

Corporate carbon footprint Scope 1&2

for Kartonpack Zrt.



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1. Executive summary

Kartonpack Zrt. (Kartonpack in the following) places great emphasis on environmental sustainability issues, and therefore asked denkstatt Hungary Kft. to calculate the carbon footprint of its activities.

During the project, we have determined the direct greenhouse gas (GHG) emissions (Scope 1) of Kartonpack from its own activities (which it directly influences) and the indirect emissions (Scope 2) from purchased energy for the calendar year 2022. The calculations were performed following the GHG Protocol guidelines. Based on the calculations, in 2022, the **direct emissions** from the activities of Kartonpack (**Scope 1**) were **99.66 tonnes of CO₂ eq**, the **indirect emissions from purchased energy (Scope 2 market-based)** were **290.88 tonnes of CO₂ eq**, the **total GHG emissions from Scopes 1 and 2 (market-based)** were **390.55 tonnes of CO₂ eq**.¹

Biogenic emissions were 2.03 tonnes of CO₂ eq. Thus the total Scope 1 and 2 emissions including biogenic emissions as well were: 392.57 t CO₂ eq.¹

In the light of the results, the largest part of the carbon footprint, 74.10%, is due to indirect emissions (Scope 2).

2. Introduction

Nowadays, there are increasingly strong societal expectations regarding sustainability and the political and legal regulations and directives (e.g. European Green Deal, EU Taxonomy) that aim to achieve this. As a result of these increasing expectations, it is essential for a responsible company to focus on sustainability aspects, and one of the first steps is to address its own greenhouse gas emissions and plan its future strategy accordingly.

Kartonpack has taken the first step on this path: with denkstatt, it has determined its carbon footprint from its own emissions. The current objective of Kartonpack is to understand the magnitude of its carbon footprint in 2022, which can serve as a basis for defining a GHG emission reduction strategy.

¹ Differences in summation are due to rounding.

3. Calculation and estimation process, methodology

In the calculation of the carbon footprint of Kartonpack, we determined the GHG emissions from its own activities (Scope 1) and the emissions from purchased energy (Scope 2). The data used for the calculation are for the calendar year 2022 and include emissions related to the operation of Kartonpack's production site at Galamb u. 11., Debrecen. Kartonpack has another site, which is out of use. The energy need of this site is negligible (less than 1% of the energy use of the production site at Galamb u. 11.)

Footprint calculation period: 01.01.2022- 31.12.2022

The carbon footprint was determined based on the Greenhouse Gas Protocol standards (Corporate Standard).

For the footprint calculation, we have considered the carbon sources recommended by the GHG Protocol, which are shown in Table 1. Company-specific activity data were provided by Kartonpack. For the calculation, the emission factors that best approximate reality were used from international databases (DBEIS² , National Inventory Report (Hungary), International Energy Agency), as well as electricity emission factor provided by the supplier.

The carbon sources considered and the uncertainty in the calculation are summarised in the following table:

Table 1. Carbon sources considered in the calculation and their associated uncertainty levels

Scope	Carbon source name	Level of uncertainty
Scope I	<ul style="list-style-type: none"> Energy sources burned locally by the company Refrigerants leaked during operation Emissions from the use of vehicles owned or operated by the company, including on-site material handling 	low
Scope II	<ul style="list-style-type: none"> Electricity purchased by the company 	low

² Department for Environment Food & Rural Affairs, Department for Business, Energy & Industrial Strategy - UK Government GHG Conversion Factors for Company Reporting

4. Results

4.1. Presentation of the results

The results are reported in tonnes of carbon dioxide equivalent (CO₂ eq), which is one metric tonne of carbon dioxide (CO₂), or an amount of greenhouse gas ((carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂ O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF₆)) with a global warming potential equivalent to the former.

The magnitude and percentage distribution of the carbon footprints determined for the activities considered in the calculations are shown in the following table.

