Hedgehog Company

Carbon footprint of Studio Anneloes

Reporting year: 2023

Company

Studio Anneloes B.V.
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The Netherlands

Reporting Company

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Executive summary

This document quantitatively assesses the carbon footprint of Studio Anneloes. The framework of this carbon footprint concerns the emissions of Studio Anneloes's operational activities in order to identify opportunities to reduce the carbon footprint of the business activities. By carefully weighing the organisational and operational boundaries, the following components have been included in this study.

Table 1. GHG scopes included in the assessment.

GHG scopes	Categories
Scope 1 - Direct emissions	Company facilities, Company vehicles
Scope 2 - Indirect emissions	Purchased electricity, steam, heating and cooling for own use
Scope 3 - Indirect emissions	Purchased goods and services, Upstream transportation & distribution, Waste generated in operations, Business travel, and Employee commuting

The input data in the analysed categories are linked to emission factors from various environmental databases. The emissions are expressed in CO_2-equivalents. This unit is used to express the extent to which greenhouse gases contribute to climate change. The effect of one kg of methane, for example, is equivalent to the effect of 28 kg of CO_2.

Given the current scope of the report, the total CO_2-footprint of Studio Anneloes is 4.919 ton CO_2-eq. More than 99% of the emissions originate from scope 3. Within this scope, purchased goods and services and upstream transportation and distribution contribute the most (89% and 9% to the total emission of scope 3, respectively). Scope 1 and 2 contribute less than 1% to the overall carbon footprint of Studio Anneloes.

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1 Introduction

1.1 Background

This greenhouse gas (GHG) report is carried out by Hedgehog Company B.V. The commissioner of this report is Studio Anneloes. Studio Anneloes is a women's fashion brand from the Netherlands. All designs are made in the Netherlands and the production of all items takes place predominantly in Europe.

This report contains an analysis of the greenhouse gas emissions in scopes 1 and 2, and part of scope 3. The relevant emission sources have been determined on the basis of the GHG protocol. This report concerns the emissions over 2023 and describes the scope of emission sources, the analysis of the relevant sources, and the final results of the calculation. Additionally, these results are calculated and displayed in the Hedgehog Carbon Platform.

1.2 Goal and scope

This analysis aims to determine the carbon footprint of Studio Anneloes transparently, based on reliable, quantitative environmental data. The report follows the GHG Protocol [1] to improve readability, structure and comprehensibility for readers. The results of this research enable Studio Anneloes to gain insight into the size and composition of their carbon footprint. Environmental data of 2023 serves as a baseline measurement for the annual analysis and monitoring of the organisational carbon footprint.

2 Studio Anneloes

2.1 Company description

Studio Anneloes is a women's fashion brand from the Netherlands. All designs are made in the Netherlands, and the production of all items takes place predominantly in Europe. The main office of Studio Anneloes is located in Amsterdam, the Netherlands.

2.2 Organisational boundaries

Defining the organisational boundaries is a key step in assessing an organisational footprint. All inputs and outputs compiled at the organisation have an impact on the environment. This step determines which operations are included in the company's organisational boundary and how emissions from each operation are consolidated by the reporting company.

For Studio Anneloes, the control approach is used to consolidate their greenhouse gas emissions. Using the control consolidation methodology, Studio Anneloes's GHG inventory reflects the emissions from sources that they have the ability to influence, based on their position in the supply chain. Hence, all emission sources are selected where Studio Anneloes has operational control, meaning where there is authority to introduce and implement operating policies.

The calculation considers the in- and outflows of the Dutch office of Studio Anneloes. In 2023, Studio Anneloes had an average of 65 employees.

2.3 Operational boundaries: Greenhouse Gas Protocol Scopes

After defining the organisational boundaries, the operational boundaries can be determined. The operational boundaries define the scope of direct and indirect emissions from activities that fall within the organisational boundaries. The operational boundaries determine the relevant scopes (1, 2 and 3) and categories (see Figure 1 for a schematic representation).

Section 2.4 describes the scopes included in this study, as determined by the GHG protocol. The scopes that have not been considered in this study are currently not considered relevant given the organisational structure and data availability of Studio Anneloes.

The worst-case scenario approach is used when the input data for a specific scope or category are incomplete. However, it is an approximation, which means that the emissions may be lower than in the calculation. The approach prevents the actual impact from being underestimated.

The scopes that are considered irrelevant for the carbon footprint of Studio Anneloes of 2023 are the following:

2.4 GHG-scopes

The following sections describe the different scopes and emissions sources that are included in this report.

2.4.1 Scope 1 & 2

Scope 1 concerns all direct emissions that originate at Studio Anneloes facilities. These are emissions that follow from natural gas consumption and leased vehicles (car fleet). The car fleet is included in scope 1, as they are a form of operating lease and are under the operational control of Studio Anneloes. Thus, the emissions from fuel consumption of these vehicles fall under the direct emissions in scope 1 of Studio Anneloes.

Scope 2 concerns the indirect emissions caused by the purchased electricity and heating. The scope 2 emissions are calculated based on the location. Specific emission factors are applied, as specific information from energy suppliers was available.

The exact values and emission sources that are used for the calculation can be found in the Appendix.

2.4.2 Scope 3, Category 1 ‘Purchased goods and services’

Scope 3 emissions are also indirect emissions, as in scope 2. However, scope 3 includes emissions caused by business activities of organisations in the supply chain. These scope 3 emission sources are not directly owned by Studio Anneloes, but Studio Anneloes is able to influence them.

The scope 3 category 'Purchased goods and services' contains various products and services purchased by Studio Anneloes in 2023. These goods are either non-product (office supplies and operational equipment) or product (e.g. textile manufacturing) related. For non-product related purchased goods and services, the annual expenses for the office is collected. Based on these expenses, specific emission factors are applied per type of expense to calculate the carbon emissions.

The exact values and emission sources that are used for the calculation can be found in the Appendix.

