Carbon Footprint Management Plan

Eight cattle ranches supplying to Minerva Foods Uruguay

2022/2023

AUGUST 2024

Carbon Footprint Management Plan	
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Carbon Footprint Management Plan

Minerva Foods - Uruguay, 2022/2023

This Carbon Footprint Management (CFM) Plan sets out Minerva Foods commitment to measure and monitor its greenhouse gases (GHG) emissions of eight beef supply ranches in Uruguay over time, while continuously reducing its GHG emissions to lessen the negative impacts of climate change. The CFM plan also helps the organization to protect and enhance future business growth and value creation.

This plan contains GHG emissions reduction targets and an action plan for achieving reductions over time. Furthermore, the CFM plan evaluates the quality of the organisation's carbon footprint efforts relating to data collection and calculation methods, data sources, processes, and activities that contribute to material emissions, as well as any estimates or assumptions used in calculations. Data quality assessments also indicate areas for improvement over time.

Any question regarding this CFM plan may be forwarded to:

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Definitions

GHG	**Greenhouse gases**
CO_2	**Carbon dioxide**
N_2O	**Nitrous oxide**
CH_4	**Methane**
CO_2e	**Carbon dioxide equivalent**

Company Background

Minerva Foods is a leader in beef export in South America and operates in the processed segment, selling its products to more than 100 countries. With 32 industrial units (3 of which are processing units, 25 slaughterhouses and deboning plants, and 4 industrial units focused on sheep) Minerva Foods offer healthy and nutritious products, which are marketed to customers worldwide through 14 distribution centers and 12 international offices. In addition to Argentina, Australia, Brazil, Colombia and Paraguay Minerva Foods is present in Uruguay.

Uruguay, a country of 176,000 km^2 and 3.5 million inhabitants, has more than 70% of its surface occupied by pastures that feed 12 million head of cattle, resulting in 3.4 head of cattle per inhabitant, the highest proportion of the world. Therefore, the agricultural sector is responsible for 75% of national greenhouse gas (GHG) emissions, and the cattle sector represents 62% of total emissions, mainly due to the digestion of cows, which generates methane.

Minerva Foods is committed to its process of transition to a low carbon economy, investing in technologies that mitigate greenhouse gas emissions, especially methane, in the livestock value chain to achieve neutrality of emissions in 2035.

In 2022, Minerva Foods started the project to integrate climate risks (physical and transition) into the company's risk management. By hiring a specialized consulting firm, climate change scenarios are being studied together with the Company's strategic vision for the medium and long term (2030 and 2050), according to TCFD recommendations. The project is being conducted according to the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD) and is scheduled for completion in 2023. More information can be found in the Sustainability Report page.

Sustainability is one of Minerva Foods' five values, present in all operations and governance structures. In 2021, the Company disclosed its commitment to sustainability with a focus on combating climate change and illegal deforestation, recognizing that business sustainability depends on maintaining the ecosystems that make agricultural production feasible. Agriculture is a highly relevant component for the economies of South American countries, acting as a mechanism for local development for communities, in addition to contributing to the food security of the planet.

The core objective in the commitment to sustainability is to drive Minerva Foods' transition to a low-carbon economy, transforming it into a carbon-neutral company (Zero Liquid Emissions) by 2035, 15 years ahead of the Paris Agreement.

RENOVE PROGRAM

Minerva Foods reiterates its purpose to provide quality food through a business that combines global competitiveness, innovation, ethics, and quality along the environmental criteria that are decisive in the meat industry.

With this objective in mind, in 2021, Minerva Foods launched the **Renove Program,** a joint effort with partner ranchers to implement low-carbon livestock systems. In partnership with renowned institutions, projects are being developed in South America, engaging more than 100 partner ranchers.

For the development of these projects, Minerva Foods uses primary data and internationally recognized methodologies to ensure soundness and scientific credibility. This way, Minerva Foods contribute to the recognition of the sustainability of South American cattle ranching.

With **Renove**, three essential components for the sustainable development of agriculture and cattle ranching are available to rural properties:

1. Training and Technical Assistance: assistance in the use of low carbon emission technologies, combining profitability and sustainability.

> Training and technical assistance are fundamental to ensure the proper application and maintenance of best practices over time. The Program supports partnerships and rural extension activities, technology transfer and training so that rural technicians and cattle ranchers are provided with the necessary tools and know-how.

2. Green Finance: access to payments for environmental services and the carbon market;
access to green credits; access to new market demands.

> Access to special financial credit for cattle ranchers engaged in sustainable livestock production is essential to ensure the widespread adoption of best practices. The **Renove Program**, is working with financial institutions to enable credit lines and funds that recognize the performance of partner ranchers.

3. Technical Partnerships: renowned and internationally credible methodologies; scientific backing; innovations.

> The **Renove Program** works alongside renowned South American institutions including the Institute of Agricultural and Forest Management and Certification (Imaflora) to warrant the use of known and internationally credible methodologies, scientific backing, and innovation.

1. Corporate Climate Policy

August, 2024

Minerva Foods Uruguay takes responsibility for our business practices and the GHG emissions resulting from our activities. This responsibility will be carried out through the following guidelines:

- **Minerva Foods Uruguay** will demonstrate a high level of commitment and adopt best practices towards climate change mitigation.
- **Minerva Foods Uruguay** will work to reduce its annual GHG emissions level by avoiding unnecessary emissions, improving energy efficiency, and maintaining climate responsible business practices across its value chain – hereby improving our corporate beef carbon footprint.
- **Minerva Foods Uruguay** will ensure that related business policies, such as procurement and travel policies, are aligned with intentions described in this policy statement.
- **Minerva Foods Uruguay** will identify and act upon areas and practices where reasonable investments can result in significant GHG emission reductions. These shall be described in this carbon footprint management plan.
- **Minerva Foods Uruguay** will continue its annual monitoring and reporting of GHG emissions. Monitoring, Documentation, and Reporting shall be complete, consistent, accurate, relevant, and transparent, and comply with Preferred by Nature's Carbon Footprint Management Standard.
- **Minerva Foods Uruguay** will communicate consistently and transparently about our climate policy, reduction targets and plans, and achievements.
- **Minerva Foods Uruguay** will ensure that any carbon credits used to offset unavoidable or non-reducible GHG emissions come from credible, sustainable, and additional projects.
- **Minerva Foods Uruguay** will work towards carbon neutrality by 2035 through a combination of emissions reductions and offsetting initiatives.
- **Minerva Foods Uruguay** will demonstrate efforts to encourage business partners and clients to also adopt climate-friendly business, production, and consumption behaviors and practices.

