



Carbon Footprint

Houben NV - Hasselt.

GENERAL PROJECT DATA

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Purpose of the study:	To calculate the organizational CO ₂ footprint of Houben NV for 2023. This includes a calculation of the Scope 1, 2 as well as business travel emissions.

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1 INTRODUCTION

1.1 CONTEXT

More and more organizations are measuring their carbon footprint and starting a CO₂ reduction program. Strengthening the corporate image, expanding the product range, compliance and cost reduction are just some of the reasons cited.

Almost everyone agrees that our planet is warming because of excessive greenhouse gas emissions. Far-reaching measures are urgently needed to contain this warming. The challenges, however, are considerable.

For thousands of years, human activity had no significant impact on our climate and living environment. All this has changed in a very short time span. The increase in CO₂ has come about in just over 150 years, during three industrial revolutions. We need to reduce this excessive increase in the next 30 years, in a timeframe that is five times shorter.

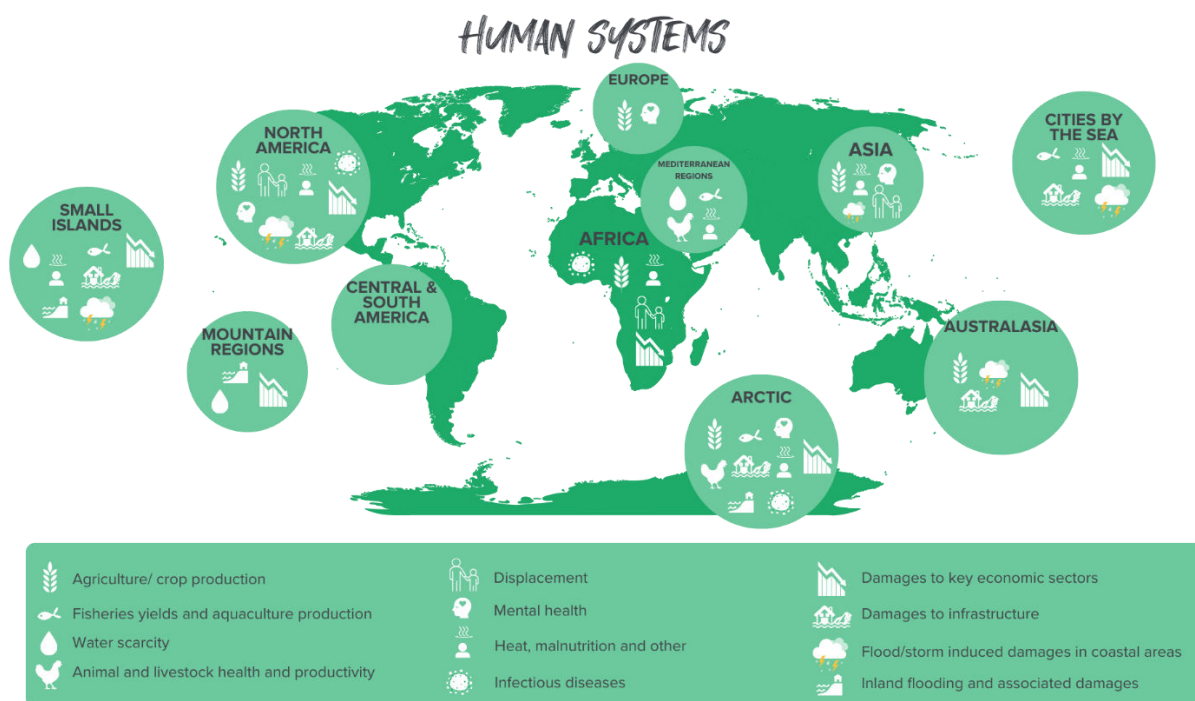


Figure 1: Perceived impact of climate change over the period 2007-2013.

The Paris Climate Agreement states that in order to avoid the major tipping points - events that could accelerate climate change irreversibly - global warming must be limited to 1.5 degrees Celsius. To achieve this, it is important to follow the Carbon Law, which states that the ambition set in Paris can be achieved by maintaining a global greenhouse gas reduction rate of 50% per decade.

