The documentation is founded on the standards published by the Greenhouse Gas (GHG) Protocol on the quantification and management of greenhouse gas emissions (GHGs). The following report covers Scopes 1 and 2 according to the Corporate Standard and Scope 3 according to the Corporate Value Chain Accounting and Reporting Standard. According to the standard, the GHGs considered are those regulated under the Kyoto Protocol: Carbon Dioxide [CO2], Methane [CH4], Nitrous Oxide [N2O], Hydrofluorocarbons and Perfluorocarbons (PFCs), Sulfur Hexafluoride [SF6], Nitrogen Trifluoride [NF3]. Other greenhouse gases, such as those regulated under the Montreal Protocol, are not documented. Emissions (expressed as CO2 equivalent (CO2e) are calculated using the Global Warming Potential (GWP) based on a 100-year period. In the following, the GWP is always related to this period.

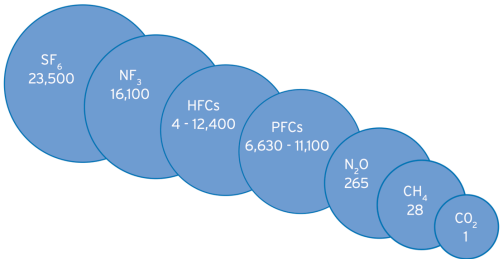

Figure 1: Global warming potential of different greenhouse gases[1]

There are five basic principles to consider when creating the Corporate Carbon Footprint and the corresponding reports:

- Relevance: The principle of relevance dictates that all significant emission sources must be considered when preparing a carbon footprint for a company and that the report should be useful for decision-making inside and outside the company;

[1] *The Global Warming Potential of IPCC recognized GHGs, AR5*

- Completeness: The principle of completeness states that all relevant emission sources within the system boundaries must be considered;
- Consistency: To enable comparability of results over time, the accounting methodologies and system boundaries should be recorded and maintained in subsequent years. Potential changes in methodology and system boundaries must be named, justified and taken into account in comparisons;
- Accuracy: biases and uncertainties should be reduced as much as possible so that the results provide a sound basis for decision-making;
- Transparency: results should be presented in a transparent and clearly understandable manner.

2.2 Target definition - CCF

The Corporate Carbon Footprint serves to identify the largest sources of emissions within the company and along the upstream and downstream stages of the value chain. It thus forms the basis for the development of a climate protection strategy in which objectives, measures and responsibilities for the reduction of greenhouse gas emissions are defined. In subsequent years, it is used to check whether the objectives have been achieved, how much areas have progressed, and in which areas there is a need for action to reduce CO2.

The starting point of the preparation of the balance sheet for the va-Q-tec AG was to record the current situation and to evaluate the methodical handling of the data in order to:

- define the procedure for all sites
- define reduction targets
- check the consideration of compensation measures

2.3 Framework - CCF

Selected consolidation approach	financial controlled Locations considered (number of employees): 1. va-Q-tec AG, Germany (Würzburg/Kölleda) (469)[1] 2. va-Q-tec AG, UK (52) 3. va-Q-tec AG, USA (17) 4. va-Q-tec AG, Korea (5) 5. va-Q-tec AG, Singapore (5) 6. va-Q-tec AG, Japan (3) 7. va-Q-tec AG, Uruguay (3) 8. va-Q-tec AG, Swizterland (2) For the sake of simplicity, the entirety of all locations will hereinafter be referred to as va-Q-tec AG.
Description of all company activities taken into account within the framework of the balance sheet	For all sites included in the consolidation approach, the balance sheet includes Scope 1 emissions resulting from stationary or mobile combustion. Emissions from fugitive gases are also included. The balance includes all Scope 2 emissions resulting from the use of electrical energy. Scope 3 upstream emissions are reported in full for all sites included in the company financial statements, unless otherwise stated. In downstream Scope 3, emissions from downstream transports are taken into account (product use and waste).
Reporting period	January 1, 2020 to December 31, 2020

[1] *Locations Würzburg and Kölleda can not be divided and were asses as being one.*

List of Scope 3 activities considered	Scope 3 Category 1 Purchased goods and services Scope 3 Category 2 Capital goods Scope 3 Category 3 Upstream fuel and energy-related emissions Scope 3 Category 5 Waste Scope 3 Category 6 Business travel Scope 3 category 7 Employee travel Scope 3 category 11 use products (only products for rent) Scope3 category 12 waste products (only products for rent)
List of excluded Scope 3 emissions with justification for exclusion	Scope 3 Category 4 Upstream transportation and distribution The recording of activity data does not allow a breakdown between Scope 3 Category 1 and Category 4. Emissions resulting from upstream transport of purchased products are indirectly included in Scope 3 Category 1. Scope 3 Category 13 Leased property, plant and equipment: There is no leasing of property, plant and equipment. Scope 3 category 14 Franchises: There are no franchises. Scope 3 category 15 Investments: There are no investments or shareholdings.

