



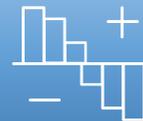
Greenhouse Gas Emissions Inventory 2024



Institutional



Methodology



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Future Actions

Madem

Madem is a Brazilian company with a global presence, specializing in the manufacture of wooden reels and spools for the electrical cable industry. Founded in Garibaldi, Rio Grande do Sul, the company has established itself as a benchmark in the sector, with production units in Brazil, Spain, Bahrain, Mexico, Colombia, and the United States. Its production capacity serves more than 150 clients in over 40 countries.

With a focus on sustainability, Madem uses 100% renewable raw materials from controlled sources. The company holds international certifications such as ISO 9001 and ISO 14001, which reinforce its commitment to quality and sustainability. Furthermore, it continuously invests in technology, innovation, and operational efficiency, ensuring high-performance products aligned with the demands of the world's most competitive markets.

The company values human development and social responsibility, cultivating a solid organizational culture focused on sustainable growth. With over 75 years of history, it continues to expand its global presence and reaffirm its position as a benchmark in its sector.



Our Numbers

7
Production Units

100%
Of the wood used is renewable

1.000
Employees

75
Years of history

Units in
6
countries

Exports to over
45
countries

Methodology

The inventory is prepared based on the concepts, principles, and guidelines established by the GHG Protocol methodology, using its specifications for accounting, quantifying, and publishing Corporate Greenhouse Gas Emissions Inventories.

Equations provided by the Intergovernmental Panel on Climate Change (IPCC) are also used to calculate emissions from specific sources and sinks (CO₂ removals by green areas).

The report structure follows the specifications of ISO 14064:2007 – “Greenhouse Gas Management System” – International Organization for Standardization, 2007.

Emissions Calculation

For the Brazilian units, emission factors published by the Brazilian GHG Protocol Program (PBGHGP) were used through its calculation tool: “ferramenta_ghg_protocol_v2025.0.1”. For the other units, the emission factors specified in the following sources were used: “Emission Factors for Greenhouse Gas Inventories” (EPA, 2025), “UK Government GHG Conversion Factor for Company Reporting” (DEFRA, 2024), Factores de emisión (Gobierno de España, 2024), “Factores de emisión del SIN” (UPME, 2023), Climate Transparency (2022) and Carbon Footprint (2024).

The global warming potential used for the calculations is that published by the IPCC Fifth Assessment Report: Climate Change 2013 (AR5).

Ecofinance Negócios is responsible for calculating GHG emissions and preparing this report. Madem is responsible for the activity data provided for the emissions calculation.

Reporting Period

This inventory covers emissions from activities carried out by Madem in 2024, including all direct emissions (scope 1), emissions from the purchase of electricity (scope 2), and part of the indirect emissions (scope 3), including all projects over which the group has operational control.

Inventory Base Year

The base year for Madem's GHG emissions inventory is 2021, the year in which the group's first GHG emissions inventory was developed.

Organizational Boundaries

Madem's emissions inventory follows the operational control accounting approach provided by the GHG Protocol methodology.

Under the operational control approach, 100% of emissions from business units over which the Group maintains control over the operation are accounted for, regardless of its shareholding in the source.



Operational Boundaries

Madem accounts for all its scope 01 (direct) and scope 02 emissions.

In scope 01, the following sources are considered:

- **Stationary**: Stationary combustion for generation of electricity, steam, heat or power using equipment in a fixed location;
- **Mobile**: Mobile combustion for general transportation of vehicles owned or controlled by the company;
- **Fugitive**: Unintentional releases of substances, such as hydrofluorocarbon (HFC) emissions during the use of refrigeration and air conditioning equipment and CO₂ in fire extinguishers;
- **Wastewater**: From septic tanks present in business units;
- **Agricultural Activities**: timber harvesting in a pine plantation area.

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Operational Boundaries

In scope 02, emissions resulting from the **acquisition of electrical** energy are accounted for.

In scope 03, the following sources are considered:

- **Transportation of raw materials**: Mobile sources used by third parties to transportation of raw materials;
- **Transportation of products**: Mobile sources used by third parties to transportation of products;
- **Wastewater**: Emissions from wastewater treatment outside the organization's boundaries;
- **Waste**: Waste disposed of in landfills, incinerated or composted, in locations not controlled by the company;
- **Air travels**: Air travel undertaken by company employees.