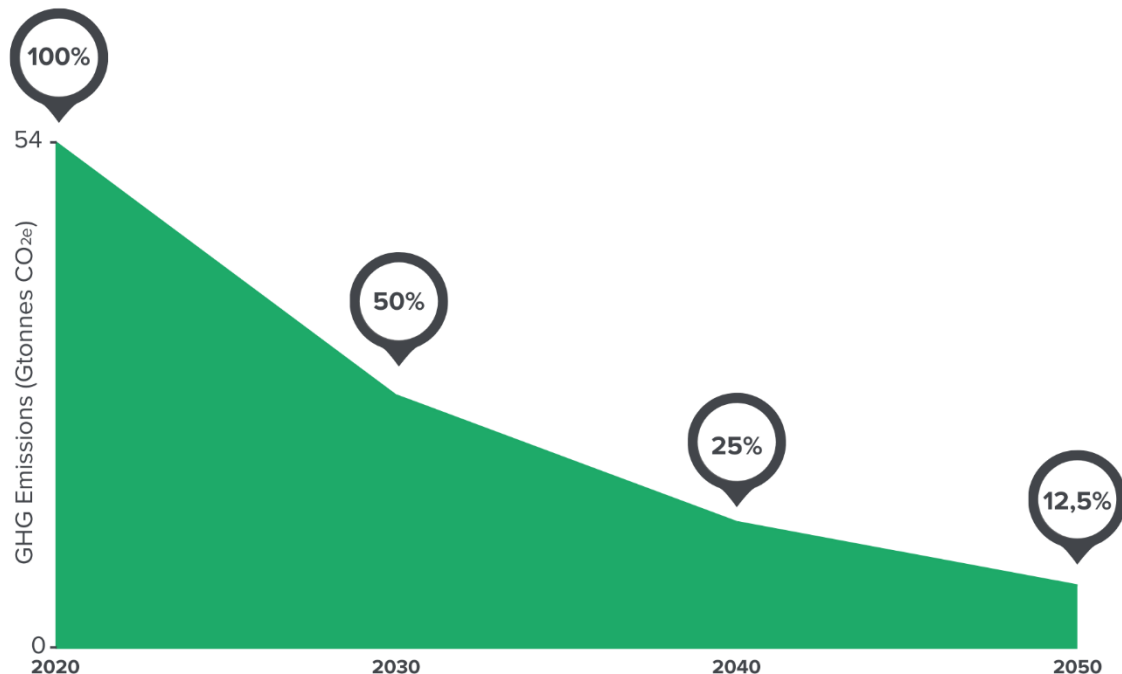


Figure 2: Global reduction in greenhouse gases needed to meet Paris climate agreement.

Contradictorily, we are technically advanced enough to face this challenge. The greatest difficulty appears to be of a societal nature. It is imperative that people - citizens, business leaders and politicians - show enough willingness to fully adopt the necessary solutions that are abundantly available. In short, the most important climate challenge is not technical, but societal.

Every single day, Encon proves conclusively that ecology and economy can coexist in an efficient manner. Encon specializes in energy-saving, renewable energy and sustainability projects and, over the course of 20 years, has achieved 1.700.000 tonnes of CO₂ savings and €266.000.000 in direct growth for its customers.

1.2 CO₂ FOOTPRINT

The CO₂ footprint, also known as the 'Carbon Footprint', is the annual greenhouse gas emissions of an organization, particular activity, event, product or person. Greenhouse gases comprise the emissions that result from a (business) activity or the life cycle of a product. These emissions can be divided into:

- Scope 1: direct emissions from sources owned, or controlled, by the company (ex: fuel combustion)
- Scope 2: indirect emissions linked to energy (e.g.: purchase of electricity)
- Scope 3: indirect emissions (e.g.: purchase of materials, waste disposal, transport,...)
 - Upstream and Downstream activities

The following figure (source: GHG Protocol Corporate Value Chain Standard) gives an overview of the different types of emissions:

