

GREENHOUSE GAS REPORT FOR BOSSARD DENMARK 2023

Calculated in 2024
Version 1.2 (25-04-2024)

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INTRODUCTION AND PURPOSE

Bossard Denmark A/S, hereafter referred to as Bossard in this report, wish to know and reduce their impact on the climate, and therefore they have decided to estimate the greenhouse gas (GHG) emissions associated with the company's activities. This is a report following their GHG inventory for 2018, 2019, 2020, and 2023.

The GHG report and inventory have been prepared based on the guidelines from the international accounting and reporting standard, GHG Protocol Corporate Standard, and covers both scope 1, 2, and 3. The GHG inventory for 2018, 2019, and 2020 covers only scope 1 and 2 and emissions associated with waste management in scope 3. The results of this report will be compared to the previous years when possible. Read more about the GHG Protocol on pages 4 and 5.

The work with the GHG report and inventory is meant to contribute to:

- Understand the challenges and possibilities associated with the GHG emissions
- Identify possibilities to reduce GHG emissions
- Setting climate targets and following the development of them
- Involving stakeholders in the reduction of GHG emissions
- Reporting transparently on accounting methods
- Improving the data quality and methods for reporting



Bossard Denmark is part of the Bossard Group, which operates worldwide, primarily in Europe, North America, and Asia. In Denmark, we are located in Hvidovre, where we advise and serve around 2,000 Scandinavian production and industrial companies.

We are one of the leading trading companies selling fasteners and industrial components to the Danish industry. Together with our logistics solutions and engineering services, we help our customers creating efficient production environments and innovative products.

GREENHOUSE GAS PROTOCOL

The internationally recognized standard for GHG accounting

The GHG Protocol is a partnership between the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). It consists of a series of internationally recognized standards for accounting and reporting GHG emissions.

CO₂-equivalents (CO₂e)

The GHG Protocol includes the six greenhouse gases mentioned in the Kyoto protocol: Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbon (HFCs), perfluorocarbon (PFCs) and sulfur hexafluoride (SF₆). 1 kg of each GHG can be converted to CO₂ equivalents (kg CO₂e) and added up to represent the total GHG emissions.

Scopes and categories

The GHG protocol divides a company's GHG emissions in scope 1, scope 2, and scope 3. Scope 1 is the direct emission from the company's owned buildings and vehicles. Scope 2 is the indirect emission from purchased energy. Scope 3 is the indirect emission from the company's value chain. Scope 3 is divided further into 15 categories, where not all categories are relevant for all types of companies. See page 5 for a visualization of scopes 1, 2, and 3.

Basic Principles:

Relevance: The GHG inventory must reflect the company's GHG emissions allowing the company to make relevant decisions and act based on the results.

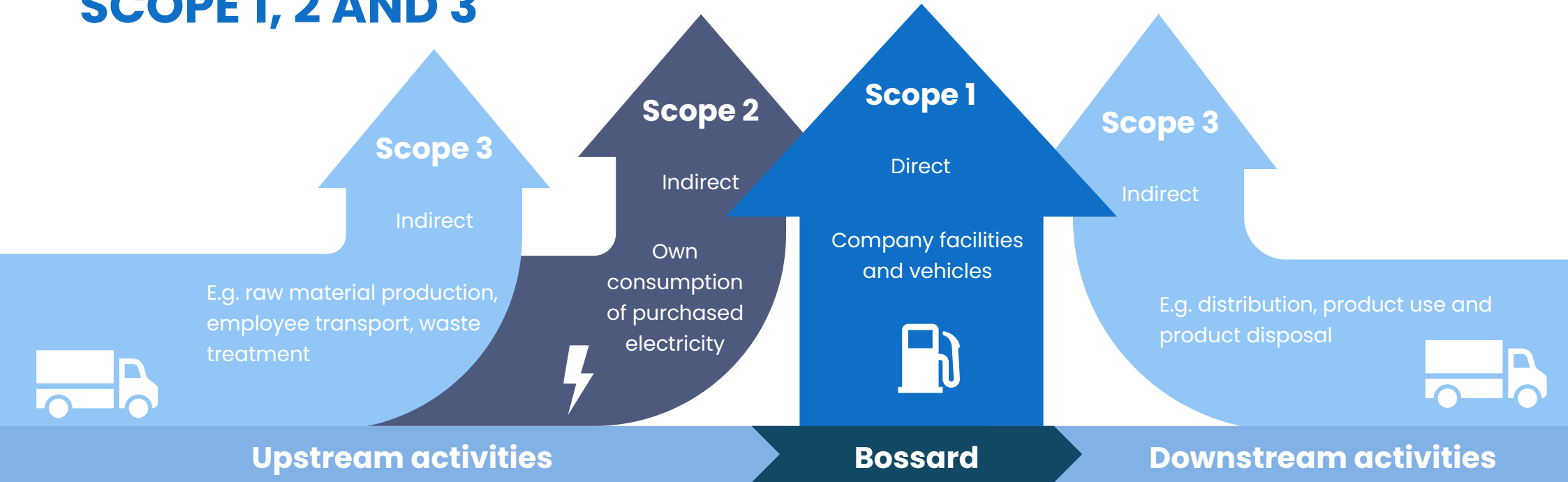
Completeness: The company must quantify and report all GHG emission sources within the boundary set by the company. And describe if and why something IS NOT included.

Consistency: The company must use methods that allow them to compare the results over time. Changes in data collection, boundaries, methods, or other relevant aspects are described and justified.

Transparency: Assumptions, opt-outs, calculation methods, etc. must be justified by facts and causality and described in an understandable manner.

Accuracy: Quantification of GHGs must not over- or underestimate the actual GHG emissions. The results must have a high credibility and integrity to provide basis for decision-making.

SCOPE 1, 2 AND 3



TOTAL GREENHOUSE GAS EMISSIONS

Bossard’s scope 1, 2, and 3 emissions are shown in Figure 1. In 2023, 99.6% of the GHG emissions are in scope 3, which includes indirect emissions from Bossard’s value chain. The total GHG emission in 2023 is 24,009.7 ton CO₂e.

The GHG emission is calculated based on the collected data for Bossard’s activities. When data was missing or incomplete, various methods have been used to estimate the emission. For scopes 1 and 2, the data accessibility and quality are high, and the uncertainty is therefore low. For scope 3 the data accessibility and quality are generally lower, and the uncertainty of the results are therefore higher.

The calculation methods for the GHG inventory can be seen on pages 22–39. Improvement of data will be part of the effort to obtain a better foundation for reducing the emission of GHGs. On the following pages, each scope and scope 3 category that is included in Bossard’s GHG inventory is presented. The included and excluded emission sources can be seen on page 22.

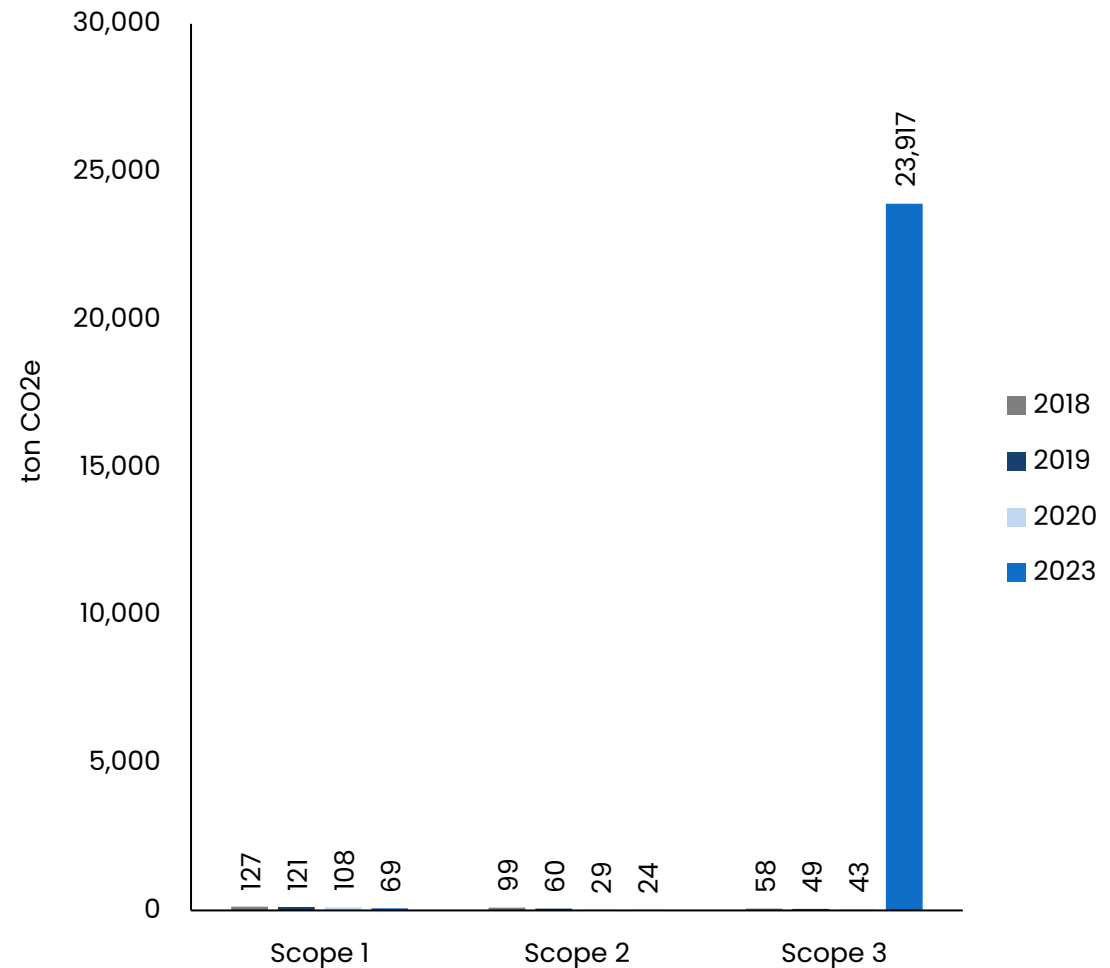


Figure 1: Bossard’s total GHG emissions in 2018, 2019, 2020, and 2023 in scopes 1, 2, and 3.

