

**HTS Dynamics**

# Carbon Footprint Report 2022

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Calculations: HTS Dynamics AS & Emisoft AS

# Methodology

## Framework

The calculation of the climate footprint for HTS Dynamics is based on the framework specified in [GHG-protokollen](#). This is the most used methodology for calculating climate impact. The climate impact is divided into the following sections “Scopes”:

### Scope 1:

Direct emissions from the company’s own equipment, e.g., combustion of fuel in vehicles or generators or emissions from industrial processes.

### Scope 2:

Indirect emissions from energy production that the company buys. According to the GHG protocol, emissions from Scope 2 are calculated in two ways:

- Location-based method bases the calculations on where in the world the electricity is produced, factor is based on average electricity mix among the electricity producers.
- Market-based method bases the calculations on whether the company has purchased guarantees of origin for its electricity consumption. Such guarantees are a support scheme for producers of renewable electricity and show that a guaranteed renewable electricity has been purchased. If you do not buy guarantees of origin, this method dictates that you should use an emission factor based on the electricity that is not renewable (also known as “residual mix”).

### Scope 3:

All other indirect emissions that the business may affect. The 15 categories include e.g. production of purchased materials, flights, waste treatment and transport performed by others. Scope 3 also includes indirect emissions from energy production; production of fossil fuels and energy lost in the grid on the way to business.

## Calculations

Climate impact from gases other than CO<sub>2</sub> has been converted to CO<sub>2</sub> equivalents (“CO<sub>2</sub>e”); this means that you can add up the figures to get an estimated sum of climate impact. Climate impact is usually expressed in “tCO<sub>2</sub>e”, i.e. tonnes of CO<sub>2</sub> equivalents.

Factors for calculation for Scopes 1 and 3 originates from [Defra \(2022\)](#). Factors for Scope 2 originates from NVE ([Nasjonal varedeklarasjon](#)), 2020). Emisoft software.

All quantity data (e.g. liters of fuel, kWh of electricity or kg of material) is entered by HTS Dynamics AS.

# Summary

The following table summarizes the greenhouse gas emissions in Scopes 1, 2 and 3 as well as what falls under the individual categories. For a more detailed overview, see the complete table on page 8 and the appendix on page 10. This table shows the power consumption with a location-based method. For a more comprehensive description, see information on location-based and market-based methods under methodology.

Carbon estimate with location-bases method	Climate impact (tCO <sub>2</sub> e)
<b>Scope 1 – Direct emissions</b>	
Vehicle – diesel	2,26
SUM Scope 1 (tCO <sub>2</sub> e)	2,26
<b>Scope 2 – Indirect emissions</b>	
Electricity with guarantees of origin	25,46
SUM Scope 2 (tCO <sub>2</sub> e)	25,46
<b>Scope 3 – other Indirect emissions</b>	
Purchase of materials and services	331,76
Emissions related to fuel consumption and energy	8,78
Business travel	11,94
Waste	0,36
Processing of sold products	2,96
Transport downstream	175,86
Transport upstream	4,34
<b>SUM Scope 3 (tCO<sub>2</sub>e)</b>	<b>535,99</b>
<b>TOTAL Scope 1 + 2 + 3 location-based method (tCO<sub>2</sub>e)</b>	<b>563,71</b>
<b>TOTAL Scope 1 + 2 + 3 Market-based method (tCO<sub>2</sub>e)</b>	<b>618,33</b>
* SUM Scope 2 and 3 marked-based method (tCO <sub>2</sub> e)	616,07