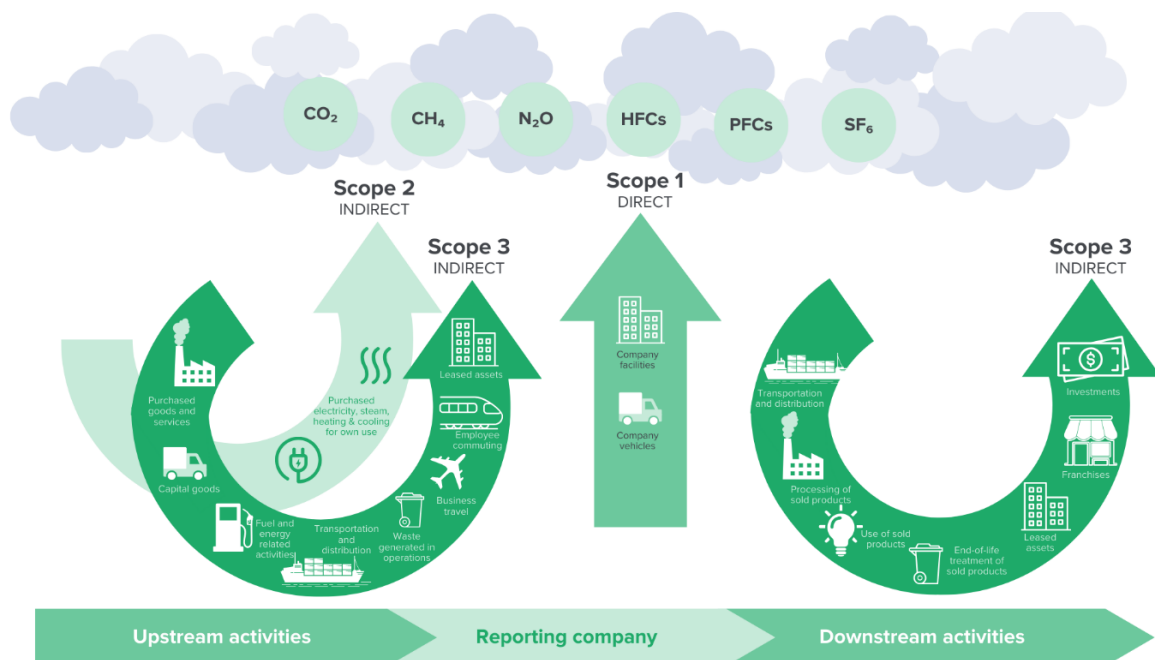


Figure 3: Overview of the different types of emissions according to the Greenhouse Gas Protocol

It is important to note that this does not only include actual CO₂ emissions, but also emissions of the other greenhouse gases defined by the Intergovernmental Panel on Climate Change (IPCC). This defines greenhouse gases as gaseous components of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the earth's surface, the atmosphere itself, and by clouds. Consequently, this study includes the seven gases listed in the Kyoto Protocol: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃). All identified GHGs are converted to CO₂e by multiplying by the corresponding Global Warming Potential factor published by the IPCC in AR5.

1.3 WHY IS IT IMPORTANT TO INCLUDE SCOPE 3?

The development of a Scope 3 inventory provides companies with a better understanding of their value chain GHG emissions, which is a step towards effectively managing emissions risks and opportunities and reducing value chain GHG emissions.

An in-depth study of scope 3 helps to identify and understand the risks and opportunities associated with value chain emissions.

Among the risks are those related to rapidly changing regulations, both for the company itself and for its suppliers and customers. For example, energy or emissions taxes or regulations in a company's supply chain may significantly increase the cost of goods or components purchased by a company.

There are also risks related to the cost and reliability of the supply chain. Suppliers can pass on to their customers the additional costs of their energy consumption or emissions.

There are also risks related to the reputation of the company or the partners in the value chain. This could include negative media coverage about a value chain entity based on its GHG emissions management practices.

The scope 3 GHG emissions inventory can also identify opportunities to produce and sell goods and services with lower GHG emissions. As more companies in the value chain measure and manage GHG emissions, demand will grow for new products that reduce emissions throughout the value chain.

These opportunities include improved efficiency and cost savings. A reduction in GHG emissions often corresponds to decreased costs and an increase in companies' operational efficiency.

Improved GHG management also drives innovation. A comprehensive approach to GHG management provides new incentives for innovation in supply chain management and product design.

It is also possible to improve sales and customer loyalty through good management of the GHGs in the value chain. Low-emissions goods and services are increasingly more valuable to consumers, and demand will continue to grow for new products that demonstrably reduce emissions throughout the value chain.

Improve stakeholder relationships through proactive disclosure is also a consequence of effective GHG management of a company's value chain. Examples include demonstrating fiduciary responsibility to shareholders, informing regulators, building trust in the community, improving relationships with customers and suppliers, and increasing employee morale.

Finally, external parties (e.g. customers, investors, regulators, shareholders, and others) are increasingly interested in documented emissions reductions. A scope 3 inventory is a best practice that can differentiate companies in an increasingly environmentally conscious marketplace.

1.4 PURPOSE OF THIS DOCUMENT

This document includes a detailed overview of the carbon footprint of Houben NV at organization level. The calculation is fully in accordance with the Greenhouse Gas protocol and follows the requirements as indicated in the CO₂ performance ladder manual v3.1. The applied methodology, practical approach and thresholds are discussed at length to demonstrate how an accurate footprint of all Houben NV's business activities has been obtained. This provides Houben NV with a clear and comprehensive overview of all factors contributing to their carbon footprint, where future measures can be taken to reduce this footprint, to join the SBTi, get certified with the CO₂ performance ladder or to provide carbon neutral services.

