Inventory of greenhouse gas emissions

Inventory year: 2023

Karina Plásticos Ltda

Trade name: Karina Plásticos
CNPJ: 51.254.159/0001-73
Economic sector: Manufacturing
Sub-sector: Chemical manufacturing
Address: Avenida Paquistão, 788 - Jardim Cumbica - Guarulhos - 07240-130
Responsible for publishing the inventory:
Flávia Cristina Ferreira Lopes (flavia.lopes@karina.com.br)
Institutional information:
Karina is one of the leading experts in the production of compounds in the global market. A pioneer in the country and a reference in its segment for more than 40 years, it excels at finding technological solutions that meet the needs of its customers.

Its products and infrastructure comply with the most stringent national and international standards and legislation governing the production of PVC Compounds, Polyolefin Specialties, Masterbatch and Compostable Bioplastics.

We are leaders in the Brazilian market for PVC compounds, we have high production capacity, state-of-the-art technological laboratory and we serve customers in the Brazilian and international markets. We are committed to innovation, sustainability and new product development.

Inventory data

Responsible for preparing the inventory

Flávia Cristina Ferreira Lopes

E-mail of the person responsible

flavia.lopes@karina.com.br

Inventory Year

2023

Verification

The inventory was verified by a third party: Yes

Verifying body: BVQI do Brasil Sociedade Certificadora Ltda

Person responsible for verification: Adriano Angelotti (adangelotti@gmail.com)

Inventory type: Complete

1. Inventory limits

Organizational limits

Below is a list of the organization's units and controlled companies included in this inventory. Detailed reporting of emissions from units that have scope 1 emissions equal to or greater than 10,000 tCO2e per year is mandatory. Reporting the emissions of other units, as well as those of subsidiaries, is optional. Emissions detailed by unit can be found in Section 2.7 - Emissions by operating units

Key

Headquarters (H) Controlled Company (C) Unit (U)

[Do the headquarters have operational control? | % of equity interest in the headquarters]

- (H) Karina Plásticos
  - (U) Karina Joinville [No | 100.00%]
  - (U) Karina Nova Serrana [Yes | 100.00%]
  - (U) Karina Extreme [No | 100.00%]

1.1 Which consolidation approach was used in the inventory?

Reporting of emissions under the Operational Control approach.

1.2 Organizational chart

Operational Limits

1.3 Operational limits reported in inventory

Scope 1
Stationary combustion
Mobile combustion
Fugitive emissions
Industrial processes
Solid waste and liquid effluents

Scope 2 - Location-based approach
Acquisition of electricity

Scope 2 - Purchase-based approach
Acquisition of electricity

Scope 3
1. Purchased Goods and Services
10. Processing of products sold
4. Transportation and distribution (upstream)
5. Waste generated in operations
6. Business travel
7. Employee emissions (home-work)
9. Transportation and distribution (downstream)

2. Emissions

Operational Control

2.1 Summary of total emissions

GHG	In tons of gas				In tons of CO_2 equivalent (tCO_2e)			
	Scope 1	Scope 2 - Location-based approach	Scope 2 - Purchase-based approach	Scope 3	Scope 1	Scope 2 - Location-based approach	Scope 2 - Purchase-based approach	Scope 3
CO_2	758.899	3,563.496	0.000	457,889.046	758.899	3,563.496	0.000	457,889.046
CH_4	0.350	0.000	0.000	6.454	9.800	0.000	0.000	180.712
N_2O	0.086	0.000	0.000	2.679	22.790	0.000	0.000	709.935
HFC	0.085	0.000	0.000	0.000	156.749	0.000	0.000	0.000
PFC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SF_6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NF_3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total					**948.238**	**3,563.496**	**0.000**	**458,779.693**

2.2 Scope 1 emissions disaggregated by category

Category	Emissions (tCO_2e)	Biogenic CO_2 emissions (t)	Biogenic CO_2 removals (t)
Mobile combustion	772.070	147.500	0.000
Stationary combustion	4.838	0.480	0.000
Industrial processes	0.300	0.000	0.000
Solid waste and liquid effluents	10.270	0.000	0.000
Fugitive emissions	157.331	0.000	0.000
Total	**944.809**	**147.980**	**0.000**

2.3 Scope 2 emissions disaggregated by category

Location-based approach

Category	Emissions (tCO_2e)	Biogenic CO_2 emissions (t)	Biogenic CO_2 removals (t)
Acquisition of electricity	3,563.436	0.000	0.000
Total	**3,563.436**	**0.000**	**0.000**