Table 1: Framework conditions of the corporate balance sheet

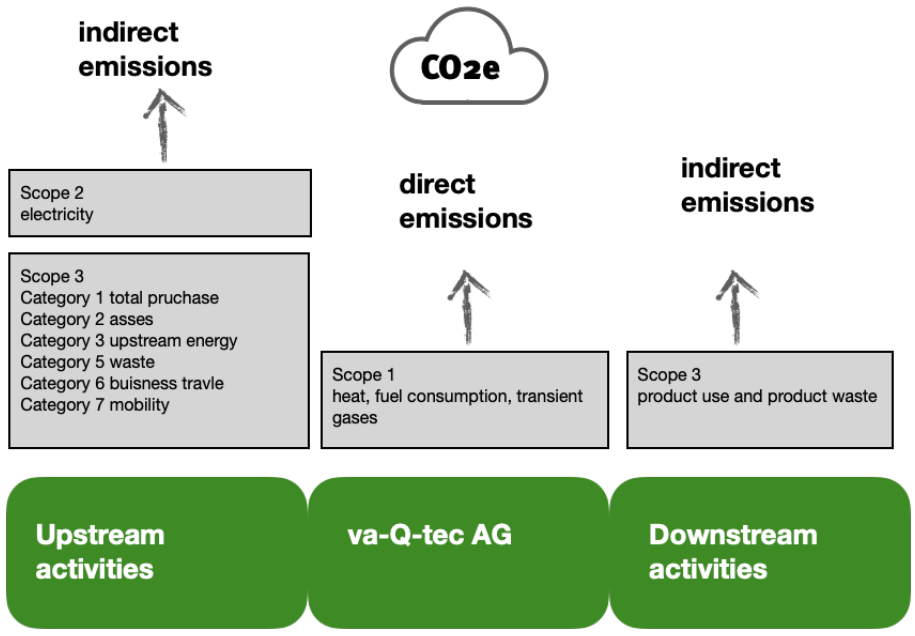

Figure 2: Subsumption of va-Q-tec AG under consideration of GHG scopes

2.4 Description of the methods and data used

Scope	Definition	Description of data types & data sources	Description of the calculation methodology
Scope 1			
Emissions from stationary combustion	This category includes direct emissions resulting from the combustion of energy sources in stationary plants (e.g. heating plants) of the reporting company.	Activity data (primary data): For the determination of emissions resulting from combustion processes in stationary plants, the amount of energy carriers consumed was determined by va-Q-tec AG for the sites considered. Emission factors (secondary data): The emission factors used for the assessment of direct emissions from the combustion of energy carriers were obtained from the German Federal Environmental Agency (UBA, 2018), GEMIS (IINAS, 2016).	The quantity of emissions resulting from the combustion of energy sources at the locations under consideration was determined by multiplying the consumption quantity by the associated emission factors.
Emissions from mobile combustion	This category includes direct emissions resulting from the combustion of energy sources in mobile facilities (vehicles) of the reporting company.	Activity data (primary data): In order to determine the emissions caused by mobile combustion processes, e.g. in vehicles, the amount of fuel consumed was determined by va-Q-tec AG. Emission factors (secondary data): For the assessment of direct emissions from fuel combustion, factors from the standard for balancing emissions from transport activities were used (EN 16258).	The quantity of emissions resulting from the combustion of fuels in vehicles (tank-to-wheel) was determined by multiplying the fuel consumption quantities by the associated emission factors.
		Data quality	Very good