2 METHODOLOGY

2.1 SUMMARY TABLE

Company name	Houben NV.
Description of the organization	Houben NV is a construction company, with construction projects in both the private and public sectors. The projects are supervised by them from start to finish. This can range from new construction, renovation, restoration to aftercare and maintenance.
Footprint calculation according to following standard:	Greenhouse Gas Protocol - Corporate standard CO ₂ performance ladder manual v3.1
Chosen consolidation approach (equity share, operational control or financial control)	Operational control: This means that a company takes into account 100% of the emissions released by its activities over which it has control. A company is assumed to have operational control over an activity if the company has full authority to set and implement its operational policies for the activity.
Description and address of the site(s) that are within the organizational boundary of the company	Site 1: Hasselt (office, penthouse): Prins Bisschopssingel 36 Hasselt Site 2: Beringen (warehouse): Schoebroekstraat 58 Beringen Site 3: Houthalen (office Future Clima): Lijsterstraat 30 Houthalen-Helchteren Construction sites in Flanders & Wallonia
Description of the activities that are within the organizational boundary of the company (Description of inventory boundary)	The activities of Houben NV which cause emissions can be summarized: • Electricity consumption by: office activities, lighting, construction activities and other technical installations; • Fuel consumption due to: heating of the buildings, processes, use of passenger cars and other vehicles.
Analysed period	31/12/2022 - 31/12/2023.

Table 1: Project Description

2.2 GENERAL INFORMATION

The footprint of Houben NV was calculated in accordance with the Greenhouse Gas Protocol - Corporate standard as well as with the requirements as indicated in the CO₂ performance ladder manual (Chapter 5). Following Chapter 5 of the CO₂ performance ladder manual, this report is also in conformity with ISO14064-1 (see also Appendix 3: ISO 14064 statement). This standard describes how the different scopes should be calculated and reported. When it was not possible to collect certain information and calculate the emissions, this will always be communicated transparently in the report.

Since Houben NV's goal is to be certified with **CO₂ performance ladder** at level 3, a full calculation was done for Scope 1 and 2. In addition, category 6 of Scope 3, business travel, has also been calculated. A deviation of this calculation from the GHG protocol required by the CO₂ performance ladder is that the upstream emissions of electricity and fuels are included in Scope 1 and 2. According to the standards of the GHG protocol, there is a category 3 Scope 3, energy and fuel related activities, which includes upstream emissions linked to extraction, production and transport of energy and fuels. These emissions were added to the related activities in Scope 1 and 2.

2.3 BASE YEAR

2022 is the base year of Houben NV. For 2023, a recalculation was performed based on collected data representative of the period 31/12/2022 to 31/12/2023, to follow up the evolution of the CO₂-emissions of Houben NV.

2.4 ACTIVITIES AND BOUNDARIES

To determine the activities and boundaries of Houben NV, the CO₂ matrix of Houben NV was completed during a collaborative workshop during the kick-off meeting.

2.4.1 CO₂ MATRIX

The objective of the CO₂ matrix is to provide a summary overview of the various emission sources present within the boundaries of the organization. These emission sources are linked to the activities carried out by Houben NV. This document serves as a basis for a complete calculation and detailed analysis, taking into account the organization's responsibilities and operational Scope.

2.4.2 SCOPE 1 & 2 LIMITS

For every site of Houben NV, the consumption data was requested from the site manager. The reliability of each consumption value was determined based on the delivered data and the estimations made by each site manager. The table below shows the different categories in which the data of each site is allocated to.

Category:	Description of activities
Reliable (R)	Reported data is reliable, no rounded numbers
Assumption (A)	Data is estimated based on different assumptions
Not applicable (N/A)	The requested data is not applicable to this site
Not reported (N/R)	There is no data reported but this is applicable
Partially reported (P/R)	Information does not represent the complete year

Table 2: Categories of the scope 1 and 2 limits

The table below shows these scope 1 and 2 limitations.

Site:	Purchased electricity	Building heating & processes	Transport own vehicles	Refrigerant leakage	Direct process emissions	Business travel
Hasselt	R	R	R	N/A	N/A	N/A
Beringen	R	R	R	N/A	N/A	N/A
Houthalen	R	R	R	N/A	N/A	N/A
Construction sites	P/R	N/A	N/A	N/A	N/A	N/A

Table 3: Reliability of scope 1 and 2 data

2.5 PRACTICAL APPROACH

2.5.1 INFORMATION REQUEST AND QUALITY OF INFORMATION

A comprehensive information request in the form of a client-specific Excel file was created for the preparation of the GHG inventory of Houben NV.