Purchase-based approach

Category	Emissions (tCO_2e)	Biogenic CO_2 emissions (t)	Biogenic CO_2 removals (t)
Acquisition of electricity	0.000	0.000	0.000
Total	**0.000**	**0.000**	**0.000**

2.4 Scope 3 emissions disaggregated by category

Category	Emissions (tCO_2e)	Biogenic CO_2 emissions (t)	Biogenic CO_2 removals (t)
1. Purchased Goods and Services	395,159.054	0.000	0.000
4. Transportation and distribution (upstream)	20,703.123	2,043.450	0.000
5. Waste generated in operations	101.628	26.304	0.000
6. Business travel	368.219	10.918	0.000
7. Employee emissions (home-work)	987.549	213.615	0.000
9. Transportation and distribution (downstream)	28,432.727	2,783.739	0.000
10. Processing of products sold	13,027.157	0.000	0.000
Total	**458,779.457**	**5,078.026**	**0.000**

2.5 Other greenhouse gases not covered by the Kyoto Protocol

Gas	Emission ($tCO_2 e$)
HCFC-22 (R22)	191.805

2.6 Emissions outside Brazil

Not reported

2.7 Emissions per unit

Not reported

3. Methods

3.1 Cross-sectoral method and/or tools

Was any intersectoral methodology and/ or tool used in addition to those provided by the Brazilian GHG Protocol Program?

None.

3.2 Method and/or tools for specific industries

Was any methodology and/ or tool used for specific sectors?

Specific method	Reference	Applied emission source
Energy consumption by processing the products sold	PE Europe (2004) Life Cycle Assessment of PVC and of principal competing materials, Commissioned by the European Commission LEED Technical & Scientific Advisory Committee (TSAC) PVC Task Group (2007) Assessment of the Technical Basis for a PVC-Related Materials Credit for LEED, US Green Building Council.	Scope 3, Category 10 - Processing of products sold

3.3 Emission factors

Was any emission factor other than those suggested by the Brazilian GHG Protocol Program used?

Emission factor	Reference	Applied emission source
Carbon Footprint Emission Factors	Suppliers and Ecoinvent®	Scope 3, Category 1 - Purchased Goods and Services

4. Other Elements

Optional fields

4.1 Information on the organization's performance, compared to internal benchmarks (e.g. other units) or external benchmarks (e.g. organizations in the same sector).

In 2023, Karina's greenhouse gas (GHG) emissions intensity was 0.003 tons of carbon dioxide equivalent per ton produced (tCO2e/t). Compared to the figures for 2022, this figure indicates a reduction of 76%, mainly influenced by the use of electricity exclusively from renewable sources in operations.

In the 2024 Cycle, we revised our criteria for accounting for the intensity of GHG emissions per ton produced, so the GHG intensities calculated for the years 2020, 2021 and 2022 are, respectively, 0.025, 0.046 and 0.013 tCO2e/t.

4.2 Description of GHG emission indicators for the organization's activities. For example, tCO2e/manufactured products.

Karina Plásticos uses the following indicators to monitor its emissions:
• tCO2e per total ton produced, considering scopes 1 and 2 (based on the purchase choice);
• Scopes 1, 2, and 3 at their absolute tCO2e values.

4.3 Description of strategies and projects for the management of GHG emissions.

Aware of the impact it has on the plastics industry, society and the environment, Karina Plásticos, as a leader and pioneer in developments in the thermoplastic market, seeks to implement actions that contribute to reducing environmental impacts. For us, respecting the environment and creating sustainable alternatives for our production process, in addition to raising awareness among our employees, are fundamental goals. These actions are not only focused on the present, but aim to positively impact the future.

This is how we introduced the "Environmental" theme, symbolized by the EKO logo, to highlight the initiatives we are developing. In line with the established goals, we adopted the following measures:

- We contracted and operated in 2023 with 100% energy from renewable sources.
- We completed the acquisition of the electric forklifts planned for 2023, still maintaining few units due to increased demand, representing approximately 10% of the current total.
- Replacement of internal cargo transports previously fueled with Diesel, with electric vehicles. Our defined

goals are to:

- Achieve carbon neutrality by 2030 in scopes 1 and 2 (Based on purchase choice).
- Operate with 100% renewable energy by 2025 (Goal achieved in 2023).
- Eliminate the consumption of LPG by 2025.