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Operational Boundaries

The inventory also accounts for:

- **Carbon Stock**: Quantity of carbon not available in the atmosphere, being maintained, for example, in biomass above and below ground, in dead organic matter, in organic matter incorporated into the soil in areas controlled by the company.
- **Biogenic Emissions**: CO₂ emissions generated in the combustion of biomass (such as ethanol, biodiesel, wood residues) and in the suppression of planted forests, generating changes in the carbon stock. These emissions are not counted as GHG because they are neutralized in the growth process of the crop that originated the biomass.
- **Biogenic Removal**: Conversions in land use carried out by the company that resulted in an increase in carbon stocks (e.g., reforestation).

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Corporate



Business Units

Emissions by Source (tCO₂e)

Emissions by Unit

Biogenic Emissions (tCO₂e)

Carbon Removal

Carbon Stock

Emissions of GHG

Synthesis 2024

2023 x 2024

Emissions by Source (tCO₂e)

In 2024, the Madem Group totaled **25,916.36 tCO₂e** in GHG emissions.

In **Scope 1**, emissions amounted to **1,957.86 tCO₂e**, representing **7.55%** of the total. Within this scope, **mobile combustion** was responsible for **1,109.88 tCO₂e**, with **552.07 tCO₂e** coming from the use of **diesel oil**, mainly in yard machinery and operational vehicles, and **515.36 tCO₂e** from the **consumption of Liquefied Petroleum Gas (LPG)**, also used in operational vehicles. **Stationary combustion** contributed **823.66 tCO₂e**, mainly resulting from CH₄ and N₂O emissions from the **burning of wood chips in boilers**, which accounted for **809.45 tCO₂e**.

Indirect emissions associated with electricity acquisition, classified under **Scope 2**, totaled **2,966.60 tCO₂e**, which corresponds to **11.45%** of the company's total emissions.

Scope 3, which covers other indirect sources of emissions, was the most significant, representing **81%** of the total. Notable within this scope are emissions from the **transportation of products** carried out by third parties, which totaled **11,956.54 tCO₂e**, and from the transportation of inputs, with **7,754.00 tCO₂e**. Together, these activities accounted for **76.06%** of the Madem Group's total emissions in 2024.

Emission Source	Total Emissions	
	tCO ₂ e	%
Scope 1	1.957,86	7,55%
Mobile Combustion	1.109,88	4,28%
Stationary Combustion	823,66	3,18%
Wastewater	17,09	0,07%
Fugitive Emissions	7,23	0,03%
Scope 2	2.966,60	11,45%
Electricity Purchase	2.966,60	11,45%
Scope 3	20.991,90	81,00%
Transportation of Products	11.956,54	46,14%
Transportation of Raw Materials	7.754,00	29,92%
Waste	1.237,44	4,77%
Wastewater	23,81	0,09%
Air Travels	20,11	0,08%
Total	25.916,36	100%

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Emissions by Source (tCO₂e)**Emissions by Unit**Biogenic Emissions (tCO₂e)

Carbon Removal

Carbon Stock

Emissions of GHG

Synthesis 2024

2023 x 2024

Emissions by Unit (tCO₂e)

Units	Total Emissions (tCO ₂ e)										Total	%
	Scope 1				Scope 2	Scope 3						
	Mobile Combustion	Stationary Combustion	Wastewater	Fugitive Emissions	Electricity Purchase	Transportation of Products	Transportation of Raw Materials	Waste	Wastewater	Air Travels		
Rio Negro	545,46	823,2	15,22	0,63	840,66	5.928,74	950,88	11,28	-	-	9.116,07	35,20%
Madem Gulf	143,41	-	-	1,36	1.022,48	2.479,01	2.950,68	919,28	3,22	-	7.519,43	29,00%
Madem MooreCraft Reels EUA - Tarboro	22,7	-	-	2,61	483,78	2.338,63	1.090,39	43,8	6,02	6,27	3.994,20	15,40%
EuroMadem Espanha	136,48	-	-	-	287,72	538,59	1.719,96	239,61	3,94	5,77	2.932,06	11,30%
Madem MooreCraft Reels EUA - Denton	63,53	-	-	2,61	245,23	563,77	1.042,10	23,4	6,57	6,27	1.953,47	7,50%
Sorocaba	34,54	-	-	-	2,67	106,64	-	-	1,45	-	145,29	0,60%
Madem Carretes de México	24,6	-	-	-	80,55	-	-	-	1,98	-	107,13	0,40%
Florestal Mostardas	102,56	0,46	1,21	0,01	0,58	-	-	-	-	-	104,81	0,40%
Barcarena	32,42	-	-	-	0,85	1,16	-	-	0,29	-	34,72	0,10%
Madem Carretes de Colômbia	4,2	-	-	0,02	2,08	-	-	0,07	0,33	1,8	8,5	0,00%
Garibaldi	-	-	0,65	-	-	-	-	-	-	-	0,65	0,00%
Total	1.109,88	823,66	17,09	7,23	2.966,60	11.956,54	7.754,00	1.237,44	23,81	20,11	25.916,36	100,00%
%	4,28%	3,18%	0,07%	0,03%	11,45%	46,14%	29,92%	4,77%	0,09%	0,08%	100%	