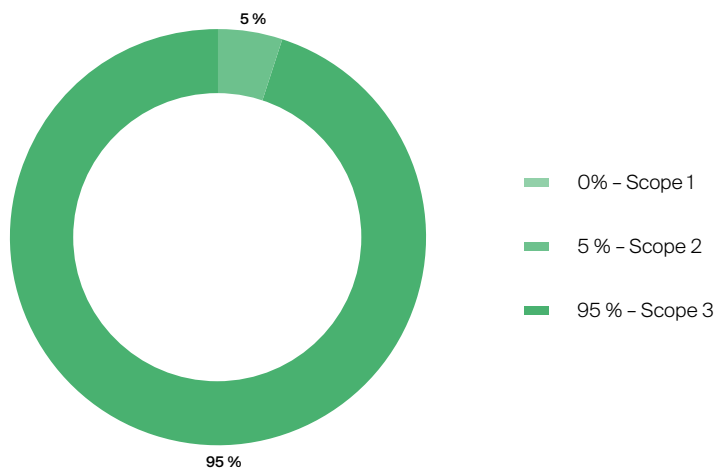
# Mapping of greenhouse gas emissions for 2022

## Introduction

The purpose of this report is to map HTS Dynamics' greenhouse gas emissions for Scopes 1, 2 and 3 in accordance with GHG protocol. This will provide an overview of which areas are important to work with in the future. HTS Dynamics has collected the data base and several types of data have been collected for the first time. Figures obtained are based on data from 2022, it may be that there is incomplete data and that the estimates are not completely accurate. In addition, several assumptions have been made, because there are no specific emission factors for all purchases. The table shows a graphical representation of the emissions distributed in Scopes 1, 2 and 3.

- **Scope 1** - Direct emissions produce only 2,26 tCO<sub>2</sub>e coming from the fuel consumption of the van. HTS Dynamics has no other direct emissions from production. The greenhouse gas emissions in Scope 1 make up 0,4 % of the total carbon emissions.
- **Scope 2** - Indirect emissions from energy account for 5% of greenhouse gas emissions and are calculated using a location-based method. Since HTS Dynamics buys guarantees of origin, the electricity is calculated at 0 tCO<sub>2</sub> with a market-based method, while with location-based emissions, the emission is 25,46 tCO<sub>2</sub>e.
- **Scope 3** - Other indirect emissions constitute the largest emissions with 95% of the total emissions. Categories included in Scope 3: Purchase of materials, emissions related to fuel consumption and energy, business travel, waste, processing of sold products as well as upstream and downstream transport. Only material purchases of production materials are included in upstream transport.

Climate accounts for Scope 1, 2 and 3



## Scope 1 – Direct emissions

The climate impact in Scope 1 comes from the fuel from the van as well as various lawnmowers/snowblower and truck for HTS Dynamics and the consumption is relatively minor compared to other emissions that the company has. No other emissions in Scope 1 have been detected in production. Overall, it is desirable to acquire an electric van, as well as a lawn mower and truck when the current leasing agreement for the van expires.

## Scope 2 – Indirect emissions

According to the GHG protocol, Scope 2 must be calculated using two methods: location-based and market-based method.

Location-based method is based on how the electricity is produced in the country where the business is located. In Norway, the electricity comes mainly from producers with a high degree of renewable energy such as hydropower.

The calculation for Scope 2 with a market-based method shows that the total greenhouse gas emissions will be 0 tCO<sub>2</sub>e. The factor for electricity with guarantees of origin is set as such because it is a support scheme for producers of renewable energy and guarantees that the electricity comes from renewable sources. The method used to calculate the emission factor after the guarantees of origin for renewable shares have been sold is called a residual mix.

If you do not buy guarantees of origin, the residual mix factor must be used.

