Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: 120 MW Sugarcane Bagasse based co-generation Energy SJC BIOENERGIA

Version 1.0

Date July 11, 2025

First CoU Issuance Period: 12 years

Monitoring Period: Jan 01, 2013 to Dec 31, 2024

Monitoring Report (MR)
CARBON OFFSET UNIT (CoU) PROJECT

Monitoring Report	
Title of the project activity	120 MW Sugarcane Bagasse based co-generation Energy SJC BIOENERGIA
UCR Project Registration Number	485
Version	Version 1
Completion date of the MR	July 11/2025
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 1 Duration of this monitoring Period: (first and last days included (Jan 01, 2013 to Dec 31, 2024)
Project participants	CARGILL BIOENERGIA LTDA., previously called SJC BIOENERGIA (OWNER) FASTCARBON (AGGREGATOR)
Host Party	Brazil
Applied methodologies and standardized baselines	CDMUNFCCC Methodology ACM0006: Electricity and heat generation from biomass (Ver.16) &UCR Standard for Emission Factor
Sectoral scopes	01- Energy industries (renewable -/ non-renewable sources)
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	2013: 146,821 CoUs (146,821 tCO2eq)
	2014: 174,892 CoUs (174,892 tCO2eq)
	2015: 163,921 CoUs (163,921 tCO2eq)
	2016: 156,732 CoUs (156,732 tCO2eq)
	2017: 119,350 CoUs (119,350 tCO2eq)
	2018: 133,052 CoUs (133,052 tCO2eq)
	2019: 120,043 CoUs (120,043 tCO2eq)
	2020: 104,770 CoUs (104,770 tCO2eq)
	2021: 108,219 CoUs (108,219 tCO2eq)
	2022: 58,062 CoUs (58,062 tCO2eq)
	2023: 67,126 CoUs (67,126 tCO2eq)
	2024: 88,859 CoUs (88,859 tCO2eq)
Total:	1,441,847 CoUs (1,441,847 tCO2eq)

SECTION A. Description of project activity

A.1. Purpose and general description of project activity >>

a) Purpose of the project activity and the measures taken for GHG emission reductions >>

The project titled "120 MW Sugarcane Bagasse based co-generation Energy SJC BIOENERGIA" is composed of two sugar cane plants, located in the cities of Quirinópolis (UTE Quirinópolis, São Francisco Plant, USF) and Cachoeira Dourada (UTE Cachoeira Dourada, Rio Dourado Plant, URD), both in the state of Goiás, Brazil.

Unit	Installed Capacity	Location	Commercial Operation Date
UTE Quirinópolis São Francisco Plant (USF)	80 MW	Quirinópolis, Goiás	November 22, 2007
UTE Cachoeira Dourada Rio Dourado Plant (URD)	40 MW	Cachoeira Dourada, Goiás	January 19, 2013

The details of the registered project are as follows:

Purpose of the project activity:

The purpose of the activity is to generate electricity using renewable biomass (sugarcane bagasse, which is the residue from the juice extraction process for the production of ethanol and sugar), and, thus, reduce GHG emissions by displacing fossil fuel in grid-based electricity.

It is a grid-connected biomass cogeneration power plant with a high-pressure steam-turbine configuration. The high-pressure boilers are fired by bagasse to generate steam which in turn is fed to the steam turbine to generate power. The power co-generation units generate biomass-based power for captive consumption of the sugar plant and the sale of surplus power to the Brazilian electricity grid.

The UCR Project activity is the construction and operation of power plants/units that use renewable energy sources and supplies renewable electricity to the grid. The UCR project activity is thus the displacement of electricity that would be provided to the grid by more-GHG-intensive means and provides long-term benefits to the mitigation of climate change. The UCR project activity qualifies under the environmental additional positive list of pre-approved project types under the UCR carbon incentive model for issuance of voluntary carbon credits.

The activity currently produces more than 650,000 MWh of electrical energy per year and, of this total, and 430,000 MWh are injected into the Brazilian electrical system, enough to supply a city of approximately 200,000 inhabitants, and thereby contributes to climate change mitigation efforts.

São Francisco Plant – USF - (UTE Quirinópolis):

The municipality of Quirinópolis was chosen to host the group's new industrial unit due to its privileged location in the southwest of the state. To build the new plant, the first step was to prepare the land at Fazenda São Francisco II. Then, in 2005 the first buildings appeared and, in parallel, a broad process of selection and training of personnel to join the team of employees at Usina São

Francisco (USF) began. In 2006, the industrial unit began operations, focusing on the production of sugar, ethanol and electricity.

In 2007, the company decided to build the second diffuser at USF, expanding its production capacity. With the new structure, the first step was taken towards becoming one of the largest bioenergy producers in the state of Goiás.