In this context, a distinction was made between primary and secondary data. According to the GHG protocol, primary data comes from specific activities within the organization's value chain. This data can be collected using measurement systems, invoices (e.g. electricity), mass balances or other internal calculations or systems. Secondary data are data that are not available and for which internationally acknowledged databases or scientific literature are used to make valid estimates and approximations. When the emission sources available in Ecolnvent 3.8 and CO2emissiefactoren.be are not identical to the specifically needed emission sources or when only monetary values are available from mass-related information, Environmental Extended Input-Output (EEIO) tables are used. These tables use the spend-based method where monetary values are converted to GHG emissions. These provide the greatest degree of inaccuracy but allow calculations/estimates to be made that would otherwise not be possible due to the large workload.

The information provided by Houben NV can in any case be considered primary data. In addition, the internationally accepted Ecolnvent 3.8 LCA database and CO2emissiefactoren.be was used to process secondary data. The supplied information was subjected to the data quality parameters specified by the Greenhouse Gas Protocol - Corporate standard;

1. Technological representativeness:

Companies should select data that is technology specific.

2. Temporal representativeness:

Companies should select data that is temporally specific.

3. Geographic representativeness:

Companies should select data that is geographically specific. Eg: emission factors such as those of electricity generation and consumption, are always used from the country where the company is located (or related countries, depending on availability in databases).

4. Completeness:

Companies must select data that are complete. If estimates are made, these estimates are based on databases or (scientific) literature.

5. Reliability:

Companies must select data that is reliable. E.g.: Reliable data is collected by distinguishing between primary and secondary data. If primary data are not available, estimates and approximations are made (proxy data).

3 CO₂ FOOTPRINT HOUBEN NV 2023.

3.1 OVERVIEW 2023.

The table below shows the consolidated CO₂ footprint of Houben NV for the year 2023. There can be seen that scope 1 has an impact of 85,79% while Scope 2 has an impact of 14,21% on the CO₂ footprint of Houben NV.

Scope	Tonnes CO ₂ e	% scope 1 + 2
Scope 1	1.459,59	85,79%
Scope 2 - market-based	241,77	14,21%
Business travel	0,00	0,00%
Total	1.701,36	100,00%

Table 4: CO₂e footprint Houben NV 2023.

As prescribed by the CO₂ performance ladder, the emission factors used in scope 1 and 2 reflect not only the use of fuels and energy, but also the upstream emissions linked to this. These upstream emissions include extraction, production and transport of fuel and energy.

The overall overview, including all subcategories, is illustrated in the figure below:

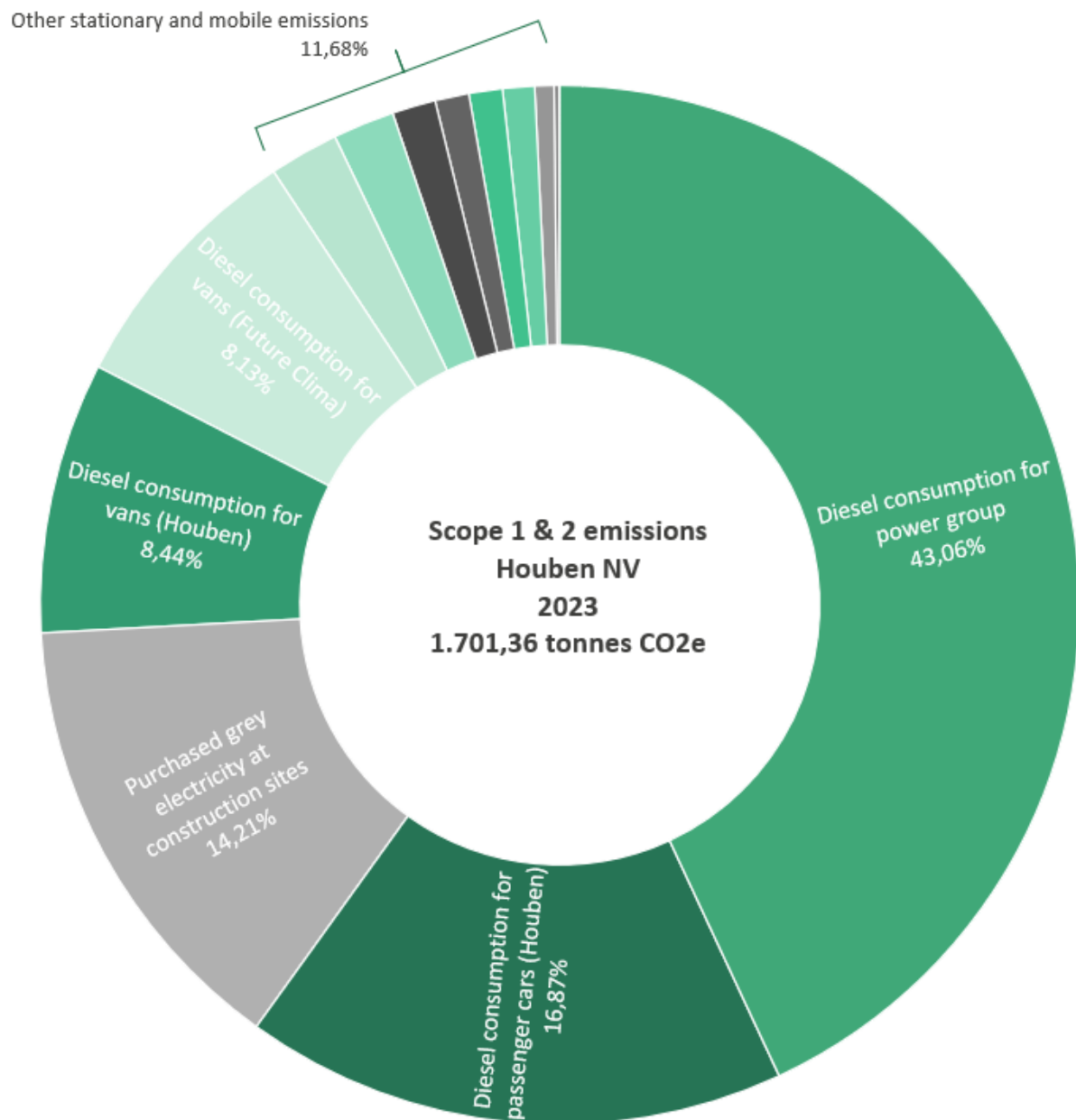


Figure 4: Scope 1 and 2 CO₂e footprint Houben NV 2023.

The figure above shows that Houben NV has a carbon footprint of 1.701,36 tonnes of CO₂e. These emissions are allocated between the different activities that are covered by the scope 1 and 2 emissions.

In the following chapters, each scope is discussed separately, with an explanation of the various emission sources.

3.2 SCOPE 1

The table below shows the different Scope 1 categories.

	Tonnes CO ₂ e	% scope 1 emissions	% scope 1 + 2
Stationary emissions	753,26	51,61%	44,27%
Mobile emissions	706,33	48,39%	41,52%
Fugitive emissions	0,00	0,00%	0,00%
Direct process emissions	0,00	0,00%	0,00%
Total	1.459,59	100,00%	85,79%

Table 5: Emission sources Scope 1 in 2023.

As already mentioned before, the scope 1 emissions comprise 85,79 % of the total carbon footprint of Houben NV, or 1.459,59 in tonnes CO₂e.

Important to note with this figure is that refrigerant leakage was also included in the calculation, however in the year 2023 there were no refrigerant leaks which ensures that no emissions were released as a result.

Within Houben NV's processes, there are no chemical reactions that cause direct process emissions so this category will not affect Houben NV's carbon footprint.

The various Scope 1 categories are discussed in detail below.

3.2.1 STATIONARY EMISSIONS

Stationary emissions are caused by the consumption of fossil fuels in the process operations of Houben NV. This category has an impact of 44,27% on the carbon footprint of Houben NV for the year 2023. Examples of stationary emissions include the consumption of natural gas for building heating, the use of diesel for an emergency generator or sprinkler systems. The stationary emissions of Houben NV are listed in the table below.

	Consumption (kWh)	Tonnes CO ₂ e	% Stationary emissions	% scope 1 + 2
Natural gas for warehouse in Beringen	73.718,13	17,76	2,36%	1,04%
Natural gas for building heating in Hasselt	840,99	0,20	0,03%	0,01%
Natural gas for building heating in Houthalen	11.188,00	2,70	0,36%	0,16%
Diesel consumption for power group at construction sites	225.000,00	732,60	97,26%	43,06%
Total	310.747,12	753,26	100,00%	44,27%

Table 6: Stationary emissions in 2023.

The table above shows that the stationary emissions of Houben NV result from the consumption of natural gas for a warehouse and building heating. The diesel consumption for power groups at construction sites has the greatest impact on the carbon footprint, with a share of 43,06% on the carbon footprint.

When calculating the diesel consumption for the power groups, it was assumed that there are 20 construction sites with a power group, each operating 9 hours a day and 250 days a year with a consumption of 5 litres per hour.

3.2.2 MOBILE EMISSIONS

Mobile emissions are emissions that arise from the combustion of fossil fuels in vehicles (passenger cars, delivery trucks, heavy duty trucks, forklifts,...) in control of Houben NV. This category includes the various vehicles in operational control of Houben NV. However, this category does not consider the commuting of staff without a company car. The impact of commuting is reflected in Scope 3 category 7: employee commuting. The table below shows the mobile emissions.