Emissions of fugitive gases	This category includes direct emissions of climate-relevant fugitive gases. These are generated at refrigeration or cooling plants where leakages can occur. The emissions, which are low in quantity, are relevant due to their high GWP.	**Activity data (primary data):** For the determination of the direct emissions, which result from the use of dry ice, were provided by va-Q-tec AG. **Emission factors (secondary data):** The emission factors for the assessment come from the Federal Environment Agency (UBA 2018).	Greenhouse gas emissions resulting from fugitive gases were determined by multiplying the amount of refrigerants charged by the emission factors determined.
		Data quality	Very good

Table 2: Methodological description - Scope1

Scope	Definition	Description of data types & data sources	Description of the calculation
Scope 2			
Emissions from the generation of the electrical energy used market based	This category includes direct emissions that result from the generation of electrical energy by the energy supplier for the provision of the consumed electricity. The market-based assessment approach takes into account emissions based on the purchased electricity mix.	**Activity data (primary data):** In order to determine the direct emissions resulting from the generation of electrical energy used, Va-Q-tec AG determined the amount of electricity consumed for the sites considered (excluding location "Switzerland"). Possible grid losses were not taken into account. The amount of electricity at the Swiss site was determined based on key figures (kWh/MA). **Emission factors (secondary data):** The emission factors used for the assessment of direct emissions during the generation of electricity are from the German Federal Environment Agency (UBA, 2018), GEMIS 4.94 (IINAS, 2016).	The emissions resulting from electricity generation were calculated on the basis of the fuel shares of electricity generation. The information on the fuel shares in electricity production was taken from the electricity labelling pursuant to Section 42 of the German Energy Industry Act (Energiewirtschaftsgesetz). The amount of electricity consumed was multiplied by the determined emission factors, taking into account the fuel shares.
		Data quality	good

Emissions from the generation of the electrical energy used location based	This category includes direct emissions generated by the generation of electrical energy from the energy supplier for the provision of the electricity consumed. The location-based valuation approach takes into account emissions that are based on the national average electricity mix.	**Activity data (primary data):** For the determination of the direct emissions generated by the generation of used electrical energy, va-Q-tec AG determined the amount of electricity consumed for the sites considered. Possible network losses were not taken into account. The amount of electricity at the Swiss site was determined based on key figures (kWh/MA). **Emission factors (secondary data):** The emission factors used to assess direct emissions from electricity generation come from the Federal Environment Agency (UBA, 2018), GEMIS 4.94 (IINAS, 2016).	The emissions generated by electricity generation were calculated on the basis of the fuel shares of electricity generation. The information on fuel shares in electricity production comes from the information on the average country-level electricity supply at the sites considered. The amount of electricity consumed was multiplied by the determined emission factors, taking into account the fuel components.
Data quality			good

Table 3: Methodological description - Scope2

Scope	Definition	Description of Data Types & Data Sources	Description of the calculation methodology
Scope3 (upstream)			
Category 1 Goods and services purchased	This category includes all upstream (i.e. cradle-to-gate) emissions from the manufacture of products or the provision of services purchased or purchased by the reporting company.	**Activity data (primary data):** In the category 'purchased goods and services', goods purchased for production were identified as the relevant source of emissions. Since va-Q-tec AG purchases a large number of different items, these were grouped into product groups that were as homogeneous as possible. Activity data in kg were determined for the product groups. Purchased consumables, as well as services, were recorded via the costs in euros. **Emission factors (secondary data):** The emission factors used for the assessment of cradle-to-gate emissions from purchased goods for the products were taken from recognized databases such as ecoinvent (version 3.7.1 (as of 2020)) and ProBas (Process-oriented basic data for environmental management systems of the German Federal Environment Agency). The emission factors for the cost-based assessment of purchased consumables and services were taken from the 2012 guidance on DEFRA / DECC GHG conversion factors for corporate reporting, Annex 13 (Indirect emissions from the supply chain).	The greenhouse gas emissions resulting from the purchase of goods in the upstream supply chains were determined by multiplying the quantities purchased or € spent by the emission factors determined.