KEY FIGURES

Bossard reports both the absolute GHG emissions, and the relative GHG emissions related to the revenue and number of employees. This makes it possible to follow the development in the GHG emissions in the future even if the level of activity changes.

	Unit	2018	2019	2020	2023
Scope 1	ton CO2e	126.6	121.3	107.8	68.7
Scope 2	ton CO2e	98.9	60.4	29.2	24.0
Scope 3	ton CO2e	58.1*	49.1*	43.1*	23,917.1
Total	ton CO2e	283.6*	230.8*	180.1*	24,009.7

CO2e-intensity per revenue (scope 1+2)	ton CO2e/M DKK	0.7	0.6	0.4	0.3
CO2e-intensity per revenue (scope 1+2+3)	ton CO2e/M DKK	-	-	-	73.6
CO2e-intensity per employee (scope 1+2)	ton CO2e/employee	2.6	2.1	1.7	1.3
CO2e-intensity per employee (scope 1+2+3)	ton CO2e/employee	-	-	-	333.5

*In the years 2018–2020 scope 3 only includes waste management in operations and WTT emissions from fuel and energy.

**For purchased energy the location-based method is used. Read more about location- and market-based calculation methods on page 25.

SCOPE 1: DIRECT EMISSIONS

Scope 1 GHG-emissions 2023	68.7 ton CO ₂ e
% of total GHG-emissions 2023	0.3%

Scope 1 is Bossard's direct GHG emissions. Bossard has a scope 1 emission of 68.7 tons CO₂e in 2023, which is from internal use of diesel and petrol for vehicles. Scope 1 constitutes 0.3% of the total GHG emissions in 2023. Both the emissions from diesel and petrol consumption have decreased in 2023 compared to 2018. The GHG emission per emission source in scope 1 is shown in Figure 2.

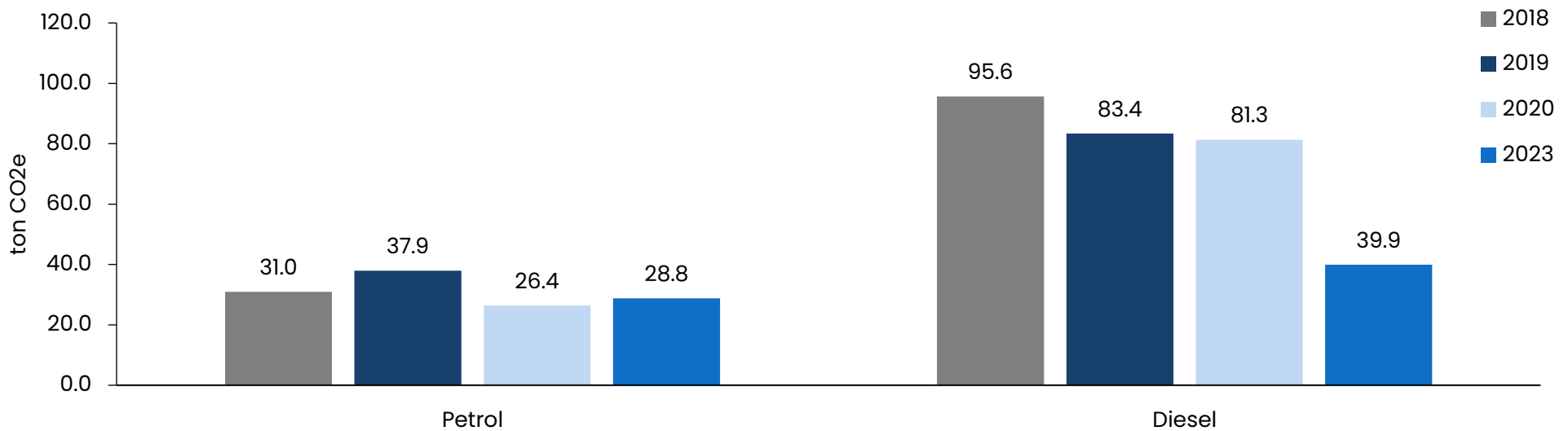


Figure 2: Bossard's scope 1 emissions in 2018, 2019, 2020, and 2023 per emission source.

SCOPE 2: INDIRECT EMISSIONS FROM PURCHASED ENERGY

Scope 2 GHG-emissions 2023	24.0 ton CO ₂ e
% of total GHG-emissions 2023	0.1%

Scope 2 is Bossard’s indirect GHG emissions from purchasing energy. Bossard has a scope 2 emission of 24.0 tons CO₂e in 2023, which is from electricity and heat consumption. In 2018 the main contributor to scope 2 emissions was the consumption of electricity. This has, however, decreased from 69.9 ton CO₂e in 2018 to 5.5 ton CO₂e in 2023 (using the location-based method, read more on page 25). In 2023 the largest contributor to Bossard’s scope 2 emissions were from district heating. Bossard generates their own electricity from solar panels which is used internally as well as sold to the grid. The amount that is sold is not included in scope 2, but is instead included in scope 3.3 (well-to-tank emissions). Scope 2 constitutes 0.1% of the total GHG-emissions. In Figure 3 the GHG emissions per emission source can be seen.

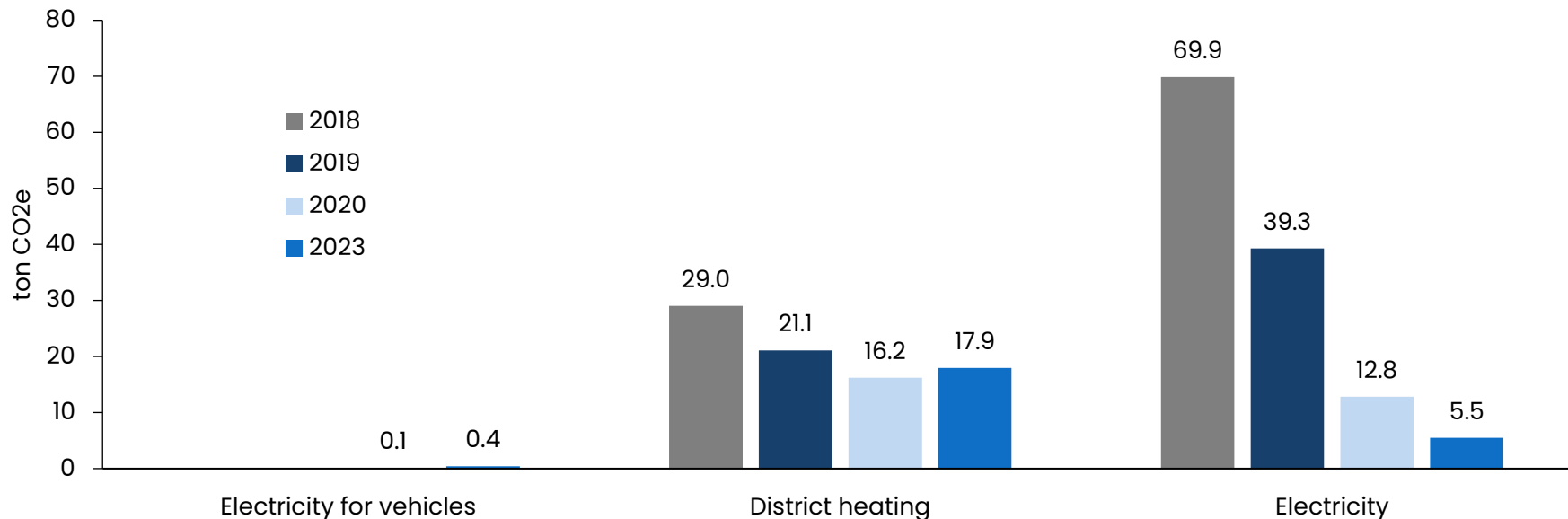


Figure 3: Bossard's scope 2 emissions in 2018, 2019, 2020, and 2023 per emission source.

SCOPE 3: INDIRECT EMISSIONS IN THE VALUE CHAIN

Scope 3 GHG-emissions 2023	23,916.0 ton CO ₂ e
% of total GHG-emissions 2023	99.6%

Scope 3 relates to indirect GHG emissions in the company's value chain. Bossard's scope 3 emission was 23,916.0 ton CO₂e in 2023 and constitutes 99.6% of the total emission in scopes 1, 2, and 3. The category that contributes the most is category 1 (Purchased goods and services). In Figure 4 Bossard's GHG emissions in scope 3 divided per category in scope 3 is shown. On the following pages the emissions in each category are elaborated on.

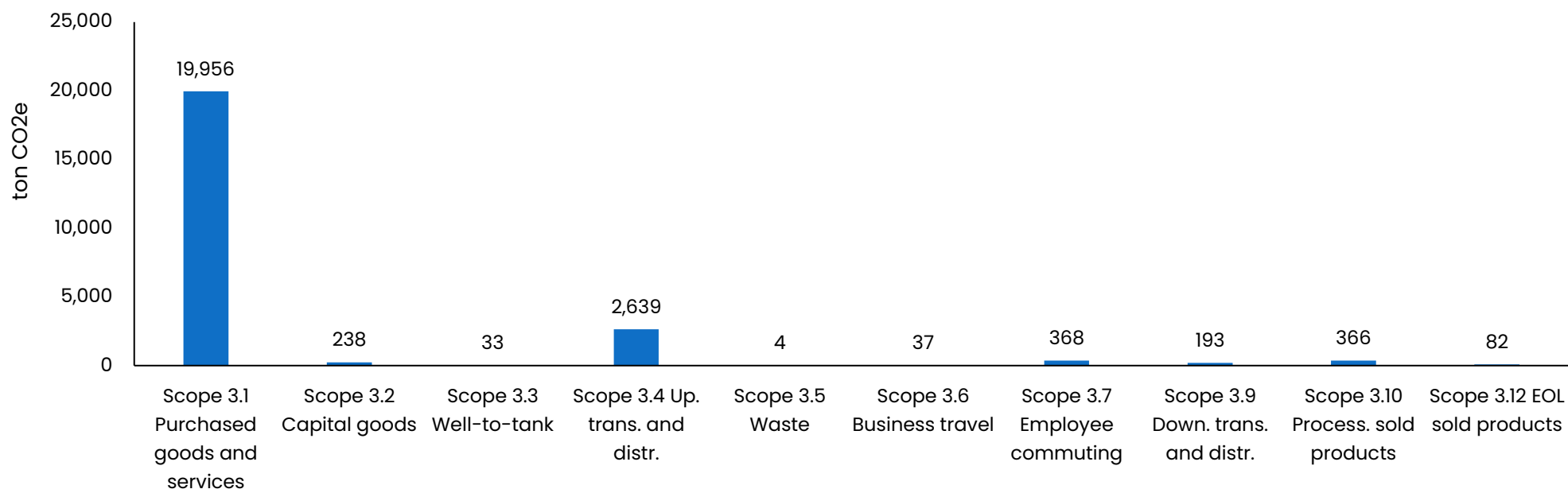


Figure 4: Bossard's scope 3 emissions in 2023 per emission category. The years 2018, 2019 and 2020 are not shown because only scope 3.3 (WTT) and 3.5 (Waste) are calculated for these years.