	Consumption (liters)	Tonnes CO ₂ e	% Mobile emissions	% scope 1 + 2
Diesel consumption for passenger cars (Houben)	88.140,00	286,98	40,63%	16,87%
Diesel consumption for passenger cars (Future Clima)	7.081,49	23,06	3,26%	1,36%
Gasoline consumption for passenger cars (Houben)	13.038,00	36,78	5,21%	2,16%
Gasoline consumption for passenger cars (Future Clima)	5.975,90	16,86	2,39%	0,99%
Diesel consumption for trucks (Houben)	3.107,00	10,12	1,43%	0,59%
Gasoline consumption for trucks (Houben)	39,00	0,11	0,02%	0,01%
Diesel consumption for vans (Houben)	44.112,00	143,63	20,33%	8,44%
Gasoline consumption for vans (Houben)	6.362,00	17,95	2,54%	1,05%
Diesel consumption for vans (Future Clima)	42.473,31	138,29	19,58%	8,13%
Diesel consumption for forklifts	10.000,00	32,56	4,61%	1,91%
Total	220.328,70	706,33	100,00%	41,52%

Table 7: Mobile emissions in 2023.

The table above shows that the use of the vehicles causes an impact of 41,52% (706,33 tonnes CO₂e) on the carbon footprint of Houben NV. Passenger cars are responsible for 51,49% of the mobile emissions.

3.3 SCOPE 2

The Scope 2 emissions are specifically linked to the purchased electricity for the entire electricity consumption of the site(s). Electricity is used to power the printers, lighting, and other technical equipment of Houben NV.

The table below shows the electricity consumption due to the purchase of grey electricity. The production of this grey electricity causes a CO₂ emission of 389,74 tonnes of CO₂e which has an impact of 37,50% on the total emissions.

Market-based	Consumption (kWh)	Tonnes CO ₂ e	% scope 2 emissions	% scope 1 + 2
Purchased green electricity for office in Hasselt	100.233,08	0,80	0,33%	0,05%
Purchased green electricity for warehouse in Beringen	107.162,05	0,86	0,35%	0,05%
Purchased green electricity in Houthalen	10.194,00	0,08	0,03%	0,00%
Purchased grey electricity at construction sites	1.237.275,60	240,03	99,28%	14,11%
Total	1.454.864,73	241,77	100,00%	14,21%

Table 8 Scope 2 emissions following the market-based method.

The above calculation was performed based on the **market-based method**, which uses supplier-specific emission factors, and the power generation situation at the sites of Houben NV. The supplier specific emission factor was obtained from association of issuing bodies (AIB)¹. Additionally, Scope 2 emissions also include the upstream emissions of extraction, production and transportation, which have an emission factor of 0,027 kg CO₂e/kWh. This method reflects the total emission connected to the choices and purchase behavior of Houben NV. Houben NV can lower this total impact by reducing their electricity consumption, choosing to buy solely green electricity, or to produce more electricity on-site.

To account for the limited data at the construction sites, the average consumption from the two available construction sites (Aarschot and Heusden-Zolder) was calculated and then extrapolated to estimate the total consumption for 2023, assuming all 20 active sites had similar usage.

Another method that should be reported according to the GHG protocol is the **location-based method**. The location-based method reflects the average emissions intensity of the grid on which energy consumption occurs depending on the country the company is located, and the year. With this method, the grid-average emission factor of all electricity produced within Belgium is multiplied by the total energy consumption of the company (meaning: the consumption of grey electricity + the consumption of all on-site produced and consumed electricity).

¹ <https://www.aib-net.org/>

This average emission factor amounts to 0,112 kg CO₂e/kWh in 2023 for Belgium. Again, the upstream emissions of 0,022 kg CO₂e/kWh are added to this. This gives a total of 194,95 tonnes CO₂e based on the location-based method. Only by reducing energy consumption can a company directly influence the total scope 2 impact as calculated by the location-based method. The table below shows the Scope 2 emissions taking into account the location-based method.

Location-based	Consumption (kWh)	Tonnes CO ₂ e	% scope 2 emissions	% scope 1 + 2
Purchased green electricity for office in Hasselt	100.233,08	13,43	6,89%	0,81%
Purchased green electricity for warehouse in Beringen	107.162,05	14,36	7,37%	0,87%
Purchased green electricity in Houthalen	10.194,00	1,37	0,70%	0,08%
Purchased grey electricity at construction sites	1.237.275,60	165,79	85,04%	10,02%
Total	1.454.864,73	194,95	100,00%	11,78%

Table 9 Scope 2 emissions following the location-based method.