Patricio Silveira
CEO Minerva Foods Uruguay

2. CFM Overview and Approach

The following outlines the focus of our carbon footprint along with relevant processes and quality management measures related to our plan.

i. **Subject of analysis**: Beef cattle production and industrial operations.

ii. **Justification of base year**: The baseline of emissions from livestock production, farm level, covered the period between **June/22 to July/2023**. In industrial operations the emissions of scopes 1, 2 and 3 were accounted for the ***base year 2022 (from January to December)***.

iii. **Staff responsibilities**: Assure that the assessment consistently and accurately reflects the greenhouse gas emissions (GHG) from the assessed production system. Ensure the completeness of the approach to the scope of the study in line with the reality of the field, including all emission sources identified in the system. Finally, report the results obtained in a transparent and responsible manner. Therefore, the dynamics of the work were divided between Minerva Foods and Imaflora.

Accounting of GHG emissions from livestock: Minerva Foods – Uruguay collected data and information on livestock production in the farms (Mr. Marcelo Cabrera was in charge for direct contact with suppliers). Imaflora´s team processed data and information collected by Minerva Foods team in the farms through a calculation method developed according to IPCC and GHG Protocol.

Accounting of GHG emissions from industrial facilities: Minerva Foods Uruguay collected data and information about GHG emissions and calculated the emissions for scopes 1, 2 e 3 with a GHG emissions management software (Climas) developed by WayCarbon (calculations audited by a third party). Imaflora assisted in the process of organizing the calculated emissions to be added to this report.

Imaflora is a Brazilian NGO, founded in 1995, when concerns about preserving the environment and better ways of using nature's resources began to take prominence throughout the world.

iv. **Staff training**: The survey of information from the farms and the accounting for the results of GHG were carried out by a team specifically trained to minimize errors and promote accurate results. The Minerva Foods Uruguay team is trained regularly and is developing training for suppliers to encourage good practices in agricultural activities.

v. **Documentation**: The information relevant to the assessed farm was obtained through forms and the results accounted for in calculators, both developed in Microsoft Excel by Imaflora. Additionally, the industrial operations scopes 1, 2 and 3 GHG emission are managed (data collection and calculation) by a GHG emissions management software and results are publicly disclosed on Minerva Foods' website and Sustainability Report.

vi. **Data collection**: 1. *Accounting of GHG emissions from livestock*: ranchers advised by Minerva Food staff reported relevant information about cattle-raising activity in the period according to forms prepared by Imaflora. Information about area, activities and production systems, breed, stocking rate, manure management system, pasture fertilization, average number of animals by age and sex etc. are part of the collected information for accounting GHG emissions and removals in livestock.

The information collected was processed in the calculation tool developed by Imaflora according to the methodology of the GHG Protocol for Agriculture and livestock (WRI, 2015) and Guidelines for National Inventories of Greenhouse Gases (IPCC, 2019 Refinement of the 2006 Guidelines).

2**.** *Accounting of GHG emissions from industrial operations:* all data from GHG emissions sources in scopes 1, 2 and 3 are inputted to the GHG emissions management software monthly.

vii. **Calculation tools**: The calculation tool and form to collect data for Livestock emissions assessment were developed based on Imaflora expertise in the agricultural sector. Imaflora calculator is a flexible tool that to be used in case of expansion of ranches number assessed. The accounting method developed by Imaflora is according to the most relevant and recent method released by the international protocols (IPCC, GHG Protocol/ WRI, Ecoinvent, etc). GHG emissions from industrial operations for scopes 1, 2 and 3 are processed in the GHG emissions management software, which contains a database of the most current emission factors available for each type of emission source (e.g., the Brazilian GHG Protocol Program for Brazil and, when not available, internationally accepted references such as the GHG Protocol, IPCC, EPA and DEFRA).

viii. **Performance monitoring**: An internal audit will be carried out annually to recalculate and monitor GHG emissions from beef cattle production, focusing on improving production in the field and on the quality of information and updating the calculation method.

ix. **Offsetting procedures**: Offsets will be used to compensate part of the GHG emissions in compliance with the agenda of the **Renove Program**.

3. Carbon Footprint Results

3.1. Base year carbon footprint and boundaries

3.1.1. FARMS (SCOPE 3)

Emissions of greenhouse gases were accounted for in the beef cattle production with an extensive management system at eight farms in Uruguay. The assessment was prepared by the Minerva´s operational team, including emissions from **100% of activities related to livestock on farm.**

The sources of GHG are: i) enteric fermentation; ii) management of liquid and solid manure; iii) combustion in mobile and stationary sources for pasture maintenance; and iv) fertilizer spreading.

The base year for our CFM plan, calculated in June 2022 and July 2023 amounts to:

Total (Absolute) GHG emissions: **21.349.64 tCO_2e** (for 8 ranches assessed).

Emissions by Scope: It is important to note that these are emissions from livestock production on the farms that supply cattle to Minerva Foods in Uruguay. Therefore, these emissions are not controlled by Minerva Foods and are classified as scope 3 emissions under the company's perspective.

Table 1. Farm emissions when considered as Minerva Foods Scope 3.

FARM	Scope 1 (tCO_2e)	Scope 2 (tCO_2e)	Scope 3 (tCO_2e)	Biogenic if known[1]
FARM 1	0	0	3,072.39	0.26
FARM 2	0	0	1,116.13	0.26
FARM 3	0	0	2,694.37	0.21
FARM 4	0	0	1,267.68	0.30
FARM 5	0	0	723.33	0.16
FARM 6	0	0	1,599.88	0.20
FARM 7	0	0	8,388.04	0.37
FARM 8	0	0	2,487.81	0.73
TOTAL	**0**	**0**	**21,349.64**	**2.49**

From the farms (considered as Minerva Foods Scope 3), GHG emissions are associated with Scopes 1, 2 and 3 as shown in the table below.