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Emissions by Unit (tCO₂e)

In 2024, Madem's **Rio Negro unit** was responsible for the largest volume of GHG emissions in the group, totaling **9,116.07 tCO₂e**, which corresponds to **35.2%** of total emissions. The main emission source in this unit was the **transportation of products**, classified in Scope 3, which accounted for **5,928.74 tCO₂e**. In Scope 1, emissions from the **burning of wood chips in boilers (stationary combustion)** stood out, totaling **823.20 tCO₂e**.

The second largest contribution came from the **Madem Gulf unit**, with **7,519.43 tCO₂e**, representing **29.0%** of the group's total emissions, and the **transportation of raw materials** was the main source of emissions from the unit, totaling **2,950.68 tCO₂e**.

In third place, the **Madem MooreCraft Reels USA – Tarboro** unit recorded **3,994.20 tCO₂e**. In this unit, the **transportation of products** stood out as the largest source of emissions, accounting for **2,338.63 tCO₂e**.

Emissions by Source (tCO₂e)

Emissions by Unit

Biogenic Emissions (tCO₂e)

Carbon Removal

Carbon Stock

Emissions of GHG

Synthesis 2024

2023 x 2024

Biogenic Emissions (tCO₂e)

Unidades	Biogenic Emissions (tCO ₂ e)							Total	%
	Scope 1			Scope 3					
	Stationary Combustion	Mobile Combustion	Agricultural Activities	Waste	Transportation of Raw Materials	Transportation of Products			
Rio Negro	47.644,14	40,24	37.063,53	0,1	138,3	614,93	85.501,24	38,82%	
Florestal Mostardas	0,12	15,22	134.701,10	-	-	-	134.716,44	61,16%	
Madem MooreCraft Reels EUA - Denton	-	-	-	-	-	-	-	0,00%	
Madem MooreCraft Reels EUA - Tarboro	-	-	-	-	-	-	-	0,00%	
Madem Gulf	-	-	-	9,26	-	-	9,26	0,00%	
EuroMadem Espanha	-	-	-	-	-	-	-	0,00%	
Barcarena	-	0,73	-	-	-	0,17	0,9	0,00%	
Sorocaba	-	1,03	-	-	-	15,51	16,54	0,01%	
Madem Carretes de Colômbia	-	-	-	3,9	-	-	3,9	0,00%	
Garibaldi	-	-	-	-	-	-	-	0,00%	
Madem Carretes de México	-	3,87	-	-	-	-	3,87	0,00%	
Total	47.644,25	61,09	171.764,64	13,26	138,3	630,61	220.252,15	100%	
%	21,63%	0,03%	77,99%	0,01%	0,06%	0,29%	100%		

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[Emissions by Source \(tCO₂e\)](#)

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Biogenic Emissions (tCO₂e)

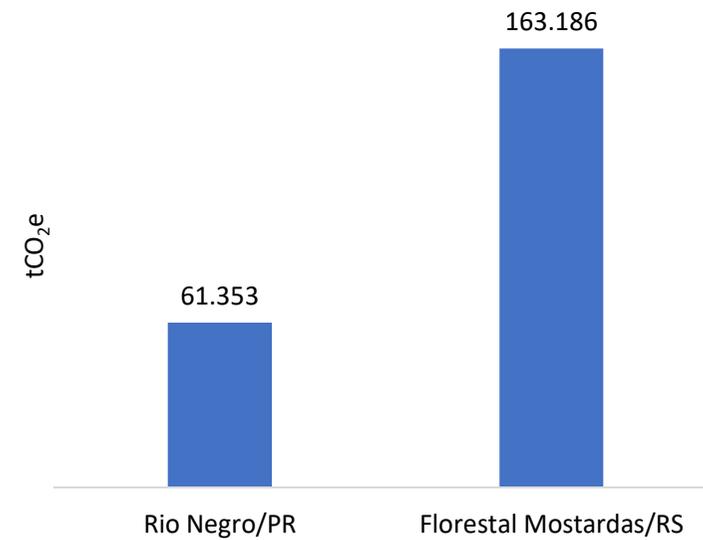
In 2024, **biogenic emissions** from the Madem Group totaled **220,252.15 tCO₂e**, mainly concentrated in **agricultural activities** and **stationary combustion**. The **Mostardas Forestry** unit was responsible for the largest share of these emissions, totaling **134,716.44 tCO₂e** (61.16% of the total).