2.4.3 Scope 3, Category 4 ‘Upstream transportation and distribution’

This category includes indirect GHG emissions related to purchased or acquired goods and services. In the case of goods purchased or sold by Studio Anneloes, upstream emissions occur up to the point of receipt by Studio Anneloes. Studio Anneloes has collected all data for upstream transportation of products and packaging over 2023. The emissions of the shipments were provided by the distributor. Accurate data for upstream transportation related to non-products was not available and is not considered in this report.

The exact values and emission sources that are used for the calculation can be found in the Appendix.

2.4.4 Scope 3, Category 5 ‘Waste generated in operations’

This category includes emissions from the disposal and treatment of waste generated in the reporting company’s owned or controlled operations in the reporting year. Studio Anneloes has collected all data regarding their waste streams for all Studio Anneloes facilities, and provided the respective treatment methods. Based on these data, the emissions originating from the treatment of these waste streams are quantified.

The exact values and emission sources that are used for the calculation can be found in the Appendix.

2.4.5 Scope 3, Category 6 ‘Business travel’

All business travel movements of employees in 2023 have been collected by Studio Anneloes. The collected data is aggregated based on the following transport modes:

- Taxi
- Train
- Flights <700 km
- Flights 700-2500 km
- Flights > 2500 km

The exact values and emission sources that are used for the calculation can be found in the Appendix.

2.4.6 Scope 3, Category 7 ‘Employee commuting’

In this category, the emissions from the daily employee commute are calculated. This concerns the emissions of the means of transport that are not owned or leased by Studio Anneloes, but are used by personnel travelling to and from their workplace. Data regarding employee commuting are collected based on a survey Studio Anneloes conducted amongst their employees in 2023. The response rate of this survey was 100%.

Employees that use a leased company car are not represented in this category. Their daily commute is included in scope 1 emissions for company vehicles.

The exact values and emission sources that are used for the calculation can be found in the Appendix.

2.4.7 Scope 3, Category 9 'Downstream transportation and distribution'

This category includes indirect GHG emissions related to the downstream transportation of goods and services. Within this category, Studio Anneloes considers only the downstream transport emissions of goods up to the point of the retailer. Further downstream emissions are not controlled by Studio Anneloes and are therefore left out of this report. Studio Anneloes has collected all data for downstream transportation of their products over 2023. The emissions of the shipments were provided by the distributor.

The exact values and emission sources that are used for the calculation can be found in the Appendix.

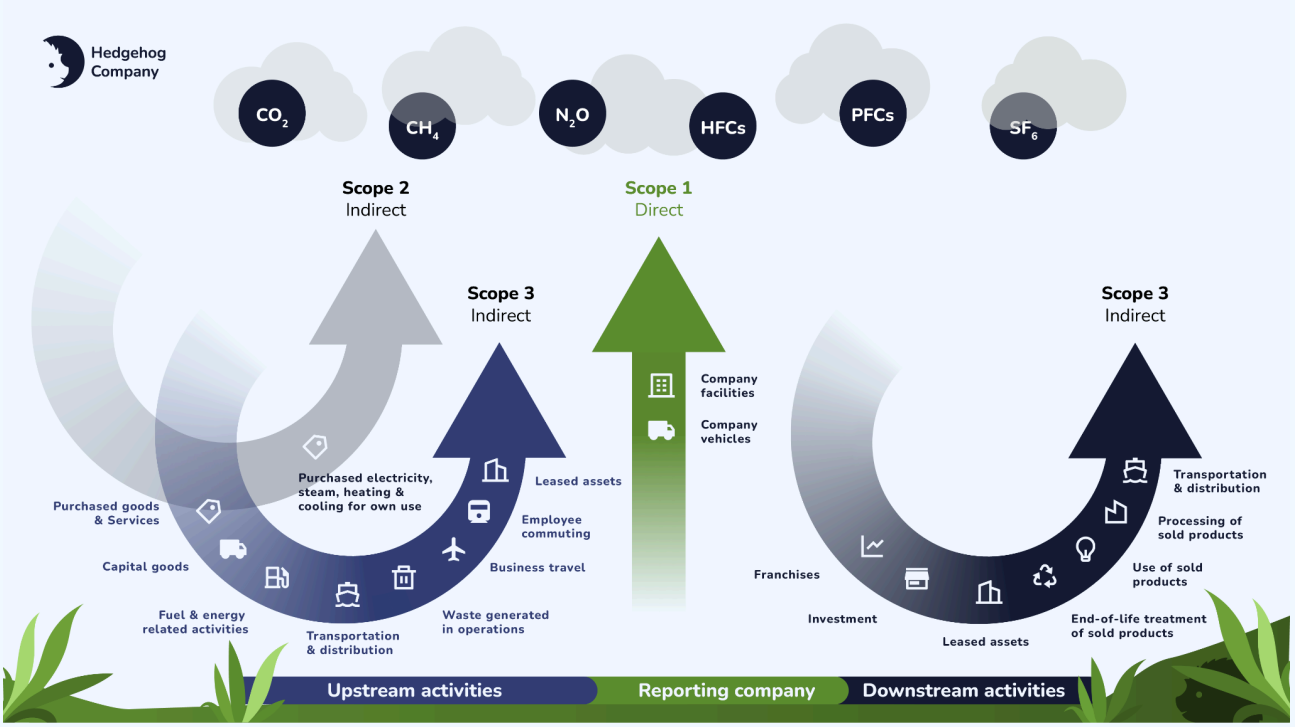

Figure 1. Overview of all categories in scope 1, 2 and 3 according to the GHG protocol.

