DORI ALIMENTOS LTDA - BIOMASS BASED PROJECT - BRAZIL

Document Prepared by Sustainable Carbon – Projetos Ambientais Ltda

Project title	Dori Alimentos Ltda - Biomass Based Project - Brazil
Project ID	332
Monitoring period	01-August-2020 to 31-December-2023
Original date of issue	26-July-2024
Most recent date of issue	15-July-2025
Version	07
VCS Standard Version	4.7
Prepared by	Sustainable Carbon – Projetos Ambientais Ltda

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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

This project activity was developed by CantorCO2e Brazil, and is now being carried out by Sustainable Carbon - Projetos Ambientais LTDA.

The project activity is a bundle project of two production units of Dori Alimentos LTDA and consists in promoting the fuel switch in Dori's boiler. Dori Alimentos LTDA is a candy industry that was created in 1967. Dori manufactures all kinds of candies, chocolates and peanuts in different flavors, to meet domestic and international demand. The company exports its products to 50 different countries, including Latin America, Australia, South Africa, United States and some European countries. Besides that, Dori Alimentos LTDA has distribution center throughout Brazil.

In the candies manufacturing process, steam is used in several different stages of the production process, for example in the greenhouse providing heat to dry the final products or during the production in order to increase the humidity of some candies' ingredients.

The project activity involves the use of biomass as a source of fuel to supply steam for the production process, replacing shale oil, which is the fuel commonly used in industries at São Paulo and Paraná. In both units, Eucalyptus and Pinus wood chips are used, and in Dori's head office peanut shells are applied. The fuel switch started in December 2004; however, the regular operation of the boiler with biomass began on August 2005 in Dori's head office and on Dori's subsidiary company on January 2005.

Since 2008, the boilers in both production units have been working predominantly with renewable biomass to generate steam. There is still a minor consumption of shale oil in Rolândia, which is related to the period of equipment maintenance or cleaning, which usually lasts from two to three hours. In 2013 Dori's head office substituted the shale oil for natural gas which has a smaller CO_2 Emission factor, 73.3 tCO_2/TJ and 56.1 tCO_2/TJ respectively. This change occurred because of the availability of a natural gas pipeline in Marilia region that brought an opportunity to Dori's Head Office to change the type of fossil fuel utilized to natural gas mainly due to its advantages regarding the decrease of environmental impacts when compared with the shale oil previously utilized. Financially, the switch to natural gas was not an advantage for the company. According to Arruda (2009)[1], the price for generate 1TJ using shale oil is around R$ 5,000.00, six times cheaper than using natural gas, R$ 30,000.00.

The implementation of this project activity in Dori Alimentos LTDA has as objective reduce the use of fossil fuel and substitutes it by renewable biomasses to feed boilers and generate steam to sustain the

[1] ARRUDA, M. Z. Análise de Combustíveis de Caldeiras. Universidade de Passo Fundo, 2009. Available at: < http://usuarios.upf.br/~engeamb/TCCs/2009-2/MATEUS%20ZART%20DE%20ARRUDA.pdf>. Last visit on: 28-11-2023.

production. The intention is to minimize environmental impacts related to the consumption of fossil fuels and mitigate greenhouse gas (GHG) emissions.

The emission reductions due to the switch of fossil fuel (shale oil and natural gas) to renewable biomasses were equal to **47,286 tCO_2e** during the monitoring period from 01-08-2020 to 31-12-2023.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation (PD 1)	(01-April-2006—31-March-2016)	VCS	TÜV NORD CERT GmbH	10 years
Verification (MR 1)	(01-April-2006—31-October-2008)	VCS	TÜV NORD CERT GmbH	2.6 years (31 months)
Verification (MR 2)	(01-November-2008—30-April-2013)	VCS	Bureau Veritas Certification SAS	4.5 years (54 months)
Verification (MR 3)	(01-May-2013—31-March-2016)	VCS	Earthood Services Private Limited	2.9 years (35 months)
Validation (PD 2)	(01-April-2016—31-March-2026)	VCS	Earthood Services Private Limited	10 years
Verification (MR 4)	(01-April-2016—30-June-2018)	VCS	Earthood Services Private Limited	2.2 years (27 months)
Verification (MR 5)	(01-July-2018—31-July-2020)	VCS	RINA Services S.p.A.	2.1 years (25 months)
Verification (M5 6)	(01-August-2020—31-December-2023)	VCS	RINA Services S.p.A.	3.4 years (41 months)

1.3 Sectoral Scope and Project Type

The project is associated to the following scope, as per UNFCCC definitions:

Sectoral scope[2]	1 - Energy industries (renewable - / non-renewable sources)

[2] *Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes*

Project activity type	Fuel switch from fossil fuel (shale oil and natural gas) to renewable biomass.

This is not an AFOLU project. This is not a grouped project.

1.4 Project Proponent

Organization name	Dori Alimentos LTDA
Contact person	Mrs. Márcia S. Cavicchioli de Oliveira; Mr. Everton Luiz Cardoso
Title	Mrs. Márcia S. Cavicchioli de Oliveira, Environmental management system coordinator is responsible to provide all information of Marília Plant and to lead the visit of the candy industry. Also, she gives detailed information on process and production lines, environmental challenges, technological challenges, research and development history and food market challenges. Furthermore, she is responsible for the monitoring data, providing the quantification of the amount of steam produced and of the amount of biomass. During this monitoring period, Mr. Everton Luiz Cardoso has taken over Mrs. Silvia Cristina Pinas's responsibilities as Environmental management technician to provide all information of Rolândia Plant and to lead the visit of the candy industry. Also, he is responsible for the monitoring data, providing all the information necessary for the Monitoring Report.
Address	Dori Alimentos S.A. (Head office in Marília/SP) Av. República, 5159/85 - Distrito Industrial Santo Barion. CEP 17512-035 - Marília/SP Dori Alimentos S.A. (Subsidiary company in Rolândia/PR) Av. Itamaraty, 1324 - Parque Industrial. CEP 86600-000 - Rolândia/PR
Telephone	Dori Alimentos S.A. (Head office in Marília/SP) +55 14 3408-3000 Dori Alimentos S.A. (Subsidiary company in Rolândia/PR)

	+55 43 3255 2400
Email	marcia.oliveira@dori.com.br everton.cardoso@dori.com.br

1.5 Other Entities Involved in the Project

As the project authorized contact, Sustainable Carbon was given the responsibility of preparing the present project report and to accompany the proponents until the end of the crediting period.

Organization name	Sustainable Carbon – Projetos Ambientais Ltda
Contact person	Eliane Seiko Maffi Yamada Aline de Paulo Costa Glenda Fauth Mariana Vieira da Costa Mário Batista da Silva Thaís de Almeida Rocha
Title	Eliane Seiko Maffi Yamada: Technical Director Aline de Paulo Costa: Technical Coordinator Glenda Fauth: Technical Analyst Mariana Vieira da Costa: Technical Analyst Mário Batista da Silva: Technical Analyst Thaís de Almeida Rocha: Technical Analyst
Address	R. Doutor Bacelar. 368 – Conj. 23 – Vila Clementino São Paulo – SP – Brazil Postal Code: 04026-001
Telephone	+55 11 2649 0036
Email	tecnica@sustainablecarbon.com

1.6 Project Start Date

Project start date	Dori's Head Office – 01-March-2005 Dori's Subsidiary – 01-December-2004

	The project start date of the project was defined as 01-December-2004, the date corresponding to the first substitution of shale oil by renewable biomass.
Justification	According to version 02 of the VCS PD[3], project start date was defined as the date when the project began reducing or removing GHG emissions through employment of renewable biomass.

1.7 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☐ Ten years, fixed ☒ Other – Ten years, twice renewable. The crediting period is in line with the VCS 2007 Standard[4], which was in force at the validation of the first crediting period.
Start and end date of first or fixed crediting period	First crediting period - 01-April-2006 to 31-March-2016 Second crediting period - 01-April-2016 to 31-March-2026

1.8 Project Location

-Head Office

Av. República, 5.159/85 - Distrito industrial Santo Barion - CEP 17512-035 Marília, SP, Brazil;

The coordinates are: 22° 12′ 50″ S and 49° 56′ 45″ W

-Subsidiary

Av. Itamaraty, 1324 - pq. Industrial - CEP 86600-000 Rolândia, PR, Brazil.