SCOPE 3.1: PURCHASED GOODS AND SERVICES

Scope 3.1 GHG-emissions 2023	19,955.9 ton CO ₂ e
% of total GHG-emissions 2023	83.1%

Scope 3.1 relates to the GHG emissions from Bossard’s purchased goods and services. Bossard has a scope 3.1 emissions of 19,955.9 ton CO₂, which is 83.1% of the total emissions in scopes 1, 2, and 3. The majority of the emissions in scope 3.1 is from import of Bossard’s products purchased from a sister company in the group. On Figure 5 the emissions from these products can be seen. It is divided into material groups of either Metals – such as aluminum and steel, Plastics – such as rubber or different polymers, Electronics – including electronic components and batteries, and Paper. Metal products make up the largest part of the emissions.

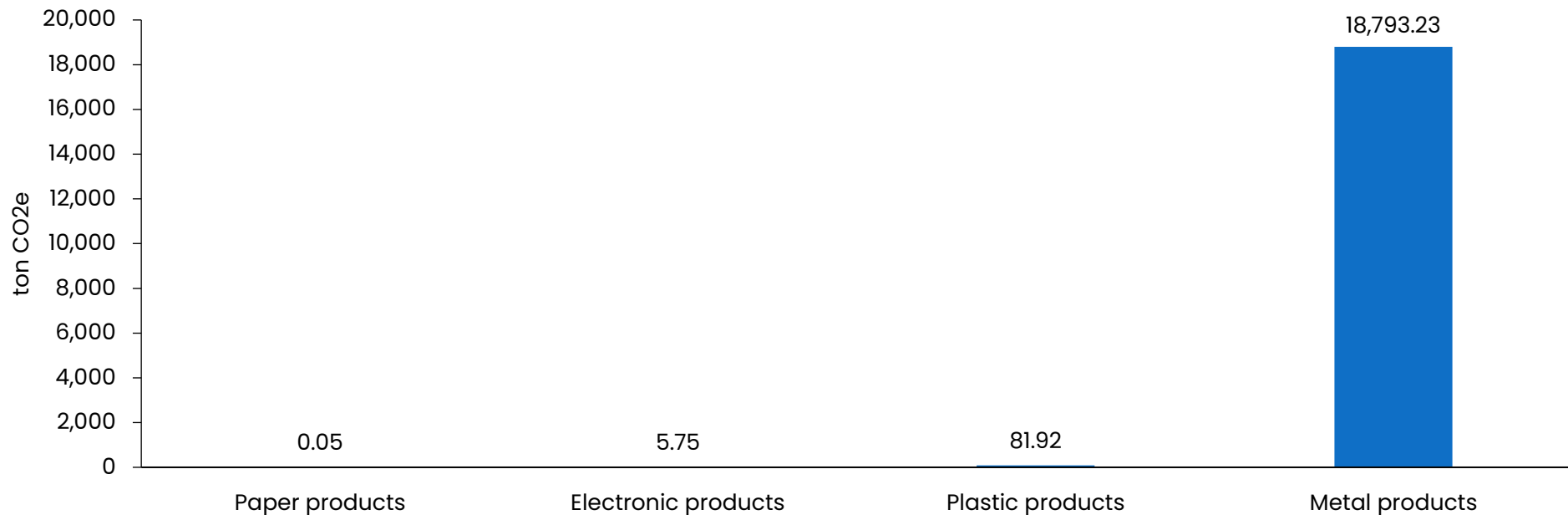


Figure 5: GHG emissions from purchased products in scope 3.1 for 2023.

On Figure 6 the emissions from other purchased goods and services is shown, and it is seen that the largest contributor is services purchased from the parent company (categorized as “Bossard” in Figure 6) followed by computer and software, which includes both computers, computer related products and consultants, and software licenses.

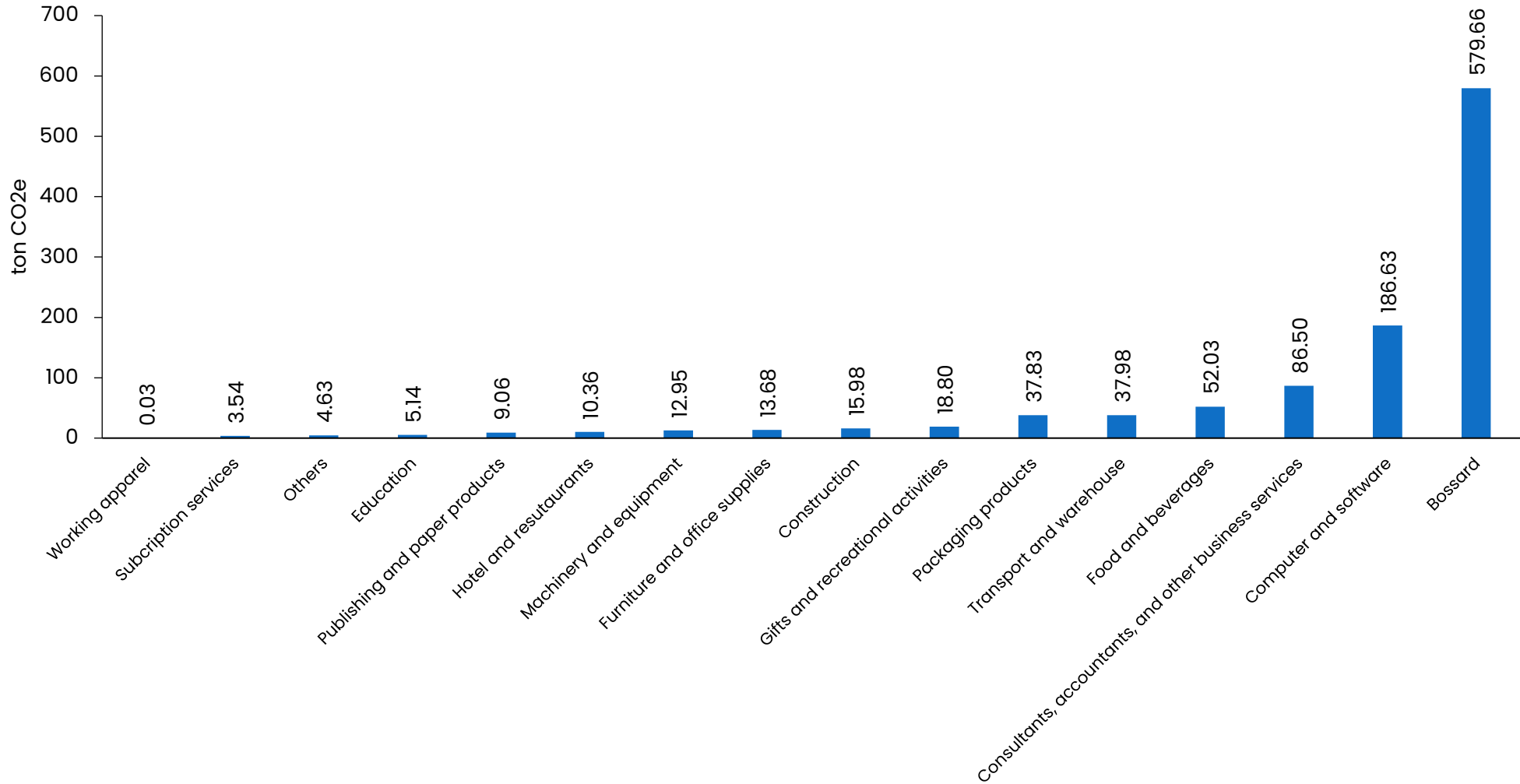


Figure 6: GHG emissions from purchased goods and services in scope 3.1 for 2023.

SCOPE 3.2: CAPITAL GOODS

Scope 3.2 GHG-emissions 2023	238.5 ton CO ₂ e
% of total GHG-emissions 2023	1.0%

Scope 3.2 relates to GHG emissions from the acquisition of capital goods. Bossard's scope 3.2 emission is 238.5 ton CO₂e in 2023 and constitutes 1.0% of the total emission in scopes 1, 2, and 3. On Figure 7 Bossard's GHG emissions in scope 3.2 divided per category is shown. The largest part of the emissions from capital goods is associated with the acquisition of machinery and equipment.