4.4 Information on contracts with customers and suppliers that include clauses linked to the preparation of

GHG inventories and/or the submission of related information.

Currently, there is no contractual clause with our customers and/or suppliers that requests the submission of the GHG Inventory.

4.5 Information on uncertainties, exclusions of data sources and other characteristics of inventory preparation.

The calculation of uncertainties performed for Karina's scope 1 and scope 2 emissions indicate rates below 4%. Karina's industrial process is predominantly mechanical in nature, involving only the emission of some moisture volatiles from the raw material, in such a way that they exert an irrelevant influence on monitoring.

4.6 Description of internal actions to improve the quality of the GHG inventory. For example, systematization of data collection, contracting external verification, etc.

In 2023, several actions contributed to the progress in improving the quality of the GHG inventory, among them, we highlight the following points:

- Optimization of the data collection system and accounting for emissions, reducing the deadline for implementation by 3 months.
- Improved integration of inventory data.
- Expansion of the inventory realization working group.
- Improvement in internal communication for data acquisition.
- Improved data accuracy for Categories 1, 4, 6, 7, 9, and 10 of Scope 3.

4.7 Information on the purchase of electricity from renewable sources.

Quantity in MWh	Generation Source	Origin tracking instrument	Additional information	Public information
97,846.016	Hydraulics	Bilateral contracts		No

4.8 Information on the self-production of energy from renewable sources for own consumption.

Not reported

4.9 Information on the carbon stock, in tons, of your organization as of December 31 of the inventoried year.

Not reported

5. Offsets and Reductions

Optional fields

5.1 Emissions offsets

Does the organization have emission offset projects?

Not reported

5.2 Emission reductions

Does the organization have emission reduction projects?

Not reported

APPENDIX A

Declaration of Verification of greenhouse gas emissions inventory
Brazilian GHG Protocol Program

This **Declaration of Verification**[1] documents that the Verification Body (VB) mentioned below carried out the verification activities in accordance with the Verification Specifications of the Brazilian GHG Protocol Program and the ABNT NBR ISO 14064-3:2007 standard.

All fields are mandatory.

Verification Body (VB)	Inventory Organization (IO)
Name of the VB: BUREAU VERITAS CERTIFICATION	Name of the IO: KARINA PLÁSTICOS LTDA
Name of the lead verifier: ADRIANO ANGELOTTI	Name of the person responsible for the inventory: FLÁVIA CRISTINA FERREIRA LOPES
E-mail: adangelotti@gmail.com	E-mail: flav ia.lopes@karina.com .br

The emissions of greenhouse gases (GHG) reported by the Inventory Organization and in its emissions inventory, from January 1 to December 31, 2023, are verifiable and meet the requirements of the Brazilian GHG Protocol Program, determined in the Specifications of the Brazilian GHG Protocol Program for Accounting, Quantification and Publication of Corporate Inventories of Greenhouse Gas Emissions (BPS).

Confidence Level

The Verification Body (VB) assigned the following level of confidence to the verification process:

☒ Verification with **reasonable confidence** level "The inventory organization's greenhouse gas inventory for the year 2023 is materially correct, is a fair representation of GHG data and information, and has been prepared in accordance with the BPS." The limitations of the verification process were:
☐ Verification with **limited confidence** level "There is no evidence that the reporting organization's GHG inventory for the year [year] is not materially correct, is not a fair representation of GHG data and information, and has not been prepared in accordance with the BPS." The limitations of the verification process were:
☐ **Unverifiable** inventory Include reason, for example: "due to data errors" or "does not comply with the BPS":

Verification Scope Description

The inventory for the year 2023 of the inventory organization was verified within the following scope:

Organization limits	Operational limits

[1] This Declaration of Verification template can be reviewed at any time and the updated version will be available on the website of the Brazilian GHG Protocol Program - **www.fgv.br/ghg**

☒ Operational Control ☐ Equity interest	☒ Scope 1 ☒ Scope 2 – location-based approach[2] ☒ Scope 2 – purchase-based approach[2] ☒ Scope 3

☐ The following sources / legal entities / operational units / etc. were excluded from the verification:

Facilities visited

List all locations visited during the verification and the date of each visit.