4 APPENDIX 1: GHG EMISSION SUMMARY

GHG Emissions Summary

Name of Business	Houben NV	
Prepared By	Encon	
Boundary for results:	Company	
Year (optional):	2023	
Scope	Activity Type	2023
Scope 1	Stationary combustion	753.256,48
	Mobile combustion	706.334,77
	Fugitive emissions from air-conditioning	0,00
	Other fugitive or process emissions	0,00
	Scope 1 - Total	1.459.591,25
Scope 2	Purchased electricity - location based	194.951,87
	Purchased electricity - market based	241.772,18
	Purchased heat and steam	0,00
	Scope 2 - Location based + heat and steam	194.951,87
	Scope 2 - market based + heat and steam	241.772,18
Scope 3	Purchased goods and services	0,00
	Capital goods	0,00
	Fuel-and energy-related activities (not included in scope 1 or scope 2)	0,00
	Upstream transportation and distribution	0,00
	Waste generated in operations	0,00
	Business travel	0,00
	Employee commuting	0,00
	Upstream leased assets	0,00
	Downstream transportation	0,00
	Processing of sold products	0,00
	Use of sold products	0,00
	End-of-life treatment of sold products	0,00
	Downstream leased assets	0,00
	Franchises	0,00
	Investments	0,00
	Scope 1 (Biogenic)	0,00
	Scope 2 (Biogenic)	0,00
	Scope 3 (Biogenic)	0,00
	Total Scope 1, 2 and 3	1.701.363,43

5 APPENDIX 2: LIST OF EMISSION FACTORS

In the table below, the emission factors used for the carbon footprint calculation are presented.

Category	Emission factor	Unit	Source
Natural gas (LHV)	0,241 (0,202 + 0,0389)	kg CO ₂ e/kWh	VEKA + co2emissiefactoren.be
Diesel (B7)	3,256	kg CO ₂ e/L	co2emissiefactoren.be
Petrol (E10)	2,821	kg CO ₂ e/L	co2emissiefactoren.be
Electricity location-based	0,134 (0,112 + 0,022)	kg CO ₂ e/kWh	AIB (production mix) + co2emissiefactoren.be
Grey electricity market-based	0,194 (0,167 + 0,027)	kg CO ₂ e/kWh	AIB (residual mix) + co2emissiefactoren.be
Green electricity market-based	0,008	kg CO ₂ e/kWh	co2emissiefactoren.be

Table 8: Scope 1 & 2 emissions factors.

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Table 13: Category 5: Processing and transport of waste generated during operations in 2023... **Fout!**
Bladwijzer niet gedefinieerd.

Table 14: Category 07: Commuting of staff in 2023. **Fout! Bladwijzer niet gedefinieerd.**

Table 15: Category 09: Emissions resulting from Downstream transport carried out in 2023..... **Fout!**
Bladwijzer niet gedefinieerd.

7 APPENDIX 3: ISO 14064 STATEMENT

Requirement	Description	Paragraph
a)	Description of the reporting organisation	2.1
b)	Responsible person/entity for the report	General project data
c)	Reporting period	2.3
d)	Documentation of the organizational boundaries	2.4
e)	Documentation on reporting limits, including established criteria for defining significant emissions	2.4
f)	Direct emissions, in tonnes of CO ₂ e	3.2
g)	Description of how biogenic CO ₂ emissions and removals are treated and quantified in tonnes of CO ₂ e	N/A
h)	Direct removal of GHG, in tonnes of CO ₂ e	N/A
i)	Exclusions of significant GHG sources or sinks	N/A
j)	Indirect emissions, in tonnes of CO ₂ e	3.3
k)	Selection of reference year	2.3
l)	Explanation of changes in reference year or other historical GHG data and any recalculation of the reference year or other historical GHG data. Documentation of any limitations of comparability resulting from a recalculation	2.3
m)	Quantification method and explanation of the choice	2
n)	Explanation of changes in quantification methods previously used	N/A
o)	Reference/documentation emission factors and removal factors	2.5 + Appendix 2
p)	Description of the impact of uncertainties regarding the accuracy of emission and removal data	2.4.2
q)	Description and results of the uncertainty assessment	2.4.2
r)	Declaration of conformity to ISO 14064-1	2.2
s)	Statement regarding the verification of the emission inventory, including mention of the degree of assurance	2.4.3 + General project data

t)	GWP values and their source used in the calculation. From the latest IPCC report, otherwise in the calculation mention the reference emission factors or database, as well as their source	Appendix 2
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8 BIBLIOGRAPHY

- [1] Carnegie Mellon University Green Design Institute, "Economic Input-Output Life Cycle Assessment (EIO-LCA) US 2007 (388 sectors) Producer model [Internet]," [Online]. Available: <http://www.eiolca.net/>. [Accessed 02 09 2021].
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- [3] IPCC, "2006 IPCC Guidelines for National Greenhouse Gas Inventories Agriculture, Forestry and Other Land Use," 2006.