Table 2. Overview of all scopes and categories included in this report

GHG Scopes	Included
Scope 1 - Direct Emissions	✔
Scope 2 - Indirect Emissions	✔
Scope 3, cat. 1 - Purchased goods and services	✔
Scope 3, cat. 2 - Capital goods	Studio Anneloes does not own any other offices or capital goods. Thus, considered insignificant and excluded from this study.
Scope 3, cat. 3- Fuel- and energy related activities (not included in scope 1 or scope 2)	This is not applicable for Studio Anneloes, since there are no fuel or energy related activities.
Scope 3, cat. 4 - Upstream transportation and distribution	✔
Scope 3, cat. 5 - Waste generated in Operations	✔
Scope 3, cat. 6 - Business travel	✔
Scope 3, cat. 7 - Employee commuting	✔
Scope 3, cat. 8 - Upstream leased assets	Studio Anneloes does not own any leased assets, therefore this is not included in this study.
Scope 3, cat. 9 - Downstream transportation and distribution	✔
Scope 3, cat. 10 - Processing of sold products	Considered insignificant and excluded from this study
Scope 3, cat. 11 - Use of sold products	Due to limited data availability on how Studio Anneloes's products are used, this is not considered.
Scope 3, cat. 12 - End-of-life treatment of sold products	Due to limited data availability on how Studio Anneloes's products are disposed of, this is not considered.
Scope 3, cat. 13 - Downstream leased assets	Considered insignificant and excluded from this study
Scope 3, cat. 14 - Franchises	Considered insignificant and excluded from this study
Scope 3, cat. 15 - Investments	Considered insignificant and excluded from this study

3 Data & methodology

This section describes the data collection, the databases used and the impact assessment method.

3.1 Data collection

The data collection was carried out at Studio Anneloes with internal coordination of Sustainability Manager Laura Koedijk. Hedgehog Company supported the data collection and provided a tailor-made datasheet for this process. The relevant input data is collected through Studio Anneloes.

When possible, primary data was collected and used. This means that data originates from the specific activity within the value chain of Studio Anneloes. If primary data was not available, literature, desk research and industry averages were used to calculate estimates. The number of work weeks used for the calculations for employee commuting is 46.

3.1.1 Scope 1 & 2

Scope 1 and 2 include the emissions from energy use in the Amsterdam office of Studio Anneloes. This data is received through the energy supplier [2]. Next to that, this scope includes the emissions from company vehicles. Studio Anneloes has collected the total driven kilometres in company vehicles. The emissions for company vehicles are calculated by making use of co2emissiefactoren.nl [3]

3.1.2 Scope 3, Category 1 'Purchased goods and services'

This scope includes purchased goods, textiles and haberdashery used for producing the clothing, water, and energy use of the production locations. For the purchased goods within scope 3 'purchased goods and services', receipts and invoices were used. An overview of the total weight of the used types of fabric was provided by Studio Anneloes.

Non-Travel fabrics are calculated with textile emission factors from CE Delft [4]. For the Travel fabrics, product specific EPDs are used. For other purchased goods the following sources are consulted: The Ecoinvent v3.10 database [5] is used to model part of the emissions of this category. The Ecoinvent database is an environmental database based on activity data. The database contains environmental profiles of specific processes and activities, such as material production and industrial processes and measures, among other things, extracted raw materials and emissions to water, air and soil. The Ecoinvent database requires input based on weight. When the weight of an input is not known, an alternative database has been used: Exiobase.

In the 'Purchased goods' category, some input data is only available in euros. In this case, Exiobase [6] was used. Exiobase is a database based on supply-use data per industry from different regions. This data is linked to each other via import and export data, resulting in Multi-Regional Environmentally Extended Supply-Use (MR-EESU) data and Environmentally Extended Input Output (EEIO) data. With these datasets, environmental data can be linked to the consumption (€) of a product.

Studio Anneloes also procures a confectioning service from contractors in Poland, as part of producing ready to wear clothing. Studio Anneloes has collected specific energy consumption data from their contractors. By applying an emission factor for the local grid [7], the emissions of this service are calculated.

3.1.3 Scope 3, Category 4 'Upstream transportation and distribution'

For scope 3 'Upstream transportation and distribution', Studio Anneloes provided transportation locations, travelled kilometres, and transportation modes. Emissions are calculated by using the emission factors of CO2 emissiefactoren.

3.1.4 Scope 3, Category 5 'Waste generated in operations'

For waste generated, Studio Anneloes provided the weight of waste treated for plastic packaging, cardboard paper, and municipal solid waste. By coupling the waste streams to correct emission factors from DEFRA [8], the emissions of this category are calculated.

3.1.5 Scope 3, Category 6 'Business travel'

For business travel, data was available for flights, train travel, and taxi travel. This data was only available for Q1 and Q4, due to a change in the system collecting this data. To overcome the data gap, data for Q2 and Q3 was interpolated by taking the average data from Q1 and Q2 to estimate business travel in those quarters (e.g.: Q2 = (Q1 + Q4)/2). One value left out of the average was a business trip where 25 employees flew to and from Milan. Since it was indicated that such a trip was very rare, the value used for the Q1 average flights excluded the special trip.

For flights, CO2emissiefactoren.nl is used as a resource. Three relevant emission factors are available for planes covering flights less than 700 km, flights between 700 and 2500 km, and flights above 2500 km. The emission factors for short-haul, medium-haul, and long-haul flights are 0,234, 0,172, and 0,157 kgCO2eq per pkm, respectively.

For trains, an average emission factor of 0,033 kgCO2eq per pkm from the European Environment Agency [9] is used. For a trip between Amsterdam and Paris a more specific emission factor of 2,6 kgCO2 per trip was used from Eurostar [10].

While data was available for taxi travel, this was only available in Euros. To estimate the travelled kilometres of taxis, the Dutch maximum price per km of €2,96 / km was used [11]. While this may constitute a best-case scenario, taxis mostly charge close to the max price. To convert the kms to CO2 emissions the CO2emissiefactoren.nl database was used again with the reference for *Auto, brandstofsoort onbekend* (NL: Car, unknown fuel type).

3.1.6 Scope 3, Category 7 'Employee commuting'

Studio Anneloes has performed a survey among all employs to understand the commuting habits of employees. By considering the total travel distance, the amount of days working from the office, and the amount of working weeks, total transport is calculated. This is multiplied with the emission factor for the used transport mode from CO2 emissiefactoren.