[1] See Section 3 of Standard for more details on reporting of biogenic emissions and removals.

Table 2. Farm emissions when considering the farms' scopes perspective.

FARM	Scope 1 (tCO_2e)	Scope 2 (tCO_2e)	Scope 3 (tCO_2e)	Biogenic if known
FARM 1	3,071.38	1.01	0	0.26
FARM 2	1,112.63	0.16	3.34*	0.26
FARM 3	2,694.18	0.18	0	0.21
FARM 4	1,266.96	0.71	0	0.30
FARM 5	722.76	0.56	0	0.16
FARM 6	1,599.18	0.70	0	0.20
FARM 7	8,387.34	0.70	0	0.37
FARM 8	2,487.81	0	0	0.73
TOTAL	**21,342.26**	**4.04**	**3.34***	**2.49**
%	**99,96%**	**0,02%**	**0,02%**	-

* ***Emissions by life cycle stage:*** emissions from fertilizer production **(0,02% of total), as *raw material acquisition.***

The target of the evaluation was the bovine production on the property. Thus, the indicator that best portrays the approach contemplated is **live animal weight**.

Intensity (tCO_2e per t of live weight) is calculated considering total emissions of the 8 ranches divided by the total live weight of the animals in the 8 ranches. Compared to the previous report the number of ranches increased from 5 to 8. The base year for our CFM plan, calculated in June 2022 and July 2023 amounts to:

Intensity (Ratio) terms: 6.34 tCO_2e per t of live weight.

3.1.2. PROCESSING FACILITIES

Emissions of greenhouse gases were accounted for in the beef production at three Minerva Foods' slaughterhouses located in Uruguay: **Canelones, Carrasco, Melo and BPU**. The inventory takes an operational control approach and consolidates scopes 1, 2 and 3 emissions.

The processing facilities GHG sources are: i) fuel consumption by stationary power equipment; ii) fuel consumption by vehicles and mobile equipment; iii) waste and wastewater treatment; iv) fugitive emission; v) agricultural activities (enteric fermentation from the cattle and management of liquid and solid manure, onsite at facility); vi) electrical energy consumption; vii) upstream transportation and distribution (cattle transport); viii) downstream transportation and distribution; ix) purchased goods and services (example, upstream emissions from the product used for skin treatment and direct emissions from the tannery related to skin treatment); x) transport of employees; and xi) Business Travel.

Additionally, on August 31, 2023, Minerva completed the acquisition of Breeders and Packers Uruguay SA (BPU Meat), one of the most modern beef processing plants in South America. Therefore, in this first moment, to engage the plant in the Renove Program, an estimate of 2022 GHG emissions was prepared based on 2021 accounting. It is important to emphasize that, for Scope 2 emissions, the location-based approach was considered.

The emission values include the slaughterhouse activities plus the leather processing in the period of January 2022 to December 2022. The processing facility's inventory is carried out from January to December of the calendar year, unlike the agricultural calendar in Uruguay, which reflects the period from July 2022 to June 2023. The base year (January to December 2022) for this CFM plan for scopes 1, 2 and 3 emissions amounts to:

Total (Absolute) GHG emissions: **75,812.37 tCO_2e *market-based approach* (considering the I-RECs acquisition)**

Table 3. Total Emissions by Scope *MARKET-BASED approach* (considering the I-RECs acquisition).

Processing facilities	Scope 1	Scope 2 (Market-based)	Scope 3	Biogenic if known
Canelones (URY)	8,647.76 tCO_2e	0tCO_2e	9,435.05 tCO_2e	10,883.55 tCO_2
Carrasco (URY)	11,024.32 tCO_2e	0tCO_2e	7,350.01 tCO_2e	10,770.38 tCO_2
Melo (URY)	18,434.46 tCO_2e	0tCO_2e	6,701.28 tCO_2e	7,840.59 tCO_2
BPU (URY)	4,611.30 tCO_2e	2,335.37 tCO_2e	7,272.82 tCO_2e	6,926.31 tCO_2
TOTAL	**42,717.84 tCO_2e**	**2,335.37 tCO_2e**	**30,759.16 tCO_2e**	**36,420.83 tCO_2**

Considering a margin of error in the calculations, a buffer was added to the emissions calculation. The indicator that best portrays the operations is the intensity of GHG emissions using tons of finished product.

Intensity (tCO_2e per t of finished product) is calculated considering total emissions of the 4 processing facilities divided by the total of finished product processed in the industry. Compared to the previous report, one more processing facility (BPU) has been included in the inventory.

Intensity (Ratio) terms: 0.37 tCO_2e per t finished product

(Average value of the four slaughterhouses)

(Important) The information related to the quantity of products and co-products processed at Uruguay units of Minerva Foods was restricted to the evaluation team as they represent important and sensitive information.

(Important) Emissions related to the slaughterhouse correspond to total animals slaughtered in 2022.

3.1.3. MINERVA FOODS URUGUAY: ESTIMATED TOTAL EMISSIONS (farms and processing facilities)

Table 4. Summary table of emission sources considered in the three scopes for the farm and for the processing facilities.

Site	Scope 1	Scope 2	Scope 3
Farm	Combustion in mobile sources Combustion in stationary Agricultural activities (enteric fermentation; management of liquid and solid manure; application of fertilizers)	Electricity	Fertilizer production (P_2O_5)
Processing facilities	Combustion in stationary Combustion in mobile sources Agricultural activities Solid waste and liquid effluents Fugitive emissions	Electricity	Transport and distribution (upstream) Displacement of employees Business Travel Waste generated in operations Goods and Services purchased Transport and distribution (downstream)

Minerva Foods has developed strategies to maximize the utilization of its primary input, cattle. The Company does not trade only meat but also in all generated by-products - hide, tallow, blood, bones, and viscera. These by-products are either sold or transformed within our Minerva Foods operations: Minerva Biodiesel, Minerva Leather, Minerva Casings, and Minerva Ingredients.

