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Greenhouse Gas Inventory 2023

13 May 2024

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Introduction & descriptive information

1. Introduction

Royal LC Packaging International BV (LC Packaging) has made a public commitment to set a science-based target aligned with the target-setting criteria defined by the Science Based Targets initiative (SBTi). In November 2023, its science based emission reduction targets were validates by the SBTi. With this commitment, LC Packaging has raised its ambition to reduce the emissions from its value chain in line with a 1.5°C pathway.

In this report the GHG inventory (scope 1, 2, 3) in line with the Greenhouse Gas Protocol (GHG Protocol) for the year 2023 is presented. The calculations are based on the Greenhouse Gas Protocol Corporate Value Chain Accounting and Reporting Standard. The Scope 3 emissions are calculated in accordance with the guidelines of the GHG Protocol Standard including at least the "minimum boundaries"

2. Descriptive information

LC Packaging is a family owned company that has been active in the packaging industry for four generations. The company is specialised in high quality flexible packaging solutions for safe, reliable and protective transportation of (dry) bulk goods. LC Packaging is specialised in FIBCs (big bags), cardboard, jute, net bags and WPP packaging for virtually every industry. The company is both manufacturer and distributor, with own production facilities for FIBCs and a solid network of about 80 production partners, of which 15 are considered key production partners, representing over 80% of procurement spend. LC Packaging has 21 offices, 3 production facilities and many warehouses in 15 countries in Africa, Asia and Europe. In 2022, the company launched its 2030 Ambition, in which it has set itself three ambitious goals with which it aims to make an important contribution to combating working poverty, waste and pollution and climate change.

In terms of combatting climate change, LC Packaging aims to reduce its direct and indirect emissions from the full value chain (Scope 1, 2 and 3) by 50% by 2030, compared to baseline year 2021. Intertwined with this goal, is the goal to have at least 80% of its turnover to come from packaging that delivers the circular economy.

Descriptive information	Company response
Company name	LC Packaging International BV
Contact information	Lotte Mastwijk (lmastwijk@lcpackaging.com) Head of Sustainability
Description of the company	LC Packaging is a family owned company, specialised in high quality flexible packaging solutions for safe, reliable and protective transportation of (dry) bulk goods.
Chosen consolidation approach	Operational control
The reporting period covered	2023
The year chosen as base year and rationale for choosing the base year	2021 2021 is chosen because this is the most recent year for which the scope 1, 2 and 3 Greenhouse Gas inventory is available.
Once a base year has been established, the chosen base year emissions recalculation policy. If base year emissions have been recalculated, the context for any significant emissions changes that triggered the recalculation.	**The following base year recalculations are already envisaged:** › Scope 3 category 12 End of life of sold products: calculations are based on statistics of end-of-life treatment of materials per region. LC Packaging intends to send out a survey to customers to get a better understanding of where products end up and what happens to them at end-of-life. **The following policies are in place** › Organic growth: in line with the GHG protocol, organic growth will not trigger a base year recalculation. › Structural changes: in case of acquisitions, divestitures, or mergers, a base year recalculation will be triggered. In case of an acquisition, historic emissions will be calculated and/or estimated and added to the company's base year. › Changes in calculation methods: changes such as updated emission factors, improved data access, updated calculation methods or protocols may require a base year recalculation. › Discovery of significant errors, or a number of cumulative errors that together are significant may require a base year recalculation. **Significance threshold** › The GHG protocol does not specify a threshold that requires recalculation. › In order to avoid constant recalculation, base year recalculation will only be required if cumulative effects of circumstances are 5% or greater of base year emissions. › However, recalculation may be performed at LC Packaging's discretion if changes represent less than 5% of base year emissions.

Descriptive information	Company response
Description of the businesses and operations included in the company's organizational boundary	LC Packaging has offices, warehouses, and production locations in 15 countries in Europe, Africa, Asia and North America. All these are accounted for under operational control. They are: › **Offices & warehouses** LC Packaging International LC Packaging Global LC Packaging Belgium LC Embalajes Ibérica LC Packaging Netherlands LC Packaging Ireland LC Packaging UK LC Packaging GmbH LC Packaging France LC Packaging Hungary LC Packaging Romania LC Packaging Nordic LC Packaging Africa LC Packaging West Africa LC Packaging South Africa Hagens Verpakkingen B.V. Karl Weiterer Sack- und Planenfabrik GmbH LC Packaging US › **Production locations** LC Shankar ltd Dutch-Bangla Pack ltd WorldBag B.V.