3.1.7 Scope 3, Category 9 'Downstream transportation and distribution'

Downstream distribution was collected by Studio Anneloes as two datasets. One for B2C deliveries and another for B2B deliveries. The only relevant data was the weight of total deliveries to a country. In order to calculate the average distance from Amsterdam to customers in these countries, the map shown in the figure below was utilised. Using the average geographical centre of population as a shipping delivery destination, the average distance travelled by truck was estimated. It was assumed that most trucks would be 20 ton trucks or larger, with a last-mile delivery done by smaller vehicles.

Since last-mile delivery differs per country, a country specific estimate of last-mile deliveries was done. The estimated last mile deliveries' kilometres were subtracted from the total delivery distance, to model the impact separately. These kilometres varied between 8 and 20 km [12, 13, 14]. The emission factors come from co2emissiefactoren.nl and are selected from the *Bulk- en stukgoederen* category (NL: Bulk and general cargo) for *Bestelauto* (NL: Van) and *Vrachtwagen* (NL: Lorry), with factors of 1,33 and 0,105 kgCO2/tkm respectively.

Figure 2. Centre population for each country in Europe from Vivid Maps [15].

3.2 Impact assessment method

The impact assessment method translates the inputs into environmental impact. All databases use the Intergovernmental Panel on Climate Change Fifth Assessment Report (IPCC AR5) for the CO_2-emission factors.

4 Results

This chapter presents the results of the organisational carbon footprint calculations for 2023. The results can be used as a baseline for upcoming years. The results are given in tonnes of CO_2-equivalents.

CO_2-equivalents are used to express the contribution of greenhouse gases to global warming, in a single unit. This unit, therefore, indicates the contribution of a greenhouse gas, relative to that of one kilogram of CO_2. For example, the emission of one kilogram of methane is equivalent to the emission of 28 kg of CO_2. In other words, one kilogram of methane contributes to global warming in the same way as 28 kilograms of CO_2. The effect per kilogram of greenhouse gas can vary greatly. For example, the effect of one kilogram of refrigerant with the number R407c is equivalent to the effect of 1.624 kg of CO_2.

4.1 Overview

An overview of the results is given in Table 3. The Table shows the total carbon impact per scope and category in tonnes of CO2-equivalents. The table also shows the share of the total impact. Figure 3 visualises the data from Table 3.

The Table shows that the largest part (>99%) of the impact is caused by scope 3. Scope 1 and 2 contribute less than 1% to the total impact.

Table 3. Overview of the carbon impact per scope and category.

GHG Scopes	Total carbon impact (tCO_2-eq.)	Share (%)
Scope 1 - Direct emissions	**6**	**<1%**
Scope 2 - Indirect emissions	**14**	**<1%**
Scope 3 - Indirect emissions	**4.899**	**>99%**
Scope 3, cat. 1 'Purchased goods and services' (non-product)	4.354	89%
Scope 3, cat. 4 'Upstream transportation and distribution'	428	9%
Scope 3, cat. 5 'Waste generated in operations'	<1	<1%
Scope 3, cat. 6 'Business travel'	54	1%
Scope 3, cat. 7 'Employee commuting'	58	1%
Scope 3, cat. 9 'Downstream transport and distribution'	5	<1%
Total	**4.919**	**100%**

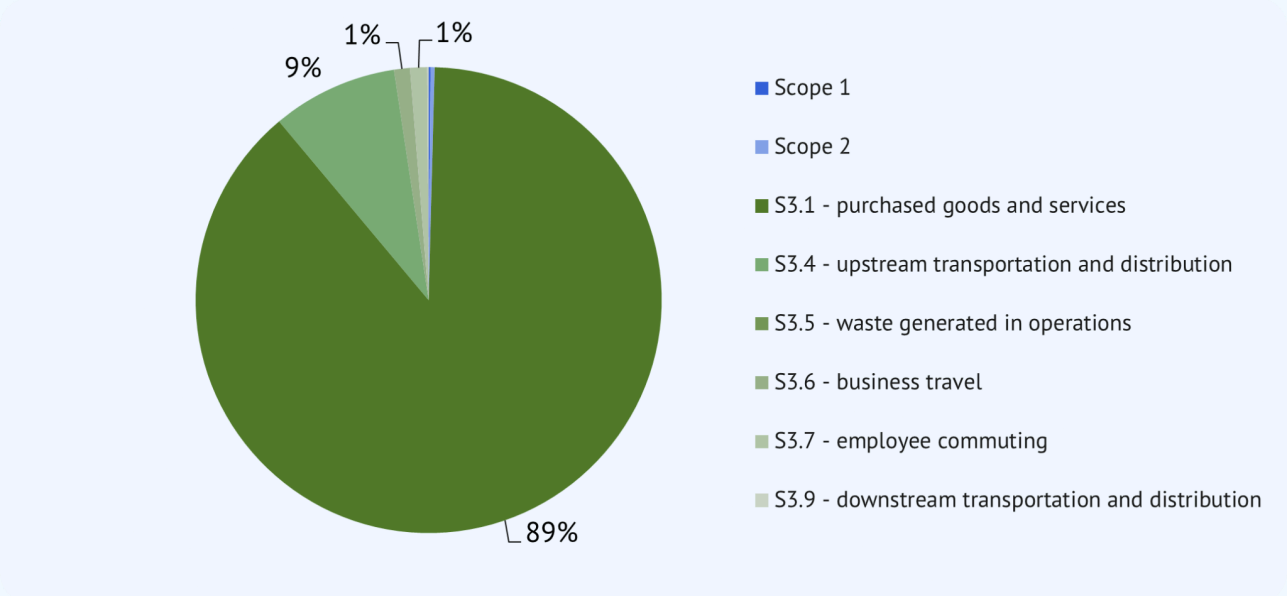

Figure 3. Impact per scope and/or category, expressed in percentage of total GHG emissions (scope 1, 2 and 3).

4.2 Scope 1 - Direct emissions

The direct emissions in scope 1 mainly comes from fuel consumption by non-electric company vehicles. The non-electric company vehicles contribute 6 tonnes of CO2-eq to the total emissions in scope 1.