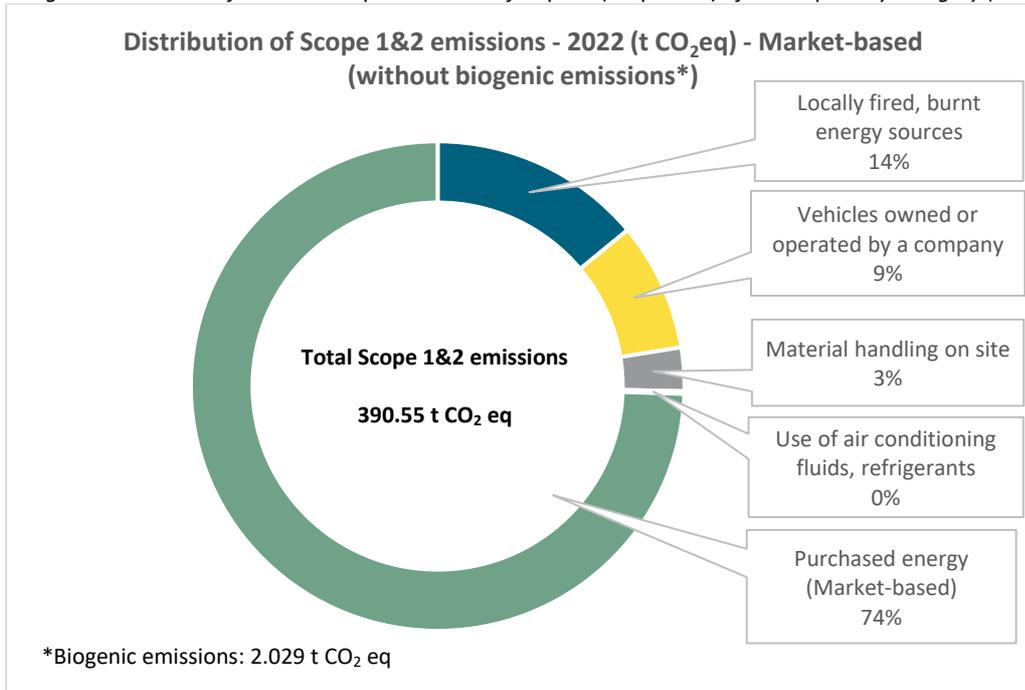
1. Table Magnitude and distribution of the carbon footprint in 2022

Scope	Category	Emissions *(tCO ₂ eq) 2022 Market-based	%
Sc1	Locally fired, burnt energy sources	54.64	13,99%
Sc1	Vehicles owned or operated by a company	33.13	8,48%
Sc1	Material handling on site	11.19	2,86%
Sc1	Use of air conditioning fluids, refrigerants	0.72	0,18%
Sc2	Purchased energy (Market-based)	290.88	74,48%
Total	Total (without biogenic)	390.55	100,00%
Total	Total (with biogenic)	392.57	

Differences in summation are due to rounding.

The results for 2022 are illustrated in the figure below:

1. Figure Distribution of the 2022 corporate carbon footprint (Scope 1&2) of Kartonpack by category (tonnes CO₂ eq)



4.2. Interpretation and analysis of results

Kartonpack's total Scope 1&2 carbon footprint for 2022 (market-based) was **390.546 tonnes CO₂ eq (not including the biogenic emissions)**.

**Direct release
(Scope 1):
99.66 t CO₂ eq (~25.52%)**

Direct emissions (Scope 1 emissions) over which the company has more influence, **amounted to 99.66 tonnes CO₂ eq in 2022**. This is about 25.52% of the result considering all direct and indirect emissions for the site. The source of this is mainly (55%) the locally fired, burnt energy sources, like natural gas. 33% is originated from the fuel-use of company vehicles owned or operated by Kartonpack, while 11% is originated from the material handling on site and about 1% from the use of air conditioning fluids, refrigerants.

**Indirect emissions
(Scope 2):
290.88 t CO₂ eq (~74.48%)**

A significant share of the GHG emissions associated with Kartonpack's 2022 operations **were caused by indirect emissions**, i.e., emissions over which the company has only indirect control. Of these, Scope 2 emissions in 2022 **amounted to 290.88 tonnes of CO₂ eq (market-based)**. This represents 74.48% of the total Scope 1&2 emissions.

4.3. Location-based vs. market-based

Scope 2 emissions can be calculated using two methods.