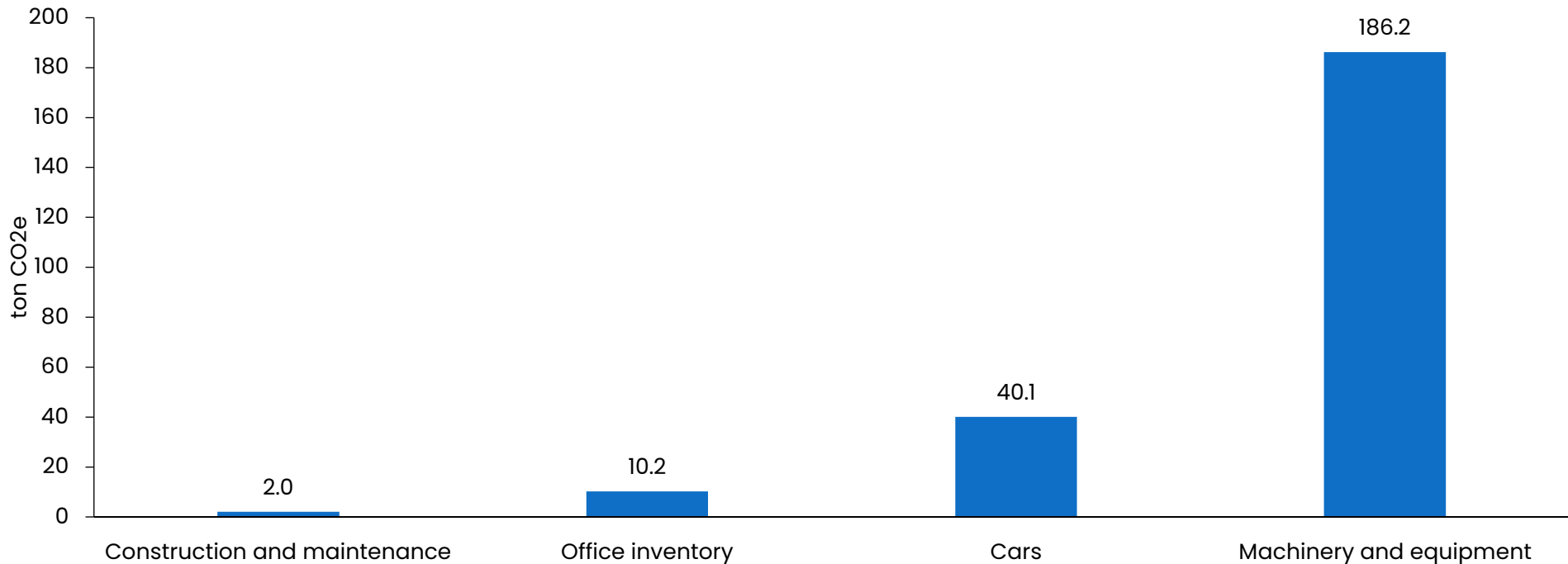


Figure 7: GHG emissions in scope 3.2 per emission source for 2023.

SCOPE 3.3: FUEL- AND ENERGY-RELATED ACTIVITIES

Scope 3.3 GHG-emissions 2023	32.8 ton CO ₂ e
% of total GHG-emissions 2023	0.1%

Scope 3.3 relates to the GHG emissions from extraction, production, and distribution of energy and fuels consumed in scopes 1 and 2. Bossard has a scope 3.3 emission of 32.8 ton CO₂e which constitutes 0.1% of the total emissions. On Figure 8 the emissions in scope divided per emission source can be seen.

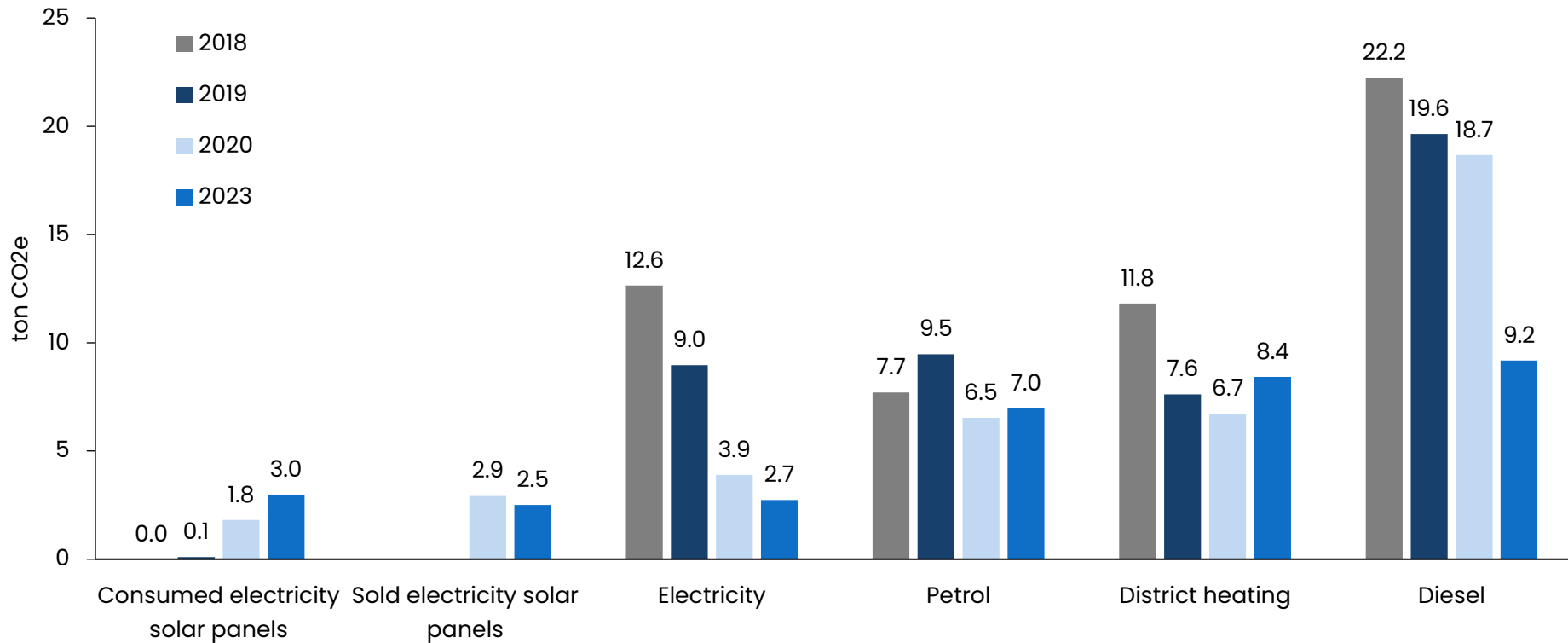


Figure 8: GHG emissions in scope 3.3 per emission source for 2018, 2019, 2020, and 2023.

SCOPE 3.4: UPSTREAM TRANSPORTATION AND DISTRIBUTION

Scope 3.4 GHG-emissions 2023	2,638.6 ton CO ₂ e
% of total GHG-emissions 2023	11.0%

Scope 3.4 relates to the GHG emissions from the upstream transport of Bossard's products. Bossard has a scope 3.4 emission of 2,638.6 ton CO₂e which constitutes 11.0% of the total emissions. It has been assumed that transport within Europe was by truck, and transport outside Europe was by container ship (see page 33 for more details). On Figure 9 the emissions in scope divided per transport type is shown.

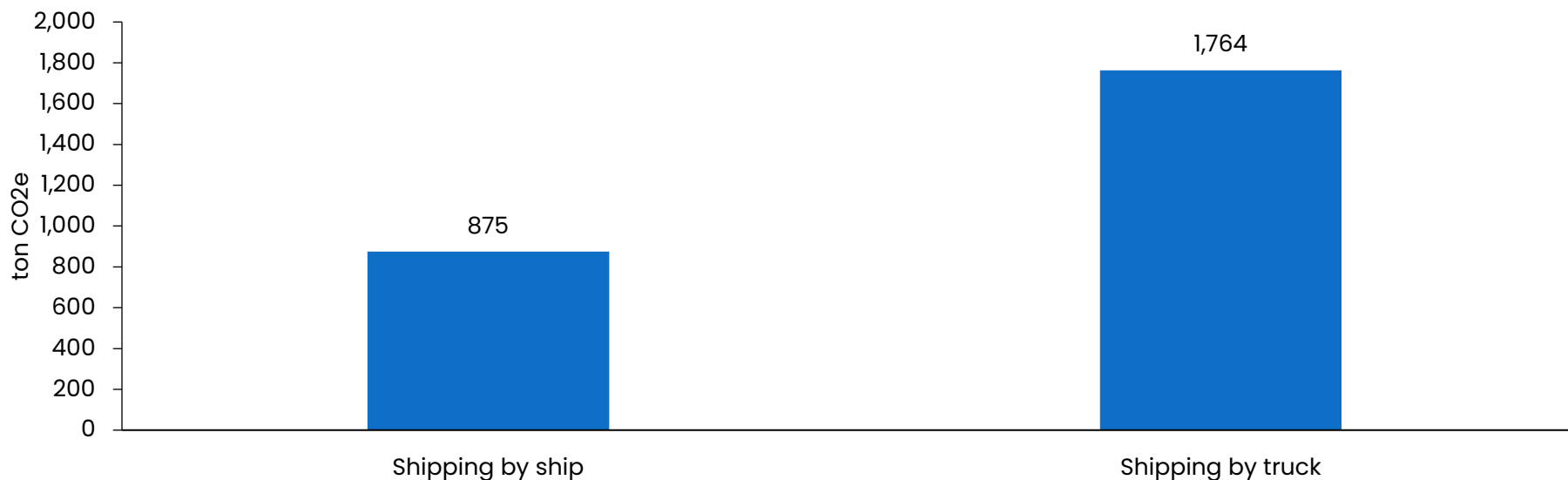


Figure 9: GHG emissions in scope 3.4 per emission source for 2023.

SCOPE 3.5: WASTE GENERATED IN OPERATIONS

Scope 3.5 GHG-emissions 2023	3.9 CO ₂ e
% of total GHG-emissions 2023	0.02%

Scope 3.5 relates to the GHG emissions from the management of waste generated at Bossard’s location. Bossard has a scope 3.5 emission of 3.9 ton CO₂e. In accordance with the GHG protocol, the management of waste is included, while the treatment of waste sent to remanufacturing and incineration have been omitted. Read more about this on page 34. Scope 3.5 constitutes 0.02% of the total emissions. On Figure 10 the emissions from scope 3.5 divided per waste fraction is shown. Values shown as 0.0 ton CO₂e means the emission is <50 kg CO₂e.