Agricultural activity, resulting from the harvesting of Pinus spp. in planted forests, was the main source of biogenic emissions, accounting for **171,764.64 tCO₂e**. Of this amount, **134,701.10 tCO₂e** originated from the **Mostardas Forestry** unit, while **37,063.53 tCO₂e** came from the **Rio Negro** unit. **Stationary combustion** represented the second largest source of biogenic emissions, totaling **47,644.25 tCO₂e**, mostly associated with the burning of wood chips in boilers at the Rio Negro unit, which alone emitted **47,644.14 tCO₂e**.

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Carbon Removal (tCO₂e)

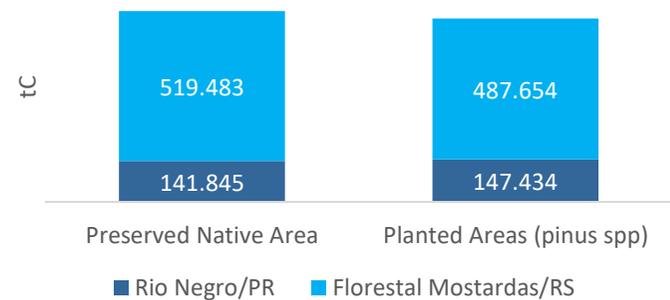
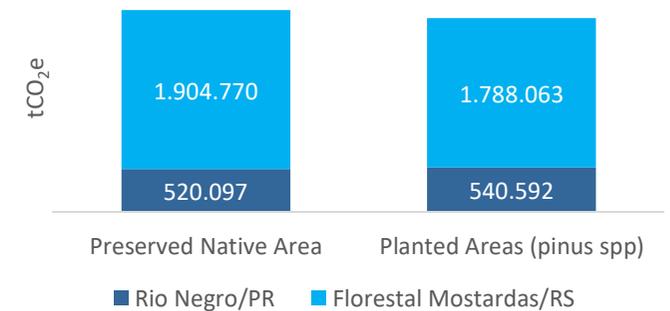
In 2024, the growth of Pinus spp. forests planted by Madem contributed to the removal of 224,539.1 tCO₂ from the atmosphere. The **Mostardas Forestry** unit accounted for **72.7%** of this total, while the **Rio Negro** unit was responsible for the remaining **27.3%**.



Carbon Stock (in tC and tCO₂e)

Madem has a total stock of **1,296,415 tons of carbon (C)** in areas of preserved native forest (51%) and planted areas (49%), which corresponds to **4,753,523 tCO₂e**.

The **Mostardas/RS Forestry** unit concentrates **77.7%** of this stock, covering 3,138.30 hectares of preserved Atlantic Forest and 4,446.08 hectares of planted areas. The **Rio Negro/PR** unit accounts for the remaining **22.3%**, with 1,016.08 hectares of preserved Atlantic Forest and 1,346.15 hectares of planted areas.



Emissions by Source, in tGEE

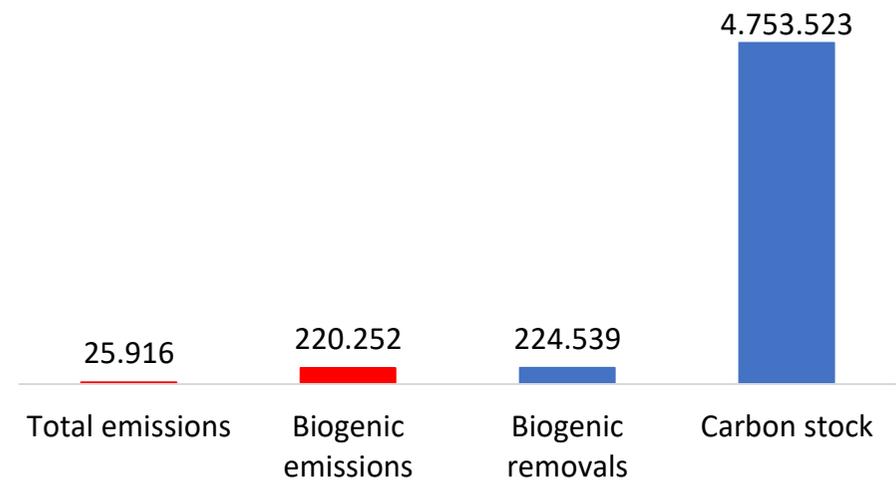
As recommended by the GHG Protocol methodology, the table below presents the emissions in metric tons of each GHG.

