

# Carbon Footprint 2023

Dana-Seals A/S climate impact



Dana-Seals

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# Contents

## | [Introduction](#) |

p. 3 Introduction to Carbon Footprint

p. 5 Purpose of the climate statement

## | [Carbon Footprint calculation](#) |

p. 6 Master Data

p. 7 Results - Overview

p. 9 Scope 1 – direct emissions

p. 11 Scope 2 – emissions from purchase of energy

p. 13 Scope 3

p. 14 Scope 3 – procurement

p. 16 Scope 3 – transport

p. 18 Scope 3 – waste

p. 20 Scope 3 - summary

## | [Conclusions and new efforts](#) |

p. 21 Conclusions and new initiatives

## | [References and calculation method](#) |

p. 22 Calculation method

p. 24 Sources and references

## | [Appendix A](#) |

# Introduction to Carbon Footprint

## Introduction

Carbon Footprint is a measure of a person, event, organization or product's total direct and indirect emissions of CO<sub>2</sub> and other greenhouse gases measured in CO<sub>2</sub> equivalents (CO<sub>2</sub>-e)

CO<sub>2</sub>-e includes CO<sub>2</sub> (carbon dioxide), CH<sub>4</sub> (methane), N<sub>2</sub>O (nitrous oxide), HFC<sub>s</sub> (hydrofluorcarbon), PFC<sub>s</sub> (perfluorocarbon) and SF<sub>6</sub> (sulfur hexafluoride).

The Carbon Footprint calculation is based on the Greenhouse Gas Protocol (GHG Protocol). The GHG Protocol is a voluntary standard that is internationally known. Reporting covers the previously mentioned 6 greenhouse gases and prescribes that the Carbon Footprint calculation must include emissions associated with three different areas (scope 1, 2 and 3). The GHG Protocol also recommends a number of principles for Carbon Footprint calculations, all of which have been followed.

The aim of the Carbon Footprint calculation is to uncover the biggest sources from Dana- Seals A/S' production and to make an assessment of the emissions that the activities entail. Dana-Seals has previously had report drawn up for 2020, 2021 and 2022, and now wants a new report for 2023.

The Carbon Footprint calculation covers the company's production with associated office facilities in Helsingør. The calculations include scope 1, 2 and partly scope 3. For scope 3, selected sources have been included. The Carbon Footprint calculation therefore does not give a complete picture of all emissions from Dana-Seals.

### Scope 1:

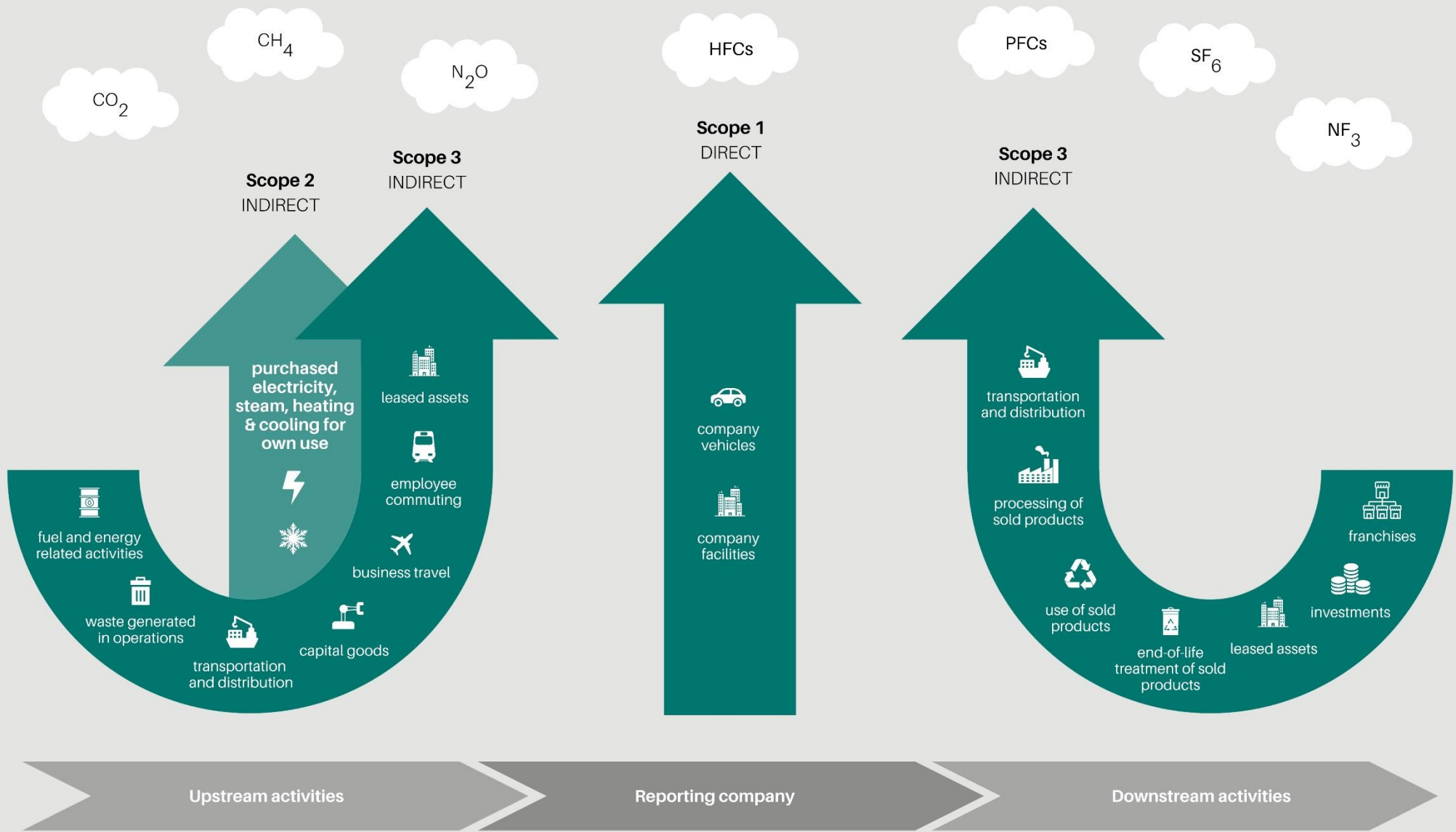
**Direct** emissions that are owned or controlled by the company, e.g. own cars or natural gas boiler

### Scope 2:

**Indirect** emissions from electricity or district heating consumed during the period

### Scope 3:

**All other emissions**, e.g. procurement, external transport, waste and employee commuting to work.



# Purpose

## Purpose

Dana-Seals A/S designs, develops and produces seals. In order to take responsibility for the company's Carbon Footprint, Dana-Seals A/S wants to continue calculating their emissions yearly, in order to keep their focus on baseline for its own Carbon Footprint.