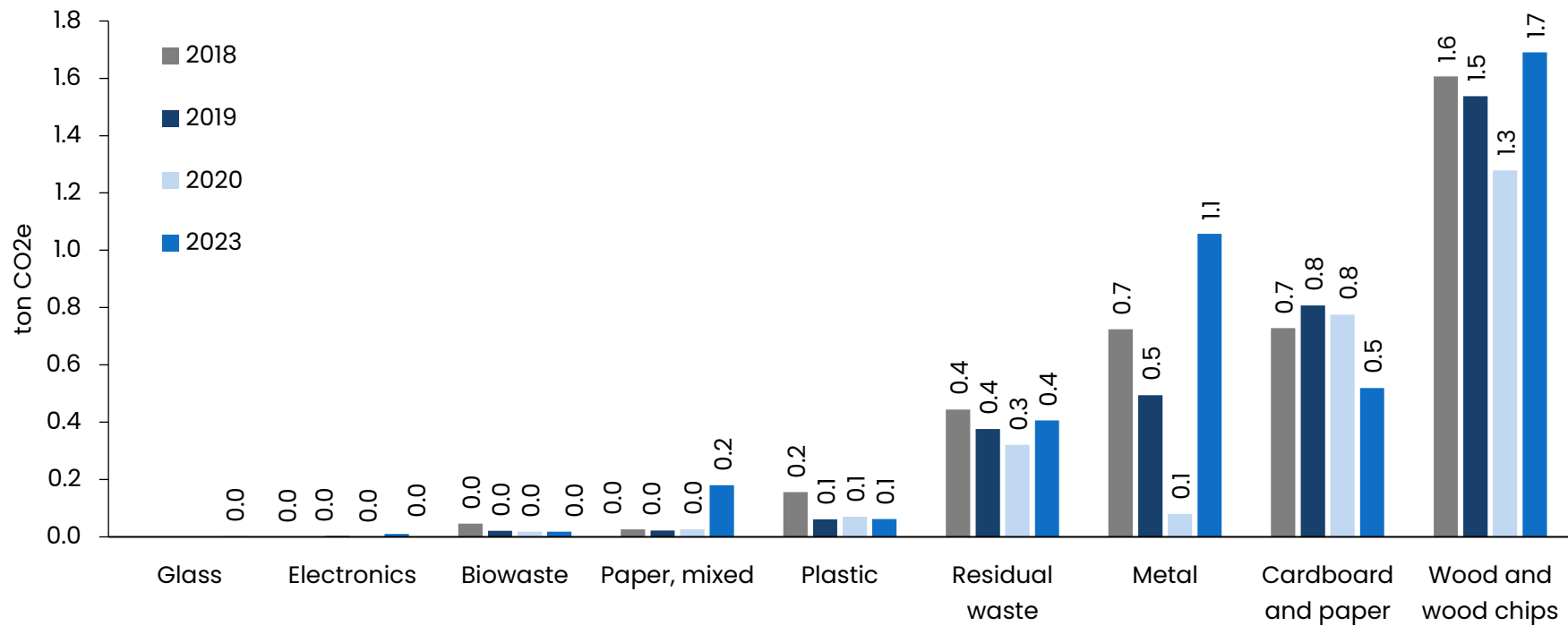


Figure 10: GHG emissions in scope 3.5 per emission source for 2018, 2019, 2020, and 2023.

SCOPE 3.6: BUSINESS TRAVEL

Scope 3.6 GHG-emissions 2023	37.6 ton CO ₂ e
% of total GHG-emissions 2023	0.2%

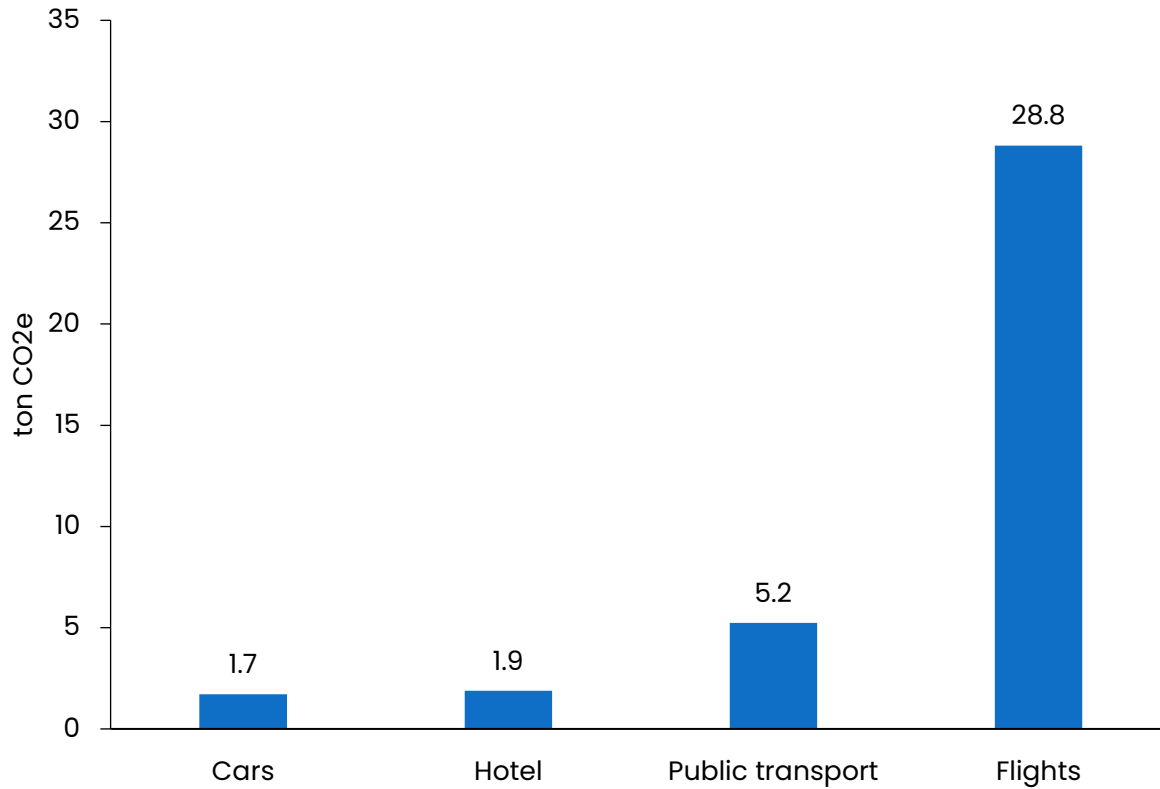


Figure 11: GHG emissions in scope 3.6 per emission source for 2023.

Scope 3.6 relates to the GHG emissions of the employee’s business trips. Bossard has a scope 3.6 emission of 37.6 ton CO₂e which comes from travel by car, public transport, flight and hotel accommodations, where most of the GHG emissions are from travel by flight. Scope 3.6 constitutes 0.2% of the total emissions. On Figure 11 the GHG emissions are divided in trips by car, public transport, flights, and hotel accommodations are shown.

SCOPE 3.7: EMPLOYEE COMMUTING

Scope 3.7 GHG-emissions 2023	368.5 ton CO ₂ e
% of total GHG-emissions 2023	1.5%

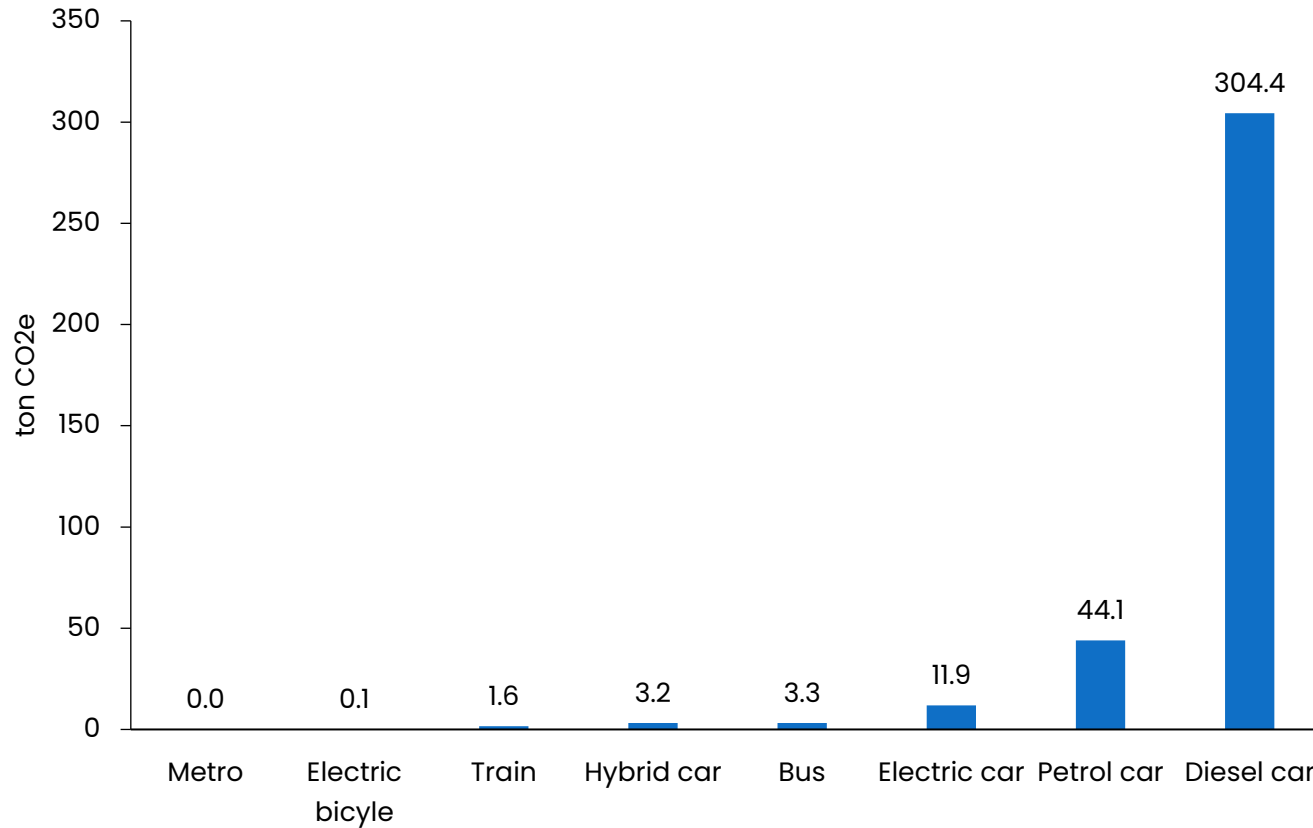


Figure 12: GHG emissions in scope 3.7 per emission source for 2023.

Scope 3.7 relates to the GHG emissions from the employee commuting. Bossard has performed a voluntary questionnaire for their employees regarding their commuting to and from work in 2023. 80% of the employees participated in the survey, and the results have been scaled up to represent 100% of the employees. Bossard has a scope 3.7 emission of 368.5 ton CO₂e in 2023, which constitutes 1.5% of the total. On Figure 12 the emission from employee commuting can be seen divided per transportation type.