Emission Source	Emissions by GHG (metric tons)			
	CO ₂ (t)	CH ₄ (t)	N ₂ O (t)	HFCs (t)
Scope 1	1.103,09	13,77	1,75	0
Mobile Combustion	1.086,87	0,38	0,05	0
Stationary Combustion	14,19	12,78	1,7	0
Fugitive Emissions	2,03	0	0	0,004
Scope 1 – Wastewater	0	0,61	0	0
Scope 2	2.966,60	0	0	0
Electricity Purchase	2.966,60	0	0	0
Scope 3	19.639,98	38,01	1,09	0
Transportation of Products	11.800,64	0,42	0,54	0
Transportation of Raw Materials	7.659,79	0,17	0,34	0
Waste	159,61	36,58	0,2	0
Air Travels	19,94	0	0	0
Wastewater	0	0,85	0	0
Total	23.709,67	51,78	2,84	0,004

Synthesis 2024

In 2024, Madem's Scope 1 and 2 emissions, added to the reported Scope 3 sources, totaled **25,916 tCO₂e**. **Biogenic emissions** reached **220,252 tCO₂e**, while **biogenic removal** from planted forests totaled **224,539 tCO₂e**. Furthermore, the **carbon stock** in the group's native and planted forest areas totaled **4,753,523 tCO₂e**.

Synthesis: emission, removal and stock (tCO₂e)



Emissions by Source (tCO₂e)

Emissions by Unit

Biogenic Emissions (tCO₂e)

Carbon Removal

Carbon Stock

Emissions of GHG

Synthesis 2024

2023x2024

2023 x 2024

Emission Source	Total Emissions				Variation	
	2023		2024		2023x2024	
	tCO ₂ e	%	tCO ₂ e	%	tCO ₂ e	%
Scope 1	2.438,00	10,50%	1.957,90	7,60%	-480,2	-19,70%
Mobile Combustion	922,8	4,00%	1.109,90	4,30%	187,1	20,30%
Stationary Combustion	1.493,70	6,40%	823,7	3,20%	-670,1	-44,90%
Fugitive Emissions	3,8	0,02%	7,2	0,03%	3,4	90,10%
Scope 1 – Wastewater	17,7	0,10%	17,1	0,10%	-0,6	-3,20%
Scope 2	2.031,70	8,70%	2.966,60	11,40%	934,9	46,00%
Electricity Purchase	2.031,70	8,70%	2.966,60	11,40%	934,9	46,00%
Scope 3	18.774,60	80,80%	20.991,90	81,00%	2.217,30	11,80%
Transportation of Raw Materials	5.455,90	23,50%	7.754,00	29,90%	2.298,10	42,10%
Transportation of Products	12.051,40	51,80%	11.956,50	46,10%	-94,9	-0,80%
Wastewater	15,1	0,10%	23,8	0,10%	8,7	57,60%
Waste	1.252,10	5,40%	1.237,40	4,80%	-14,7	-1,20%
Air Travels	0,04	0,00%	20,11	0,08%	20,07	44680,50%
Total	23.244,29	100%	25.916,36	100%	2.672,10	11,50%

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2023 x 2024

Between 2023 and 2024, the Madem Group's total emissions **increased by 2,672.1 tCO₂e**, representing an **11.5%** increase compared to the previous year. This increase was mainly due to the **rise** in emissions in **Scopes 2 and 3**, totaling **46%** and **11.8%**, respectively. In contrast, **Scope 1** recorded a **reduction of 19.7%**.

In absolute terms, the largest variations occurred in emissions related to **transportation of raw materials**, with an increase of **2,298.1 tCO₂e**. The main reason was the expansion of cargo transported by sea, which increased from **25,700 m³ to 43,500 m³**, resulting in an increase in emissions of **1,169.2 tCO₂e**. The units that contributed most to the increase in emissions were Bahrain (+1,163.5 tCO₂e) and the US units (+1,001 tCO₂e).

The second largest contributor to the increase in emissions was **electricity purchase**, which increased by **934.9 tCO₂e**, mainly influenced by the **increase in electricity consumption** in the **US units** (1,104 MWh to 1,914 MWh; an increase of 378.4 tCO₂e) and **Bahrain** (1,397 MWh to 2,001 MWh; an increase of 308.8 tCO₂e). The **increase in the emission factor of the Brazilian national interconnected system** (41.5% between 2023 and 2024) also influenced the increase in emissions in this scope in the Brazilian units (198.1 tCO₂e), although there was a reduction in electricity consumption.