Table 4. Emission sources in scope 1 (pkm = passenger*kilometre).

Emission source	Unit	Amount	Total carbon impact (ton CO2-eq.)
Company vehicles	pkm	32.976	6
Total scope 1	-		**6**

4.3 Scope 2 - Indirect emissions

Scope 2 contains all indirect emission from purchased energy sources. This is mostly energy use from the office. Lastly, emissions from energy used by electric company vehicles are included in scope 2.

The Studio Anneloes facility makes use of a heat pump for heating and cooling. This heat pump uses a refrigerant, however this is contained in a closed system. No maintenance or refilling of refrigerants was required in 2023, and thus no emissions of refrigerants are reported.

As the Studio Anneloes office consumes a mixture of purchased wind and own generated electricity from photovoltaics, the total carbon impact of the electricity is 0.

Table 5. Emissions sources in scope 2.

Emission source	Unit	Amount	Total carbon impact (ton CO2-eq.)
Electricity - wind	kWh	143.321	0
Electricity - solar (PV)	kWh	138.279	0
Company vehicles - Electric	kWh	42.633	14
Total scope 2	-	-	**14**

4.4 Scope 3 - Indirect emissions

4.4.1 Scope 3, cat. 1 'Purchased goods and services'

The purchased goods and services category considers all procurement activities of Studio Anneloes. Studio Anneloes has provided an overview of all purchased goods. Next to that, Studio Anneloes outsources the confection of their sold products to external parties in Poland. The energy consumption of these facilities is also considered within this scope, as they are a purchased service.

This category contributes to 89% of the total emission of Studio Anneloes. Within this category, the purchased textile contributes the most to the emissions.

Table 6. Emissions sources in scope 3, category 1 'Purchased goods and services'.

Emission source	Unit	Amount	Total carbon impact (ton CO2-eq.)
Packaging			
Shipping bag - recycled	kg	1.190	1
Glass paper bag	kg	420	<1
Paptic garmentbag	kg	3.668	4
Kraft garment bag	kg	560	1
Etiquettes	kg	1.313	2
Packaging boxes	kg	36.195	36
Plastic garment bags	kg	7.961	31
Textiles			
Acrylic	kg	2.603	28
Wool	kg	1.874	110
Elastane, Polyurethane	kg	38.956	538
Cotton	kg	12.532	193
Cotton - recycled	kg	1.802	18
Linnen	kg	153	2
Polyamide	kg	101.896	1.936
Polyester	kg	10.952	131
Polyester - recycled	kg	1.277	11
Viscose	kg	17.633	201
Leather	kg	918	6
Travel quality fabric	kg	70.442	932
Other purchased goods			
Post & office	euros	15.176	1
Shoes	euros	162.228	12
Water	m^3	409	<1
Label printer	euros	600	>1
Labels - polyester	kg	384	2
Hangtags - paper	kg	500	2

Plastic hangers	kg	1.662	8
Woven QR labels	kg	10	<1
Haberdashery			
Elastic	kg	2.862	39
Buttons - metal	kg	731	4
Buttons - polyester	kg	52	<1
Buttons - pearl	kg	8	<1
Zipper - polyester	kg	60	<1
Zipper - metal	kg	7	<1
Energy use confectioning locations			
Electricity	kWh	143.552	99
Electricity - PV	kWh	22.750	0
Natural gas	m^3	1.410	3
Total	-	-	**4.354**

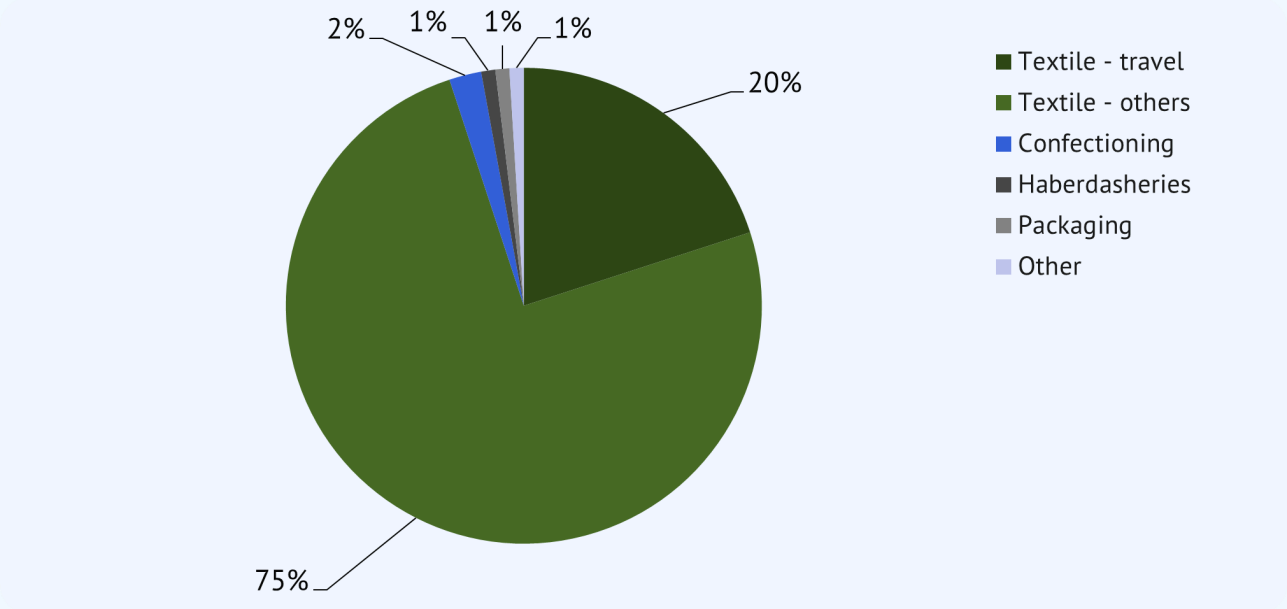

Figure 4. Emission sources of purchased goods and services.