Dana-Seals A/S is already working on a number of initiatives to reduce their climate impact. Here are selected initiatives:

- Recycling of PTFE from production
- Purchase of green electricity, **VINDenergi**(explained on p.11)
- Have a collaboration regarding recycling and upcycling waste cycles across the industry between both competitors and suppliers
  
- Investment in **KLIMAtiltag**(explained on p.11)
- Investment in **KLIMAskov**(explained on p.11)
- Sorts waste for recycling

The Carbon Footprint calculation will be used as an internal management tool to structure the work with climate reductions. The report can help Dana-Seals A/S, to select initiatives to reduce their climate impact, based on facts.

Based on the calculations, it becomes visible where the major climate culprits are, and Dana-Seals A/S can consciously target efforts to reduce their climate impact.

This report is an investigation of the most important climate impacts from Dana-Seals A/S's activities in 2023. This is Dana-Seals A/S's fourth climate report, as they have previously had climate reports drawn up for 2020, 2021 and 2022.

The reports from 2020, 2021, and 2022 are based on different emission factors than the report for 2023. In 2023, Dana-Seals received and used updated data from suppliers as well as data from another and more widely used source, Ecoinvent v. 3.10. In Appendix B comparison with previous data is provided.

# Master data

	Actual emissions Relative to turnover			
<i>Facts</i>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>Number of employees</b>	17,32	17,69	21,39	22,63
<b>Production area</b>	1.503,00	1.503,00	1.687,70	2.043

# Overview Climate accounting 2020-2023

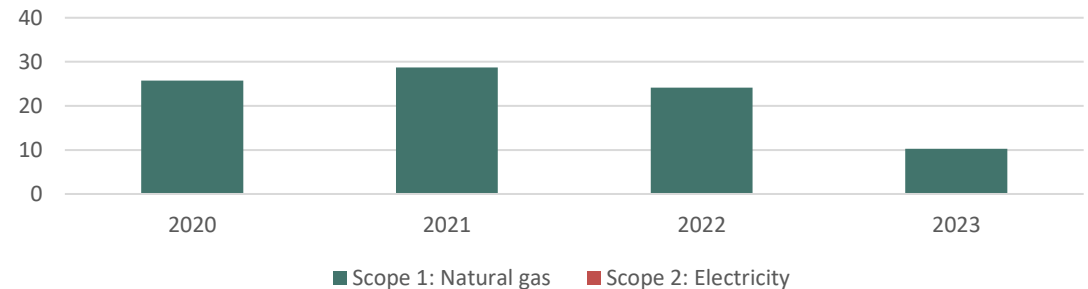
In 2020, the total emission for scope 1 and 2 in Dana-Seals was 25.7 tonnes of CO<sub>2</sub>-e. This emission increased in 2021 to 28.7 tonnes. 2020 was a special year due to the Covid-19 epidemic, and because of this be difficult to compare with the other years. In 2022, Dana- Seals had emissions of 24.1 tonnes. In 2023, the total emission was 10.3 tonnes of CO<sub>2</sub>-e. 2023 is the year with the lowest emissions within the period 2020-2023. There are no emissions related to electricity in the years 2020-2023, as the electricity came from wind energy and this is assessed to be CO<sub>2</sub> neutral.

For scope 3, the emission of CO<sub>2</sub>-e in 2020 was on 3,752 tonnes. In 2021 it rose to 5,840 tonnes and in 2022 it fell again to 4,945 tonnes. In 2023, this emission fell again to 1,533 tonnes of CO<sub>2</sub>-e.

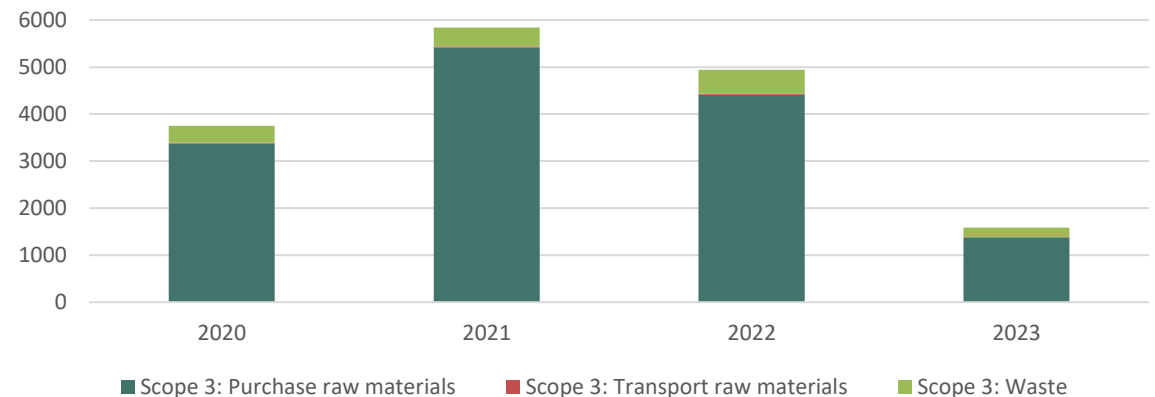
Due to updated emission factors in 2023, it would be inaccurate to compare 2023 directly to previous years. The updated emission factors are mainly due to new data from suppliers and a change of database.

In Appendix B comparison with previous data is provided.