In **Scope 1**, the main **reduction** was observed in **stationary combustion (-670.1 tCO₂e; -44.9%)**, **resulting** from the reduction in the **volume of wood chips burned in the boiler**, which went from **59,794 tons** in 2023 to **32,824 tons** in 2024, at the Rio Negro unit, Brazil.



Rio Negro
Brazil



Madem Gulf
Bahrain



Madem MooreCraft Reels
USA - Tarboro



EuroMadem
Spain



Madem MooreCraft Reels
USA - Denton



Sorocaba
Brazil



Madem Carretes
Mexico



Floresta Mostardas
Brazil



Barcarena
Brazil



Madem Carretes
Colombia



Garibaldi
Brazil

Rio Negro - Brazil

The **Rio Negro** unit presented the largest contribution to the Madem group's GHG emissions, totaling **9,116.07 tCO₂e**. The main sources were **transportation of products**, which represented **65.04%** of the total, followed by **transportation of raw materials (10.43%)** and **electricity purchase (9.22%)**.

Biogenic emissions at the unit totaled 85,501.24 tCO₂e. **Stationary combustion** was responsible for **55.72%** of these emissions, mainly from the burning of wood chips in boilers. **Agricultural activities**, especially the suppression of *Pinus spp.*, accounted for **43.35%** of this total.

Emissions by Source (tCO₂e)

Emission Source	Total Emissions		Biogenic Emissions	
	tCO ₂ e	%	tCO ₂ e	%
Scope 1	1.384,51	15,19%	84.747,91	99,12%
Stationary Combustion	823,2	9,03%	47.644,14	55,72%
Mobile Combustion	545,46	5,98%	40,24	0,05%
Fugitive Emissions	0,63	0,01%	-	0,00%
Agricultural Activities	-	0,00%	37.063,53	43,35%
Wastewater	15,22	0,17%	-	0,00%
Scope 2	840,66	9,22%	-	0,00%
Electricity Purchase	840,66	9,22%	-	0,00%
Scope 3	6.890,90	75,59%	753,33	0,88%
Transportation of Products	5.928,74	65,04%	614,93	0,72%
Transportation of Raw Materials	950,88	10,43%	138,3	0,16%
Wastewater	-	0,00%	-	0,00%
Waste	11,28	0,12%	0,1	0,00%
Total	9.116,07	100%	85.501,24	100%

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Madem Gulf - Bahrain

In 2024, **Madem Gulf**, located in Bahrain, was the second largest emitter of GHGs among the Madem group's units, totaling **7,519.43 tCO₂e**. Most of these emissions were concentrated in scope 3, with emphasis on **transportation of raw materials (39.24%)** and **transport of products (32.97%)**.

The unit's **biogenic emissions** totaled **9.26 tCO₂e**, originating exclusively from waste treatment, due to the sending of wood waste to landfill.

Emissions by Source (tCO₂e)

Emission Source	Total Emissions		Biogenic Emissions	
	tCO ₂ e	%	tCO ₂ e	%
Scope 1	144,77	1,93%	-	0,00%
Mobile Combustion	143,41	1,91%	-	0,00%
Fugitive Emissions	1,36	0,02%	-	0,00%
Scope 2	1.022,48	13,60%	-	0,00%
Electricity Purchase	1.022,48	13,60%	-	0,00%
Scope 3	6.352,19	84,48%	9,26	100,00%
Transportation of Raw Materials	2.950,68	39,24%	-	0,00%
Transportation of Products	2.479,01	32,97%	-	0,00%
Waste	919,28	12,23%	9,26	100,00%
Wastewater	3,22	0,04%	-	0,00%
Total	7.519,43	100%	9,26	100%

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Madem MooreCraft Reels – EUA – Tarboro

The **Madem MooreCraft Reels unit, located in Tarboro, USA**, was responsible for the emission of **3,994.20 tCO₂e**. The main emission sources were in scope 3, with emphasis on **transportation of products**, which accounted for **58.55%** of the total, followed by **transportation of raw materials (27.30%)**. **Electricity purchase** contributed **483.78 tCO₂e**, representing **12.11%** of emissions.

Throughout 2024, no biogenic emissions were recorded at the unit.