To calculate the environmental impact of travel quality fabrics, product-specific data were utilised. The Travel quality fabrics are responsible for 932 tCO2-eq. Despite constituting 27% of the total weight of all fabrics, travel fabrics represented only 23% of fabric GHG impact. This reflects the lower emission intensity of travel fabrics, compared to the other fabrics procured by Studio Anneloes.

4.4.2 Scope 3, cat. 4 'Upstream transportation & distribution'

With 428 tCO_2-eq., upstream transportation & distribution contributes 9% to the total carbon footprint of scope 3. Table 7 gives an overview of all individual means of transport and distances travelled in 2023 and related carbon emissions.

Table 7. Emissions sources in scope 3, category 4 'Upstream transportation & distribution'.

Emissions source	Unit	Amount	Total carbon impact (tCO2-eq.)
Aeroplane	tkm	176.260	97
Truck	tkm	1.271.141	325
Own truck	tkm	12.600	5
Delivery van	tkm	743	1
Ship	tkm	14.499	1
Total emissions	**-**	**-**	**428**

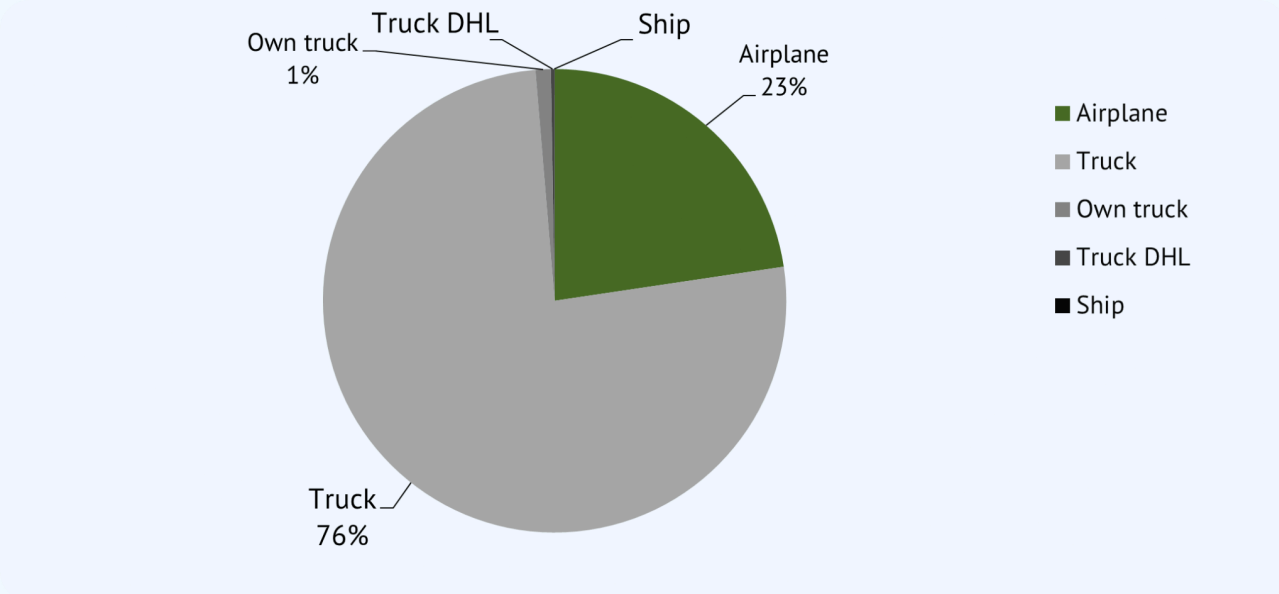

Figure 5. Emission sources of upstream transportation and distribution.

4.4.3 Scope 3, cat. 5 'Waste generated in operations'

Table 8 presents an overview of all waste streams and their respective GHG emissions. Studio Anneloes separates their office waste in three streams; cardboard, plastic foil and residual waste.

As seen from Table 8, the contribution of this category to the total emissions of Studio Anneloes is very little.

Table 8. Emissions sources in scope 3, category 5 'Waste generated in operations'.

Emissions source	Unit	Amount	Total carbon impact (tCO2-eq.)
Plastic foil	kg	1.020	<1
Cardboard	kg	5.610	<1

Residual waste	kg	6.720	<1
Total	-	-	**<1**

4.4.4 Scope 3, cat. 6 'Business travel'

The emissions of business travel by aeroplane, taxi, and train travel are considered within this category. Due to limitations within the accounting software of Studio Anneloes, data was only available for Q1 and Q4. Data for Q2 and Q3 was extrapolated in consultation with Studio Anneloes.

The main contributor to total category six emissions is aeroplane travel, with 75% stemming from medium haul flights. This is caused by a special business trip where 25 employees flew to Milan. The flight for this trip emitted 22 tons of CO_2-eq.

Table 9. Emissions sources in scope 3, category 6 'Business travel' (pkm = passenger*kilometre, vkm = vehicle*kilometre).

Emissions source	Unit	Amount	Total carbon impact (tCO2-eq.)
Aeroplane	pkm	295.000	54
Train - Eurostar	trips	1	<1
Train - Europe	pkm	5.124	<1
Taxi	€	462,70	<1
Total	-		**55**

4.4.5 Scope 3, cat. 7 'Employee commuting'

With 58 tCO_2-eq., employee commuting contributes 1% to the total carbon footprint of scope 3. The impact within this category is primarily caused by the fuel consumption of cars of employees used to commute to the Studio Anneloes offices.

Table 10 gives an overview of all individual means of transport and distances travelled in 2023 and related carbon emissions.

Table 10. Emissions sources in scope 3, category 7 'Employee commuting'.