SCOPE 3.9: DOWNSTREAM TRANSPORTATION AND DISTRIBUTION

Scope 3.9 GHG-emissions 2023	192.6 ton CO ₂ e
% of total GHG-emissions 2023	0.8%

Scope 3.9 relates to the GHG emissions from the downstream transportation of Bossard's products. Bossard has a scope 3.9 emission of 192.6 ton CO₂e in 2023 which is 0.8% of the total emissions. It was assumed that transport within Europe was by truck, and transport outside Europe was by container ship (see page 37 for more details). Part of the downstream transportation were delivered directly from the parent company in Switzerland to the customer. On Figure 13 the emissions from downstream transport divided in deliveries from Switzerland and deliveries from Denmark is seen.

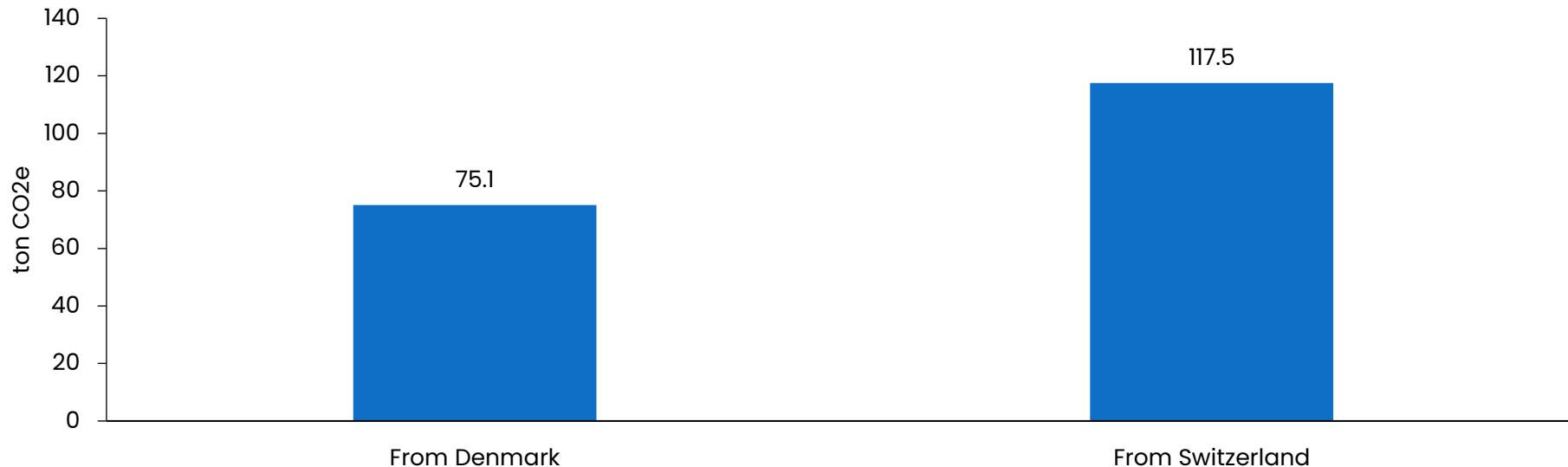


Figure 13: GHG emissions in scope 3.9 per emission source for 2023.

SCOPE 3.10: PROCESSING OF SOLD PRODUCTS

Scope 3.10 GHG-emissions 2023	366.5 ton CO ₂ e
% of total GHG-emissions 2023	1.5%

Scope 3.10 relates to the processing of sold products and includes the surface treatment of Bossard’s products (e.g. processing of steel to galvanized steel – zinc surface treatment). Bossard has a scope 3.10 emission of 366.5 ton CO₂e in 2023 which is 1.5% of the total. On Figure 14 the emissions from scope 3.10 divided per treatment type is seen. The emission from transport of products to surface treatment facilities is included in scope 3.9.

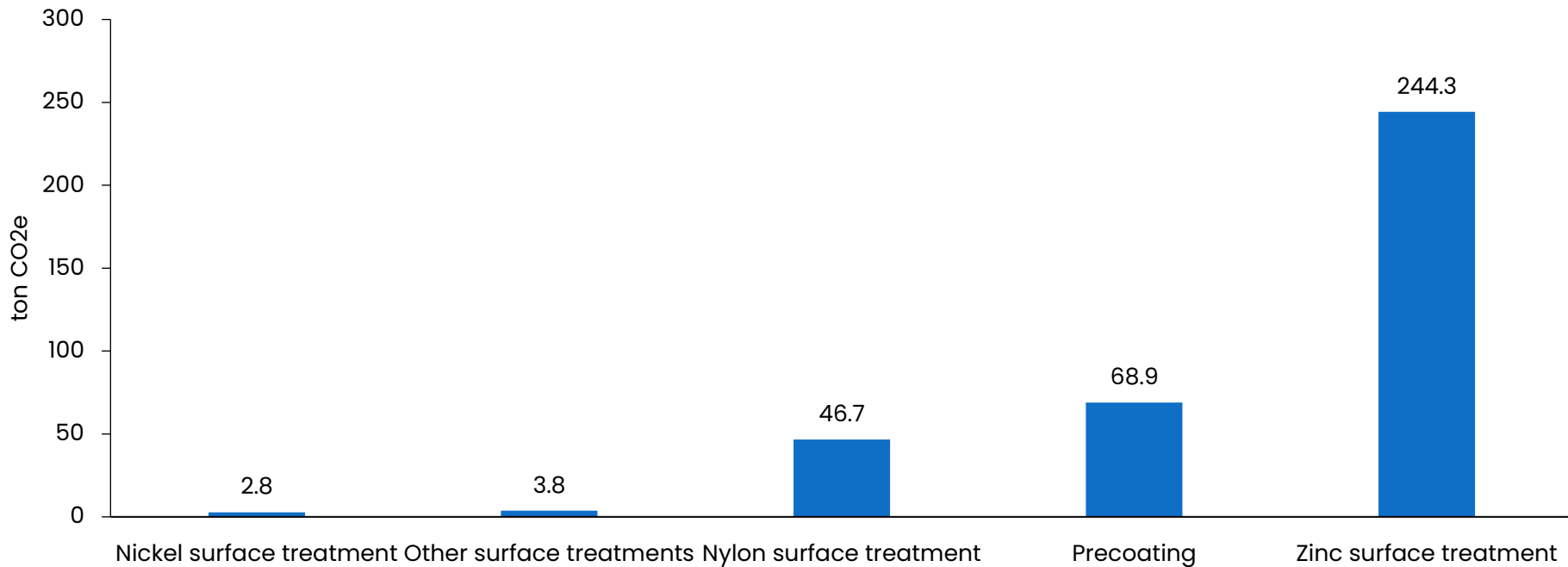
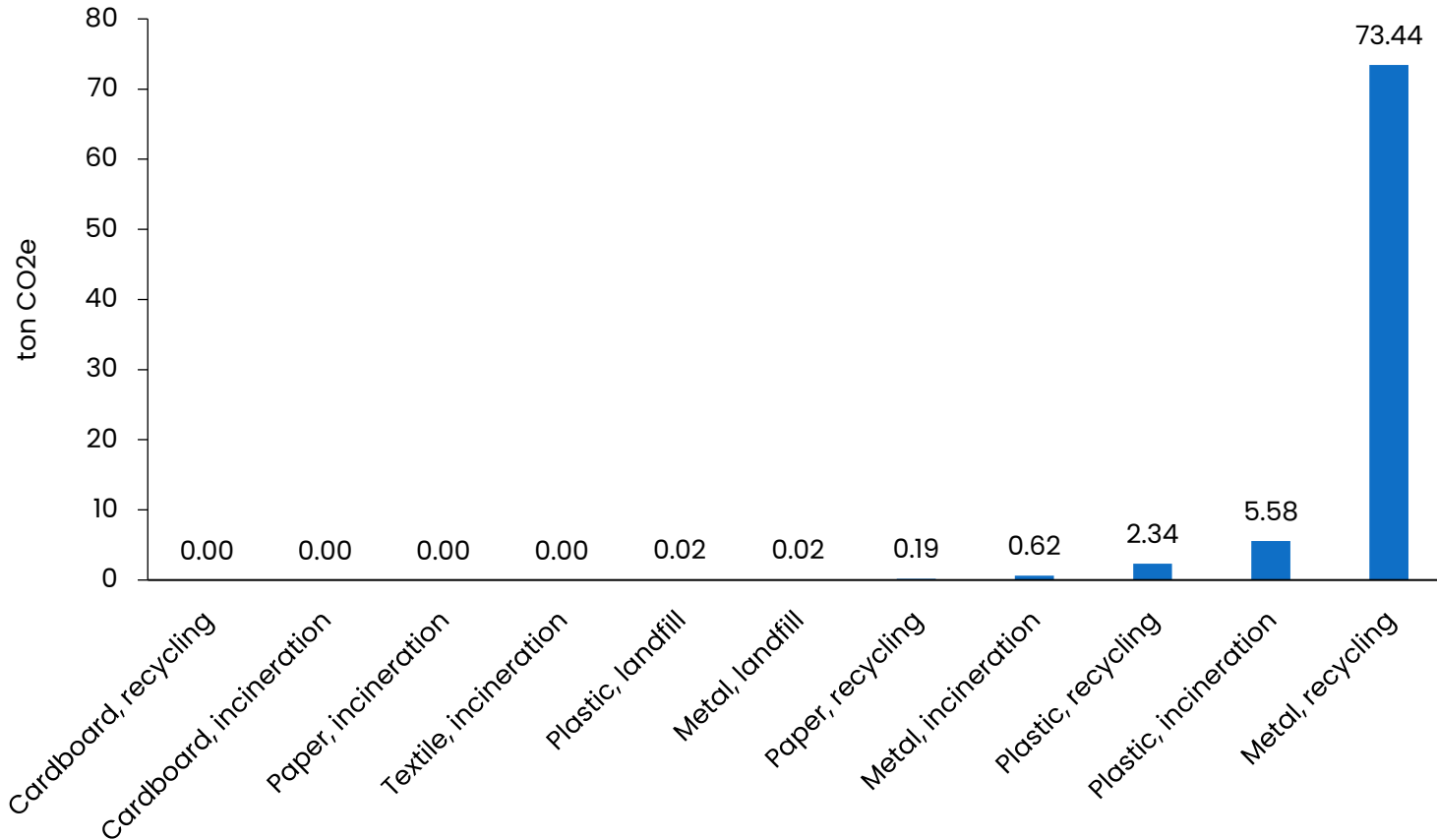


Figure 14: GHG emissions in scope 3.10 per emission source for 2023.