Emissions by Source (tCO₂e)

Emission Source	Total Emissions	
	tCO ₂ e	%
Scope 1	25,31	0,63%
Mobile Combustion	22,7	0,57%
Fugitive Emissions	2,61	0,07%
Scope 2	483,78	12,11%
Electricity Purchase	483,78	12,11%
Scope 3	3.485,11	87,25%
Transportation of Products	2.338,63	58,55%
Transportation of Raw Materials	1.090,39	27,30%
Waste	43,8	1,10%
Air Travels	6,27	0,16%
Wastewater	6,02	0,15%
Total	3.994,20	100%

EuroMadem - Spain

In 2024, the **EuroMadem** unit, located in Spain, recorded a total of **2,932.06 tCO₂e** in emissions. The largest share, corresponding to **85.53%**, was attributed to **scope 3**, with **transportation of raw materials (1,719.96 tCO₂e)** and **transport of products (538.59 tCO₂e)** standing out as the main emission sources.

In **scope 2**, **electricity purchase** accounted for **9.81%** of the unit's emissions, totaling **287.72 tCO₂e**. **Scope 1** contributed only **4.65%** of the total, equivalent to **136.48 tCO₂e**, coming exclusively from **mobile combustion** (use of diesel and LPG in operational vehicles).

Throughout the year, no biogenic emissions were identified in the unit's operation.

Emissions by Source (tCO₂e)

Emission Source	Total Emissions	
	tCO ₂ e	%
Scope 1	136,48	4,65%
Mobile Combustion	136,48	4,65%
Scope 2	287,72	9,81%
Electricity Purchase	287,72	9,81%
Scope 3	2.507,87	85,53%
Transportation of Raw Materials	1.719,96	58,66%
Transportation of Products	538,59	18,37%
Waste	239,61	8,17%
Air Travels	5,77	0,20%
Wastewater	3,94	0,13%
Total	2.932,06	100%

Madem MooreCraft Reels – EUA – Denton

Emissions by Source (tCO₂e)

The **Madem MooreCraft Reels unit, located in Denton, USA**, recorded total emissions of **1,953.47 tCO₂e**.

The main contributor was **scope 3**, which totaled an emission of **1,642.11 tCO₂e**. **Transportation of raw materials** stands out, representing **53.35%** of the unit's total emissions, followed by **transportation of products**, with **28.86%**. **Electricity purchase** generated **245.23 tCO₂e**, corresponding to **12.55%** of the total.

During the year 2024, there were no records of biogenic emissions at the unit.

Emission Source	Total Emissions	
	tCO ₂ e	%
Scope 1	66,13	3,39%
Mobile Combustion	63,53	3,25%
Fugitive Emissions	2,61	0,13%
Scope 2	245,23	12,55%
Electricity Purchase	245,23	12,55%
Scope 3	1.642,11	84,06%
Transportation of Raw Materials	1.042,10	53,35%
Transportation of Products	563,77	28,86%
Waste	23,4	1,20%
Wastewater	6,57	0,34%
Air Travels	6,27	0,32%
Total	1.953,47	100%

Sorocaba - Brazil

Emissions by Source (tCO₂e)

In 2024, the **Sorocaba** unit recorded a total of **145.29 tCO₂e** in emissions. The main contribution came from **scope 3**, with product transportation accounting for **73.39%** of the total emitted.

Scope 1 emissions totaled **23.77%** and were entirely from **mobile combustion**, resulting from the use of **LPG and gasoline** in operational vehicles.

Biogenic emissions also had **product transportation** as their main source, representing **93.78%** of the total biogenic emissions recorded by the unit.

Emission Source	Total Emissions		Biogenic Emissions	
	tCO ₂ e	%	tCO ₂ e	%
Scope 1	34,54	23,77%	1,03	6,22%
Mobile Combustion	34,54	23,77%	1,03	6,22%
Scope 2	2,67	1,84%	-	0,00%
Electricity Purchase	2,67	1,84%	-	0,00%
Scope 3	108,08	74,39%	15,51	93,78%
Transportation of Products	106,64	73,39%	15,51	93,78%
Wastewater	1,45	1,00%	-	0,00%
Total	145,29	100%	16,54	100%

Madem Carretes de Mexico

In 2024, the **Madem Carretes de México** plant recorded a total of **107.13 tCO₂e** in emissions. The main source was the **purchase of electricity**, which accounted for **80.55 tCO₂e**, equivalent to **75.19%** of the plant's total emissions. Next, **mobile combustion** contributed **22.96%** of the plant's total emissions. **Scope 3** emissions contributed **1.85%**, specifically from the **treatment of effluents** outside the plant.

In addition, **mobile combustion** in vehicles generated **3.87 tCO₂e** in **biogenic emissions**, resulting from the presence of biodiesel in the diesel fuel used.