Emissions source	Unit	Amount	Total carbon impact (tCO2-eq.)
Car - electric	vkm	32.243	2
Car - petrol	vkm	21.251	4
Car - fuel unknown	vkm	257.900	50
Moped	vkm	3.664	1
Bicycle	vkm	25.740	0
Train	pkm	15.938	0
Public transport - type unknown	pkm	69.433	1
Total	-		**58**

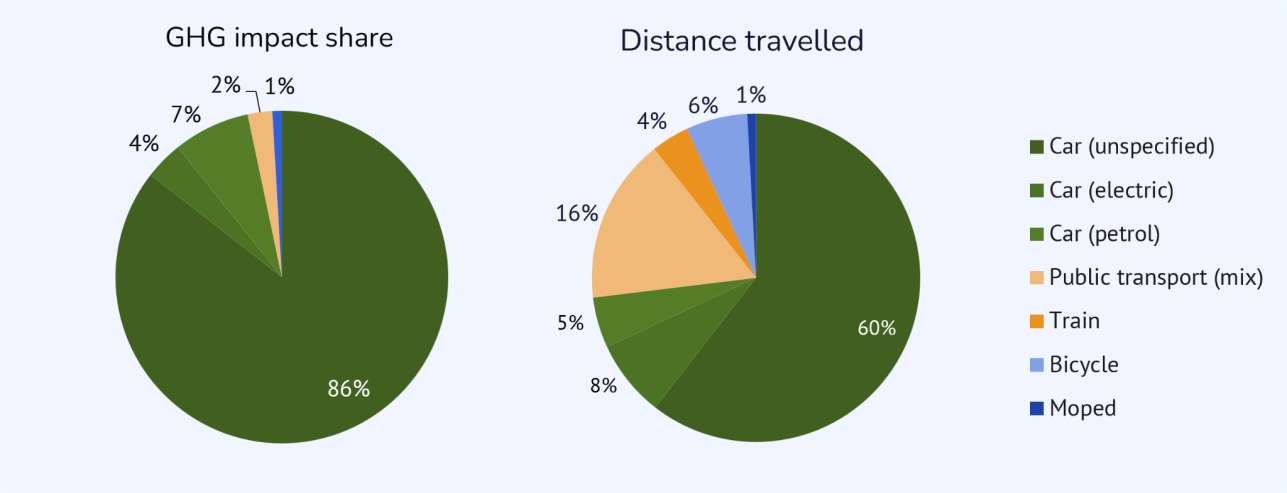

Figure 6. Emission sources of employee commuting. The kilometres travelled (right) and related carbon impacts (left) are indicated per transport method.

The impact of car commuting in the scope 3 category 'Employee commuting' is visualised in Figure 6. Car commuting already takes up a big share of total kilometres travelled. This share grows when looking at the carbon impacts. Going by train, bike or other public transport showed a lower emission intensity. Electric cars also contribute to a lower emission intensity, although this highly depends on the carbon intensity of the energy mix.

4.4.6 Scope 3, cat. 9 'Downstream transportation and distribution'

The emissions depicted in Table 11 give an impression of the downstream transportation impacts of Studio Anneloes. The countries are listed in descending order of emissions. More than 97% of total emissions originate from the Netherlands, which is the location with the most deliveries. For most of these destinations, more than 60% of these emissions originate from shipments to B2B clients.

Table 11. Emissions sources in scope 3, category 9 'Downstream transportation and distribution'.

Emissions source	Unit	Amount	Total carbon impact (tCO2-eq.)
The Netherlands	tkms	15.700	5
Austria	tkms	638	<1
Belgium	tkms	153	<1
Germany	tkms	208	<1
Spain	tkms	36	<1
France	tkms	31	<1
Italy	tkms	21	<1
Luxembourg	tkms	12	<1
Sweden	tkms	4	<1
Denmark	tkms	0,4	<1
Total emissions	**-**	**-**	**5**

Figure 7. Emission sources of downstream transportation expressed in tCO2-eq. Countries with contributions smaller than 1 kg CO2 eq do not have a value indicated.

5 Conclusion

The total carbon footprint of Studio Anneloes is 4.919 tonnes of CO_2- eq in 2023. Scope 3 (indirect emissions) is the highest contributor to the total with a >99% share, followed by scope 2 (<1%) and scope 1 (<1%). Emissions in scope 3 are primarily caused by the manufacturing and transporting of purchased goods, such as the procurement of textile for the production of clothes. Scope 1 impact originates from the exhaust emissions of company vehicles. Scope 2 emissions are caused by the electricity consumption at the facilities.

6 Reduction steps

The two major recommendations based on this report are for Studio Anneloes to (1) avoid emissions and (2) reduce emissions. Regarding the first point, strong ways to avoid emissions are by encouraging circular practices through workshops, repair possibilities, and promoting high quality materials like the travel fabrics. A strong practice to reduce overproduction, which Studio Anneloes has also already implemented, is a make-to-order system which curbs overproduction.

Regarding the second point, reduction, a priority can be given to logistics by ships or trucks, trying to use close to no planes. If possible, the choice for logistics partners with electric or low emission transportation should be made. The same prioritisation applies to business travel, where choosing for trains can result in high emission reduction impacts, especially when a large group is travelling together. Additionally to this, employees commuting with fossil powered cars emitted a similar amount of greenhouse gases as business travel by plane in the same year. Hence, the same point can be made for commuting, where a strong stimulation scheme for electric cars, public transport, biking or carpooling has the potential to lead to lower emissions. Electric car incentive programs are particularly effective when use of self-generated solar power during peak production times is implemented. This would avoid further fossil related energy emissions.

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8 Appendix

In this Appendix, the applied emission factors are presented. In all tables in the Appendix, databases are abbreviated in the following way: CO2 emissiefactoren.nl = CEF, the UK GHG conversion factors 2022 = UK GHG, Exiobase Hybrid 2017 = EX and the European Environmental Agency = EEA, Milieuinformatie textiel = MIT.