The coordinates are: 23° 18′ 36″ S and 51° 22′ 8″ W

[3] Document available at: https://registry.verra.org/app/projectDetail/VCS/332. Last visited on 30-11-2023.

[4] Document available at: https://verra.org/wp-content/uploads/VCS-2007.pdf. Last visited on 09-05-2024.

Figure 1. Geographic location of the cities of the project activity that has the following coordinates.

1.9 Title and Reference of Methodology

The project applies a small-scale methodology approved under the Clean Development Mechanism, as follows:

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	AMS-I.C	AMS-I.C: Thermal energy production with or without electricity. This category comprises renewable energy technologies that supply individual households or users with thermal energy that displaces fossil fuels.	20.0 (Valid from June 01st, 2014 to 13th June 2019)[5]
TOOL	3	TOOL 3 – "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"	3
TOOL	12	TOOL 12 – "Project and leakage emissions from transportation of freight"	1.1.0
TOOL	16	TOOL 16 – "Project and Leakage Emissions from Biomass"	5.0

[5] This version of the methodology is available at: http://cdm.unfccc.int/methodologies/DB/JSEM51TG3UVKADPA25IPUHXJ85HE8A. Last visited on 30-11-2023.

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

1.12 Sustainable Development Contributions

The project continuously contributes to the sustainable development of the host country by investing in solar energy, reusing waste, and switching to clean technologies with renewable biomass as fuel. This approach reduces GHG emissions without causing negative impacts, as all energy is derived from optimal natural resource use. Additionally, the project improves local

environmental conditions by properly treating renewable biomass, reducing fossil fuel use and reducing waste.

The project aligns with Agenda 21, Brazilian Sustainable Development Criteria, and Sustainable Development Goals, specifically contributing to:

- SDG 7 – Affordable and Clean Energy
- SDG 12 – Responsible Consumption and Production
- SDG 13 – Climate Action

The project proponents keep records of these activities, allowing Sustainable Carbon to monitor and report on progress.

Table 1. Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	7.0	Amount of fossil fuel displaced by project activity (tonnes)	Implemented activities to increase	During this monitoring period, the project activity displaced the use of 21,120 tonnes of fossil fuel to use renewable biomass instead.	Over the project lifetime, 107,421 tonnes of fossil fuel were displaced to use renewable biomass instead.
2)	12.5	Reduce waste generation by reutilizing it in the production process.	Implemented activities to increase	Dori's Head office unit uses the peanut shell, which are residues from Dori's production, as renewable biomass, reducing the amount of residues from the production process and making this sector self-sustainable. In this monitoring period, 1,744 tonnes of peanut shell were used as renewable biomass.	The project used 44,157 tonnes of peanut shell as renewable biomass in the production process.
3)	13.0	Tonnes of greenhouse gas emissions avoided	Implemented activities to increase	The project activity avoided the emission of 47,286 tCO_2 in the atmosphere by switching from non-renewable fuels to renewable biomass.	The project has avoided the release of 267,251 tCO_2 into the atmosphere over its lifetime.

1.13 Commercially Sensitive Information

None of the information exposed to the Validation and Verification Body was withheld from the public version of the report.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	Stakeholders were identified at validation and there were no changes since then. The stakeholders considered in this project are the local government, the Brazilian Association of Food Industry and the employees.
Legal or customary tenure/access rights	The project activity is developed in two units of Dori Alimentos LTDA. industry, both located on private property. The stakeholders were aware of the project at the validation period, and no legal or customary tenure/access rights were held by the stakeholders.
Stakeholder diversity and changes over time	The project involves stakeholders from the local government, the Brazilian Association of Food Industry and the employees. Therefore, it can be considered that the project covers the social, economic and cultural diversity of the stakeholders. No changes were identified among the stakeholders involved with the project. Any future significant changes will be informed in this section.
Expected changes in well-being	The project improves the local environmental conditions by replacing the consumption of shale oil and natural gas, and by establishing proper treatment for biomass residue, reflecting positively in the stakeholder's well-being.

Location of stakeholders	Both units of Dori Alimentos LTDA that compose the project are in industrial areas. The Head Office is in an industrial area in Marília city, state of São Paulo, and the Subsidiary unit is in an industrial area in Rolândia city, state of Paraná. No negative impacts on the boundaries or outside the plant area are expected from the project.
Location of resources	The project activity is developed in two units of Dori Alimentos LTDA., both located on private property. No stakeholder owns or have customary access to the territory or resources on the factory's boundaries.

2.1.2 Stakeholder Consultation and Ongoing Communication

The formal stakeholder consultation was carried out during the validation of the project. Currently the company's environmental management area is available to receive any kind of suggestions and comments from the community through the Customer Service Center on the website, telephone, e-mail or even personally.

Ongoing consultation	Dori's team is available to the stakeholders via website, telephone or email: Website: https://dori.com.br/fale-conosco/ **Telephone:** **+55 14 3408-3000 - Dori Alimentos S.A. (Head office)** +55 43 3255 2400 - Dori Alimentos S.A. (Subsidiary) Email: marcia.oliveira@dori.com.br everton.cardoso@dori.com.br Sustainable Carbon team is also available to discuss the project and is easily accessible via email and telephone: Email: tecnica@sustainablecarbon.com Telephone: +55 11 2649 0036 In addition, every document regarding the project is public and accessible on the VERRA registry page: https://registry.verra.org/app/projectDetail/VCS/332

Date(s) of stakeholder consultation	At project validation, a letter was sent to the stakeholders informing about the project. In Dori's facilities, the letter was posted on the employees' board which is a visible place with high circulation of employees. The letter was available for 7 days and the comments were expected for a period of 7 days after the letter has been posted. The comments received from the stakeholders are described in the validation PD v.02 dated 19/10/2009.
Communication of monitored results	No comments or suggestions were received from the stakeholders during this Monitoring Period. If there are any in the future, they will be answered in a culturally appropriate and in a timely manner.
Consultation records	Dori has an open and secure ethics channel where complaints, suggestions and questions can be registered. Stakeholders can also contact the Customer Service Center via the website (https://dori.com.br/fale-conosco/).
Stakeholder input	Stakeholders did not suggest any changes to the project design. If there are any in the future, they will be answered in a culturally appropriate and in a timely manner.

2.1.3 Free, Prior, and Informed Consent

Consent	The project activity is developed in two units of Dori Alimentos LTDA., both located on private property. The stakeholders were aware of the project at the validation period, and no legal or customary tenure/access rights were held by the stakeholders.
Outcome of FPIC	The outcome of the stakeholder consultation was the project validation. The project did not encroach on private, stakeholder or government property, nor relocate people off their lands.

2.1.4 Grievance Redress Procedure

During this monitoring period, no grievances were raised. Currently the company's environmental management area is available to receive any kind of suggestions and comments from the community through the Customer Service Center on the website, telephone, e-mail or even

personally. In the event of any grievance, it will be resolved within a reasonable time period, taking into account culturally appropriate conflict resolution methods.

Grievances received	Resolution and outcome
N/A	N/A

2.1.5 Public Comments

During this Monitoring Period, no comments were received. Currently the company's environmental management area is available to receive any kind of suggestions and comments from the community through the Customer Service Center on the website, telephone, e-mail or even personally.

Summary of comments received	Actions taken
N/A	N/A

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experiences

This project activity is a bundle project involving two production units of Dori Alimentos LTDA., and is carried out by Sustainable Carbon – Projetos Ambientais LTDA.

With over 15 years of experience, Sustainable Carbon – Projetos Ambientais LTDA is a pioneer and leader in Latin America in the development of carbon credit projects for the Voluntary Carbon Market (VCM). Sustainable Carbon also excels in corporate sustainability and climate change management, boasting a robust portfolio of over 40 verified fuel switch and renewable biomass projects.