SCOPE 3.12: END-OF-LIFE TREATMENT OF SOLD PRODUCTS

Scope 3.12 GHG-emissions 2023	82.2 ton CO ₂ e
% of total GHG-emissions 2023	0.3%



Scope 3.12 relates to the End-of-Life treatment of Bossard’s sold products. Bossard has a scope 3.12 emission of 82.2 ton CO₂e in 2023, which is 0.3% of the total. On Figure 15 the emissions from scope 3.12 divided per material and treatment is seen. The treatment type for each waste category has been assumed to follow Eurostat, see more on page 39.

Figure 15: GHG emissions in scope 3.12 per emission source for 2023.

APPENDIX

BOUNDARY SETTING

To avoid double counting of the same emissions in several companies' scope 1 and 2, a company must choose an organizational boundary for its GHG inventory. Bossard has chosen to quantify and report its GHG emissions according to the principle of operational control. Therefore, it is the sources of GHG emissions over which Bossard has operational control that are counted in Bossard's scope 1 and 2. The remaining GHG emissions are accounted for in scope 3. In the table below the scopes and categories included and excluded in Bossard's GHG inventory are listed along with relevant emission sources for Bossard.

INCLUDED SCOPE/CATEGORY	EMISSION SOURCES INCLUDED	EMISSIONS SOURCES EXCLUDED
Scope 1	Fuels for vehicles	Refrigerant leakage. Considered irrelevant after the emissions were calculated and represented a negligible amount.
Scope 2	Electricity for location and electrical vehicles. District heating for location.	No known sources excluded.
Scope 3, Category 1: Purchased goods and services	Purchasing of goods and services.	No known sources excluded.
Scope 3, Category 2: Capital goods	Capital goods.	No known sources excluded.
Scope 3, Category 3: Fuel- and energy-related activities	Upstream emissions from fuels and energy counted in scopes 1 and 2.	No known sources excluded.
Scope 3, Category 4: Upstream transportation and distribution	Upstream transport from suppliers.	No known sources excluded.
Scope 3, Category 5: Waste generated in operations	Management of waste	No known sources excluded.
Scope 3, Category 6: Business travel	Business travel in cars and flights.	No known sources excluded.
Scope 3, Category 7: Employee commuting	All employees transport to and from work	No known sources excluded.
Scope 3: Category 8: Upstream leased assets	Not relevant – no leased assets that are not included in scopes 1 and 2.	Not relevant.
Scope 3, Category 9: Downstream transportation and distribution	Transport of products to customers and suppliers.	No known sources excluded.
Scope 3, Category 10: Processing of sold products	Surface treatment of products.	No known sources excluded.
Scope 3, Category 11: Use of sold products	Not relevant.	Not relevant.
Scope 3, Category 12: End-of-life treatment of sold products	End-of-life treatment of products.	No known sources excluded.
Scope 3, Category 13: Downstream leased assets	Not relevant – no downstream leased assets	Not relevant.
Scope 3, Category 14: Franchises	Not relevant – no franchises	Not relevant.
Scope 3, Category 15: Investments	Not relevant – no investments	Not relevant.

EMISSION OVERVIEW 2023

In the table below, GHG emissions for Bossard in 2023 are shown. For scope 2 and 3.3 the electricity results are shown using both the location-based and market-based method.

EMISSION SOURCE	TON CO ₂ E 2023	
	Location based	Market based
Scope 1	68.7	
Diesel	39.9	
Petrol	28.9	
Scope 2	24.0	18.0
District heating	18.0	
Electricity	6.0	0
Scope 3	23,916.0	23,906.9
1. Purchased goods and services	19,955.9	
2. Capital goods	238.5	
3. Fuel- and energy-related activities	32.8	23.3
4. Upstream transportation and distribution	2,638.6	
5. Waste generated in operations	3.9	
6. Business travel	36.3	
7. Employee commuting	368.5	368.7
9. Downstream transportation and distribution	192.6	
10. Processing of sold products	355.8	
12. End-of-life treatment of sold products	82.2	
Total scope 1 + 2 + 3	24,008.6	23,994.8

TECHNICAL TERMS

What are location- and market-based CO₂e emissions?

The terms location-based and market-based are related to different ways of calculating CO₂e emissions from the use of electricity.

- the location-based method reflects the emissions from the average electricity in the region where the company is located and connected to the grid. The purchase of renewable energy certificates does not influence the location-based emissions.
- the market-based method reflects the emissions from the electricity a company purchases “contractually” and not necessarily the electricity on the grid that the company is connected to. When a company purchases renewable energy certificates the market-based method reflects a lower emission than the location-based method. When a company does not purchase renewable energy certificates the market-based method will reflect a higher emission than the location-based method.

According to the GHG Protocol a company may include its purchase of renewable electricity in its GHG inventory. However, it is important that the company reports its emissions both with and without the purchase of renewable electricity. Bossard has purchased certificates for renewable electricity in 2023, and therefore their market-based emission from electricity is 0. On page 24 Bossard’s emissions are presented using both methods. In the rest of the report the location-based method has been used for representation in tables and graphs.

ACCOUNTING PROCEDURE

PROCEDURE AND ASSUMPTIONS

Calculation method: GHG emissions per activity are calculated using the following formula:

$$CO_2e\text{-emission} = \text{activity input} * \text{emission factor}$$

Where the emission factor is a value that represent the GHG emissions per unit of an activity. The activity is represented by the activity input. Examples of activity inputs are kWh electricity consumption or L diesel consumption, and the associated emission factors are given in the units kg CO₂e/kWh or kg CO₂e/L diesel consumption. A list of all activity inputs and emission factors and their references can be found on the following pages.

Global warming potential: For the calculation of CO₂e from other GHGs than CO₂, the following global warming potentials (GWPs) are used in accordance with the IPCC's Fifth Assessment Report (2014). A timeframe for the radiation impact of a 100 years is selected.

GREENHOUSEGAS	GWP (100-YEAR)	REFERENCE
CO ₂	1	Intergovernmental Panel on Climate Change, Fifth Assessment Report (2014)
CH ₄	28	
N ₂ O	265	
HFCs	116-12,400	
PFCs	6,630-23,500	
SFs	23,500	

SCOPE 1: DIRECT EMISSIONS

Scope 1 includes emissions connected to the consumption of diesel and petrol. The emission factors for 2023 have not been published yet, and therefore the emission factors for 2022 have been used.

Activity	Emission factor	Reference
Diesel	2.66 kg CO ₂ e/L	Energistyrelsen, 2022, <i>Standardfaktorer anvendt i CO₂-kvoteindberetninger</i>
Petrol	2.40 kg CO ₂ e/L	

SCOPE 2: INDIRECT EMISSIONS FROM PURCHASED ENERGY

Scope 2 includes emissions connected to the purchasing of electricity and district heating. The electricity consumption covers both the consumption of electricity at Bossard's location and the electricity consumption for electric vehicles. When possible, the data for consumption of electricity for vehicles has been collected from Clever and covers the actual consumption of electricity. The emission from electricity not purchased from Clever has been calculated using the spend-based method. The emission factor for electricity per DKK has been calculated using the expense and consumption from Clever.

Bossard has purchased certificates of renewable energy, which is why the market-based emission factor is 0 kg CO₂e/kWh.

Activity	Emission factor location-based	Emission factor market-based	Reference
Electricity	0.055 kg CO ₂ e/kWh	0.0 kg CO ₂ e/kWh	Location-based: Energinet, 2024, <i>Foreløbig miljødeklaration for 2023 (DK2)</i> Market-based: Zero-emission for purchased renewable energy
Electricity	0.012 kg CO ₂ e/DKK	0.0 kg CO ₂ e/DKK	Calculated based on the expense of electricity for electric vehicles and electricity consumption.
District heating	0.053 kg CO ₂ e/kWh		Energistyrelsen, 2022, <i>Energistatistik for 2021</i>

SCOPE 3.1: PURCHASED GOODS AND SERVICES

Scope 3.1 includes Bossard’s purchased goods and services. Scope 3.1 has been divided into purchased products and purchased goods and services. The GHG emissions from purchased products have been calculated using mass-based data. The weight and materials for each product has been matched with emission factors from ecoinvent v. 3.9.1, APOS system model, for a specific location including both the extraction and production of the materials. Emissions factors from ecoinvent are not presented here, as it requires a license.

GHG emissions from purchased goods and services have been calculated using spend-based data. 90% of the expenses to Bossard’s vendors were categorized in accordance with emission factors from EXIOBASE v. 3.8.2 using the industry-by-industry format, and Denmark as the region. The unit of the emission factors has been recalculated from kg CO₂e/M EURO2022 to kg CO₂e/DKK2022 using an average currency exchange rate for 2022¹, and to kg CO₂e/DKK2023 using the inflation rate from 2022 to 2023².

Activity: Goods and services	Emission factor	Reference
Subscription services	0.04 kg CO ₂ e/DKK	EXIOBASE v. 3.8.2, MRIO archive for 2022, industry-by-industry, DK
Furniture and office supplies	0.06 kg CO ₂ e/DKK	
Computer and software	0.01 kg CO ₂ e/DKK	
Construction	0.03 kg CO ₂ e/DKK	
Food and beverages	0.06 kg CO ₂ e/DKK	
Education	0.01 kg CO ₂ e/DKK	
Consultants, accountants, and other business services	0.01 kg CO ₂ e/DKK	
Hotel and restaurant	0.01 kg CO ₂ e/DKK	
Food and beverages	0.07 kg CO ₂ e/DKK	
Machinery and equipment	0.04 kg CO ₂ e/DKK	

¹ <https://www.exchangerates.org.uk/EUR-DKK-spot-exchange-rates-history-2022.html>

² <https://www.inflationtool.com/>

Packaging products	0.03 kg CO ₂ e/DKK	
Working apparel	0.00 kg CO ₂ e/DKK	
Bossard	0.02 kg CO ₂ e/DKK	
Transport and warehouse	0.08 kg CO ₂ e/DKK	
Publishing and paper products	0.05 kg CO ₂ e/DKK	
Gifts and recreational activities	0.02 kg CO ₂ e/DKK	

SCOPE 3.2: CAPITAL GOODS

Scope 3.2 includes Bossard's capital goods. Emission factors from EXIOBASE v. 3.8.2 have been applied using the industry-by-industry format, and Denmark as the region. The unit of the emission factors has been recalculated from kg CO₂e/M EURO2022 to kg CO₂e/DKK2022 using an average currency exchange rate for 2022³, and to kg CO₂e/DKK2023 using the inflation rate from 2022 to 2023⁴.