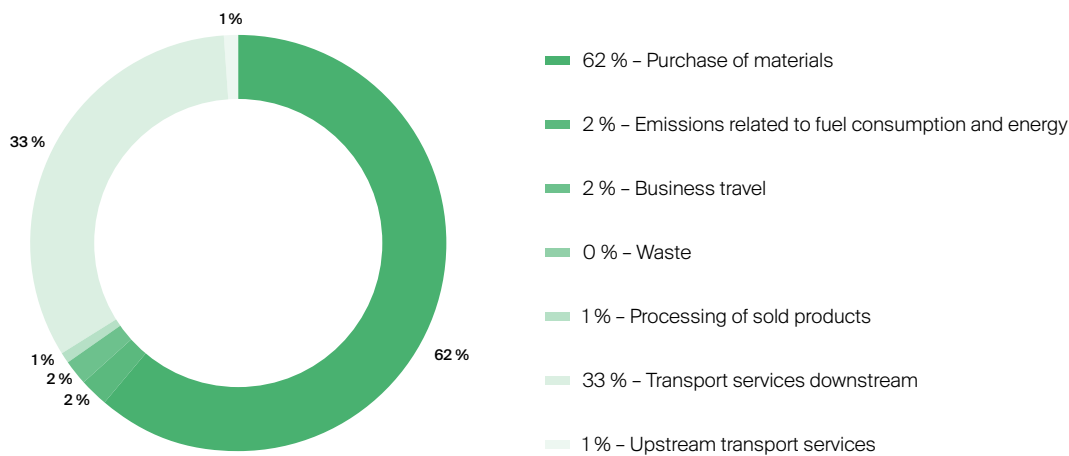
## Scope 3 – Other Indirect emissions

The largest greenhouse gas emissions are in Scope 3 - other indirect emissions. There are 15 different categories in Scope 3. The categories in this climate account have been chosen based on materiality and that eventually it is desirable to have a complete Scope 3 account. There are some categories that are not included and that is because it is difficult to find numbers or because the categories are not covered by the business.

- **Purchase of materials:** The company's purchases of goods account for 62% of the total climate impact in Scope 3. The category also includes operating supplies for own use, such as food, beverages and electronics. Several assumptions have been made when calculating estimates, which may therefore deviate from actual purchases. Steel is by far the greatest purchase category, for 2020 and 2021 Steel parameter general has been used, for 2022 we have obtained a more accurate parameter for our types of steel (chromium steel 18/8 hot rolled) that has a higher value than common steel. This further enlarges our emissions from purchased materials.
- **Upstream transport services:** Upstream transport services are in the accounts for 2022 only intended for the purchase of materials for production, but in terms of weight, this includes the main quantity and is where the company has good enough insight to calculate the transport emissions. Upstream transport services account for 1% of the total climate impact from Scope 3.
- **Emissions related to fuel consumption and energy:** This category includes fuel production and the effect of grid losses. The category accounts for 2 % of the emissions in Scope 3. This is, for example, the extraction, production and transport of fuel. Another example is that the electricity grid in Norway can have a grid loss of up to 10%. This means that the electricity supplier must produce 110 kWh for every 100-kWh purchased.
- **Business travel:** The number of flights has been low after the pandemic. An average for typical travel over three years has been calculated for 2020 and 2021. For 2022 is the actual travels calculated, but is still a little low in comparisons with a normal year. This is 2,2% of the total emissions in Scope 3. HTS Dynamics AS has gone to a greater extent using video conferencing even after the pandemic.
- **Waste:** For waste, a report has been obtained from Ragn Sells which provides a good basis for calculation and the emissions account for less than 1% of the carbon emissions in Scope 3. As GHG123 calculates emissions, only the transport of the waste for treatment is included. The waste treatment for recycled materials or district heating is calculated in Scope 1 for renovators who treat the waste.
- **Transport services downstream:** When the product is sold FCA and ExWorks by the company and the customer pays for the shipping, this must be entered in downstream transport services. Based on the knowledge of whether it is air freight or van and destinations it calculated an estimate of 33%.
- **Processing of sold products:** HTS Dynamics resells metal chips from production. This category accounts for less than 1 % of greenhouse gas emissions in Scope 3 using a location-based method. If you use a market-based method, the emission is 83,03 tCO<sub>2</sub>e, if the company has not purchased guarantees of origin.