Therefore, judiciously, every ton of live animal entering the slaughterhouse industry is transformed into products (meat) and by-products (leather, blood, bones, etc).

Premisses: For ***finished product*** all the weight of live animal were considered.

Emission calculations are currently divided into stages:

Stage 1 – Farms: Emissions per ton of live animal on farms.

6.34 tCO_2e

Stage 2 – Processing Facilities: Emissions per ton of total finished products generated in the industry.

0.37 tCO_2e

Stage 3 – Farms and Processing Facilities: Summation of farm emissions with emissions from industrial processes per ton of finished product. This stage brings a total emissions value per ton of product (Stage 3), regardless of the specific product.

6.71 tCO_2e

Therefore, estimated carbon intensity, including livestock production (farm) and Minerva Foods Slaughterhouse, for ***finished product.***

Intensity (Ratio) terms: **6.71 tCO_2e $t^{-1}_{finished\ product}$** ($CO_2$ equivalent emissions per tons of **finished product**).

3.2. CARBON FOOTPRINT EMISSIONS OVER TIME

The carbon footprint will be monitored annually and compared with the carbon footprint of the base year (Jul 22 to Jun 23). The table below shows the absolute emissions and emissions intensity rates and the estimated reduction potential.

Table 5. Absolute emissions and the estimated reduction potential.

Farms	**Jul/22 – Jun/23** (New Base Year – Actual Emission – new farms)	**Jul/23 – Jun/24** Estimated Reduction Potential (%)	**Jul/24 – Jun/25** Estimated Reduction Potential (%)
Absolute emissions (tCO_2e)	21,349.64	21,349.64	20,495.65
% reduction	-	0%	4%
Processing Facility	**Jan/22 – Dez/22** (New Base Year – Actual Emission – new farms)	**Jan/23 – Dez/23** Estimated Reduction Potential (%)	**Jan/24 – Dez/24** Estimated Reduction Potential (%)
Absolute emissions (tCO_2e)	75,812.37	72,628.25	69,577,86
% reduction	-	4,2%	4,2%

3.3. Avoided emission at processing facilities (Scope 2)

Minerva Foods has already zeroed its net scope 2 emissions. All the electricity that supplies Minerva Foods' operations comes from renewable sources, traceable through Renewable Energy Certificates (I-RECs). In Brazil, wind energy certificates have been acquired; in other South American countries, hydroelectric energy certificates have been acquired. In this way, as well as zeroing out scope 2 emissions from the purchase of electricity, the company is fostering the market for energy generated from high-performance renewable sources. It is also the first company in Brazil to obtain the Renewable Energy Seal, issued by the Totum Institute in partnership with the Brazilian Association of Wind Energy (*Associação Brasileira de Energia Eólica* – ABEEólica) and the Brazilian Association of Clean Energy (*Associação Brasileira de Energia Limpa* – Abragel), which guarantees, in addition to the

renewable origin, the adoption of differentiated practices in the social and community relations aspects by the generating plants.

Only for this 2022 report were the scope 2 emissions from BPU included in the calculations by means of extrapolation, as the plant was not under the operational control of Minerva Foods. The company only acquired the BPU in 2023, and from the date of acquisition the industrial plant already has zero scope 2 emissions.

In the table below is a summary of the Scope 2 avoided emissions:

Table 6. Summary of the Scope 2 avoided emissions.

Description	**Status**	**Timeframe (implementation)**	**Avoided tCO_{2e} emissions:**
Scope 2: Renewable Energy	Concluded	Since 2020	2020: 20.50 tCO_{2e} 2021: 56.45 tCO_{2e} 2022: 50.06 tCO_{2e}

* Acquisition of the new BPU industrial plant.

The table below summarizes the avoided emissions, evidence, measurement, and monitoring methodology for emissions related to scope 2.

Table 7. Avoided emissions, evidence, measurement, and monitoring methodology for emissions related to scope 2.

Action	***Evidence***	***Measurment methodology***	***Monitoring methodology***
Scope 2: Renewable energy	Energy consumption invoices for each industrial plant and Renewable Energy Certificates (I-RECs)	Energy consumption in industrial operations measured through the *Industry 4.0 Project**, which supplies the automated tool that calculates annual emissions using specific emission factors for the operation and region.	The Annual Corporate Greenhouse Gas Inventory according to the Brazilian GHG Protocol Program methodology, using the automated tool for calculating emissions and managing evidence.

*In 2022, one of the primary objectives and challenges was to use technology to standardize and digitize processes. Minerva Foods has teams focused on optimizing production through advanced data analysis and Industry 4.0 to prepare its plants for real-time information from the industrial equipment, implementing carcass typing by computer vision, allowing more assertiveness in classifying raw

material. The aim of the *Industry 4.0 Project* is to manage the operation and performance of processes and indicators more efficiently, including those related to energy efficiency.

4. GHG emissions reductions plan

4.1. Reduction targets

Minerva Foods intends to make genuine and committed efforts to reduce GHG emissions in its activities, organized between its emission scopes 1, 2, and 3. Therefore, Minerva Foods announced its Commitment to Sustainability in 2021 and has been working on three significant axes to achieve zero liquid emissions by 2035. The first axis is linked to the eco-efficiency of its operations, the second to the fight against illegal deforestation in the value chain, and the third to the development of the Renove Program, which aims to support the production chain in implementing low-carbon practices.

Regarding the eco-efficiency axis of the company's operations, projects to reduce emissions are in the company's scopes 1 and 2. The Commitment to Sustainability focuses on mitigating climate impacts, including managing the carbon footprint and energy efficiency of its operations. The company has made progress in studies to identify efficiency projects and actions that will reduce the intensity of greenhouse gas (GHG) emissions by 30% by 2030. The target considers scope 1 and 2 emissions, and intensity is measured by the volume of gases emitted per ton of finished product.

To manage Minerva Foods' GHG emissions (Scopes 1, 2, and 3), operational data is collected monthly from the company's businesses via an automated tool and with the support of specialized consultants. The Sustainability area manages GHG emissions and the decarbonization plan, reporting to the Sustainability Committee and the Sustainability and Innovation Advisory Board.