Descriptive information	Company response
A list of scope 3 activities included in the report	› **Category 1:** Purchased goods and services › **Category 2**: Capital goods › **Category 3:** Fuel- and energy-related activities (not included in scope 1 or scope 2) › **Category 4:** Upstream transportation and distribution › **Category 5:** Waste generated in operations › **Category 6:** Business travel › **Category 7:** Employee commuting › **Category 12:** End-of-life treatment of sold products › **Category 13:** Downstream leased assets

Descriptive information	Company response
A list of scope 1, scope 2, and scope 3 activities excluded from the report with justification for their exclusion	**Scope 1 & 2:** US office. Since the US office is new and really small, they weren't able to deliver data for 2023. We will include them in 2024. **Category 8:** Upstream leased assets LC Packaging doesn't have upstream leased assets **Category 9:** Downstream transportation and distribution LC Packaging sells packaging to clients around the world. These packaging's primary use is to transport and store products. LC Packaging mostly sells to producers and distributers. This means that LC Packaging is not in a position to gather reliable data to estimate downstream transportation and distribution. Note that transport to LC Packaging's clients is included in Category 4: Upstream transportation and distribution as LC Packaging pays for this transport. **Category 10:** Processing of sold products LC Packaging does not sell intermediate products that require further processing, transformation, or inclusion in another product before use. **Category 11:** Use of sold products LC Packaging's products don't emit GHG emissions in use. **Category 14:** Franchises LC Packaging doesn't have franchises. **Category 15:** Investments In 2023 LC Packaging was 50% shareholder of Bluepack. No information was available this year. Next year LC Packaging will be 100% owner and Bluepack will be included in the organisational boundaries.