		Data quality:	moderate
		Percentage of supplier-specific data used:	0%
Category 2 assets	This category includes all upstream (i.e. cradle-to-gate) emissions from the production of fixed assets purchased or purchased by the reporting company.	**Activity data (primary data):** In the category of fixed assets, the purchase of equipment, vehicles and equipment was identified as a source of emissions. Due to the complexity of the product range, fixed assets were valued on the financial purchase volume for va-Q-tec AG. **Emission factors (secondary data):** The emission factors used to assess supply chains for purchased assets come from the 2012 Guidelines on DEFRA / DECC-THG Conversion Factors for Corporate Reporting, Annex 13 (Indirect Issues from the Supply Chain).	The greenhouse gas emissions generated by the purchase of fixed assets in the upstream supply chains were determined by multiplying the financial purchase volume by the determined emission factors.
		Data quality:	moderate
		Percentage of supplier-specific data used:	0%

Category 3 Upstream energy-related emissions	This category includes emissions related to the production of fuels and energy purchased and consumed by the reporting company in the year under review and not included in the categories of direct emissions (scope 1) and indirect emissions (scope 2).	**Activity data (primary data):** The energy consumption was provided by va-Q-tec AG in the form of electricity, heat and fuel consumption. **Emission factors (secondary data):** The cradle – to – gate emission factors, which were used for the assessment of upstream energy-related emissions from electricity and heat consumption, come from the Federal Environment Agency (UBA, 2018), GEMIS 4.94 (IINAS, 2016). The emission factors for the assessment of the well-to-tank emissions of fuels come from EN 16258.	The greenhouse gas emissions resulting from upstream energy-related emissions were determined by multiplying the energy consumption indicated by the associated emission factors.
		Data quality:	Very good
		Percentage of supplier-specific data used:	0%

Category 5 Emissions from waste generation	This category includes emissions from the disposal and treatment of waste by third parties that occur at va-Q-tec Ag. This category includes emissions from the disposal of solid waste and waste water. Scope 3 emissions only include waste treatment in facilities owned or operated by third parties	**Activity data (primary data):** The greenhouse gas emissions from the transport and incineration of waste were taken into account based on the quantities of waste in kg determined by va-Q-tec AG. The physical recovery (recycling) of waste outside the site is allocated to zero emissions in accordance with the cut-off approach of the life cycle assessment. The quantities of solid waste and waste water generated during production at va-Q-tec AG production sites were taken from an internal ETS database. No more detailed information was available on the type of disposal (waste incineration with and without energy recovery, landfill, physical recovery, waste water treatment and others) for the assessment of disposal. Therefore, a worst-case scenario was adopted **Emission factors (secondary data):** The emission factors were taken from the ProBas database.	The greenhouse gas emissions resulting from the recovery and disposal of waste generated on the farm were determined by multiplying the amounts of waste indicated by the associated emission factors.
		Data quality:	moderate
		Percentage of supplier-specific data used:	0%

Category 6 Emissions from business travel	This category includes emissions from the transport of employees for business activities in vehicles owned or operated by third parties, such as. B aircraft, trains, buses and passenger cars.	**Activity data (primary data):** The greenhouse gas emissions associated with the transport of all va-Q-tec AG employees for business activities were calculated on the basis of the following data: Greenhouse gas emissions from air travel: Air travel was categorized in domestic and intercontinental flights and the flight distances travelled (in passenger km pkm) were determined in the corresponding categories. Greenhouse gas emissions from business travel by train or trips by car or taxi were not taken into account. **Emission factors (secondary data):** The emission factors were taken from the ProBas database (process-oriented basic data for environmental management systems of the Federal Environment Agency) obtained.	Greenhouse gas emissions from business travel activities were determined by multiplying the identified routes (pkm) by the associated emission factors.
		Data quality:	good
		Percentage of supplier-specific data used:	0%

Category 7 Emissions employee mobility	This category includes emissions from the transport of employees between their homes and their workplaces	**Activity data (primary data):** For the evaluation of the travel of the employees to the workplace, no activity data could be provided by va-Q-tec AG. In order to be able to evaluate the GHG emissions that occur in this category, key figures from the natureOffice internal database were used. **Emission factors (secondary data):** GHG emissions in kg per employee.	The greenhouse gas emissions caused by employees traveling to their workplace were determined by multiplying the number of employees by the CO2e/MA indicator.
		Data quality:	bad
		Percentage of supplier-specific data used:	0%

Category 11 Emissions from the use of products	This category includes emissions from the use of products rented by va-Q-tec AG. In the case of products rented by va-Q-tec AG, these are exclusively emissions that arise during the transport of the products. Only products that were classified as relevant for the present balance were taken into account.	**Activity data (primary data):** The transported quantities (transport weight * transport distance) and the type of transport were provided by va-Q-tec AG. The types of transport were differentiated into transport by truck, by air freight or by sea freight. **Emission factors (secondary data):** The emission factors for the transport types are taken from the Federal Environment Agency's ProBas database (Process-oriented basic data for environmental management systems of the Federal Environment Agency).	The greenhouse gas emissions resulting from the use of the products of the rental system were determined by multiplying the determined transport volumes (tkm) by the associated emission factors of the transport category.