The project activities are managed by a highly skilled team of technical experts. Our team members bring extensive experience in implementing nature-based and technology-based solutions projects, ensuring that all aspects of the project are executed with professionalism and expertise. Their broad knowledge of carbon project management and socio-environmental co-benefits enables us to effectively achieve project goals and deliver long-lasting sustainable solutions and environmental benefits.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	No risk identified.	The project does not offer any risk to the stakeholders' wellbeing.
Risks to stakeholder participation	No risk identified.	The project does not offer any risk to the stakeholders.
Working conditions	No risk identified.	The project does not offer any working conditions risk.
Safety of women and girls	No risk identified.	The project does not offer any risk to the safety of women and girls.
Safety of minority and marginalized groups, including children	No risk identified.	The project does not offer any risk to the safety of minority and marginalized groups.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified. A negative impact identified is that the project activity will generate ashes due to the burning of the biomass. Nonetheless, the ashes are correctly destined: The ashes generated in Marília site are used as fertilizer and in Rolândia site are destined to a worm farm to produce compost.	The project does not offer any pollution risk.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified[6]	Mitigation or preventative measure(s) taken
Discrimination	No risk identified.	Dori complies with anti-discrimination policies as

[6] The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

		evidenced by its Code of Conduct[7].
Sexual harassment	No risk identified.	Dori complies with anti-sexual harassment policies as evidenced by its Code of Conduct.
Gender equity in labor and work	No risk identified.	Dori complies with gender equity policies as evidenced by its Code of Conduct.
Forced labor	No risk identified.	Dori is not involved with forced labor as evidenced by its Code of Conduct.
Child labor	No risk identified.	The factory is not involved with child labor, as evidenced by its Code of Conduct.
Human trafficking	No risk identified.	The factory is not involved with human traffic, as evidenced by its Code of Conduct.

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified.	There are no IPs or customary right holders living on neither Dori's units' boundaries. Dori's Head office and Dori's subsidiary are located in industrial districts, respectively, in Marília and Rolândia cities.

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
No risk identified.	There are no IPs or customary right holders living on neither Dori's units' boundaries.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken

[7] Available at < https://dori.com.br/wp-content/uploads/2024/06/Dori-Codigo-de-Conduta-2024-Digital-2.pdf> Last visited on 12-07-2024.

No risk identified.	The project did not encroach on private, stakeholder or government property, nor relocate people off their lands. The two units of Dori Alimentos LTDA. that compose the project are privately owned and located in industrial areas.

2.3.5 Benefit Sharing

Not applicable. The project did not impact property rights. The two units of Dori Alimentos LTDA. that compose the project are privately owned and located in industrial areas.

Summary of the benefit sharing plan	N/A
Benefit sharing during the monitoring period	N/A

2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified.	The project attends all legal requirements, and no environmental impacts are predicted.
Soil degradation and soil erosion	No risk identified.	Environmental Impact analysis at revalidation found improvements of soil conditions because of the use of ashes as fertilizer as well as due to the use of effluent from the factory for irrigation of the eucalyptus farm in Rolândia site.
Water consumption and stress	No risk identified.	Environmental Impact analysis at revalidation found preservation of hydric resources and water quality by avoiding the use of shale oil – shale oil is obtained by injecting large quantities of water and

		chemicals under high pressure onto the rock. Dori is in compliance with water quality and quality licenses, standards and regulations at both units.

2.4.1 Rare, Threatened, and Endangered species

The two units of Dori Alimentos LTDA. that compose the project are privately owned and located in industrial areas, and therefore are not located in or adjacent to habitats of rare, threatened, or endangered species.

Species or habitat	N/A
Areas needed for habitat connectivity	N/A

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No risk identified.	The two units of Dori Alimentos LTDA. that compose the project are privately owned and located in industrial areas, and therefore are not located in or adjacent to habitats of rare, threatened, or endangered species.
Areas for habitat connectivity	No risk identified.	The two units of Dori Alimentos LTDA. that compose the project are privately owned and located in industrial areas, and therefore are not located in areas for habitat connectivity.

2.4.2 Introduction of species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
N/A	N/A	N/A	N/A

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
N/A	N/A

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	No risk identified.	N/A

2.4.3 Ecosystem conversion

Not applicable. This is not an ARR, ALM, WRC or ACoGS project.

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified.	N/A

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project description document of the second credit period was validated by the Designated Operational Entity Earthood Services Private Limited and this present monitoring report will be verified by RINA Services S.p.A.

The emission reductions are achieved by displacing the use of fossil fuels to provide thermal energy in Dori candy industry that occurs with the renewable biomasses employed in this project activity. The Dori's Head Office implemented the use of natural gas during the first crediting period of the project activity, in substitution to the shale oil previously utilized. This decision was made due to the new natural gas pipeline available in Marília region, which brings an opportunity to the Dori's Head Office to change the type of fossil fuel utilized to natural gas due to its advantages regarding the environmental impacts when compared with the shale oil previously utilized. Thus, currently, the emission reductions are achieved by displacing the use of natural gas in the Marília site and shale oil in the Rolândia site.

The boilers have been utilized in the company since 2005 and their lifetime is more than 20 years. Considering the low utilization, since the boilers of natural gas and shale oil are only for back up use, the lifetime of the boilers would encompass all the project crediting period.

In the head office unity, wood chips are bought in bulk and discharged in a third company that realizes the bagging work, the full bags are transported to Dori Alimentos in Marília where it keeps stored under a shed until its use. The same kind of storage and bagging work happens with the peanut shells which are residues from Dori's production making this sector self-sustainable. Biomass transportation from the bags to the metallic silo will take place by means of a conveyor belt that will start and stop automatically based on the biomass amount required by the boiler.

The Dori's subsidiary unity does not make use of bags for biomass storage and the first silo feeding is made by a motorized cart which feed the wood chips directly into the first mill hopper. From there, the wood chips go through a conveyor belt into a classifier where the thicker wood chips are excluded. The selected wood chips fall into the second silo, and then they are carried by a conveyor belt to the metallic silo which feeds the boiler with the help of two screws that dose the biomass. This dosage is controlled by an automated system which controls other instruments such as pressure and flow meter.

This Monitoring Report refers to the sixth monitoring period of this project and includes data from 01-08-2020 to 31-12-2023.

3.2 Deviations

3.2.1 Methodology Deviations

There were no methodology deviations during this monitoring period.

3.2.2 Project Description Deviations

During this monitoring period (6th MR), the Marília and Rolândia units were not covered by the calibration certificates for the road weight for a few months. In addition, both units were also not covered by the calibration certificates for the flow meter during part of the period. Following conservative assumptions or discount factors, paragraph 231, point b.ii. of the CDM Project Standard for Project Activities (version 02.0 CDM-EB93-A04-STAN)[8] was used as reference, and a 10% discount was applied for the months of the 6th MP in which there was no calibration certificate, both for the road weight and for the flow meters in both units.

At the Marília unit, the flow meter developed defects and was replaced with new equipment in 2021. According to the technical manual for the new device, several tests and simulations have shown that it maintains the guaranteed calibration and accuracy in non-abrasive and non-

[8] CDM Project Standard for Project Activities. Available at: <https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20181221092046526/Reg_stan04v02.pdf>. Last visited: 24-09-2024.

corrosive media, such as water and steam, ensuring a long-lasting accuracy[9]. It is worth noting that Inmetro, National Institute of Metrology, Quality and Technology of Brazil, does not establish validity periods for calibration, and the frequency should be defined by the user, considering the condition of the instrument and the level of service provided, among other factors[10].

Based on these guidelines, Dori has determined that the calibration of the new flow meter at the Marília unit will be performed every three years, in a conservative manner, given that steam is a non-abrasive and non-corrosive medium, ensuring a long-lasting accuracy. The initial calibration of this new equipment was performed in 2021, and the next one will take place in 2024, according to the agreed three-year interval. Despite this, no discounts were applied for the months without a calibration certificate after the replacement of the flow meter, as the technical manual confirms long-lasting accuracy under current operating conditions, and Inmetro does not require annual calibration. This deviation did not impact the applicability of the methodology, additionality, or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology and accuracy.

According to VCS rules, project description deviations shall be reported in all subsequent verification reports. This section describes all project description deviations verified in the 4th MP (01-04-2016 to 30-06-2018) and 5th MP (01-07-2018 to 31-07-2020).

During the past monitoring period (5th MP, from 01-07-2018 to 31-07-2020) Marília and Rolândia units did not had all the road weight calibration certification and did not presented all the flow meter calibration evidence. Following conservative assumptions or discount factors, the paragraph 231 point b.ii of the Standard CDM Project Standard for Project Activities (version 02.0 CDM-EB93-A04-STAN) was used as reference, and a 10% was discounted for the months of the 5th MP when there was no calibration certificate[11].