Tonnes of CO<sub>2</sub>-e, emissions, Scope 1+2



Tonnes of CO<sub>2</sub>-e, emissions, Scope 3



# Overview in numbers

Scope	Actual emissions				Relative to turnover				Relative to employees				Relative to production area				Relative to units produced			
	Emission Tonnes of CO2-e				Emission Tonnes of CO2-e/ DKK				Emission Tonnes of CO2-e/employee				Emission Tonnes of CO2-e/m2				Emission Tonnes of CO2e/unit			
	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
1	25,71	28,70	24,14	10,25	1,54	1,56	1,00	0,39	1,48	1,62	1,13	0,45	0,02	0,02	0,01	0,01	9,84 E-06	1,99 E-05	8,62 E-06	4,80 E-06
2	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
3*	3.751,62	5.839,96	4.945,02	1.584,91	224,43	316,63	205,90	59,99	208,10	318,97	218,90	70,04	2,50	3,89	2,93	0,78	1,44 E-03	4,04 E-03	1,77 E-03	7,43 E-04
SUM Scope 1+2	25,71	28,70	24,14	10,25	1,54	1,56	1,00	0,39	1,48	1,62	1,13	0,45	0,02	0,02	0,01	0,01	9,84 E-06	1,99 E-05	8,62 E-06	4,80 E-06
SUM Scope 1+2+3	3.777,33	5.868,66	4.969,16	1.595,16	225,97	318,19	206,91	60,38	209,58	320,59	220,03	70,49	2,51	3,90	2,94	0,78	1,45 E-03	4,06 E-03	1,77 E-03	7,48 E-04

**Overview in numbers:** Emissions from 2020-2023, expressed as actual emission tonnes of CO2-e and relative to turnover, employees, production area and units produced. \*For scope 3, only selected sources have been included, because of this the carbon footprint calculation therefore does not give a complete picture of all emissions from Dana-Seals.



# Scope 1 – direct emissions

The only thing Dana-Seals A/S contributes in scope 1 is natural gas, for heating production areas and office facilities.

Natural gas is a fossil fuel that, like oil and coal, is formed from plants and other organisms that have been transformed over millions of years under intense pressure and high temperatures. Natural gas is also a limited resource.

Natural gas has a lower Carbon Footprint than oil and coal and no emissions of sulfur dioxide and to a lesser extent, emissions of nitrogen oxides. Therefore, natural gas is preferred for the production of electricity and heat over coal and oil.

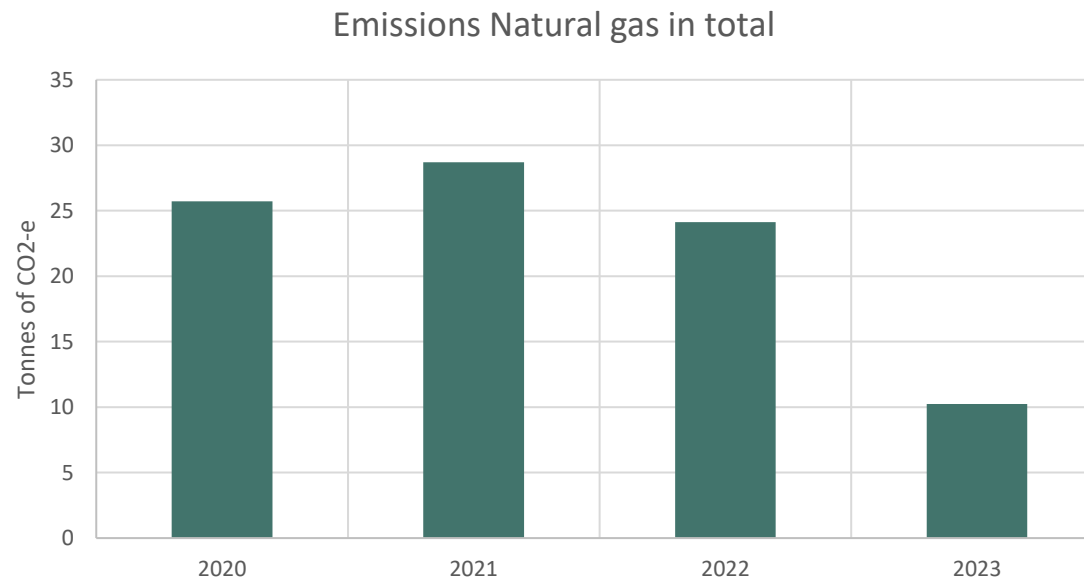
In the work to further reduce emissions, an option is to utilize excess heat from production to a much greater extent than today. Surplus heat is an unused resource, which would otherwise disappear into the blue, and which has a neutral Carbon Footprint.

In the long term, another option is to make greater use of renewable energy sources such as sun and wind. When using heat pumps for heating, the energy will come from wind energy, which has a much lower Carbon Footprint than natural gas. In 2024 Dana-Seals will shift from natural gas to district heating.

In order to get better control of what exactly Dana-Seals consumes, it is recommended that they install their own meters. The consumption is currently distributed by a distribution key between 5 companies, which means that if Dana-Seals changes the consumption of gas, it cannot be directly measured at Dana-Seals.

# Emissions Scope 1 - 2020 to 2023

If you look at the emission of CO<sub>2</sub>-e related to scope 1 for Dana-Seals for the last 4 years, it can be seen that the emission is highest in 2021 and the least 2023.



*Climate accounting scope 1: Emission of CO<sub>2</sub>-e originates from natural gas and a lower electricity consumption, which is noted in connection with natural gas consumption*

In Appendix B comparison with previous data is provided.

# Scope 2 – emissions from energy purchase

In scope 2, Dana-Seals A/S contributes with electricity used for machines and ovens in production, for light that is used both in the office and in production, and partially for heating office facilities.

In October 2016 Dana-Seals A/S switched to a 100 % wind energy product with their energy supplier, Scanenergi called **VINDenergi**. This means that the electricity Dana-Seals buys today is green and considered CO2-neutral.

The **VINDenergi** solution, Scanenergi ensures, that the power used, is matched 100% with a certificate of origin for wind energy from Danish wind turbines.

In addition to VINDenergi, Dana-Seals A/S has chosen a solution with **KLIMAtiltag** since 2021 and **KLIMAskov** since 2022, which means they are involved in securing afforestation.

**KLIMAskov** is Scanenergi planting trees based on the company's electricity consumption, so the planted trees during their lifetime, are expected to absorb the amount CO2 which the company emits within the year in question. **KLIMAtiltag** are a pool of different climate initiatives that guarantee CO2 compensation for the equivalent of the company's climate burden related to electricity.

The table below shows the effect of the compensation solutions that Dana-Seals has chosen.

Even with various initiatives such as VINDenergi , Dana-Seals still has the opportunity to reduce their electricity consumption. It is recommended that Dana- Seals monitor power consumption every year and investigate which machines/processes use the most electricity. When purchasing new machines, it is important to choose with energy consumption in mind.