		Data quality:	good
		Percentage of supplier-specific data used:	0%
Category 12 Emissions from the waste and disposal of products	This category includes emissions that occur during the disposal of products that are rented by va-Q-tec AG. Only products that were classified as relevant for the present balance were taken into account.	**Activity data (primary data):** The amount of the disposal material were provided by va-Q-tec AG. For the evaluation of disposal, no more detailed information was available on the type of disposal (waste incineration with and without energy recovery, landfill, physical recycling, wastewater treatment, and others). Therefore, a worst-case scenario was assumed. **Emission factors (secondary data):** The emission factors for the transport types are taken from ProBas database.	The greenhouse gas emissions resulting from the disposal of the products of the rental system were determined by multiplying the determined weight of the material (in kg) by the associated emission factors.
		Data quality	good
		Percentage of supplier-specific data used:	0%

Table 4: Methodological description – Scope3

3 Greenhouse gas balance - CCF

3.1 Summary of GHG emissions 2020

Scope – emission source	Emissions in t CO2e	Share rel.
Scope 1 – direct emissions ...		
Thermal energy	1.145,860	1,43%
Fuel consumption (on road)	123,842	0,15%
Transient gases	29.69	0,04%
Scope 2 – direct emissions from the production ...		
Electricity consumption (market based)	618,72	0,77%
Scope 3		
Category 1 - Emissions from the purchase of goods and services		
Usage materials	58,27	0,07%
Materials for productions	19.474,41	24,25%
Supply of services	2.929,477	3,65%
transports	4.209,053	5,24%
Category 2 - Issues from purchasing fixed assets		
	1.500,82	1,87%
Category 3 - Upstream energy-related emissions from ...		
Electricity consumption (market based)	142,17	0,18%
Heat	252,60	0,31%
Fuel consumption (on road)	24,49	0,03%
Category 5 - Emissions from waste generation		
	285,99	0,36%
Category 6 - Emissions from business travel		
	114,52	0,14%
Category 7 - Emissions from employee commuting		
	260,145	0,36%
Categorie 11 – Emissions from usage of products		
	48.972,53	60,97%
Categorie 12 – Emissions from product waste		
	176,34	0,22%
Total emissions	**80.318,949**	**100%**

Table 5: Tabular results overview of all corporate GHG emissions

	CO2e in t	percentage
Scope 1	1.299,39	1,62%
Scope 2	618,72	0,77%
Scope 3	78.400,83	97,61%
Total emissions (market based)	80.318,94	100%