For the third year running, Minerva Foods won the Gold Seal for its Greenhouse Gas Emissions Inventory in the Brazilian GHG Protocol program. The seal is awarded to complete inventories of institutions that have their GHG emissions verified by specialized companies. The complete GHG emissions inventory for the base year 2023 was audited and will receive the seal in the program's next assessment cycle.

Scope 1: Minerva Foods has been working on projects to optimize efficiency and reduce emissions in the industry. Minerva Foods' Environmental Management System includes various actions to promote adequate control of emissions and the generation of waste and effluents, as well as a detailed study of the impacts of the business on natural water and energy resources.

Throughout 2022, Minerva Foods carried out many projects to improve eco-efficiency in operations at all Minerva Foods locations. Maintenance and modernization of equipment, installation of new water and effluent treatment systems, and automation of processes were among the investments made in

2022, which totaled R$130 million in Brazil and U$1.96 million for the Latam division units, which include Uruguay.

The company aims to have zero liquid emissions by 2035, 15 years ahead of the Paris Agreement. To manage GHG emissions, operational data from Minerva Foods businesses is collected monthly via an automated tool and with the support of specialized consultants. The sustainability area manages GHG emissions and the decarbonization plan, reporting to the Sustainability Committee and the Sustainability and Innovation Advisory Board.

Within Scope 1, direct emissions from Minerva Foods operations, the largest sources of emissions are linked to Effluent Treatment Plants (ETPs). Decarbonization studies have identified opportunities with the potential to reduce these emissions, including projects to modernize effluent treatment to reduce emissions.

In Uruguay, industrial plant operations contribute to over 45% of emissions, a significant portion of which is attributed to Effluent Treatment Plants (ETPs). Recognizing this, the company has initiated projects aimed at enhancing and modernizing these operations. The improvements encompass the resizing of biodigesters, refurbishment of tarpaulins, and upgrades to other facilities at both Canelones and BPU locations. Currently, these projects are under evaluation by suppliers, with budgeting underway for the commencement of activities in 2024.

Scope 2: Minerva Foods has already zeroed its net scope 2 emissions (See Section 3.2).

Scope 3: Most of the Company's emissions come from enteric fermentation and other emissions from the Company's cattle supplier farms. For this reason, within the Company's Public Commitments, there is a Dedication to the Planet pillar, in which the focus is on action to prevent the worst effects of climate change while supporting rural producers in implementing practices that reduce and remove carbon, protect biodiversity, and increase resilience with the Renove Program.

The program is designed to promote involvement and joint efforts with agricultural producers for the adoption of good agricultural practices that will increase productivity and income, in addition to protecting the environment through low carbon emissions and sustainable intensification of livestock production. The Renove Program is based on three essential components for its implementation: (i) training and technical assistance; (ii) green finance; and (iii) technological and institutional partnerships. Minerva Foods has the goal to purchase 50% of the total number of animals from farms participating in the Renove Program by 2030.

In addition to the Renove Program, which directly supports sustainable production improvement practices, there is an exclusive team at Minerva Foods that deals with traceability issues in the supply chain. Considering that land use change has a significant impact on emissions in the chain, the Company has been working on socio-environmental monitoring of its supply chain as part of its

commitment to combating climate change and protecting ecosystems, through which it proposes to combat illegal deforestation throughout its supply chain in South America by 2030.

Minerva Foods' traceability practices adopt the best available technology to ensure the compliance of its supplier portfolio with environmental, labor, and land tenure compliance, focusing on issues such as biodiversity and human rights. The Company was a pioneer in expanding the adoption of geospatial monitoring technology to 100% of direct supplier farms in all biomes in Brazil (Amazonian, *Cerrado*, *Pantanal*, *Caatinga*, and Atlantic Forest). In 2021, Minerva Foods completed the implementation of monitoring for 100% of cattle purchases in Paraguay and Colombia and maintained the same result in 2023. In Argentina, the Company monitored around 90% of direct supplier farms. In Uruguay, Minerva Foods has already started socio-environmental monitoring, with more than 40% of direct supplier farms monitored, and has studied local socio-environmental legislation to define later criteria for monitoring and implementing systems in the country.

In the context of land use and occupation in Uruguay, a large part of the country is made up of natural pastures, in which there is a predominance of extensive livestock farming. Animals are raised on pasture and fed on native forage. Knowing that land use conversion is one of the most significant categories impacting farm emissions, the Renove Program chooses the farms participating in the project that has followed the criterion of zero deforestation in recent years based on the cattle marketing protocol implemented in 2022.

In Uruguay, vegetation cover is analyzed using the GLAD dataset for deforestation monitoring, a methodology for verifying vegetation clearing and technical interpretation will be applied for analysis, considering only polygons overlapping with Uruguay's Native Forest areas.

Another essential information about Uruguay is an animal movement and control system called DICOSE that involves verifying registration information, precisely demarcating perimeters, and identifying possible overlaps with socio-environmental liabilities. The DICOSE is a unique registration number in the National Livestock Information System (SNIG) and MGAP (Uruguay's Ministry of Livestock, Agriculture and Fisheries) assigned to a company that owns livestock and land. DICOSE stands for "*División Contralor de Semovientes*," which can be translated as "Livestock Control Division." DICOSE's main objective is to keep an up-to-date record of all the rural properties in the country and their characteristics, including the identification of cattle and other animals raised on these properties. This register is essential for managing livestock and the environment, as well as ensuring the traceability of animals for health purposes and food safety. In addition, DICOSE also plays a vital role in tax administration and rural planning, providing essential information for the government and other relevant authorities. In short, it is Uruguay's unique property registration number (DICOSE); each territorial unit (establishment) with livestock must have a unique DICOSE assigned by the National Livestock Information System (SNIG) (Dec.300/October 19, 2019, Law 17.997).