Also, for the leakage due to transportation of biomass calculation, two parameters that were not described in the Project Description were included from the 5th MR onwards, according to the applied methodology AMS-I.C. v.20. This methodology requires the use of the methodological tool 16 - “Project and Leakage Emissions from Biomass”, v. 05.0, for calculating leakage emissions from biomass, which in turn requires the use of the methodological tool 12 - “Project and leakage emissions from transportation of freight", v. 01.1.0, for calculating emissions resulting from transportation of biomass, if distance is more than 200 km. Tool 12 requested the utilization of the parameters $EF_{CO2,f}$ (default CO_2 emission factor for freight transportation activity f) and $FR_{f,m}$ (total mass of freight transported in freight transportation activity f in monitoring period m). Thus,

[9] Technical Information: Proline Prowirl D 200 Vortex flowmeter. Available at: <https://www.instrumart.com/assets/D-200-Vortex-Datasheet.pdf>. Last visited: 08-10-2024.

[10] Inmetro: Metrologia Científica. Available at: <http://www.inmetro.gov.br/metcientifica/FAQ.asp#:~:text=O%20Inmetro%20n%C3%A3o%20define%20prazos,seus%20clientes%2C%20entre%20outros%20par%C3%A2metros>. Last visited: 08-10-2024.

[11] CDM Project Standard for Project Activities. Available at: <https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20181221092046526/Reg_stan04v02.pdf>. Last visited: 30-11-2023.

this deviation did not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology.

During the 4th monitoring period (01-04-2016 to 30-06-2018) Rolândia unit have never calibrated the flow meter. To the periods that flow meter has not been calibrated an accuracy error of 0.1% was applied to the steam generation, according to the manufacturer's instructions. Once Marília unit did not presented all the flow meter calibration evidences an accuracy error of 0.04% was applied to the data according to the manufacturer's instructions. Furthermore, Rolândia unit did not have the road weight calibration certification. According to the "CDM validation and verification standard for project activities (CDM-EB93-A05-STAN)[12]", it was applied +5% of error ensuring the most conservative scenario regarding the generation of leakage.

3.3 Grouped Projects

Not applicable. This is not a grouped project.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{projected\ fossil\ fuel}$
Data unit	tCO_2/TJ
Description	CO_2 Emission factor of fossil fuel
Source of data	Value checked at: -IPCC: Intergovernmental Panel on Climate Change. Available at: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf. Last visited on 01-12-2023.

[12] CDM validation and verification standard for project activities Available at: https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20170502114945162/reg_stan06.pdf. Last visited: 25-07-2024

Value applied	Baseline Emissions 73.3 tCO_2/TJ (shale oil) 56.1 tCO_2/TJ (natural gas) Project Emissions 79.2 tCO_2/TJ (shale oil) 58.3 tCO_2/TJ (natural gas)
Justification of choice of data or description of measurement methods and procedures applied	It was considered IPCC default value for fossil fuel (shale oil and natural gas). The CO_2 emissions from the consumption of fossil fuel in the project activity have to be discounted of the emission reductions (project emissions).
Purpose of data	• Calculation of baseline emissions, and • Calculation of project emissions.
Comments	Applicable for stationary combustion in the manufacturing industries and construction. Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	$NCV_{fossilfuel}$
Data unit	TJ/Tonne of fossil fuel
Description	Net Calorific Value
Source of data	Value average checked at: IPCC - Intergovernmental Panel on Climate Change.[13]
Value applied	Baseline Emissions 0.0381 TJ/Tonne (shale oil) 0.048 TJ/Tonne (natural gas) Project Emissions 0.0452 TJ/Tonne (shale oil) 0.0504 TJ/Tonne (natural gas)
Justification of choice of data or description of measurement methods and procedures applied	It was considered IPCC default value for fossil fuel, as recommended in the applied methodology - "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", on Data/parameter table 4[14], source of data option d.
Purpose of data	• Calculation of baseline emissions, and

[13] https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf last visited on 01-12-2023

[14]Methodological tool – Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion. Available at http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v3.pdf Last visited: 01-12-2023

	• Calculation of project emissions.
Comments	IPCC default values shall be used only when country or project specific data are not available or difficult to obtain, according to "Guidance on IPCC default values" (Extract of the report of the twenty-fifth meeting of the Executive Board, paragraph 59). Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits income for this project activity, whichever occurs later

Data / Parameter	$\rho_{fossilfuel}$
Data unit	tonne/m³
Description	Specific gravity of the fossil fuel
Source of data	Value provided by the fuel provider through the technical form of the fossil fuel.
Value applied	0.00097 (shale oil) 0.000766 (natural gas)
Justification of choice of data or description of measurement methods and procedures applied	Project participants measured this data, as recommended in the applied methodology - "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", on Data/parameter table 3, source of data option b.
Purpose of data	• Calculation of baseline emissions.
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	$\rho_{renbiomass}$
Data unit	Tonne / m³
Description	Specific gravity of renewable biomass
Source of data	Value measured and recorded by the project proponent.
Value applied	
Justification of choice of data or description of measurement methods and procedures applied	Project participants measured this data, as recommended in the applied methodology - "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", on Data/parameter table 3, source of data option b.
Purpose of data	• Calculation of baseline emissions, and

Biomasses	Specific Gravity (tonne/m³)
Wood chips	0.350
Peanut shells	0.117

	• Calculation of leakage emissions.
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	$EF_{CO2,f}$
Data unit	gCO_2/t km
Description	Default CO_2 emission factor for freight transportation activity f
Source of data	Methodological tool: Project and leakage emissions from transportation of freight. Available at: <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-12-v1.1.0.pdf>. Last visit on: 01-12-2023
Value applied	Vehicle class: Light vehicles — Emission factor: 245 Vehicle class: Heavy vehicles — Emission factor: 129
Justification of choice of data or description of measurement methods and procedures applied	The source of data is the methodological tool default values, a reliable validated document developed by UNFCCC
Purpose of data	• Calculation of project emissions
Comments	This parameter was utilized to calculate project emissions for freight that exceeds 200 km. Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later

Data / Parameter	Efficiency Factor
Data unit	Tonne of fossil fuel per tonne of steam.
Description	Efficiency of the boiler, used for determining the amount of fossil fuel consumed, based on the amount of steam generated
Source of data	This value was calculated through historical steam generation data and fossil fuel consumption registries provided by Dori Alimentos LTDA.
Value applied	0.074074 (shale oil) 0.056741 (natural gas)
Justification of choice of data or description of	This parameter was calculated through historical data provided by Dori Alimentos LTDA. The efficiency of the boiler is 0.074074

measurement methods and procedures applied	tonne of shale oil per tonne of steam generate and 0.056741 tonne of natural gas per tonne of steam generate
Purpose of data	• Calculation of baseline emissions.
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	$COEF_{i,y}$
Data unit	tCO_2e / tonne of fossil fuel
Description	CO_2 emission coefficient of the fossil fuel
Source of data	Value calculated through the parameters $NCV_{fossil\ fuel}$ and $EF_{fossilfuel}$ $COEF_{i,y} = NCV_{fossil\ fuel} * EF_{fossil\ fuel}$ [tCO_2e/tonne]
Value applied	Project Emissions 3.57984 (shale oil) 2.93832 (natural gas)
Justification of choice of data or description of measurement methods and procedures applied	Required by the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (version 03, EB 96, Annex 4).
Purpose of data	• Calculation of project emissions
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	η_{th}
Data unit	%
Description	The efficiency of the plant using fossil fuel that would have been used in the absence of the project activity.
Source of data	Value provided by the project proponent
Value applied	100%
Justification of choice of data or description of measurement methods and procedures applied	Dori's facilities did not monitor the energy generated by the fossil fuel consumed. However, it is well known the amount of fossil fuel and the amount of fuel required to generate one tonne of steam. Therefore, this project estimates the baseline emissions through the energy generated by the real consumption of fossil fuel and assuming that ηth is 100%. The efficiency of 100% was considered in order to be more conservative.