Source	Compensation	Unit
Electricity 2020	N/A	Tonnes of CO2-e
Electricity 2021	-34,00	Tonnes of CO2-e
Electricity 2022	-32,10	Tonnes of CO2-e
Electricity 2023	-32,00	Tonnes of CO2-e

*Climate compensation, outside scope : Savings when purchasing KLIMAskov and other climate measures, i.e. compensations are not something that, cf. the GHG protocol, count in the climate accounts and are therefore only included here to show the effect.*

# Scope 3

Scope 3 consists of different categories, of which 4 have been included, as illustrated in the figure on the right. The 4 categories have been selected based on whether the category has a purpose in this climate report to Dana-Seals A/S. See table to the right.

Only purchases included for Scope 3 is polytetrafluoroethylene (PTFE), bronze powder and a mixed product, called PTFE compounds, which consist of 9 different sub-components. The background for this is, these raw materials make up, by far, the largest share of purchases, both financially and in terms of quantity.

Transport is partially included. It has been decided to include upstream transport, i.e. transport to the company, for PTFE, bronze powder and PTFE compounds, as it makes up the majority of the freight to the company. Downstream, i.e. Transport from the company is not included, as the products are picked up by customers at the address.

Waste generated at the company is also included. This applies to small combustibles, cardboard, landfill waste and scraps of PTFE and plastic.

## Scope 3: other indirect emissions

- Water ✓
- Purchase of goods and services ✓
- Construction activities
- Fuel and energy-related activities  
(not scope 1 + 2)
- Upstream transport ✓
- Waste ✓
- Business trips
- Employee transport to work
- Upstream leased activities
- Downstream transport
- Processing of sold products
- Use of sold products
- Processing/disposal of sold products
- Downstream leased activities
- Franchises
- Investments

# Scope 3 - procurement

Carbon Footprint calculation scope 3, procurement. Emissions from the purchase of the raw materials PTFE, bronze powder and the mixed product PTFE compounds are calculated. The background for this is these raw materials make up the vast majority of purchases both financially and in terms of quantity. Dana-Seals produces seals that are mainly made of PTFE.

The emission from purchases is dominated by the purchase of PTFE and PTFE Compounds. This is where the largest quantities are purchased and, combined with the high emission factor, this is also where the largest emissions are found.

For carbon footprint calculation, it would be a great advantage to purchase PTFE made from recycled PTFE. Dana-Seals has considered this option, but the quality unfortunately means that it cannot be done at this time.

PTFE is a polymeric substance made from tetrafluoroethylene, which is distinguished by many good properties, such as handling extreme temperatures, both cold and hot and it is resistant to chemicals and friction. These good properties gives a very long lifespan compared to other materials that could be considered for same use. The disadvantage is that PTFE has a high carbon footprint.

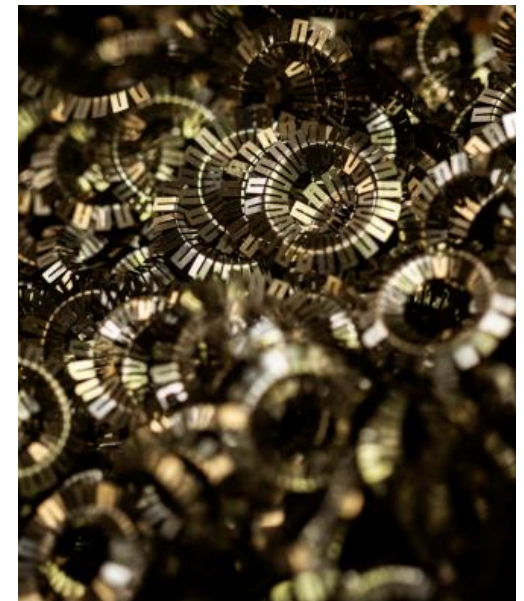
In Appendix B comparison with previous data is provided.

Source	2020	2021	2022	2023	Unit
PTFE	2.802,60	4.749,12	3.729,12	635,18	Tonnes of CO <sub>2-e</sub>
Bronze powder	14,11	22,57	19,75	4,76	Tonnes of CO <sub>2-e</sub>
PTFE Compounds	561,92	647,53	665,17	735,05	Tonnes of CO <sub>2-e</sub>
Water	-	-	-	0,02	Tonnes of CO <sub>2-e</sub>
<b>Total</b>	<b>3.377,63</b>	<b>5.419,22</b>	<b>4.414,04</b>	<b>1.375,01</b>	<b>Tonnes of CO<sub>2-e</sub></b>

# Initiatives Procurement

Dana-Seals A/S can reduce the carbon footprint from purchases through the following initiatives:

- Put pressure on suppliers to continuously improve and develop their production, to get the carbon footprint lower
- Focus on how the industry can collaborate broadly to find solutions for the recycling of PTFE, which is typically used in particularly demanding applications such as cryogenics and liquefied gas
- Investigate the possibility of using other materials with a lower climate impact
- Reduce waste of PTFE in production
- Follow the development in the quality of PTFE produced from recycled PTFE
- Ask suppliers for product-specific LCA, which can be implemented in the carbon footprint calculation



# Scope 3 – transport

Transport covers the transport of raw materials to Dana-Seals A/S. The primary raw materials used in the production of seals are PTFE, bronze powder and PTFE compounds. PTFE is mainly imported from India, while the others are imported from Europe.

Just as with purchases, it can be seen that the transport of PTFE is the biggest contributor to the emission of CO<sub>2</sub>-e. Here it is due to both the quantity and the distance.

The total emission (tonnes of CO<sub>2</sub>-e) is based on tonne-km. Tonne-km indicates the weight of a given material multiplied by the distance it is transported. The unit thus reflects both the quantity transported and the distance.

In Appendix B comparison with previous data is provided.

Source	2020	2021	2022	2023	Unit
PTFE	8,74	14,87	12,63	8,47	Tonnes of CO <sub>2</sub> -e
Bronze powder	0,77	1,16	0,98	1,37	Tonnes of CO <sub>2</sub> -e
PTFE Compounds	1,07	1,21	1,25	1,72	Tonnes of CO <sub>2</sub> -e
<b>Total</b>	<b>10,58</b>	<b>17,24</b>	<b>14,85</b>	<b>11,56</b>	<b>Tonnes of CO<sub>2</sub>-e</b>



There is a significant difference in greenhouse gas emissions depending on modes of transport. For the year 2020, the CO<sub>2</sub>e emission was 230.7 Kg CO<sub>2</sub>-e/tonne-km per trip from the factory in India to the port. Had this transport been by train, the emissions would have been 0.92 Kg CO<sub>2</sub>-e/tonne-km.

Dana-Seals can no longer transport their products via trains, now the transport takes place exclusively by truck or ship.