Company's products are not related to illegally deforested areas or environmental embargoes (punitive measures issued by inspection and control bodies that stop productive activities that degrade the environment), overlap with protected areas, indigenous and traditional community lands and conservation units, and the use of slave-like labor. The Company's policy establishes the purchase criteria (Acquisition of Agricultural Commodities and Livestock Products). It is worth noting that Minerva Foods follows the principles of the environmental legislation in force in each country where it operates, as well as the guidelines of the Public Livestock Commitment (CPP), the Conduct Adjustment Term (TAC) of the State of Pará and the Monitoring Protocol for Cattle Suppliers in the Amazon, initiatives to which it has adhered in Brazil.

Geospatial monitoring tracks the situation of farms, ensuring that the system is audited annually, with outstanding results for the company. Minerva Foods maintained its excellent performance in the third-party audits supervised by the Federal Public Prosecutor's Office, the main and most reliable instrument for socio-environmental verification of the Brazilian production chain.

In yet another year, the company also achieved 100% compliance in the audit of the Public Livestock Commitment, signed in 2009, with results audited by BDO RCS Auditores Independents. The audit reports are public and can be accessed on the Minerva Foods website. All the auditing processes resulted in 100% compliance for Minerva Foods, reinforcing the robustness of its monitoring system and the company's ongoing efforts to achieve increasingly sustainable livestock farming.

In the table below is a summary of the activities underway to address the company's scope 1 and 3 emissions, with the reduction commitments and deadlines signed.

Table 8. Activities underway to address the company's scope 1 and 3 emissions.

Description	**Status**	**Timeframe (implementation)**	**Reduction amount**
Scope 1: Industrial Operations Projects, that includes resizing the biodigesters, renovating the tarpaulins and other facilities at Canelones and BPU	In progress	2023-2035	30% reduction in tCO_2e by 2030. Zero Liquid Emissions until 2035*.
Scope 3: Renove Program	In progress. Investment for implementation is confidential and	2021 - 2035	Scope 3 Zero Liquid Emissions by 2035*.

	shared only with interested parties.		

*The company is investing in emission reduction projects (scopes 1 and 3), and MyCarbon will compensate the residual emissions in 2035 through insetting and offsetting projects.

4.2. Other considerations

Since the Company derives its primary resources from the environment, in-depth knowledge of the effects of climate change is essential for risk management. Changes in the environment have the potential to impact livestock productivity, increasing the Company's operating costs. Changes in rainfall patterns can also affect operating costs for electricity. In the second half of 2022, the Sustainability and Audit, Risks, and Compliance areas began a project in partnership with a specialized consultancy to map risks and opportunities related to climate change and improve the adaptation strategy of Minerva Foods' business in its operations and value chain. The project is being conducted by the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), and the results will be published in 2024 in the Sustainability Report.

Minerva Foods is thoroughly analyzing the requirements and potential impacts of the new European Union Regulation for Deforestation-Free Products (EUDR) and discussing it at a sectoral level through the Brazilian Beef Exporters Association (*Associação das Empresas Exportadores de Carne* - ABIEC) in Brazil and partnership with other members and relevant stakeholders in the market.

Analyses and discussions are also focused on unclear points of the regulation to ensure that South American products maintain access to the European market and undesirable effects, such as increased costs for customers and consumers and the exclusion of small and medium-sized rural producers from the global market, perpetuating socio-economic vulnerabilities, even for those who already operate in compliance with local socio-environmental legislation and food quality and safety criteria. In addition, the Company has hired a specialized law firm to conduct detailed due diligence on the new regulations and advise on the relevant negotiations that Minerva Foods will undertake.

4.3. Reduction plans

Minerva Foods is committed to the efforts described in item 4.1 to reduce emissions in scopes 1 and 3.

4.3.1. PROCESSING FACILITIES (SCOPES 1)

The table below summarizes the reduction actions, evidence, measurement, and monitoring methodology for emissions related to scopes 1.

Table 9. Reduction actions, evidence, measurement, and monitoring methodology for emissions related to scopes 1.

Action	*Evidence*	*Measurment methodology*	*Monitoring methodology*	Estimated Reduction Potential
Scope 1: Projects to improve the eco-efficiency of industrial operations, that includes resizing the biodigesters, renovating the tarpaulins and other facilities at Canelones and BPU	Volume of gases emitted per ton of finished product in industrial units, based on the emission factors for each industrial operation.	Data and indicators from the industrial operation measured by the *Industry 4.0 Project**, which supply the automated tool that calculates annual emissions using specific emission factors for the operation and region.	The Annual Corporate Greenhouse Gas Inventory according to the methodology of the Brazilian GHG Protocol Program, using the automated tool for calculating emissions and managing evidence.	4,2% by 2025 4,2% by 2026

*In 2022, one of the primary objectives and challenges was to use technology to standardize and digitize processes. Minerva Foods has teams focused on optimizing production through advanced data analysis and Industry 4.0 to prepare its plants for real-time information from the industrial equipment, implementing carcass typing by computer vision, allowing more assertiveness in classifying raw material. The aim of the *Industry 4.0 Project* is to manage the operation and performance of processes and indicators more efficiently, including those related to energy efficiency.

4.3.2. FARMS (SCOPE 3)

To demonstrate its commitment and efforts in reducing greenhouse gas emissions in the supply chain, Minerva Foods engages partner ranchers in implementing best cattle management practices. The aim is to provide support that strengthens livestock farming, making it more sustainable and profitable for the entire production chain.

In 2021, the Renove Program was structured to work collaboratively with our partners, encouraging the adoption of climate-adapted livestock practices. One of the pillars of Renove is support in implementing low-carbon emission technologies.

Ranchers in the Renove Program are encouraged to become partners with the Company in the sustainable journey of livestock farming, although they could have commercial relationships with other slaughterhouses in the finished cattle market.

The ranchers sell the cattle to the slaughterhouse, which is responsible for meat processing. Thus, the ranchers are part of the slaughterhouse's supply chain, and even though they are involved in the Renove Program, their farms are not under the management control of Minerva Foods.

Operations within these partner farms are exclusively conditioned to the strategic management carried out by the rancher themselves, with the partnership with the Renove Program being a way to strengthen strategic decisions for improving productivity and sustainability.