Purpose of Data	• Calculation of baseline emissions.
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

4.2 Data and Parameters Monitored

Data / Parameter	$Q_{renbiomass}$
Data unit	Tonnes
Description	Amount of renewable biomass (per year)
Source of data	Values measured and supplied by the project proponent
Description of measurement methods and procedures to be applied	As predicted in the VCS PD, the amount of renewable biomass would be monitored in accordance with the weight described in the receipts from the providers and the number of trucks which arrives in the companies. In both sites, all processes are controlled and recorded. Biomass purchase, storage, and consumption are all monitored through purchase invoice, truck entry receipts, and stock monitoring based on biomass consumption. The $Q_{renbiomass}$ was monitored by an internal control.
Frequency of monitoring/recording	Monthly
Value monitored	

Period	Wood chips consume (tonnes)		Peanut shells consume (tonnes)
	Marília	Rolândia	Marília
August	1,019	975	104
September	1,018	1,027	115
October	1,039	928	126
November	933	996	112
December	1,058	833	116
Total 2020	**5,067**	**4,760**	**573**
January	1,197	888	109
February	1,351	852	48
March	1,318	925	122
April	1,091	915	108
May	1,317	805	121
June	1,310	930	111
July	1,386	931	45

	August	1,718	789	0
	September	1,646	1,115	0
	October	1,466	1,117	0
	November	1,426	1,012	32
	December	1,599	803	35
	Total 2021	**16,826**	**11,080**	**732**
	January	1,544	861	13
	February	1,354	745	51
	March	1,642	908	7
	April	1,386	927	0
	May	1,462	1,082	52
	June	1,599	868	39
	July	1,685	849	47
	August	1,673	1,116	12
	September	1,662	982	33
	October	1,251	948	20
	November	1,281	873	29
	December	951	1,032	2
	Total 2022	**17,491**	**11,190**	**306**
	January	1,316	1,066	6
	February	1,285	824	0
	March	1,702	934	0
	April	1,445	744	32
	May	1,536	975	53
	June	1,549	1,026	30
	July	1,583	889	11
	August	1,805	978	0
	September	1,276	740	0
	October	1,551	864	0
	November	1,498	840	0
	December	1,171	937	0
	Total 2023	**17,718**	**10,816**	**133**
	Total monitoring period	**57,103**	**37,845**	**1,744**

Monitoring equipment	Dori's units have a road weight machine, both from Toledo, being part of accuracy class III (model 820J, serial number 10254955 for Marília site and model 810II, serial number 195 for Rolândia site) responsible for measurement of biomass purchased. The number of renewable biomasses was monitored in accordance with Dori's internal control spreadsheet. Data regarding renewable biomass were organized by month.

QA/QC procedures to be applied	The weighing-machine was calibrated periodically according to the INMETRO[15] procedures and parameters, in order to guarantee the quality and precision of the amount of biomass weighted.
Purpose of the data	This parameter was used to: a) Compare the total energy produced in a monitoring period to the thermal energy that would be necessary according to the VCS PD estimates; b) Demonstrate that the Project fits in small scale category for biomass renewable energy projects (capacity < 45MWth); • Calculation of leakage
Calculation method	Not applicable
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	$EG_{thermal,y}$
Data unit	TJ
Description	Amount of heat supplied (per year)
Source of data	The amount of steam generated (Q_{steam} - tonnes) is measured by the project developer (Dori Alimentos) and converted in TJ through the equation: $EG_{thermal,y}$ (TJ) = $Q_{shaleoil}$ (tonnes) * $NCV_{shaleoil}$ (TJ/ton) $EG_{thermal,y}$ (TJ) = $Q_{naturalgas}$ (tonnes) * $NCV_{naturalgas}$ (TJ/ton)
Description of measurement methods and procedures to be applied	The amount of heat supplied was calculated based on the amount of fossil fuel that would be consumed in the baseline scenario and the energy generated by it, through the Net Calorific Value of fossil fuel.
Frequency of monitoring/recording	Monthly
Value monitored	

Period	Marília	Rolândia
August	12	6

[15] INMETRO – Instituto Nacional de Metrologia, Normalização e Qualidade Industrial (National Institute for metrology, normalization and industrial quality) is a federal institution, responsible for verifiying calibration and quality procedures in Brazil.

	September	12	6
	October	12	7
	November	11	7
	December	12	4
	Total 2020	**58**	**30**
	January	13	5
	February	15	5
	March	17	5
	April	12	6
	May	15	6
	June	15	6
	July	15	7
	August	20	6
	September	20	7
	October	18	7
	November	17	8
	December	19	6
	Total 2021	**196**	**74**
	January	18	6
	February	17	8
	March	20	10
	April	19	6
	May	19	6
	June	20	5
	July	21	7
	August	21	6
	September	20	6
	October	17	7
	November	16	5
	December	13	6
	Total 2022	**219**	**78**
	January	17	7
	February	16	3
	March	21	5
	April	18	4
	May	21	6
	June	21	6
	July	21	7
	August	22	6
	September	16	5
	October	19	6
	November	18	6
	December	16	6
	Total 2023	**227**	**67**
	Total monitoring period	**700**	**249**
Monitoring equipment	No monitoring equipment was used to determine this parameter.		

QA/QC procedures to be applied	Not applied
Purpose of the data	• Calculation of baseline emissions
Calculation method	The amount of heat supplied was calculated through the equation: $EG_{thermal,y}$ (TJ) = $Q_{shaleoil}$ (tonnes) * $NCV_{shaleoil}$ (TJ/tonne) $EG_{thermal,y}$ (TJ) = $Q_{naturalgas}$ (tonnes) * $NCV_{naturalgas}$ (TJ/tonne)
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	$Q_{fossilfuel}$
Data unit	Tonnes
Description	Amount fossil fuel that would be consumed in the baseline scenario
Source of data	Calculated based on the amount of steam generated by boilers of Dori's units and an Efficiency Factor determined by historical data.
Description of measurement methods and procedures to be applied	The amount of fossil fuel that would be consumed was calculated through the amount of steam generated, which is measured monthly by the project proponent, and an Efficiency Factor. The Efficiency Factor was determined through historical steam generation data and fossil fuel consumption registries according to the baseline scenario.
Frequency of monitoring/recording	Monthly
Value monitored	

Period	Marília (natural gas in tonnes)	Rolândia (Shale oil in tonnes)
August	246	167
September	240	167
October	248	178
November	221	176
December	249	108
Total 2020	**1,203**	**796**
January	281	129
February	311	139
March	350	121
April	259	165

	May	307	155
	June	307	167
	July	317	179
	August	426	170
	September	408	194
	October	365	183
	November	359	203
	December	400	151
	Total 2021	**4,089**	**1,955**
	January	376	146
	February	345	202
	March	411	251
	April	388	162
	May	393	166
	June	414	135
	July	427	173
	August	427	170
	September	422	162
	October	347	173
	November	343	143
	December	265	155
	Total 2022	**4,560**	**2,040**
	January	355	178
	February	341	80
	March	437	135
	April	376	116
	May	447	157
	June	437	159
	July	447	174
	August	450	155
	September	332	139
	October	396	152
	November	384	145
	December	326	156
	Total 2023	**4,729**	**1,748**
	Total monitoring period	**14,581**	**6,539**
Monitoring equipment	No monitoring equipment was used to determine this parameter.		
QA/QC procedures to be applied	The project developer was responsible for gathering and maintaining in adequate archives all data from steam production (measured by flow meter daily).		
Purpose of the data	• Calculation of baseline emissions		
Calculation method	The amount of fossil fuel that would be consumed in the baseline scenario was calculated through the equation:		

	$Q_{fossilfuel}$ = Q_{steam} (tonnes of steam)* Efficiency Factor (tonnes of fossil fuel/tonne of steam)
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	Q_{steam}
Data unit	Tonnes
Description	Amount of steam generated by the boiler
Source of data	Value measured daily by the project proponent (Dori Alimentos).
Description of measurement methods and procedures to be applied	As described in the VCS PD, the amount of steam generated would be measured monthly by a flow meter installed in the boiler by the project proponent and registered in electronic format (Excel spreadsheets).
Frequency of monitoring/recording	Monthly
Value monitored	

Period	Marília (tonnes)	Rolândia (tonnes)
August	4,329	2,248
September	4,226	2,254
October	4,364	2,406
November	3,900	2,376
December	4,383	1,462
Total 2020	**21,202**	**10,746**
January	4,954	1,746
February	5,485	1,872
March	6,165	1,635
April	4,561	2,225
May	5,406	2,094
June	5,404	2,248
July	5,591	2,417
August	7,512	2,292
September	7,189	2,624
October	6,431	2,469
November	6,321	2,736
December	7,053	2,036
Total 2021	**72,072**	**26,393**
January	6,632	1,975
February	6,083	2,725
March	7,242	3,386
April	6,835	2,191