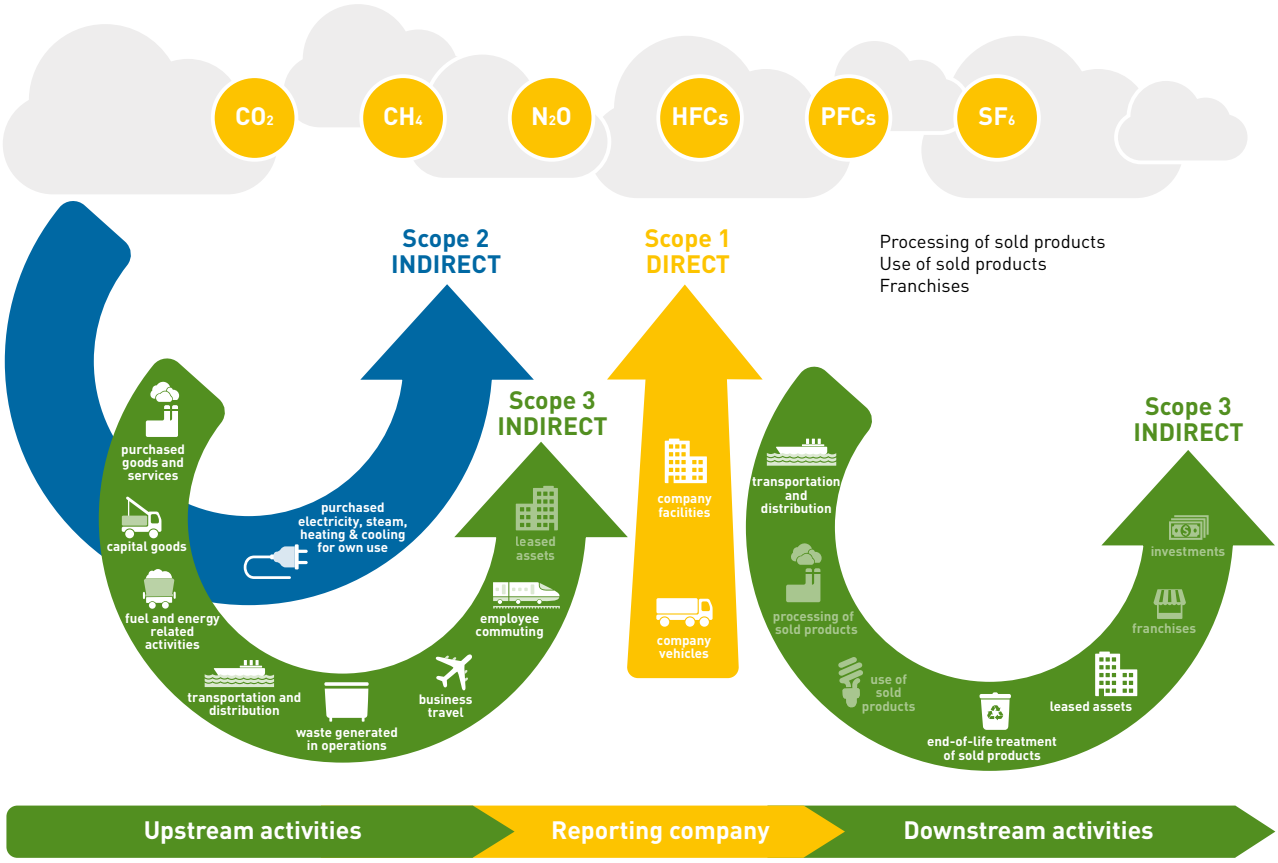
Greenhouse Gas Inventory 2023

In accordance with the Greenhouse Gas Protocol (GHG Protocol)

Total Gross GHG emissions	Total GHG emissions per net turnover	Gross Scope 1 GHG emissions	Gross Scope 2 GHG emissions (market based)	Gross Scope 3 GHG emissions
275,886 MT CO_2e	0.0013 MT CO_2e	5,511 MT CO_2e	4,617 MT CO_2e	265,757 MT CO_2e

Scope	Category	MT CO_2e	% of total emissions	Progress compared to 2021 (%)
Scope 1 (Direct emissions)	Fuel use and refrigerants in activities	4,889	1.8%	-12%
	Vehicles (leased and company owned)	623	0.2%	-9%
Scope 2 (indirect emissions)	Purchased electricity for own use	4,617	1.7%	+33%
Scope 3 (indirect emissions)	Purchased goods and services	209,111	75.8%	-20%
	Capital goods	931	0.3%	-37%
	Fuel and energy related activities	987	0.4%	-19%
	Upstream transportation and distribution	7,258	2.6%	-11%
	Waste generated in operations	98	0.04%	+21%
	Business travel	222	0.1%	+134%
	Employee commuting	269	0.1%	+6%
	End-of-life treatment of sold products	46,706	16.9%	-28%
	Downstream leased assets	175	0.1%	-3%
	Total	275,886	100%	-21%

Overview GHG Protocol scopes and emissions across the value chain



Explanation: The calculations for the 2023 GHG Inventory are based on the Greenhouse Gas Protocol Corporate Value Chain Accounting and Reporting Standard. The Scope 3 emissions are calculated in accordance with the guidelines of the GHG Protocol Standard, including at least the "minimum boundaries".

3 Greenhouse gas emissions data

Scope 1, 2, 3 combined: 275,886 metric tons CO_2e
Scope 3: 265,757 metric tons CO_2e (96.3%)

Scopes and categories	Metric tons CO_2e	Percentage
Scope 1: Direct emissions from owned/controlled operations	5,511	2.0%
Scope 2 market-based: Indirect emissions from the use of purchased electricity, steam, heating, and cooling	4,617	1.7%
Upstream scope 3 emissions		
Category 1: Purchased goods and services › Product-related › Other	 207,760 1,350	75.8%
Category 2: Capital goods	931	0.3%
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)	987	0.4%
Category 4: Upstream transportation and distribution	7,258	2.6%
Category 5: Waste generated in operations	98	0.0%
Category 6: Business travel	222	0.1%
Category 7: Employee commuting	269	0.1%
Downstream scope 3 emissions		
Category 12: End-of-life treatment of sold products	46,706	16.7%
Category 13: Downstream leased assets	175	0.1%

3.1 Part 2: Greenhouse gas emissions data (continued)

Greenhouse gas emissions	CO_2		CH_4		N_2O		HFCs		PFCs		SF_6	
	Metric tons CO_2	Metric tons CO_2e	Metric tons CH_4	Metric tons CO_2e	Metric tons N_2O	Metric tons CO_2e	Metric tons of each HFC	Metric tons CO_2e	Metric tons of each PFC	Metric tons CO_2e	Metric tons SF_6	Metric tons CO_2e
Scope 1	5,297	5,297	0.28	8	0.03	8	R410A: 0.0255 R22: 0.073 R143A: 0.062	198	n/a	n/a	n/a	n/a
Scope 2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

4 Part 3: Biogenic CO_2 emissions data (if applicable)

Scopes and categories	Metric tons biogenic CO_2
Direct biogenic CO_2 emissions from owned/controlled operations	28
Indirect biogenic CO_2 emissions from the use of purchased electricity, steam, heating, and cooling	unknown
Indirect biogenic CO_2 emissions - Upstream	
Purchased goods and services	-4,790
Capital goods	unknown
Fuel- and energy-related activities (not included in scope 1 or scope 2)	unknown
Upstream transportation and distribution	unknown
Waste generated in operations	92
Business travel	unknown
Employee commuting	unknown
Upstream leased assets	unknown
Indirect biogenic CO_2 emissions - Downstream	
End-of-life treatment of sold products	1,379
Downstream leased assets	unknown
Investments	unknown