The Renove Program supports ranchers in understanding and recognizing the sources of greenhouse gas emissions and in conducting technical consultancy to propose solutions for achieving emission reductions and intensifying production. The proposed Reduction Plans are customized respecting the unique characteristics of the properties, including size, soil type, climate, resource availability, and existing management practices. The Renove Program encourages the adoption of practices that may require investments; therefore, in addition to technical support, the program is seeking institutional partnerships to offer rural credit with differentiated advantages for the implementation of the practices proposed in the Action Plan, which demand long-term investments.

Customizing greenhouse gas (GHG) emission reduction practices allows for the identification of the most effective and feasible solutions for each specific context under the Carbon Footprint Management Plan 2.0. The suggested management and implementation practices for farms contribute to achieving the goals set in the CFM standards, item 4.2 (Carbon emission reduction), in accordance with the methods established in item 4.2.2 for each scope of activity.

The Reduction Plans are developed by a team of technicians with knowledge in livestock farming in Uruguay and are conducted after the consent of the partner supplier. The stages consist of:

- Diagnostic stage: collection and survey of information (diet, weight gain, pasture management) relevant to the Reduction Plan;
- Construction stage of the Reduction Plan: determining livestock scenarios based on emission reduction;
- Validation stage: presentation and approval of the Reduction Plan report for the partner supplier;
- Practice Implementation stage: operationalization of livestock farming in the field;
- Monitoring stage: data collection and visit to monitor the established Reduction Plan.

Uruguay has defined specific objectives of contributions to the Paris Agreement aimed at improvements in the beef production chain focused on practical actions of natural pasture management to provide a better diet for cattle, increase herd efficiency, use of food additives to reduce CH4 emissions, and prevention of diseases in animals.

Beef production in Uruguay is predominantly based on natural pastures, which also characterizes the Uruguayan ecosystem. Natural forages vary according to the region, season of the year, and management, although they are generally associated with pastures of low nutritional value, low digestibility, and inferior quality compared to implanted pastures.

In general, high-quality pastures in rotational grazing with forage mixtures provide better feed efficiency for cattle, positively contributing to the composition of the ruminal microbiota, potentially reducing methane production.

The activities suggested for improving natural pastures are simple and replicable, allowing scalability and continuity over time in Uruguay. The promotion of livestock farming in natural fields is beneficial for the herd and for the preservation of this natural resource.

According to Modernel et al. (2013)[2], in full-cycle livestock systems in Uruguay that used an alternating model between natural pastures and cultivated pastures over 5 years, a significant reduction in total greenhouse gas emissions was observed, decreasing to 13.0 kg CO_{2e} per kg of live weight, compared to a system exclusively based on natural pastures, in which total emissions were 16.7 kg CO_{2e} per kg of live weight, a reduction of approximately 20% in total emissions.

DeRamus et al. (2003)[3]determined that by incorporating a rotation system consisting of the best management practices, with periodic fertilization and frequent rotation of animals, the annual production of enteric methane was reduced by 22% compared to a continuous grazing management system.

In experiments conducted at the Experimental Station of INIA (National Institute of Agricultural Research), the quantification of enteric methane emissions in beef cattle under grazing conditions in a high nutritional value implanted pasture showed an average reduction of 13.8% in the methane (CH_4) emission rate compared to the grazing of a degraded natural field of low nutritional value (CIGANDA et al., 2om 016)[4].

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[2] Modernel, P., Astigarraga, L., & Picasso, V. (2013). Global versus local environmental impacts of grazing and confined beef production systems. Environmental Research Letters, 8(3), 035052. https://doi.org/10.1088/1748-9326/8/3/035052

[3] DeRamus, H. A., T. C. Clement, D. D. Giampola, and P. C. Dickison. 2003. Methane emissions of beef cattle on forages. J. Environ. Qual. 32:269–277. https://doi.org/10.2134/jeq2003.2690.

[4] Ciganda, Veronica & Dini, Yoana & Romero, Bach & Mariotta, Bach & Cajarville, Cecilia. (2016). EMISIÓN DE METANO ENTÉRICO EN BOVINOS DE CARNE BAJO CONDICIONES REPRESENTATIVAS DE PASTOREO EN URUGUAY: pasturas implantadas vs. campo natural degradado. Revista INIA. 45. 49-52.

Therefore, based on the data from the literature of scientific research carried out in Uruguay, and the current production conditions of the project's ranchers, it is proposed in the table below the action of reducing emissions that will be proposed to the ranchers, followed by the evidence, measurement and monitoring methodologies, as well as the estimated potential for emission reduction based on the literature.

Table 10. Reduction actions, evidence, measurement, and monitoring methodology for emissions related to scopes 3.

Action	*Evidence*	*Measurement methodology*	*Monitoring methodology*	*Estimated Reduction amount Potential*
Incorporation of good natural field management practices	Presence of natural field species combined with sown pastures in rotational paddocks for fattening (intended for cattle <24 months) with the ideal number of animals for available food.	Calculations of stocking rate, density rate, and carrying capacity in relation to seasonality.	Monitoring will be carried out in two ways: On-site: The measurement of the forage height, at the entrance and exit of animals from the pasture. And control of the average weight and the expected weight gain. Remote: Monitoring of biophysical parameters of vegetation to assess seasonal and interannual changes in vegetation development and activity.	4% by 2026

5. Offset Projects and Carbon Credits

5.1. Carbon Offset targets

All the offsets made under this project use credits from projects verified according to Verra's Verified Carbon Standard, guaranteeing the quality and transparency of the origination. The carbon credits come from nature-based solutions projects developed in Uruguay. In this way, the project is in line with the CFM Standards. It receives the Carbon Neutral seal when the emissions associated with the tons of product produced are offset by allocating the emissions from the farms, industrial processing, and logistics of the products to be marketed.

The entire process of the number of animals from the farms participating in the project, the industrial processing of this raw material, and the products that receive the 'Carbon Neutral' seal for sale are tracked and managed by an internal control tool. All information related to marketing, product destination, product quantity, related emissions, carbon credits used for offsetting, and the VCS credit retirement certificate is controlled and sent annually to Preferred by Nature during audits.