	May	6,920	2,244
	June	7,304	1,829
	July	7,533	2,336
	August	7,532	2,294
	September	7,442	2,191
	October	6,121	2,338
	November	6,047	1,932
	December	4,670	2,096
	Total 2022	80,361	27,537
	January	6,253	2,402
	February	6,012	1,086
	March	7,709	1,824
	April	6,627	1,571
	May	7,879	2,123
	June	7,696	2,153
	July	7,884	2,354
	August	7,935	2,090
	September	5,851	1,871
	October	6,984	2,058
	November	6,768	1,962
	December	5,750	2,105
	Total 2023	83,347	23,599
	Total monitoring period	256,983	88,275
Monitoring equipment	Flow meter equipment, installed in the boiler, was used to determine this parameter. In this monitoring period, a flow meter equipment was installed at Marília's unit specified as 7D2C1F-1HV2/0, high accuracy, serial number S8058416000, technology developed by Endress+Hauser. For Rolândia units the flow meter installed is specified as VLM10 by Spirax Sarco, scale accuracy of 99.9% and serial number 121341-VLM001.		
QA/QC procedures to be applied	The project developer was responsible for gathering and maintaining in adequate archive all data from steam generation (measured by flow meter daily) and also for controlling the flow meter calibration (according to the INMETRO requirements).		
Purpose of the data	• Calculation of baseline emissions		
Calculation method	Not applied		
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.		

Data / Parameter	$D_{f,m}$
Data unit	Kilometer

Description	Return trip distance between the origin and destination of freight transportation activity f in monitoring period m
Source of data	Monitored
Description of measurement methods and procedures to be applied	Determined once for each freight transportation activity f for a reference trip using the vehicle odometer or any other appropriate sources (e.g. on-line sources).
Frequency of monitoring/recording	To be updated whenever the distance changes
Value monitored	

Df,m (km)			
2020*	2021	2022	2023
294	598	896	1,204

*From August to December

Provider	Return trip distance (km)
ANDERSON LUIZ MARTINS E CIA LT	87.8
FEMIN INDUSTRIA E COMERCIO DE MADEI	47.2
MAXIMINO PASTORELLO S.A.	31
SER OIL COMERCIAL EIRELI	36
DASOS FLORESTAL LTDA	38.6
COMBUSTIVEIS GASOIL LTDA	4.6
CHARLES BRUNO KAVA DOS SANTOS & CIA	288
N. Y. COMERCIO ATACADISTA DE CAVACO	304
ALAMAX COMERCIO DE CAVACOS DE MADEIRA LTDA	53.6
IMPERIO DA ENERGIA - EIRELI	294
AGF DE ALMEIDA EUCALIPTOS EPP	7.2
COMBUSALTE COMERCIO E TRANSP.	29
GAS BRASILIANO DISTRIBUIDORA S/A	14.8
IMPERIO DA ENERGIA - EIRELI ME	274
MANCANO & OZAWA LTDA ME	13.6
JANAINA SARAIVA BOSQUETI EPP	127.8
META FLORESTAL COM. E TRANSP. EIRELI	318
JC COMERCIO DE RESIDUOS AGRICOLAS	25.4

Monitoring equipment	No monitoring equipment is used to determine this parameter
QA/QC procedures to be applied	Data available regarding the company freight of biomass transportation
Purpose of the data	• Calculation of project emissions
Calculation method	Information in section 5.3 - Leakage
Comments	This parameter was not monitored during the first crediting period. Values started to be monitored from the second credit period onwards. Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later

Data / Parameter	$FR_{f,m}$
Data unit	Tonnes
Description	Total mass of freight transported in freight transportation activity f in monitoring period m
Source of data	Records by project participants or records by truck operators
Description of measurement methods and procedures to be applied	This parameter is recorded by the company in a spreadsheet with the biomass delivered by suppliers.
Frequency of monitoring/recording	Annually
Value monitored	

Provider	$FR_{f,m}$ in tonnes			
	2020*	2021	2022	2023
	Wood Residues	Wood Residues	Wood Residues	Wood Residues
CHARLES BRUNO KAVA DOS SANTOS & CIA	-	-	-	562.07
N. Y. COMERCIO ATACADISTA DE CAVACO	-	13,332.00	32,747.03	4,264.73
IMPERIO DA ENERGIA - EIRELI	6,400.88	10,123.97	-	16,695.30

	IMPERIO DA ENERGIA - EIRELI ME	-	-	329.51	-
	META FLORESTAL COM. E TRANSP. EIRELI	-	-	15,695.40	17,377.05
	Total per year	**6,400.88**	**23,455.97**	**48,771.94**	**38,899.14**
	Total monitoring period	**117,527.93**			
	*From August to December				
Monitoring equipment	No monitoring equipment is used to determine this parameter				
QA/QC procedures to be applied	Data available regarding the company freight of biomass transportation				
Purpose of the data	• Calculation of project emissions				
Calculation method	Information in section 5.3 - Leakage				
Comments	This parameter was not monitored during the first crediting period. Values started to be monitored from the second credit period onwards. Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later				

Data / Parameter	**Leakage due to transportation of Biomass**
Data unit	tCO_2e
Description	Leakage resulting from transportation of biomass
Source of data	Distance of biomass suppliers was monitored through a registry of all biomass providers containing their addresses.
Description of measurement methods and procedures to be applied	The distance between the provider and Dori's units was monitored through Google Maps. In case of more than 200 kilometers distance between the source and the company, leakage estimates must be calculated.
Frequency of monitoring/recording	Annually

Value monitored	LETR,m 2020* | 2021 | 2022 | 2023 | Total 243 | 907 | 1,941 | 1,536 | 4,627 *From August to December
Monitoring equipment	No monitoring equipment was used to determine this parameter
QA/QC procedures to be applied	Information about the location biomass suppliers will be monitored to check the occurrence of leakage.
Purpose of data	• Calculation of leakage.
Calculation method	The distance between the provider and Dori's units was monitored through Google Maps.
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	**Renewable Biomass origin**
Data unit	Not applicable
Description	Origin of renewable biomass
Source of data	Documents proving that the biomass is renewable.
Description of measurement methods and procedures to be applied	The documentation from renewable biomass providers was provided to prove the renewable origin of the biomass.
Frequency of monitoring/recording	At each monitored period
Value monitored	Not directly applied for the calculation. It was considered that all biomass used are renewable.
Monitoring equipment	No monitoring equipment was used to determine this parameter.
QA/QC procedures to be applied	The biomasses were considered renewable as they were in accordance with the definition given by the Annex 18, EB 23 of UNFCCC definition.
Purpose of the data	This parameter was utilized to prove the renewable origin of the biomasses utilized in the project.
Calculation method	Not applicable

Comments	All the renewable biomasses utilized in the monitoring period were already described in the project design document. Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

Data / Parameter	$FC_{i,j,y}$
Data unit	Tonnes per year
Description	Amount of fossil fuel combusted in the project activity
Source of data	Amount of shale oil and natural gas consumed are monitored by the project proponent
Description of measurement methods and procedures to be applied	The amount of shale oil and natural gas consumed was measured through the variation observed at SAP system which control the amount required by the responsible for feeding the boiler. Also, the total amount of fuel purchased was registered through receipt registries archived in Dori's units at the SAP system. The measurement is registered in m^3 for natural gas at Marília's unit, and in liter for shale oil at Rolândia's unit.
Frequency of monitoring/recording	Annually
Value monitored	

Period	$FC_{i,j,y}$ - Total of Fossil Fuel consumed (tonnes)	
	Marília	Rolândia
2020*	78	18
2021	306	63
2022	570	90
2023	654	59
TOTAL	1,608	230
Total - Project	1,838	

*From August to December

Monitoring equipment	No monitoring equipment was used to determine this parameter. This parameter was measured according to SAP registries.

QA/QC procedures to be applied	The project developer was responsible for gathering and maintaining in adequate archives all documents related to the shale oil and natural gas consumption and purchase.
Purpose of the data	• Calculation of project emissions
Calculation method	Not applicable.
Comments	Data will be kept for two years after the end of the crediting period or the last issuance of carbon credits for this project activity, whichever occurs later.