Biogenic CO_2 is considered for the following categories:

- Scope 1: burning of forecourt fuels that contain small amounts of biofuels, based on BEIS.
- Scope 3: Purchased goods and services and end-of-life: for the product group jute biogenic carbon is calculated both in purchased goods and services and for end-of-life treatment of sold products. Biogenic carbon for cardboard is not considered in line with the product carbon footprints performed by LC Packaging.
- Scope 3: Waste generated in operations.

5 Description of methodologies and data used

	Description of the types and sources of data used to calculate emissions	Description of the methodologies, allocation methods, and assumptions used to calculate emissions
Scope 1 Company facilities & company vehicles	**Activity data (primary data)** Activity data (primary data) Data on fuel and refrigerant use were gathered from LC Packaging's offices, warehouses & production facilities. If fuels for company owned vehicles was not known, the sites provided kilometres driven, type of fuel and size of vehicle (unknown, small, medium or large). **Emissions factors (secondary data)** › UK's Department for Business, Energy & Industrial Strategy (BEIS, 2023)	Scope 1 is calculated for all locations individually. It includes refilled refrigerants, fuels used (stationary combustion), company owned cars (mobile combustion) and forklifts, vans, or trucks (mobile combustion). The amounts of fuel and refrigerants were multiplied with the respective emission factors. Only refilled refrigerants were calculated. It is assumed that EU+UK uses biofuels as specified in BEIS 2023. For other countries it is assumed pure mineral fuels were used.
Description of the data quality of reported emissions		Good
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		0%

	Description of the types and sources of data used to calculate emissions	Description of the methodologies, allocation methods, and assumptions used to calculate emissions
Scope 2 Purchased electricity, steam, heating & cooling for own use	**Activity data (primary data)** Data on electricity use and electric vehicles charging was gathered from LC Packaging's offices, warehouses & production facilities. **Emissions factors (secondary data)** **Location-based:** › for Europe and UK AIB Production Mixes 2022, and Ecoinvent 3.10 for rest of world. **Market-based:** › Supplier-specific emission factors where available. If not available, for EU AIB Residual mixed 2022 and Ecoinvent 3.10 for rest of world	Scope 2 is calculated for all locations individually. The amount of electricity used by buildings and electric vehicles in 2023 was multiplied with either location-based emission factors or market-based emission factors. Totals reported are market-based No steam, heating or cooling for own use was reported by any site.
Description of the data quality of reported emissions		Good
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		29%

Category 1 Purchased goods and services	**Activity data (primary data)** Calculations are based kilograms and composition of purchased goods. Non-product emissions were calculated based on procurement spend. **Emissions factors (secondary data)** a) Purchased goods: emissions factors were used from Ecoinvent 3.10. Where available, supplier specific emission factors were used. b) For procurement spend the Exiobase 3.8.2 was used.	LC Packaging sells both products that are made in their own production locations and by suppliers. Emissions for purchased products were calculated following the Product Carbon Footprints (PCF) performed by LC Packaging for all mayor product groups. Emissions from raw materials are calculated based on sold volume and material constitution data from PCFs. For all key suppliers (covering 86% of procurement by weight), energy use data and direct emissions were collected for 2023. Data gaps were filled by average data. Results were extrapolated to cover procurement by non-key suppliers. For additional procurement not covered by PCFs, emission factors from Ecoinvent 3.10 were used. Emissions from non-product related procurement was calculated using the spend-based method.
Description of the data quality of reported emissions		Good
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		21%

	Description of the types and sources of data used to calculate emissions	Description of the methodologies, allocation methods, and assumptions used to calculate emissions
Category 2 Capital goods	**Activity data (primary data)** Monetary purchasing volumes of capital goods purchased in 2023 **Emissions factors (secondary data)** › Exiobase 3.8.2	Each type of procurement of capital goods was assigned a corresponding Exiobase category. The amount of spending was then multiplied by the respective GHG conversion factor.
Description of the data quality of reported emissions		Fair
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		0%

Category 3 Fuel and energy related activities	**Activity data (primary data)** Data on energy use were gathered from LC Packaging's offices, warehouses & production facilities. **Emissions factors (secondary data)** › fuels: BEIS 2023 › electricity: TTW emissions are estimated for AIB residual mixes using data from CE Delft	GHG emissions from the extraction, production, and transportation of fossil fuels and electricity were determined by multiplying the amount of purchased energy by the WTT emission factor. Transmission and distribution losses for electricity acquired are already included in scope 2. Generation of electricity and steam that is sold to end users is not applicable.
Description of the data quality of reported emissions		Good
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		0%