For the sale of the product, the customer is provided with all the documentation attesting to the origin of the product, such as:

- The carbon footprint certificate from Preferred by Nature.
- The Verra VCS carbon credit retirement certificate evidencing offset of residual emissions.
- A letter from Minerva Foods, communicating the certification and offsetting process to the customer.
- A letter from MyCarbon (Minerva Foods' subsidiary company for carbon trading) containing the complete information on the process related to the product and the retirement of Verra's carbon credits.

Therefore, MyCarbon acquires carbon credits from accredited suppliers and follows the offset principles set out in Annex IV of the Preferred by Nature CFM.

5.2. Carbon Neutrality

The Minerva Foods - Uruguay announced decisive action to combat climate change and protect ecosystems, with the launch of its sustainability strategy, committing to reduce the intensity of its emissions by 30% by 2035 (compared to the year 2020) and have 50% of its beef suppliers participating in the **Renove Program**, which supports the implementation of low-carbon practices in the chain.

6. Data Quality

6.1. Data Quality Assessment

Minerva Foods attempts to collect and apply data that is actual and accurate to the greatest extent possible. This includes locating primary data for all activities under our control and scope three emissions, with primary data collected onsite annually. Minerva Foods Uruguay collected real and accurate data from the supplying ranches. It is important to note that these are suppliers' emissions. Therefore, its emissions are not directly controlled or under the responsibility of Minerva Foods. Within the scope of the slaughterhouse, they are classified as Scope 3 emissions. The following inputs were included in the accounting of emissions from supplying ranches: litres of fuel consumed, kilogram of fertilizer for pastures, kilogram of fertilizer applied in agricultural production areas for animal nutrition, number and weight of livestock, weight gain (depending on availability of farm information), etc.

The following table demonstrates the results of our data quality assessment based on the factors and data quality indicators as described in Section 3 of the Preferred by Nature Standard. Renove Program uses the principles ISO 14064 that identifies five commonly accepted principles: relevance, completeness, consistency, transparency, and accuracy.

- Relevance: Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.
- Completeness: Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions of emission sources.
- Consistency: Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
- Accuracy: Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.
- Transparency: Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.

The table demonstrates the results of our data quality assessment based on the factors and data quality Indicators follow ISO 14064 principles and scores are assigned to project fundamentals on a

scale of 1 to 5, where the highest score indicates the best data result our data quality.

Table 11. Data quality assessment.

Considerations	Relevance	Completeness	Consistency	Accuracy	Transparency
Farm selection	4	4	4	4	5
Primary data collection (farms)	5	4	4	4	5
Primary data collection (Processing Facilities)	5	5	4	4	5
Calculation approach	5	4	4	5	5
Reduction Plan	3	3	3	3	5

6.2. Data Quality Improvement Plan

The Company is committed to improving its data collection methods and sources to reflect emission totals and reductions that are accurate and relevant. Based on this, Minerva Foods is taking ongoing measures to enhance the quality of data by incorporating industry best practices, using the most recent resources, and prioritising the use of primary data. The following demonstrates our actions to reduce data uncertainty and quality issues in the future.

- Aggregate a greater number of farms participating in the study, producing more representative average values;
- Prioritize agricultural properties with management system implanted. Requesting inputs reports, when possible, from inputs applications in livestock and pasture management. Also, complete output reports of animal sales;
- For agricultural properties where management systems are not implemented, employee training will be promoted and optimized forms will be developed to collect primary information in accordance with the inputs and outputs evidenced by the purchase and sale invoices.
- Refinement of production information: i) information on monthly sell / buy of cattle will be collected to improve estimates e ii) information on animal weight gain during the period evaluated will be a priority target.
- The calculation of GHG emissions will be internally verified to minimize errors, from typing to checking the methods provided for in international protocols for accounting for emissions.

7. Climate Communications, claims, and labels

7.1. Public reporting

The Minerva Foods – Uruguay communicates the results of its carbon footprint as well as its progress on GHG emissions reductions on an annual basis. The information is available in the following documents.

Table 12. Carbon footprint reports documents.

Report Description	Name and Date	Content / Purpose	Link
CFM Plan	Carbon Footprint Management Plan 2022-2022	Carbon Footprint Management Plan for eight Minerva Foods cattle farms suppliers evaluated for the period of 2022-2022 in Uruguay.	https://minervafoods.com/en/product-quality-and-respect-life/ *(Way to access: Certification > Environment & Sustainability > Carbon Neutral Seal)*
Carbon on Track Platform	Carbon on Track Platform - IMAFLORA	Communicate the results and advances of Minerva's carbon estimates within a friendly and didactic platform developed by Imaflora	https://carbonontrack.imaflora.org/home/
Sustainability report	Sustainability Report 2022 Minerva Foods	The report contents provide a comprehensive account of the environmental, social and economic performance of the Company's plants, offices and broader supply chain, and the ways that Minerva Foods has applied industry best practices in managing sustainability. As in previous years, the report has been prepared in accordance with the Core option under the Global Reporting Initiative (GRI) guidelines.	https://minervafoods.com/en/sustainability-reports/

7.2. Claims and Labels

Minerva Foods – Uruguay uses CFM claims and labels to demonstrate our climate efforts to stakeholders. This document along with Sustainability Report serve as supporting evidence to stakeholders wishing to validate the appropriateness of our claims and label use. In particular, we validate that the information supporting our claims and labels are clearly accessible, do not misrepresent any emissions or results, and appropriately identify the parts of the business or product

under investigation; carbon footprint results as well as reductions and offsets achieved; date of verification and approvals.

The following demonstrates an overview of our verification scope(s) and related claims and labels.

Date of verification approval: 23-02-2022

Date of Label and/or claim use approval: 23-02-2022

Table 13. Overview of our verification scope(s) and related claims and labels.

	CFM Label	CFM claim	Evidence
Corporate			
Measuring CO_2		Products with carbon footprint measured	
CO_2 Neutral		Products with carbon footprint measured and emissions offset	https://minervafoods.com/wp-content/uploads/2023/01/Carbon-Management-Plan-MINERVA_2022_URY.pdf