Table 6: Distribution of emissions according to GHG scopes

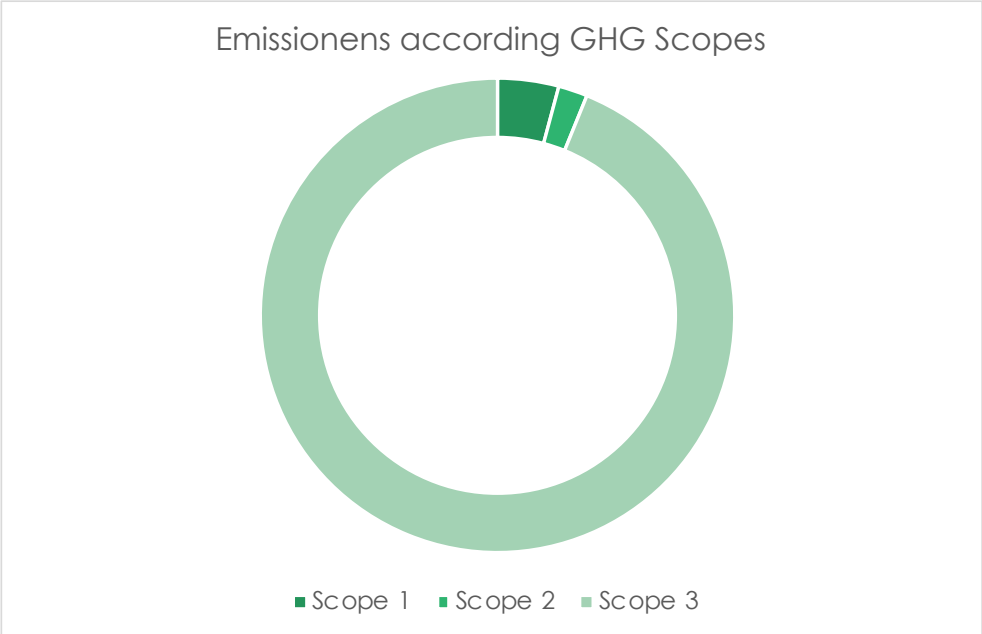

Figure 3 Distribution of total emissions from va-Q-tec AG according to GHG scopes.

3.2 GHG emissions according to global company sites

Scope Emission source Emissions in t CO2e	Germany Würzburg/Kölleda	UK	USA	Korea	Singapore	Japan	Uruguay	Switzer-land
Scope 1								
Thermal energy	1.072,83	30,95	40,08	0	0	0	0	1,19
Fuel consumption (on road)	115.82	5,88	0	0	0	0	2,67	0
Transient gases	29,69	0	0	0	0	0	0	0
Scope 2								
electricity	420,74	119,66	60,02	1,55	10,32	0,45	1,13	4,6
Scope 3								
Category 1 - Emissions from the purchase of goods and services[1]								
total	26.671,21	0	0	0	0	0	0	0
Category 2 - Issues from purchasing fixed assets[2]								
	1.500,82	0	0	0	0	0	0	0
Category 3 - Upstream energy-related emissions from								
electricity	111,20	20,12	8,04	0,13	1,7	0,041	0,1	0,77
heat	238,66	5,89	7,63	0	0	0	0	0,23
Fuel consumption (on road)	24,469	0	0	0	0	0	0	0
Category 5 - Emissions from waste generation								
	279,13	3,93	1,28	0,38	0,38	0,23	0,23	0,151
Category 6 - Emissions from business travel								
	111,19	15,98	0	0	0	4,57	0	0
Category 7 - Emissions from employee commuting								
	225,12	20,8	6,8	3	2	1,2	1,2	0,8
Category 11 – Emissions from usage of products								
	48.972,53	0	0	0	0	0	0	0
Categorie 12 – Emissions from product waste								
	176,34	0	0	0	0	0	0	0
Total emissionen (market based)								
	79.932,81	**222,19**	**123,86**	**4,06**	**1,40**	**6,49**	**5.33**	**7.74**

Table 7: Tabular results overview of all GHG emissions by site

[1] Emissions resulting from the purchase of consumables and production materials, as well as purchased services, are recorded for all sites at the Würzburg/Kölleda location.

[2] see assessment Scope3 Category 1

3.3 (Potential) Reduction/optimization measures CCF

In principle, it should be noted that a more precise and consequently more favorable assessment of GHG emissions would be possible, especially for purchased goods and services, through a finer differentiation in the specification of activity data. From this, expected reductions in the amount of CO2e emissions can already be represented by an adjustment of the methodology. However, when preparing the subsequent balance sheet (reporting period 01.01.2021 - 31.12.2021) of the corporate emissions, special care must then be taken to ensure that the resulting reductions in GHG emission quantities, which result exclusively from an adjustment in the methodology, are also identified as such, so as not to give the impression that physical emissions have been reduced. Optimization measures can also be implemented in the collection of activity data from global sites. For example, due to data gaps in the collection of activity data, key figures from a wide variety of databases were used. Adjusting the methodology in this area can also result in a more favorable balance with reduced GHG emissions in the following year.

Table 5 clearly shows that the main sources of emissions are in the downstream value chain. It can be deduced from this that this is also where the greatest leverage for reducing emissions lies. The use of the products in the rental system takes place exclusively through the transport of the products. Optimization potentials here are a complete utilization of the containers and reductions in the re-positionings.

The second most important source of emissions is the purchase of production materials. It should be checked whether suppliers have already established carbon footprints for the products/raw materials and can report these. Raising awareness within the supply chains can reveal optimization opportunities in the long term and result in a reduction of GHG emissions.

5 List of Tables

6 List of figures

EDITOR

natureOffice GmbH

Steubenhof 1

65207 Wiesbaden

www.natureoffice.com

natureOffice

Gemeinsam ist es Klimaschutz