Name of the location	Relation of the location with the holding	Address	Visit date
KARINA PLÁSTICOS LTDA	Headquarters	Av . ANTRANIG GUEREKMEZIAN 788 – GUARULHOS-SAO PAULO Zip code: 07240-130	05/08/2024
	Headquarters, controlled company or unit visited		
	Headquarters, controlled company or unit visited		
	Headquarters, controlled company or unit visited		
	Headquarters, controlled company or unit visited		
	Headquarters, controlled company or unit visited		
	Headquarters, controlled company or unit visited		
	Headquarters, controlled company or unit visited		
	Headquarters, controlled company or unit visited		

Total verified emissions throughout the organization, according to the Operational Control approach

	GHG emission in tons of CO_2 equivalent (tCO_2e)			
GHG	**Scope 1**	**Scope 2** Location-based	**Scope 2** Purchase-based	**Scope 3** (if applicable)

[2] For more information, see the Technical Note “Recommendations for accounting for scope 2 emissions in corporate greenhouse gas inventories under the Brazilian GHG Protocol Program”.

		approach	approach	
CO_2	758.899	3,563.496	0.00	457,889.046
CH_4	9.800			180.712
N_2O	22.790			709.935
HFCs	156.749			
PFCs				
SF_6				
NF_3				
TOTAL	948.238	3,563.496	0.00	458,779.693
CO_2 biogenic	150.068			5,078.087

Total removals verified throughout the organization, according to the Operational Control approach

	Removal of biogenic CO_2 (tCO_2 e)			
GHG	**Scope 1**	**Scope 2** Location-based approach	**Scope 2** Purchase-based approach	**Scope 3** (if applicable)
CO_2 biogenic	N/A	N/A	N/A	N/A

Total verified issues throughout the organization, according to the Equity Interest approach (if applicable)

	GHG emission in tons of CO_2 equivalent (tCO_2 e)			
GHG	**Scope 1**	**Scope 2** Location-based approach	**Scope 2** Purchase-based approach	**Scope 3** (if applicable)
CO_2				
CH_4				
N_2O				
HFCs				
PFCs				
SF_6				
NF_3				
TOTAL				
Biogenic CO_2				

Total removals verified throughout the organization, according to the Equity Interest approach (if applicable)

	Removal of biogenic CO_2 (tCO_2e)			
GHG	**Scope 1**	**Scope 2** Location-based approach	**Scope 2** Purchase-based approach	**Scope 3** (if applicable)
CO_2 biogenic				

Additional comments

Conflict of Interest (COF) [3]

I, Adriano Angelotti, certify that no conflict of interest exists between the Inventory Organization and the Verification Body, or any of the individuals on the verification team involved in the verification of the inventory, as defined in chapter 3.2.1 of the Verification Specifications of the Brazilian GHG Protocol Program.

Adriano Angelotti, Lead Verifier

05/13/2024
Date

☒ Digital signature recognition[4]

Verifier´s conclusion on GHG emissions inventory[3]

As those responsible for the verification activities of the GHG inventory of the inventory organization, we certify that the information contained in this document is true.

[3] If for some reason the lead verifier cannot sign the declaration on behalf of the Verification Body (due to legal representation issues, for example), then the company's legal representatives can sign/attest on behalf of the company in this field. In this case, it is necessary to change the [lead verifier] field to “Legal Representative”.

[4] By checking the “Digital signature recognition” box, I agree that this declaration of verification shall be deemed “made in writing” and “signed” for all purposes and that any electronic records shall be deemed “made in writing”. I expressly waive any and all rights to deny the legal obligation, validity or enforceability of this declaration of verification and any documents related to it on the basis that they have been prepared and completed electronically.

Adriano Angelotti, Lead Verifier

05/13/2024
Date

☒ Digital signature recognition[4]

Thiago Milagres, Independent reviser and

05/15/2024
Date

☒ Digital signature recognition[4]

Authorization

I, Flávia Cristina Ferreira Lopes, accept the results of this declaration of verification.

[Signature of the representative and IO]

05/15/2024
Date

☒ Digital signature recognition[5]

Revision (if applicable)[6]

Revision number: 1
Justification for the change: Emission

Verification team (optional)

The verification team is made up of the following professionals: Adriano Angelotti - Lead Auditor

[5] By checking the "Digital signature recognition" box, I agree that this declaration of verification shall be deemed "made in writing" and "signed" for all purposes and that any electronic records shall be deemed "made in writing". I expressly waive any and all rights to deny the legal obligation, validity or enforceability of this declaration of verification and any documents related to it on the basis that they have been prepared and completed electronically.

[6] If the Declaration of Verification has to be redone, this field **should** be used to inform the revision number of the document and the justification for the change.