Activity	Emission factor	Reference
Construction and maintenance	0.03 kg CO ₂ e/DKK	EXIOBASE v. 3.8.2, MRIO archive for 2022, industry-by-industry, DK
Cars	0.03 kg CO ₂ e/DKK	
Machinery	0.05 kg CO ₂ e/DKK	
Office supplies	0.02 kg CO ₂ e/DKK	
Equipment	0.05 kg CO ₂ e/DKK	

³ <https://www.exchangerates.org.uk/EUR-DKK-spot-exchange-rates-history-2022.html>

⁴ <https://www.inflationtool.com/>

SCOPE 3.3: FUEL- AND ENERGY-RELATED ACTIVITIES

Scope 3.3 includes all upstream emissions associated with extraction, production, and distribution of fuels and energy in scopes 1 and 2. In scopes 1 and 2 the direct emissions from combustion of fuels are included. For electricity and district heating a transmission and distribution loss of 5% is assumed.

Activity	Emission factor location-based	Emission factor market-based	Reference
Diesel	0.61 kg CO ₂ e/L		DEFRA, 2024, UK Government GHG Conversion Factors for Company Reporting 2023
Petrol	0.58 kg CO ₂ e/L		
Electricity	0.025 kg CO ₂ e/kWh	0.004 kg CO ₂ e/kWh	Ecoinvent, weighted average of 4 types of wind turbines in Denmark from ecoinvent v7 for market-based wind; DEFRA, UK Government GHG Conversion Factors for Company Reporting for location-based
District heating	0.025 kg CO ₂ e/kWh		DEFRA, 2024, UK Government GHG Conversion Factors for Company Reporting 2023
Solar panels	0.0027 kg CO ₂ e/kWh		Calculated as an average of 2 types of solar panels in Denmark from ecoinvent v7

SCOPE 3.4: UPSTREAM TRANSPORTATION AND DISTRIBUTION

Scope 3.4 includes the upstream transport of Bossard's products. The data has been collected from Bossard's purchasing department providing an overview of purchased products, their origin and weight. Distances were measured on country-basis to Bossard's office using Google Maps and EcoTransIT. It was assumed that all shipments from Europe was by a 7.5-17 ton truck, and that shipments outside Europe was by a 7.5-17 ton truck and containership.

Activity	Emission factor	Reference
Shipment by truck	0.44 kg CO ₂ e/tonkm	DEFRA, 2024, <i>UK Government GHG Conversion Factors for Company Reporting 2023</i>
Shipment by ship	0.02 kg CO ₂ e/tonkm	

SCOPE 3.5: WASTE GENERATED IN OPERATIONS

Scope 3.5 includes emissions from waste generated in operations. Emission factors from recycling and incineration does not include the emissions from treatment of the waste. The recommended method in the GHG protocol is used, where emissions associated with recycling is allocated to the consumer of the recycled material, and emission from the incineration plant is allocated to the consumer of heat and electricity produced by the plant. In accordance with the GHG protocol, it is voluntary to include the transport of waste from the company to the treatment facility. This emission from transport of waste is included in the applied emission factors. Because of this, the emission factors are the same within each treatment method.

Activity	Emission factor	Reference
Wood and wood chips, recycling	21.28 kg CO2e/ton	DEFRA, 2024, UK Government GHG Conversion Factors for Company Reporting 2023
Residual waste, incineration	21.28 kg CO2e/ton	
Plastic, recycling	21.28 kg CO2e/ton	
Cardboard and paper, recycling	21.28 kg CO2e/ton	
Paper, mixed, recycling	21.28 kg CO2e/ton	
Electronics, recycling	21.28 kg CO2e/ton	
Metal, recycling	21.28 kg CO2e/ton	
Biowaste, biogas	8.91 kg CO2e/ton	
Glass, recycling	21.28 kg CO2e/ton	

SCOPE 3.6: BUSINESS TRAVEL

Scope 3.6 includes business travel by Bossard's employees by car, public transport, or flights and hotel stays. For travel by car, the driven number of km have been collected. For travel by flight, the amount of emitted CO₂ was provided by Bossard's supplier. A consumption of 3.16 kg CO₂e/kg fuel was used to calculate the WTT emissions⁵. Data for travel by public transport was collected from Bossard's list of suppliers and was calculated using the spend-based method.

Activity	Emission factor	Reference
Diesel car	0.20 kg CO ₂ e/km	Energistyrelsen, Emissionsfaktorer for vejtransporten (pr. km.) and DEFRA, UK Government GHG Conversion Factors for Company Reporting
Petrol car	0.22 kg CO ₂ e/km	
Taxi	0.07 kg CO ₂ e/DKK	EXIOBASE v. 3.8.2, MRIO archive for 2022, industry by industry, DK
Ferry	0.31 kg CO ₂ e/DKK	
Bus	0.07 kg CO ₂ e/DKK	
Flight (spend-based)	0.06 kg CO ₂ e/DKK	
Train	0.06 kg CO ₂ e/DKK	

⁵ [ICAO Emissions Calculator](#)

SCOPE 3.7: EMPLOYEE COMMUTING

Scope 3.7 includes Bossard's employee's transport to and from work. Data was collected through a questionnaire sent out to the employees regarding their commuting. Here, they had the opportunity to respond to several questions that describe and their transport to and from work on an average day. The average day is scaled up to represent a whole year (taking weekends and vacations into account). 80% of the employees responded to the questionnaire. The responses have been scaled up to cover and represent 100% of the employees.

Activity	Emission factor	References
Small electric car	0.055 kg CO ₂ e/km	Energistyrelsen, Emissionsfaktorer for vejtransporten (pr. km.) and DEFRA, UK Government GHG Conversion Factors for Company Reporting
Medium petrol car	0.21 kg CO ₂ e/km	
Large diesel car	0.28 kg CO ₂ e/km	
Medium diesel car	0.17 kg CO ₂ e/km	
Large electric car	0.066 kg CO ₂ e/km	
Large petrol car	0.31 kg CO ₂ e/km	
Medium electric car	0.060 kg CO ₂ e/km	
Small petrol car	0.16 kg CO ₂ e/km	
Medium plug-in hybrid car	0.11 kg CO ₂ e/km	
Medium hybrid car	0.14 kg CO ₂ e/km	
Large plug-in hybrid car	0.13 kg CO ₂ e/km	
Electric bicycle	0.0011 kg CO ₂ e/km	COWI, TRANSPORTMINISTERIET, TRANSPORTØKONOMISKE ENHEDSPRISER FOR CYKLING, 2020, Energinet and DEFRA, UK Government GHG Conversion Factors for Company Reporting
Train	0.021 kg CO ₂ e/person-km	DSB, Miljøårsopgørelse and DEFRA, UK Government GHG Conversion Factors for Company Reporting
Metro	0.019 kg CO ₂ e/person-km	Dansk Energi, 2019, Energien i Cityringen and DEFRA, UK Government GHG Conversion Factors for Company Reporting
Bus	0.13 kg CO ₂ e/person-km	DEFRA, UK Government GHG Conversion Factors for Company Reporting

SCOPE 3.9: DOWNSTREAM TRANSPORTATION AND DISTRIBUTION

Scope 3.9 includes the upstream transport of Bossard’s products. Several methods have been applied to collect the data:

- 1) Some of the shipping companies have their own calculations of the GHG emissions from the transport of Bossard’s products. In these cases, their calculated emissions have been used directly in the GHG inventory.
- 2) For the remaining data the weight and destination for each product was gathered. The distance was calculated using Google Maps and EcoTransIT on a country-basis assuming transport by a 7.5-17 ton truck within Europe, and a 7.5-17 ton truck and containership outside Europe.

Activity	Emission factor	Reference
Truck	0.44 kg CO ₂ e/tonkm	DEFRA, 2023, UK Government GHG Conversion Factors for Company Reporting 2022
Containership	0.02 kg CO ₂ e/ tonkm	

SCOPE 3.10: PROCESSING OF SOLD PRODUCTS

Scope 3.10 includes the surface treatment of Bossard's sold products. The spend-based method was used to calculate the GHG emissions from surface treatment. The expenses to each supplier and each surface treatment were collected and paired with an emission factor from the EXIOBASE database. The EXIOBASE v. 3.8.2, MRIO archive for 2022, industry by industry format in DK was used. The unit of the emission factors has been recalculated from kg CO₂e/M EURO2022 to kg CO₂e/DKK2022 using an average currency exchange rate for 2022⁶, and to kg CO₂e/DKK2023 using the inflation rate from 2022 to 2023⁷.

Activity	Emission factor	Reference
Zinc surface treatment	0.07 kg CO ₂ e/DKK	EXIOBASE v. 3.8.2, MRIO archive for 2022, industry by industry, DK
Nylon surface treatment	0.04 kg CO ₂ e/DKK	
Precoating	0.06 kg CO ₂ e/DKK	
Other surface treatments	0.05 kg CO ₂ e/DKK	
Nickel surface treatment	0.09 kg CO ₂ e/DKK	

⁶ <https://www.exchangerates.org.uk/EUR-DKK-spot-exchange-rates-history-2022.html>

⁷ <https://www.inflationtool.com/>

SCOPE 3.12: END-OF-LIFE TREATMENT OF SOLD PRODUCTS

Scope 3.12 includes the End-of-Life treatment of Bossard's sold products. Data for the materials and weights for all sold products were collected. These were divided into waste categories, and the fraction of each waste category going to different treatment facilities was assumed to follow Eurostat's "Treatment of waste by waste category, hazardousness and waste management operations" for 2023. Emission factors from ecoinvent v. 3.9.1, APOS system model were used, but are not presented here, as it requires a license.

The GHG inventory is developed in cooperation with



Better Green ApS (Jylland)

Under Lien 3, 9000 Aalborg

Better Green (Sjælland)

Virumvej 64, 2830 Virum

Email: hello@bettergreen.dk

Tel [+45 44 10 68 44](tel:+4544106844) or [+45 22 90 00 68](tel:+4522900068)

CVR: 37679909



www.bettergreen.dk



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