4.3 Monitoring Plan

The monitoring is done with the aim of determining the most approximate quantity of fossil fuel that, in the absence of the project, would be used in the Dori's boilers and consequently the amount of GHG that would be emitted in tonnes of CO_2e. Section 4.2 describes data and parameters monitored, as well as the procedures involved on the monitoring plan.

Dori Alimentos personnel are responsible to monitor the operating conditions at head office and subsidiary unity, including the amount of renewable biomass consumed, amount of steam and heat generated by the boiler and amount of fossil fuel combusted. They are also responsible to store invoices, receipts of sales and other documents related to purchase or acquisition of biomass.

Based on this information, Sustainable Carbon is responsible to assess if the biomasses are from renewable origin, to evaluate if there is a surplus of renewable biomass and to calculate emission reductions, including an assessment of leakage emissions. Furthermore, Sustainable Carbon's technical team is responsible for preparing this monitoring report, calculating emission reductions, and verifying all information and data received from Dori. The Technical Coordinator and Technical Director are responsible for oversight and review.

Sustainable Carbon assists the Dori' personnel to double check the monitored data on biomass, steam generated by the boiler and fossil fuel combusted. The data analysis did not reveal any non-conformities or inconsistencies. Any questions or additional documentation requested by Sustainable Carbon technical team were answered by Dori' personnel.

The responsible for the monitoring plan is Mrs. Márcia S. Cavicchioli from Dori's head office unity. Sustainable Carbon technical team (including those members described on Section 1.4) was also involved in the project monitoring.

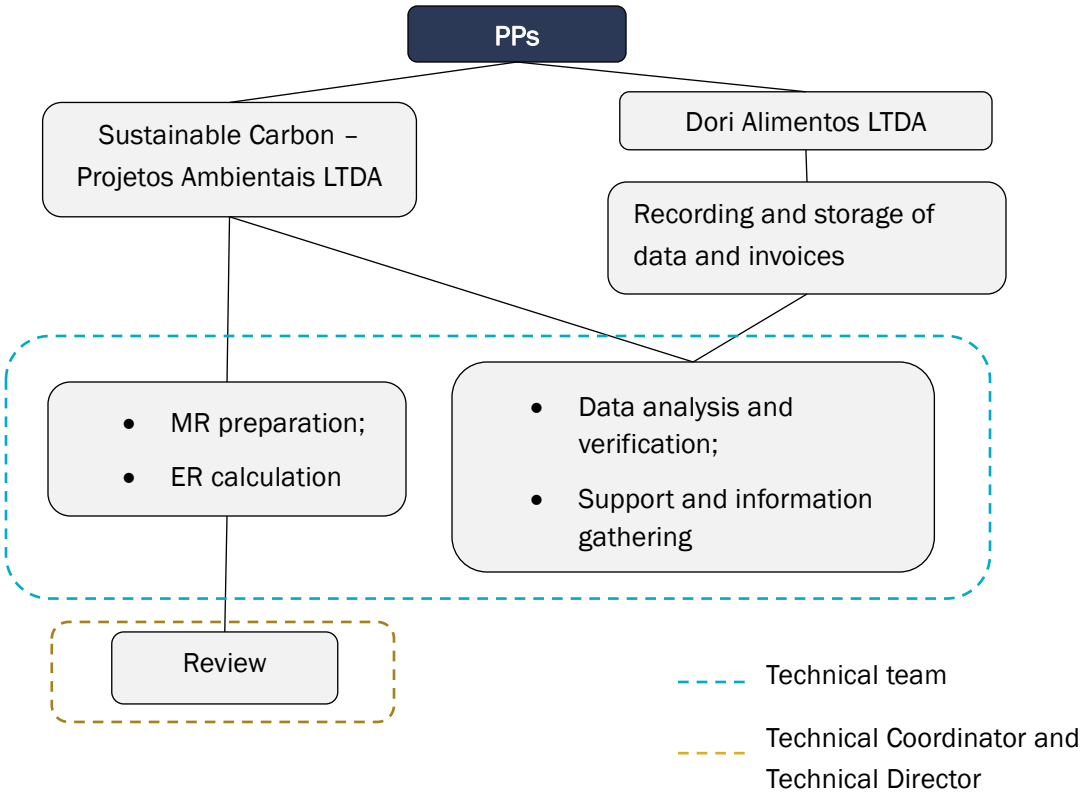

Figure 2. Organization structure of the monitoring team.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

According to the methodology applied to this project activity (AMS-I.C: Thermal energy production with or without electricity, version 20), the baseline emissions calculations consider renewable energy technologies that displace technologies using fossil fuels. The calculations for this project activity consider the baseline emissions for heat production:

In this monitoring period that encompasses 41 months, the project generated 465 TJ per year. Converting this number to MWh, it was generated 129,248 MWh per year, which corresponds to the use of 15 MWthermal that is less than the limits of 45 MWthermal for Type I Small Scale project activities.

"For thermal energy produced using fossil fuels and/or grid electricity the baseline emissions are calculated as follows:"

$$BE_{thermal,Co2,y} = \left(\frac{EG_{thermal,y}}{\eta_{BL,thermal}}\right) \times EF_{FF,CO2}$$ Equation (01)

Where:

$BE_{thermal,Co2,y}$ = Baseline emissions from thermal energy displaced by the project activity during the year y (tCO_2)

$EG_{thermal,y}$ = Net quantity of thermal energy supplied by the project activity during the year y (TJ)

$EF_{FF,CO2}$ = CO_2 emission factor of the fossil fuel that would have been used in the baseline plant (tCO_2/TJ)

$\eta_{BL,thermal}$ = Efficiency of the plant using fossil fuel that would have been used in the absence of the project activity

Dori's Rolândia unit facilities do not use to monitor the energy generated by the shale oil consumed. However, it is well known the amount of shale oil consumed as well as the amount of fuel required to generate a tonne of steam. Therefore, this project estimated baseline emissions through the energy generated by the real consumption of fossil fuel and assuming that ηBL is 100%.

As no specific equation is mandatory under the methodology applied to this project activity (AMS.I-C: Thermal energy for the user with or without electricity, version 20) to calculate the net quantity of heat supplied by the project activity ($EG_{thermal,y}$) during the year y (in TJ), this parameter was calculated according to the equation 02, which is an equation established by the project proponent based on the amount of fossil fuel consumed by the project (specific data available at the project activity sites) and on the net calorific value of the fossil fuel (default value provided by the IPCC):

$$EG_{thermal,y} = Q_{fossilfuel} \times NCV_{fossilfuel}$$ Equation (02)

Where:

$Q_{fossilfuel}$ = Amount of fossil fuel (shale oil or natural gas) consumed (tonne)

$NCV_{fossilfuel}$ = Net calorific value of fossil fuel (shale oil or natural gas) (TJ/tonne)

The baseline emission for the current monitoring period is described as follow:

Year	Baseline emissions (tCO_2e)
2020*	5,458
2021	16,465
2022	17,969
2023	17,609
Total	57,501

*From August to December

5.2 Project Emissions

The application of TOOL 16 – "Project and leakage emissions from biomass", as per section 5.3.5. of the AMS-I.C. methodology (version 20.0), to calculate project emissions from biomass cultivation was disregarded since the project activity utilizes wood chips and peanut shells, which does not represent biomass cultivation in a dedicated plantation.

The project emissions are those related to the CO_2 emissions from the consumption of fossil fuels shale oil in Rolândia site and Natural Gas in Marília site. The project emissions are calculated according to the third version of the methodological tool "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (EB 96, annex 4).

Both shale oil and natural gas consumption are considered a minor emission source in the project activity, once the small amount of fossil fuel consumption is required only to perform cleaning and maintenance of the steam generation equipment, so it is a sporadic routine.