Source4	Issue	Unit
Lorry	0,194	Kg CO <sub>2</sub> -e/Tonne-km
Ship	0,0102	Kg CO <sub>2</sub> -e/Tonne-km

Dana-Seals A/S can reduce the carbon footprint from the transport of goods through the following initiatives:

- Make demands on the carrier for better documentation, including calculation of the climate impact
- Start a dialogue with the carrier about climate-friendly transport (form/propellant)
- Considerations about delivery frequency can be changed
- Consider the type of packaging in terms of weight and volume
- Combine shipments in larger packages if possible

*The initiatives are theoretical proposals and must be compared with reality.*

# Scope 3 – waste

Dana-Seals A/S has waste in the form of small combustibles, cardboard (and paper), PTFE mixed for landfill, plastic, mixed plastic and scrap of PTFE for recycling.

The profit from reusing, recycling or recovering waste accrues to the buyer of waste, and lies outside scope 3 for the waste producer, in this case Dana-Seals. For waste producers, only the transport of the waste to the treatment site is included in scope 3, cf. the GHG protocol. In Appendix B comparison with previous data is provided.

Source	2020	2021	2022	2023	Unit
Slightly flammable for combustion	77,17	89,01	108,1	1,60	Tonnes of CO 2-e
Cardboard (and paper) for recycling	5,54	9,16	10,64	0,04	Tonnes of CO 2-e
PTFE mixed with other for landfill	216,02	206,17	253,34	11,06	Tonnes of CO 2-e
Plastic	0	0	0	0,61	Tonnes of CO 2-e
Plastic, mixed	0	0	0	7,75	Tonnes of CO 2-e
Scrap of PTFE for recycling	64,68	99,17	144,04	177,28	Tonnes of CO 2-e
<b>Total</b>	<b>363,41</b>	<b>403,50</b>	<b>516,13</b>	<b>198,35</b>	<b>Tonnes of CO 2-e</b>

Dana-Seals A/S can work actively with waste to minimize its climate impact. This can be done, among other things, by:

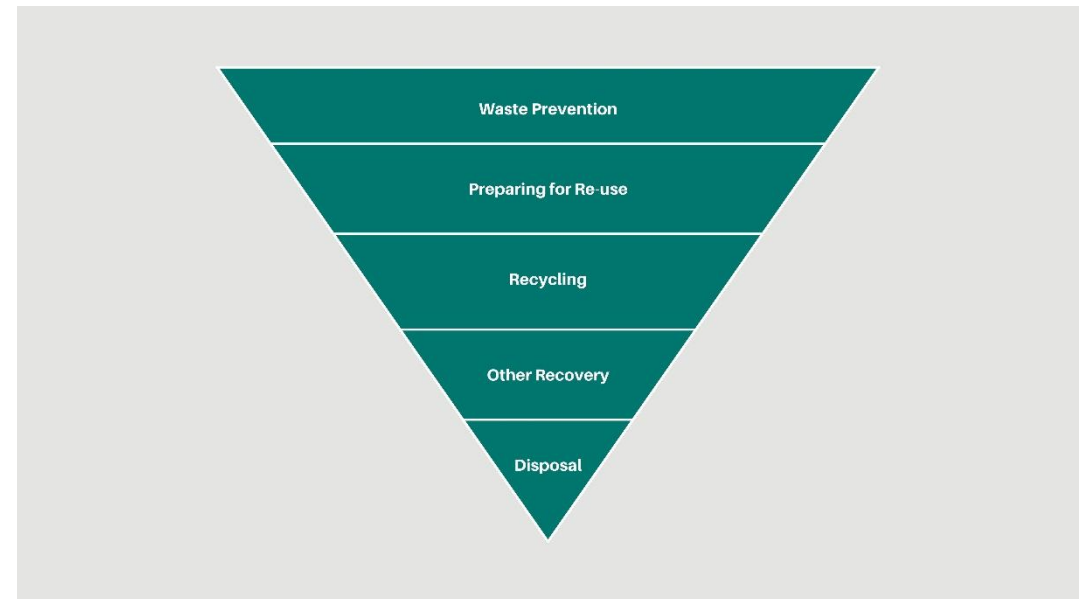
- Sort the waste better and into more fractions
- Move the waste up in the waste hierarchy
- Minimize waste generation by reducing waste in production or by selling/donating faulty production
- Set requirements when purchasing for the amount of packaging and the content of recycled materials
- Consider waste already in production, so the product can be included in a material loop after the end of its useful life
- Keep track of waste data and know what happens to the waste
- To recycle packaging

### **Circular economy**

Circular economy is about keeping materials and products in circulation with the highest possible value for as long as possible. It is therefore about recycling materials, or even better: waste prevention through products that can be repaired or upgraded. In principle, no resources are lost and the materials retain their value. The same principle applies to biological materials

### **The waste hierarchy**

The waste hierarchy indicates how to basically achieve the best environmental result when handling and processing waste. At the bottom there is landfill, then other recovery (including for energy), then reuse, recycling and at the top and best of all there is waste prevention.

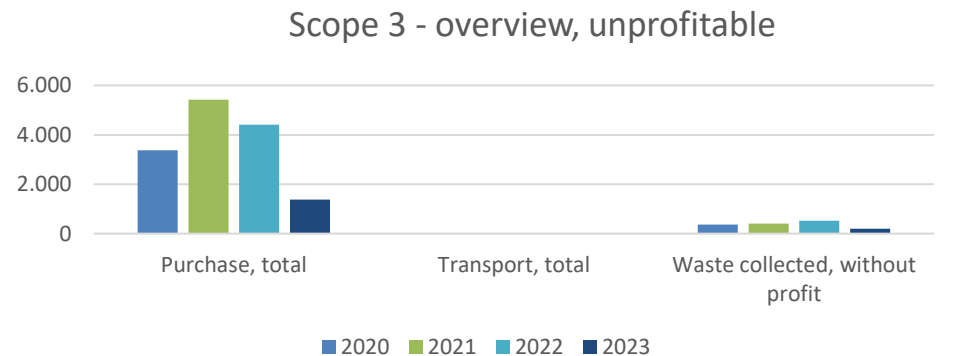
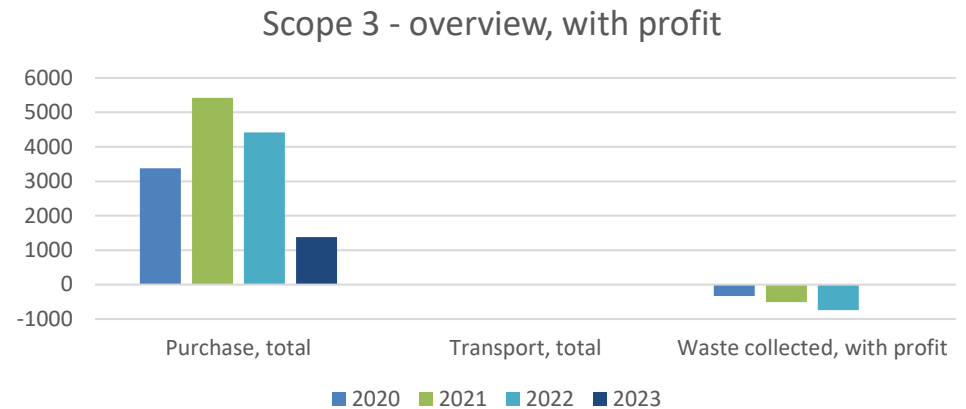