Table A. Scope 1 emissions 2023

Source	Amount	Unit	Emission factor (kg CO2-eq/unit)	Database	Tonnes CO2-eq
Company vehicles	32.976	pkm	0.193	CEF	6

Table B. Scope 2 emissions 2023

Source	Amount	Unit	Emission factor (kg CO2-eq/unit)	Database	Tonnes CO2-eq
Electricity - wind	143.321	kWh	0	CEF	0
Electricity - solar (PV)	138.279	kWh	0	CEF	0
Company vehicles - Electric	42.633	kWh	0,328	CEF	14

Table C. Scope 3 emissions - Purchased goods and services 2023

Source	Amount	Unit	Emission factor (kg CO2-eq/unit)	Database	Tonnes CO2-eq
Packaging					
Shipping bag - recycled	1.190	kg	1,059	Ecoinvent v3.10	1
Glass paper bag	420	kg	1,098	Ecoinvent v3.10	<1
Paptic garmentbag	3.668	kg	1,098	Ecoinvent v3.10	4
Kraft garment bag	560	kg	1,098	Ecoinvent v3.10	1
Etiquettes	1.313	kg	1,324	Ecoinvent v3.10	2
Packaging boxes	36.195	kg	0,996	Ecoinvent v3.10	36
Plastic garment bags	7.961	kg	3,913	Ecoinvent v3.10	31
Textiles					
Acrylic	2.603	kg	10,7	MIT	28

Wool	1.874	kg	58,7	MIT	110
Elastane, Polyurethane	38.956	kg	13,8	MIT	538
Cotton	12.532	kg	15,4	MIT	193
Cotton - recycled	1.802	kg	9,9	MIT	18
Linen	153	kg	22,0	MIT	2
Polyamide	101.896	kg	29,0	MIT	1.936
Polyester	10.952	kg	23,0	MIT	131
Polyester - recycled	1.277	kg	8,9	MIT	11
Viscose	17.633	kg	11,4	MIT	201
Leather	918	kg	6,5	MIT	6
Travel quality fabric	70.442	kg	-	EPD	932
Other purchased goods					
Post & office	15.176	euros	0,093	EX	1
Shoes	162.228	euros	0,072	EX	12
Water	409	m^3	0,177	UK GHG	<1
Label printer	600	euros	0,093	EX	<1
Labels - polyester	384	kg	6,424	Ecoinvent v3.10	2
Hangtags - paper	734	kg	2,651	Ecoinvent v3.10	2
Plastic hangers	1.662	kg	4,823	Ecoinvent v3.10	8
Woven QR labels	10	kg	6,424	Ecoinvent v3.10	<1
Haberdashery					
Elastic	2.862	kg	13,8	MIT	39
Buttons - metal	731	kg	5,872	Ecoinvent v3.10	4
Buttons - polyester	52	kg	6,565	Ecoinvent v3.10	<1
Buttons - pearl	8	kg	6,565	Ecoinvent v3.10	<1
Zipper - polyester	60	kg	6,565	Ecoinvent v3.10	<1
Zipper - metal	7	kg	5,872	Ecoinvent v3.10	<1

Energy use production locations					
Electricity	143.552	kWh	0,690	[7]	99
Electricity - PV	22.750	kWh	0	-	-
Gas	1.410	m^3	2,040	UK GHG	3

Table D. Scope 3 emissions - Upstream transportation 2023

Source	**Amount**	Unit	Emission factor (kg CO2-eq/unit)	Database	Tonnes CO2-eq
Airplane	176.260	tkm	0,550	CEF	97
Truck	1.271.141	tkm	0,256	CEF	325
Own truck	12.600	tkm	0,363	CEF	5
Delivery van	743	tkm	1,326	CEF	1
Ship	14.499	tkm	0,007	CEF	1

Table D. Scope 3 emissions - Waste generated 2023

Source	**Amount**	Unit	Emission factor (kg CO2-eq/unit)	Database	Tonnes CO2-eq
Plastic foil	1.020	kg	0,02128	UK GHG	<1
Cardboard	5.610	kg	0,02128	UK GHG	<1
Residual waste	6.720	kg	0,02128	UK GHG	<1

Table E. Scope 3 emissions - Business travel 2023

Source	**Amount**	Unit	Emission factor (kg CO2-eq/unit)	Database	Tonnes CO2-eq
Airplane < 700 km	24.227	pkm	0,234	CEF	6
Airplane 700-2500 km	231.921	pkm	0,172	CEF	40
Airplane >2500 km	52.328	pkm	0,157	CEF	8
Train - Eurostar	1	trips	2,6	[8]	<1
Train - Europe	2.985	pkm	0,033	[7]	<1
Taxi	156	pkm	0,193	CEF	<1

Table F. Scope 3 emissions - Employee commuting 2023

Source	**Amount**	Unit	Emission factor (kg CO2-eq/unit)	Database	Tonnes CO2-eq
Car - electric	32.243	vkm	0,067	CEF	2
Car - petrol	21.251	vkm	0,204	CEF	4
Car - fuel unknown	257.900	vkm	0,193	CEF	50
Moped	3.664	vkm	0,146	CEF	1
Bicycle	25.740	vkm	0	-	0
Train	15.938	pkm	0	CEF	0
Public transport-type unknown	69.433	pkm	0,020	CEF	1

Table G. Scope 3 emissions - Downstream transportation and distribution 2023

Source	**Truck** (tkms)	Delivery Van (tkms)	Truck Emission factor (kg CO2-eq/unit)	Delivery Van Emission factor (kg CO2-eq/unit)	Database	Tonnes CO2-eq
Denmark	0,36	<0,01	0,105	1,326	CEF	<1
Germany	201	6,93	0,105	1,326	CEF	<1
France	30	0,72	0,105	1,326	CEF	<1
Italy	20	0,18	0,105	1,326	CEF	<1
Luxembourg	11	0,25	0,105	1,326	CEF	<1
Austria	631	6,07	0,105	1,326	CEF	<1
Spain	36	0,31	0,105	1,326	CEF	<1
Sweden	4	0,06	0,105	1,326	CEF	<1
The Netherlands	13.189	2.512	0,105	1,326	CEF	5
Belgium	147	5,55	0,105	1,326	CEF	<1