Emissions by Source (tCO₂e)

Emission Source	Total Emissions		Biogenic Emissions	
	tCO ₂ e	%	tCO ₂ e	%
Scope 1	24,6	22,96%	3,87	100%
Mobile Combustion	24,6	22,96%	3,87	100%
Scope 2	80,55	75,19%	-	0%
Electricity Purchase	80,55	75,19%	-	0%
Scope 3	1,98	1,85%	-	0%
Wastewater	1,98	1,85%	-	0%
Total	107,13	100%	3,87	100%

Mostarda Forestry – Brazil

The **Mostardas Forestry** unit recorded total emissions of **104.81 tCO₂e** in 2024. The main source was **mobile combustion**, driven primarily by the use of **diesel fuel** in tractors and operational vehicles, which contributed **69.78 tCO₂e (66.6%** of the source) and **21.09 tCO₂e (20.13%** of the source), respectively.

Regarding biogenic emissions, **agricultural activities** (timber harvesting) accounted for **134,701.10 tCO₂e**. **Mobile combustion** also generated **15.22 tCO₂e** of biogenic emissions, due to the presence of biodiesel in the diesel fuel used in tractors, operational vehicles, and forestry buses, as well as the use of gasoline in operational vehicles.

Emissions by Source (tCO₂e)

Emission Source	Total Emissions		Biogenic Emissions	
	tCO ₂ e	%	tCO ₂ e	%
Scope 1	104,24	99,45%	134.716,44	100,00%
Mobile Combustion	102,56	97,85%	15,22	0,01%
Stationary Combustion	0,46	0,43%	0,12	0,00%
Fugitive Emissions	0,01	0,01%	-	0,00%
Agricultural Activities	-	0,00%	134.701,10	99,99%
Wastewater	1,21	1,16%	-	0,00%
Scope 2	0,58	0,55%		0,00%
Electricity Purchase	0,58	0,55%	-	0,00%
Total	104,81	100%	134.716,44	100%

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Barcarena - Brazil

The **Barcarena** unit reported total emissions of **34.72 tCO₂e**. The main source was **mobile combustion**, responsible for **32.42 tCO₂e (93.38%** of the unit's emissions), resulting from the use of LPG and gasoline in operational vehicles.

Transportation of products contributed **1.16 tCO₂e**, representing **3.35%** of total emissions.

Regarding **biogenic emissions**, a total of **0.90 tCO₂e** was emitted, with the majority originating from **mobile combustion** in operational vehicles, totaling **0.73 tCO₂e**.

Emissions by Source (tCO₂e)

Emission Source	Total Emissions		Biogenic Emissions	
	tCO ₂ e	%	tCO ₂ e	%
Scope 1	32,42	93,38%	0,73	81,20%
Mobile Combustion	32,42	93,38%	0,73	81,20%
Scope 2	0,85	2,44%	-	0,00%
Electricity Purchase	0,85	2,44%	-	0,00%
Scope 3	1,45	4,18%	0,17	18,80%
Transportation of Products	1,16	3,35%	0,17	18,80%
Wastewater	0,29	0,83%	-	0,00%
Total Geral	34,72	100%	0,9	100%

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Madem Carretes de Colombia

Emissions by Source (tCO₂e)

In 2024, the Madem Carretes unit in Colombia emitted **8.50 tCO₂e**. **Mobile combustion** was its main source of scope 1 emissions, generating **4.20 tCO₂e** due to the combustion of gasoline and LPG in operational vehicles.

The unit's **biogenic emissions** occurred exclusively due to the **incineration of 2.5 tons of wood chips (3.90 tCO₂e)**.

Emission Source	Total Emissions		Biogenic Emissions	
	tCO ₂ e	%	tCO ₂ e	%
Scope 1	4,21	49,58%	-	0,00%
Mobile Combustion	4,20	49,37%	-	0,00%
Fugitive Emissions	0,02	0,21%	-	0,00%
Scope 2	2,08	24,52%	-	0,00%
Electricity Purchase	2,08	24,52%	-	0,00%
Scope 3	2,20	25,90%	3,90	100,00%
Wastewater	0,33	3,94%	-	0,00%
Waste	0,07	0,78%	3,90	100,00%
Air Travels	1,80	21,18%	-	0,00%
Total	8,50	100%	3,90	100%

Garibaldi - Brazil

In 2024, the **Garibaldi** unit had a total emission of **0.65 tCO₂e**, resulting exclusively from the controlled effluent treatment carried out by the unit.

Emissions by Source (tCO₂e)

Emission Source	Total Emissions	
	tCO ₂ e	%
Scope 1	0,65	100%
Wastewater	0,65	100%
Total	0,65	100%