# Scope 3 - summary

Scope 3 is calculated based on emissions from purchase of the raw materials PTFE, bronze powder and the mixed product PTFE compounds as well as the transport of these to Dana-Seals in Helsingør. In addition, there is waste generated in production and in the office.

In order to reduce the climate footprint from scope 3, Dana-Seals can make demands on their supplier. For instance, if the supplier actively demonstrates that they are working to reduce emissions from production. Dana-Seals can also demand product-specific LCAs (life cycle assessments) or an EPD (environmental product declaration) so that Dana-Seals knows the exact emission factor of the product they are purchasing.

Waste has the second highest emission in scope 3. The profit from reusing/recycling waste is outside the scope of Dana-Seals' climate accounting, but there is no doubt it would help lower the climate footprint, see the figure on the right. Dana-Seals should definitely continue to focus on sorting more waste, sorting better, to contribute to recycling/recycling of the waste.



*Climate impacts related to scope 3 distributed among the 3 selected topics procurement, transport and waste. The top figure is without the gain from recycling/utilizing waste and the bottom figure is with it*

# Conclusions and new efforts

The climate accounting for Dana-Seals A/S covers scope 1, 2 and partly scope 3. For scope 3, relevant and/or areas where data have been available, have been included. The carbon footprint calculations do therefore not give a complete picture of all emissions from Dana-Seals A/S. For 2023, water consumption is included.

Based on the prerequisites, Scope 3 is by far the largest contributor to Dana Seals A/S's climate impact. This is mainly due to the purchase of PTFE and PTFE compounds. Dana-Seals has considered purchasing recycled PTFE, but this is not an option right now, because of the quality. The emission factors for PTFE is different from previous years due to more specific data. Dana-Seals supplier of PTFE in India have product specific data from an EPD, that have been included in the 2023 calculations.

The second largest item in scope 3 is waste. Dana-Seals is already actively working to reduce waste. They sort their waste, and have just added metal and plastic as fractions. They also recycle PTFE in production for specific applications. In 2024 Dana-Seals established a partnership with a business capable of recycling a portion of their excess PTFE material. This collaboration will enable them to reduce the amount of waste they send to landfills moving forward. There is still the option of sorting into several fractions and, in particular, a reduction in the amount of waste to landfill can make a difference.

However, the emission from waste is relatively small compared to the emission from scope 1, which originates from natural gas. Here, Dana-Seals can consider switching to more renewable energy, e.g. install heat pumps where possible.

Scope 2 consists of electricity. In 2016, Dana-Seals switched to VINDenergi, which is considered to be CO<sub>2</sub> neutral.

Regardless of where you buy your power, it will be a mixture of green and black power, therefore it is still an advantage for Dana-Seals to monitor power consumption with the aim of reducing power consumption.

Dana-Seals has a relatively high emission, which is mainly due to the purchase of PTFE. However, it is important to keep in mind that Dana-Seals produces many millions of units each year.

# Conclusions and new efforts

The climate statement is prepared based on the GreenHouse Gas Protocol (GHG protocol).

DGE has previously, in collaboration with Dana-Seals A/S, reviewed which sources of emissions should be included in the carbon footprint calculation. For scope 1 and 2, all sources are included. For scope 3, the most relevant sources are selected, where data is available.

The majority of data is drawn from SimaPro, which is a lifecycle software that accesses several databases. In SimaPro, the Ecoinvent 3.10 database has been used for selecting datasets for raw materials, transport, waste and so on.

Calculation of the emission factor is based on supplier specific emission factors and data sets found in EcoInvent. As factors from the Climate Compass have primarily been used in previous years, the results from EcoInvent datasets in the climate accounts in 2023 are not 1:1 comparable. EcoInvent is a recognized database used for the development of LCA and EPD worldwide. The data sets from EcoInvent have been checked and approved by a large number of actors, which is why these are more representative than the emission factors from the Climate Compass.

## **Heat**

It is heated with natural gas. The emission factors are taken from EcoInvent, where standard factors are used for natural gas and actual key figures are used for electricity.

## **Electricity**

The consumption of electricity is based on the invoice from Scanenergi. The emission factor is taken from Scanenergi's electricity declaration. In addition, information from Scanenergi's website has been used, where they describe how they compensate with KLIMAtilag and KLIMAskov. Compensations are not recognized, cf. the GHG protocol in the climate statement. In this report, they are included to show the effect of climate compensation.

## **Purchase**

The emission factor for calculating the emissions from purchases is extracted from EcoInvent and Dana-Seals supplier where data sets for the various raw materials have been used.

# Calculation method and references

## Transportation

Data sets from EcoInvent have been selected for the calculation of transport. This includes data sets for truck transport as well as transport by ship.

## Waste

Waste quantities are based on the invoice from Marius Pedersen. Waste is recognized with the CO<sub>2</sub>e emission that the waste disposal company creates by collecting the waste, cf. the GHG protocol. The total discharge from waste treatment is calculated by use of emission factors from EcoInvent.

The profit from reuse/recycling/utilization accrues to the purchaser, which is why it is not included in the climate accounting. The profit in 2020-2022 carbon footprint calculation results is used in this climate account to illustrate the advantage of sending the waste for recycling/utilization.

The emission factor, in which the saved CO<sub>2</sub>e emission is factored in, is based on data from Marius Pedersen and the climate compass.