Location based calculation relies on country average electricity grid emission factors (from IEA).

Scope 2 market- based emissions are calculated primarily using emission factors provided by the energy providers contracted by the company. If such factors are not available, country level residual mix emission factors can be used. If the company purchases renewable energy certificates, the decrease in emissions shows up in market-based calculations, but not location-based. In the case of Kartonpack, the energy provider specific emission factor was available at the time of the calculation. For this reason, the calculation was done with the use of the energy provider specific emission factor.

2. Table Market-based and Location-based emission from electricity use by Kartonpack in 2022.

	Market-based	Location-based
Electricity emissions	290.88 t CO₂ eq	180.19 t CO₂ eq

4.4. Biogenic emissions

The source of biogenic emissions is the electricity purchased by the company (under the assumption that the Hungarian grid contains bioenergy) and the fuels used in company vehicles (under the assumption that it is an average biofuel blend based on DBEIS).

Biogenic emissions from the operations of Kartonpack are **2.03 t CO₂ eq**.

3. Table Scope 1&2 biogenic emissions by Kartonpack in 2022.

Scopes and categories	Biogen tonne of CO ₂
Direct biogenic CO ₂ emissions from owned/managed activities	1.41
Indirect biogenic CO ₂ emissions from purchased electricity, steam, heating and cooling	0.62

5. Annexes

5.1. Key data, descriptive information (as required by the Greenhouse Gas Protocol)

Type of information	Information
The name of the company	Kartonpack Zrt.
A brief introduction to the company	<p>Kartonpack Zrt. is a producer of paper-based packaging material in Hungary, focusing on printed folding cartons. Kartonpack's technical equipment and experienced staff enable the company to meet the highest requirements of their clients.</p> <p>The pharmaceutical industry holds a key-position amongst their client base. Due to Kartonpack's comprehensive development programme of recent years, the company possesses the latest technology in every field of the production process. In addition to printing, cutting and gluing activities, the company also provides other value-adding services (stamping of hologram- or coloured foil, Braille, embossing, etc.).</p>
The consolidation approach chosen	Operational control
Description of the business lines and activities within the organisational boundaries of the company	This carbon footprint covers all activities of Kartonpack Zrt. except the minimal energy need of one site which is out of use (it has minimal energy need which is negligible: less than 1% of the energy need of the production site at Galamb street 11.)
The reporting period	2022.01.01.-2022.12.31.
List of Scope 3 activities included in the report	Not included. Kartonpack plans to calculate its Scope 3 emissions in the near future.
List of Scope 1, 2 and 3 activities not included in the report or calculation, together with the reasons for their exclusion.	Scope 3 is not included due to available resources. Kartonpack plans to calculate its Scope 3 emissions in the near future.

Type of information	Information
<p>The year chosen as the base year and the justification for the choice of the base year</p>	<p>The base year chosen is 2022 as:</p> <ol style="list-style-type: none"> 1) This is the first year, when Scope 1&2 carbon emissions are calculated. 2) This is the most recent year for the target setting procedure as well (Kartonpack aims to set a near-term Science-Based Target based on the Scope 1&2 emission calculation).
<p>Once the base year is defined, the emissions recalculation policy for the selected base year. If the base year emissions have been recalculated, a description of the background of the significant emission changes that triggered the recalculation</p>	<p>Kartonpack's base year emissions recalculation policy includes a significance threshold of 5% in accordance with SBTi recalculation criteria.</p>

5.2. Description of methods and data used

Scope	Methods used to calculate or measure emissions, with reference to the calculation tools used
Scope 1	Scope 1 emissions include energy sources (natural gas) burned on site at the Kartonpack site, vehicles owned and operated by the company, material handling on site and refrigerants leaked. The amount of natural gas burnt is broken down by month, while the consumption of vehicles and climate leaks are aggregated for the whole year 2022. Sources for emission factors are the National Inventory Report (Hungary), and DBEIS databases.
Scope 2	The Scope 2 emissions activity data (primary data) includes the electricity purchased by Kartonpack, which is read from meters. The location-based emission factor is a field factor based on the International Energy Agency (IEA) Hungarian energy mix. The market-based emission factor is the emission factor provided by the electricity service provider.

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