- It is the energy consumption that goes into producing new metal to be calculated as well as transport to the smelter. Shipping to the smelter is not calculated because we do not have a data basis.
- Scrap metal from production is in demand because it can be recycled with an energy saving of up to 95% compared to primary metal. The energy savings obviously depend on the types of metal that are recycled. An average of 85% is estimated in these climate accounts. The calculation is with location-based method. For the calculation of energy consumption, several assumptions have been made, where all the fractions are calculated with a general average. When choosing a new supplier, local players should be considered due to the shipping distance.

Distribution of emissions Scope 3, marked based



### Further work

The results from these climate accounts show that the highest emissions are in Scope 3. Collection of data in Scope 3 is demanding, and that there are not always emission factors for all categories / products. For future reporting, it may be appropriate to set requirements for the largest suppliers. As it becomes more common to keep climate accounts, people will to a greater extent expect to get greenhouse gas emissions from shipping and purchasing. This will make it easier to report. In the long term, efforts should also be made to establish good routines for collecting data. In summary, the most relevant measures, and goals in the years to come:

- Become climate neutral by reducing greenhouse gas emissions and compensating by purchasing quotas / guarantees of origin.
- Achieve better categorization for purchasing goods and services in SAP.
- Set requirements for suppliers to deliver EPD or greenhouse gas emissions per order.
- Attain complete climate accounts for Scope 3.

# Climate accounts for 2022 with location-based method

## Scope 1 – Direct emissions

Category	Type	Amount	Unit	Climate impact (tCO <sub>2</sub> e)
Fuel consumption	Diesel for van/Truck	883,00	l	2,26
<b>SUM Scope 1 (tCO<sub>2</sub>e)</b>				<b>2,26</b>

## Scope 2 – Indirect emissions purchased energy

Category	Type	Amount	Unit	Climate impact (tCO <sub>2</sub> e)
Energy consumption	Power with guarantees of origin	2 314 543,00	kWh	25,46
<b>SUM Scope 2 (tCO<sub>2</sub>e)</b>				<b>25,46</b>

Scope 3 – Other Indirect emissions

Category	Type	Amount	Unit	Climate impact (tCO2e)
Purchased materials	Steel (S355JH/S420MH)	5 895,00	kg	12,61
	Steel,Chromium steel 18/8 hot rolled	55 732,00		287,02
	Plastics	199		6,87
	Food and drinks	5 500,00		20,36
	Electronics	-		-
	Cabinets (metal construction)	-		-
	Mineral oil	3 500,00	l	4,90
Business travels	Car	-	km	-
	Taxi	-		-
	Train	-		-
	Flights – Domestic	11	Number of trips	1,20
	Flights – Europe	10		1,92
	Flights – The rest of the world	6		9,00
Emissions related to fuel consumption and energy	Diesel and Energy	-	tCO2e	8,78
Waste	Mixed EE waste	0,005	t	0,00
	Paint, glue and varnish	0,003		0,00
	Spray cans	0,015		0,00
	Fluorescent tubes and energy-saving bulbs	0,016		0,00
	Mixed industrial waste for sorting	10,82		0,23
	Wastewater / washing water / oil separation	259	l	0,01
Transport downstream	Cargo flight	-	km	175,56
	Van	-		0,30
Transport upstream	Cargo ship	-	km	0,63
	Heavy truck	-		3,71
Processing of sold products		235 740,00	kWh	83,03
<b>Sum Scope 3 (tCO2e)</b>				<b>535,99</b>
<b>TOTAL Scope 1 + 2 + 3 location based method (tCO2e)</b>				<b>561,45</b>
<b>*TOTAL Scope 1 + 2 + 3 marked based method (tCO2e)</b>				<b>618,33</b>
<b>*SUM Scope 2 og 3 marked based method (tCO2e)</b>				<b>616,07</b>



# Attachments

The tables show estimates for material types and emission factor.

Material	Material or alloy type	Weight (t)	Climate impact {t/t}
Plast	KETRON 1000 PEEK Round Bolt	0,199	6,87
Steel (primary metal)	Stål (S355J2H/S420MH)	5,895	12,61
	Steel, chromium steel 18/8, hot rolled	55,732	287,02

# Sources

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