*For more information on data sources, see the section, [References and associated spreadsheets](#)*



## References

Source of emission	Data source	Detailed description
Natural gas	SimaPro 9.6.0.1, Ecoinvent 3.10	Natural gas, high pressure {DK}  market for natural gas, high pressure   Cut-off, U
Natural Gas (Electricity)	SimaPro 9.6.0.1, Ecoinvent 3.10	Electricity, low voltage {DK}  electricity, low voltage, residual mix   Cut-off, U
Electricity, wind energy	Scan energy	Electricity declaration
Water	SimaPro 9.6.0.1, Ecoinvent 3.10	Tap water {Europe without Switzerland}  market for tap water   Cut-off, U
Purchasing, PTFE	Gujarat	Data from ERP: Kompas & Business central
Procurement, Bronze powder	Makin	Data from ERP: Kompas & Business central
Procurement, PTFE Compounds	SimaPro 9.6.0.1, Ecoinvent 3.10	Chosen dataset : Tetrafluoroethylene {GLO}  market for tetrafluoroethylene   Cut-off, U Polyester resin, unsaturated {RER}  market for polyester resin, unsaturated   Cut-off, U Lubricating oil {RER}  market for lubricating oil   Cut-off, U Carbon black {GLO}  market for carbon black   Cut-off, U Glass fibers {GLO}  market for glass fibers   Cut-off, U Toner , color , powder {GLO}  toner production, color , powder   Cut-off, U
Transport ( upstream ) truck	SimaPro 9.6.0.1, Ecoinvent 3.10	Transport, freight , lorry 16-32 metric tonnes, EURO5 {RER}  market for transport, freight , lorry 16-32 metric tonnes, EURO5   Cut- off , U
Transport ( upstream ) Ship	SimaPro 9.6.0.1, Ecoinvent 3.10	Transport, freight, sea, container ship {GLO}  market for transport, freight, sea, container ship   Cut-off, U
Slightly flammable for combustion	SimaPro 9.6.0.1, Ecoinvent 3.10	Municipal solid waste {DK}  treatment of municipal solid waste, municipal incineration   Cut-off, U
Cardboard (and paper) for recycling	SimaPro 9.6.0.1, Ecoinvent 3.10	Waste graphical paper {DK}  market for waste graphical paper   Cut-off, U
PTFE mixed with other for landfill	SimaPro 9.6.0.1, Ecoinvent 3.10	Average incineration residue { RoW }  market for average incineration residue   Cut-off, U Waste paperboard {DK}  market for waste paperboard   Cut-off, U
Plastic	SimaPro 9.6.0.1, Ecoinvent 3.10	Waste polyethylene {DK}  market for waste polyethylene   Cut- off , U
Plastic, mixed	SimaPro 9.6.0.1, Ecoinvent 3.10	Waste plastic, mixture {DK}  market for waste plastic, mixture   Cut-off, U
Scrap of PTFE for recycling	DEFRA, 2022	Data from ERP: Compass