Category 4 Upstream transportation and distribution	**Activity data (primary data)** a) Distance and trade lane for sea container transport b) Weight and distance for truck shipments. c) Supplier reported CO_2e emissions. d) Air transport data **Emissions factors (secondary data)** › BEIS 2023 › Ecoinvent › GLEC Framework impact factors for sea transport	LC Packaging products are shipped by container ship and by truck. Truck transport producer to harbour: tonne.km was multiplied by an impact factor from Ecoinvent. Sea container transport teu.mk were multiplied with emissions factors from the GLEC Framework. Truck transport affiliates: All affiliates work with specific suppliers for truck transport. Where available, supplier reported CO_2e emissions were used. Where these were not available, a survey was used to determine type of truck and tonne.km. GHG emissions were calculated by multiplying tkm with BEIS 2023 emissions factors.
Description of the data quality of reported emissions		Good
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		15%

	Description of the types and sources of data used to calculate emissions	Description of the methodologies, allocation methods, and assumptions used to calculate emissions
Category 5 Waste generated in operations	**Activity data (primary data)** The types of waste and the disposal methods were reported by LC Packaging's offices, warehouses & production facilities. **Emissions factors (secondary data)** › Ecoinvent 3.10	The GHG emissions from waste incineration and landfill were selected from Ecoinvent 3.10. Emissions associated with recovery are added for the following waste materials: › Paper › Metal For the use of recycled plastic in LC Packaging's products cradle-to-gate emission factors are used that include collection & sorting. This is reflected in scope 3, category 1. To avoid double counting, we excluded collection & sorting for recycled polypropylene. The GHG emissions of on-site recycling of polypropylene at production facilities are already included in scope 1 & 2.
Description of the data quality of reported emissions		Good
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		0%

Category 6 Business travel	**Activity data (primary data)** a) Overview of flights b) For other business travel, spend was used. **Emissions factors (secondary data)** › BEIS 2023 › For spend the 2019 Exiobase database was used.	Each type of business travel expense was assigned a corresponding Exiobase category. The amount of spending was then multiplied by the respective GHG conversion factor. Flight emissions were calculated by multiplying the distances and flight class with the corresponding emission factors from BEIS 2023.
Description of the data quality of reported emissions		Good
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		0%

Category 7 Employee commuting	**Activity data (primary data)** Activity data (primary data) The distances, transport mode and travel days of employees were reported by LC Packaging's offices, warehouses & production facilities. **Emissions factors (secondary data)** › BEIS, 2023	GHG emissions were calculated by multiplying the travelled distance (216 days per year, back and forth) with the respective GHG conversion factor.
Description of the data quality of reported emissions		Good
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		0%

	Description of the types and sources of data used to calculate emissions	Description of the methodologies, allocation methods, and assumptions used to calculate emissions
Category 12 End-of-Life treatment of sold products	**Activity data (primary data)** Quantity and material constitution of products sold in 2023 and the percentage of sales in different regions (EU, Africa). The ratio of the different waste disposal methods (incineration, landfill, recycling) in each region was derived from data on waste treatment provided by OECD (Global Plastics Outlook, 2022), Eurostat (Recycling rate of paper by type of packaging) and Ecoinvent (waste treatment for biowaste). **Emissions factors (secondary data)** › Ecoinvent 3.10	Emissions were calculated assuming that the products would be disposed of in the regions to which LC Packaging sold them. Emissions were calculated separately for each region, material, and end-of-life method. For recycling, sorting is included as end-of-life treatment. An exemption is recycled plastic, since for the use of recycled plastic in LC Packaging's products cradle-to-gate emission factors are used that include collection & sorting. This is reflected in scope 3, category 1. To avoid double counting, we excluded collection & sorting for recycled polypropylene.
Description of the data quality of reported emissions		Fair
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		0%

Category 13 Upstream leased assets	**Activity data (primary data)** LC Packaging leases cardboard erecting machines. Electricity use was calculated based on the power of the machine and the time it was in use as specified by the lessees. **Emissions factors (secondary data)** Electricity Location-based › Europe: AIB European Residual Mixes 2022	The amount of electricity used in 2023 was multiplied with location-based emission factors.
Description of the data quality of reported emissions		Good
Percentage of emissions calculated using data obtained from suppliers or other value chain partners		0%

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