The project emissions (PE_y) are calculated through equation 03:

$$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y} \qquad \text{Equation (03)}$$

Where:

$FC_{i,j,y}$ = quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)

$COEF_{i,y}$ = CO_2 emission coefficient of fuel type i in year y (tCO_2/mass or volume unit)

i = fuel types combusted in process j during the year y

The parameter $COEF_{i,y}$ is calculated as per the following equation, based on net calorific value and CO_2 emission factor of the fuel type i, as follows:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$ Equation (04)

Where:

$EF_{CO2,i,y}$ = Weighted average CO_2 emission factor of fuel type i in year y (tCO_2/TJ)

$NCV_{i,y}$ = Weighted average net calorific value of the fuel type in year y (TJ/ mass or volume unit)

i = fuel types combusted in process j during the year y

The project emission for the current monitoring period is described as follow:

Year	Project emissions
2020*	298
2021	1,135
2022	2,010
2023	2,145
Total	5,588

*From August to December

Emission Reductions

According to the methodology applied the emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$ Equation (05)

Where:

ER_y = Emission Reductions in year y (tCO_2e)

BE_y = Baseline Emissions in year y (tCO_2e)

PE_y = Project emissions in year y (tCO_2e)

LE_y = Leakage emissions in year y (tCO_2e)

The emission reduction for the current monitoring period is described as follow:

Year	Emission reductions
2020*	4,917
2021	14,423
2022	14,018
2023	13,928
Total	**47,286**

*From August to December

5.3 Leakage Emissions

According to the methodology AMS-I.C - Thermal energy for the user with or without electricity (version 20) and TOOL 12 - Project and leakage emissions from transportation of freight (version 1.1.0), the leakage predicted is estimated as 4,627 tCO_2e during the entire monitoring period.

The leakage from biomass projects, like the project activity, shall also be estimated according to the "General guidance on leakage in biomass project activities (Annex 28, EB 47)[16]" of Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories, which identifies different emission sources based on type of biomass being considered. Table below identifies the sources of leakage applicable to each type of biomass.

Table 2. Sources of leakage according to the type of the biomass

Biomass Type	Activity/Source	Shift of pre project activities	Emissions from biomass generation/ cultivation	Competing use of biomass

[16] UNFCCC. General guidance on leakage in biomass project activities - Version 03. Available at: http://cdm.unfccc.int/methodologies/SSCmethodologies/approved/history/c_leak_biomass/guid_biomass_v03.pdf. Last visited on 01-12-2023.

Biomass from forests	Existing forests	-	-	X
	New forests	X	X	-
Biomass from croplands or grasslands (woody or non-woody)	In the absence of the project the land would be used as a cropland/wetland	X	X	-
	In the absence of the project the land will be abandoned	-	X	-
Biomass residues or waste	Biomass residues or wastes are collected and use.	-	-	X

Observing table above, the source of leakage of the present project is showed below according to each type of biomass applied to the Dori's units. The biomass surplus in the region was evaluated *ex ante* according to the methodology AMS-I.C (version 20) and the "General guidance on leakage in biomass project activities" (Annex 28, EB 47) to demonstrate whether there is a competing use for the biomass.

<u>Wood Chips</u>

The total production of wood in 2016 in São Paulo and Paraná was 56,025,091m³, according to IBGE data[17]. The average of annual consumption of wood chips by the head office in Marília is estimated at around 34,934 m³. The average of annual consumption of wood chips in the second office in Rolândia was around 34,162m³. Considering that approximately 22% is the production of wood chips so it will generate[18] 12,325,520.02m³ of wood residues the total of wood chip, the project wood chips consumption (69,066m³) represents around 0.56% of the São Paulo and Paraná wood chips production.

[17] According to https://cidades.ibge.gov.br/brasil/sp/pesquisa/31/29644 Last visit: 01-12-2023.

[18] EMBRAPA, Comunicado Técnico No, Nov/92, p.1-2. Available at:

<http://www.cpatsa.embrapa.br/public_eletronica/downloads/COT51.pdf>. Last visit in 01-12-2023.

Peanut Shell

In 2016 the production of peanut was 190,480 tonnes in São Paulo and Paraná. Separately São Paulo produced 177,520 tonnes while Paraná produced 12,960 tonnes, according to IBGE data. The annual average consumption of peanut shell by the head office in Marília is 15,871.79 tonnes. The shell of the peanut has a weight of 30% of the total weight of the peanut[19].Then, the consumption of Marília´s office represents 0.27% of the São Paulo and Paraná peanut shell production. Rolândia does not use peanut shells.

The AMS-I.C (version 20) methodology states that the project has leakage if the processing and transportation of biomass residues occurs outside the project boundary and if the biomass is transported more than 200 kilometers. Based on Dori's biomass information, appropriate discounts were applied to suppliers whose biomass is transported over 200 kilometers using TOOL 12 (version 1.1.0).

According to the Methodological TOOL 12 - Project and Leakage Emissions from Transportation of Freight (version 1.1.0) it is possible, by using conservative default values, to determine leakage emissions from road transportation of freight. This option relies on conservative default emission factors to estimate leakage emissions from road transportation of freight. These default values are established for two vehicle classes: light vehicles and heavy vehicles.

Under this option, the following data were monitored separately for each freight transportation activity *f* to estimates the emissions: the quantity of freight transported ($FR_{f,m}$); the origin and destination of the freight transported and the road distance between the origin and the destination ($D_{f,m}$); and the vehicle class used. Leakage emissions were determined as follows:

$$LE_{TR,m} = \sum_{f} D_{f,m} \times FR_{f,m} \times EF_{CO2,f} \times 10^{-6} \qquad \text{Equation (06)}$$

Where:

$LE_{TR,m}$ = Leakage emissions from road transportation of freight monitoring period *m* (tCO_2)

[19] According to Atlas de bioenergia <http://www.moretti.agrarias.ufpr.br/eletrificacao_rural/livro_atlas_de_bioenergia_2008.pdf> Last visit in 01-12-2023.

$D_{f,m}$ = Return trip road distance between the origin and destination of freight transportation activity *f* in monitoring period *m* (km)

$FR_{f,m}$ = Total mass of freight transported activity f in monitoring period m (t)

$EF_{CO2,f}$ = Default CO_2 emission factor for freight transportation activity f (g CO_2 / t km)

f = Freight transportation activities conducted in the project activity in monitoring period m

5.4 GHG Emission Reductions and Carbon Dioxide Removals

The information in the tables below relates to the net GHG emission reductions from the current monitoring period and the entire crediting period of DORI Alimentos Ltda.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2020*	5,458	298	243	4,917
2021	16,465	1,135	907	14,423
2022	17,969	2,010	1,941	14,018
2023	17,609	2,145	1,536	13,928
Total	**57,501**	**5,588**	**4,627**	**47,286**

*From August to December.

Vintage period	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage emissions (tCO_2e)	Reduction VCUs (tCO_2e)	Removal VCUs (tCO_2e)	Total VCUs (tCO_2e)

01-Apr-2016 to 31-Dec-2016	10,155	794	0	9,361	0	9,361
01-Jan-2017 to 31-Dec-2017	11,324	1,358	0	9,966	0	9,966
01-Jan-2018 to 31-Dec-2018	12,787	847	0	11,940	0	11,940
01-Jan-2019 to 31-Dec-2019	12,452	1,544	415	10,493	0	10,493
01-Jan-2020 to 31-Dec-2020	12,087	655	468	10,964	0	10,964
01-Jan-2021 to 31-Dec-2021	16,465	1,135	907	14,423	0	14,423
01-Jan-2022 to 31-Dec-2022	17,969	2,010	1,941	14,018	0	14,018
01-Jan-2023 to 31-Dec-2023	17,609	2,145	1,536	13,928	0	13,928

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
01-Apr-2016 to 31-Dec-2016	8,533	9,361	+9.7%	Although the *ex ante* and *ex post* estimates are different and variable throughout the years, they remain similar to the forecast, with a total percentage difference of +7.9%. This variation is already expected due to the fluctuation and difference in the values of production and use of biomass used in the monitored period.
01-Jan-2017 to 31-Dec-2017	11,377	9,966	-12.4%	
01-Jan-2018 to 31-Dec-2018	11,377	11,940	+4.9%	
01-Jan-2019 to 31-Dec-2019	11,377	10,493	-7.8%	
01-Jan-2020 to 31-Dec-2020	11,377	10,964	-3.6%	
01-Jan-2021 to 31-Dec-2021	11,377	14,423	+26.8%	
01-Jan-2022 to 31-Dec-2022	11,377	14,018	+23.2%	
01-Jan-2023 to 31-Dec-2023	11,377	13,928	+22.4%	

Total	88,172	95,093	+7.9%	

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Section	Information	Justification
N/A	N/A	N/A

APPENDIX X: <TITLE OF APPENDIX>