## Appendix

Scope	Subject	Emission source	Actual discharge				Actual discharge				Relative to turnover				Relative to employees				Relative to production area				Relative to units produced			
			Emission kg CO2-e				Emission Tonnes of CO2-e				Emission Tonnes of CO2-e/ DKK				Emission Tonnes of CO2-e/employee				Emission Tonnes of CO2-e/m2				Emission Tonnes of CO2-e/unit			
			2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
1	Energy	Natural gas, shared boiler	25.288,51	28.130,89	23.715,99	8767,44	25,289	28,131	23,716	8,767	1,513	1,525	0,988	0,332	1,460	1,590	1,109	0,387	0,017	0,019	0,014	0,004	9,68E-06	1,95E-05	8,47E-06	4,11E-06
1	Energy	Electricity consumption, common boiler	422,41	568,58	419,45	1481,31	0,422	0,569	0,419	1,481	0,025	0,031	0,017	0,056	0,024	0,032	0,020	0,065	0,000	0,000	0,000	0,001	1,62E-07	3,94E-07	1,50E-07	6,94E-07
1	Energy	Natural gas, total consumption	25.710,92	28.699,47	24.135,44	10248,75	25,711	28,699	24,135	10,248	1,538	1,556	1,005	0,388	1,484	1,622	1,128	0,453	0,017	0,019	0,014	0,005	9,84E-06	1,99E-05	8,62E-06	4,80E-06
2	Energy	Electricity consumption, without wind	19.852,20	22.519,66	20.908,86	0,00	19,852	22,520	20,909	0,000	1,188	1,221	0,871	0,000	1,146	1,273	0,978	0,000	0,013	0,015	0,012	0,000	7,60E-06	1,56E-05	7,47E-06	0,00E+00
2	Energy	Electricity consumption, with wind energy	0,00	0,00	0,00	0,00	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Outside	Energy	Electricity consumption, with wind + trees	0,00	-22.519,66	-41.817,72	-32000,00	0,000	-22,520	-41,818	-32,000	0,000	-1,221	-1,741	-1,211	0,000	-1,273	-1,955	-1,414	0,000	-0,015	-0,025	-0,016	0,00E+00	-1,56E-05	-1,49E-05	-1,50E-05
3	Water	Shopping, water	0,00	0,00	0,00	15,10				0,015				0,001				0,001				0,000				7,08E-09
3	Purchase	Purchasing, PTFE	2.801.600,00	4.749.120,00	3.729.120,00	635184,00	2.801,600	4.749,120	3.729,120	635,184	167,601	257,491	155,275	24,041	161,755	268,464	174,339	28,068	1,864	3,160	2,210	0,311	1,07E-03	3,29E-03	1,33E-03	2,98E-04
3	Purchase	Procurement, Bronze powder	14.108,00	22.572,80	19.751,20	4757,50	14,108	22,573	19,751	4,758	0,844	1,224	0,822	0,180	0,815	1,276	0,923	0,210	0,009	0,015	0,012	0,002	5,40E-06	1,56E-05	7,05E-06	2,23E-06
3	Purchase	Procurement, PTFE Compounds	561.920,00	647.525,00	665.172,80	735051,02	561,920	647,525	665,173	735,051	33,616	35,108	27,697	27,821	32,443	36,604	31,097	32,481	0,374	0,431	0,394	0,360	2,15E-04	4,48E-04	2,37E-04	3,45E-04
3	Purchase	Purchases, total	3.377.628,00	5.419.217,80	4.414.044,00	1375007,62	3.377,628	5.419,218	4.414,044	1.375,008	202,061	293,822	183,795	52,042	195,013	306,344	206,360	60,760	2,247	3,606	2,615	0,673	1,29E-03	3,75E-03	1,58E-03	6,45E-04
3	Transportation, upstream	Transport PTFE	8.739,20	14.867,63	12.628,00	8472,63	8,739	14,868	12,628	8,47	0,523	0,806	0,526	0,32	0,505	0,840	0,590	0,37	0,006	0,010	0,007	0,004	3,34E-06	1,03E-05	4,51E-06	23,97E-06
3	Transportation, upstream	Transportation, Bronze	773,75	1.156,76	975,04	1369,83	0,774	1,157	0,975	1,37	0,046	0,063	0,041	0,05	0,045	0,065	0,046	0,06	0,001	0,001	0,001	0,001	2,96E-07	8,01E-07	3,48E-07	6,42E-07
3	Transport, upstream	Transport, mixed product	1.070,76	1.212,01	1.245,04	1715,83	1,071	1,212	1,245	1,716	0,064	0,066	0,052	0,065	0,062	0,069	0,058	0,076	0,001	0,001	0,001	0,001	4,10E-07	8,39E-07	4,45E-07	8,04E-07
3	Transportation, upstream	Transport together	10.583,71	17.236,40	14.847,72	49006,73	10,584	17,236	14,848	49,007	0,633	0,935	0,618	1,855	0,611	0,974	0,694	2,166	0,007	0,011	0,009	0,024	4,05E-06	1,19E-05	5,30E-06	2,30E-05
3	Trash	Waste, Slightly flammable, no gain	77.167,54	89.008,92	108.102,40	1603,71	77,168	89,009	108,102	1,604	4,616	4,826	4,501	0,061	4,455	5,032	5,054	0,071	0,051	0,059	0,064	0,001	2,95E-05	6,16E-05	3,86E-05	7,52E-07
Outside	Trash	Waste, slightly combustible, with profit	450,00	530,00	640,00		0,450	0,530	0,640	0,000	0,027	0,029	0,027	0,000	0,026	0,030	0,030	0,000	0,000	0,000	0,000	0,000	1,72E-07	3,67E-07	2,29E-07	0,00E+00
3	Trash	Waste, mixed for landfill	216.024,12	206.170,32	253.343,16	11063,22	216,024	206,170	253,343	11,063	12,923	11,178	10,549	0,419	12,473	11,655	11,844	0,489	0,144	0,137	0,150	0,005	8,27E-05	1,43E-04	9,05E-05	5,19E-06
3	Trash	Garbage, cardboard, no profit	5.542,42	9.156,42	10.640,00	40,18	5,542	9,156	10,640	0,040	0,332	0,496	0,443	0,002	0,320	0,518	0,497	0,002	0,004	0,006	0,006	0,000	2,12E-06	6,34E-06	3,80E-06	1,88E-08
Outside	Trash	Waste, cardboard, with profit	-416,00	-688,00	-800,00		-0,416	-0,688	-0,800	0,000	-0,025	-0,037	-0,033	0,000	-0,024	-0,039	-0,037	0,000	0,000	0,000	0,000	0,000	-1,59E-07	-4,76E-07	-2,86E-07	0,00E+00
3	Trash	Plastic				610,00				0,610				0,023				0,027				0,000				2,86E-07
3	Trash	Plastic, mixed				7745,40				7,745				0,293				0,342				0,004				3,63E-06
3	Trash	Waste, PTFE scrap, without profit	64.675,78	99.166,16	144.044,32	177283,68	64,676	99,166	144,044	177,284	3,869	5,377	5,998	6,710	3,734	5,606	6,734	7,834	0,043	0,066	0,085	0,087	2,47E-05	6,86E-05	5,14E-05	8,31E-05
Outside	Trash	Waste, PTFE scrap, with profit	-330.099,20	507.613,00	737.821,00		-330,099	-507,613	-737,821	-19,748	-27,522	-30,722	0,000	-19,059	-28,695	-34,494	0,000	-0,220	-0,338	-0,437	0,000	0,000	-1,26E-04	-3,51E-04	-2,63E-04	0,00E+00
3	Trash	Total waste, no gain	363.409,86	403.501,82	516.129,88	202678,31	363,410	403,502	516,130	202,678	21,740	21,877	21,491	7,671	12,47	11,65	11,84	8,956	0,242	0,268	0,306	0,099	1,39E-04	2,79E-04	1,84E-04	9,50E-05
3	Trash	Waste collected, with profit	-330.065,20	507.771,00	737.981,00	181615,80	-330,065	-507,771	-737,981	181,616	19,09	11,37	7,73	6,874	9,92	0,70	-3,61	8,025	-0,220	-0,338	-0,437	0,089	-1,26E-04	-3,51E-04	-2,63E-04	8,51E-05
SUM Scope 1+2			25.710,92	28.699,47	24.135,44	10248,75	25,71	28,70	24,14	10,248	1,54	1,56	1,00	0,388	1,48	1,62	1,13	0,453	0,02	0,02	0,01	0,005	9,84E-06	1,99E-05	8,62E-06	4,80E-06
SUM Scope 1+2+3			3.777.332,49	5.868.655,48	4.969.157,04	1595145,75	3.777,33	5.868,66	4.969,16	1595,145	225,97	318,19	206,91	60,37	209,58	320,59	220,03	70,49	2,51	3,90	2,94	0,78	1,45E-03	4,06E-03	1,77E-03	7,48E-04
SUM Scope 1+2, with gain*			25.710,92	6.179,81	-17.682,28	-21751,25	25,71	6,18	-17,68	-21,751	1,54	0,34	-0,74	-0,823	1,48	0,35	-0,83	-0,961	0,02	0,00	-0,01	-0,011	9,84E-06	4,28E-06	-6,31E-06	-1,02E-05
SUM Scope 1+2+3, with gain*			2.507.829,43	4.264.765,21	2.988.304,44	844055,28	2.507,83	4.264,77	2.988,30	844,055	188,86	270,13	162,88	31,946	173,77	270,49	170,60	37,298	1,67	2,84	1,77	0,413	9,60E-04	2,95E-03	1,07E-03	3,96E-04
Scope 3			3.751.621,57	5.839.956,02	4.945.021,60	1584896,99	3.751,62	5.839,96	4.945,02	1.584,90	224,43	316,63	205,90	59,99	208,10	318,97	218,90	70,04	2,50	3,89	2,93	0,78	1,44E-03	4,04E-03	1,77E-03	7,43E-04