Rio Dourado Plant – URD (UTE Cachoeira Dourada):

To expand its operations in the state of Goiás, the USJ Group began, in 2009, the construction of the second industrial unit, the Rio Dourado Plant (URD). The location chosen for the new headquarters was the municipality of Cachoeira Dourada, as it is close to the USF, which would allow the optimization of agricultural and industrial operations.

In July 2013, the Rio Dourado Plant (URD) was inaugurated, with the most modern industrial structure in the country at the time. The unit is dedicated to the production of ethanol and electricity.

b) Brief description of the installed technology and equipment>>

1. Implementation Status of the Project Activity

The CARGILL Bioenergia project is a 120 MW sugarcane bagasse-based cogeneration energy system composed of two industrial units:

UTE Quirinópolis – São Francisco Plant (USF): 80 MW, operational since November 22, 2007.
UTE Cachoeira Dourada – Rio Dourado Plant (URD): 40 MW, operational since February 5, 2009.

The project is fully implemented and operational, supplying renewable electricity to the Brazilian national grid and for captive consumption within the industrial units.

2. Installed Technology and Equipment

The project activity is a grid-connected biomass cogeneration power plant, using high-pressure steam turbine technology. The process follows the Rankine cycle for efficient energy conversion, with the main steps as follows:

Combustion of Sugarcane Bagasse: Biomass residue from sugarcane processing is burned in high-pressure boilers.
Steam Generation: The combustion process generates steam at high temperatures and pressure.
Electricity Generation: The steam drives high-efficiency extraction-condensing steam turbines, which are connected to alternators to produce electricity.

Main Components:

Boilers (Caldema):
UTE Quirinópolis: 2 x 270 TPH (tons per hour), 67.6 kgf/cm², 480°C.
UTE Cachoeira Dourada: 1 x 270 TPH, 67.6 kgf/cm², 480°C.

Turbines (TGM Turbinas):
UTE Quirinópolis: 2 units, 42,163 kW and 41,438 kW, 65 bar, 480°C.
UTE Cachoeira Dourada: 1 unit, 41,438 kW, 65 bar, 480°C.

Alternators (WEG):
UTE Quirinópolis: 2 units, 50,000 kW each, 13,800 V, 60 Hz.
UTE Cachoeira Dourada: 1 unit, 50,000 kW, 13,800 V, 60 Hz.

Auxiliary Systems:
Fuel and ash handling equipment.
Water-cooled condenser system.
Electrical and automation systems.

c) Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.)>>

The CARGILL Bioenergia project consists of two biomass cogeneration plants that have been operational for several years, supplying renewable electricity to the Brazilian national grid and for captive consumption. The relevant dates for the project activity are as follows:

Unit	License Date	Commercial Operation Date
UTE Quirinópolis São Francisco Plant (USF)	December 12, 2006	November 22, 2007
UTE Cachoeira Dourada Rio Dourado Plant (URD)	February 5, 2009	January 19, 2013

UCR Project ID: UCR ID Number: 485
Start Date of Crediting Period: Jan 01,2013.
End Date of Crediting Period: Dec 31, 2024.
Monitoring Period: Jan 01, 2013 to Dec 31, 2024.

The project has been in continued operation since its commissioning, consistently generating renewable energy and contributing to greenhouse gas (GHG) emission reductions through the displacement of fossil fuel-based electricity.

d) Total GHG emission reductions achieved or net anthropogenic GHG removals by sinks achieved in this monitoring period>>

The total GHG emission reductions achieved in this monitoring period is as follows:

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	Jan 01,2013
Carbon credits claimed up to	Dec 31, 2024
Total ERs generated (tCO_{2eq})	1,441,847 tCO_{2eq}
Leakage	0

e) Baseline Scenario>>

The electricity supplied to the grid by the CARGILL Bioenergia (project activity) that would have otherwise been generated by fossil-fuel-fed powerplants connected to the national grid, which are carbon intensive sources of electricity generation.

A.2. Location of project activity>>

São Francisco Plant – USF - (UTE Quirinópolis):

Country: Brazil
District: Quirinópolis
State: Goiás
Zip Code: 75860-000

Latitude: -18.432117972706212º
Longitude: -50.25815098361247º

Rio Dourado Plant – URD (UTE Cachoeira Dourada):

Country: Brazil
District: Cachoeira Dourada
State: Goiás
Zip Code: 75560-000

Latitude: -18.50473413915859
Longitude: -49.65439691516649

A.3. Parties and project participants >>

Party (Host)	Participants
Brazil	**Owner:** CARGILL Bioenergia Ltda Av. Dr. Chucri Zaidan, 1240, 8o andar, Sala 802, Vila São Francisco São Paulo/ SP Zip Code: 04.711-130 https://www.sjcbioenergia.com.br/ **Aggregator:** FastCarbon Consultoria e Negócios Ltda Rua Viradouro, 63, conjunto 61, Itaim Bibi São Paulo/SP Zip Code: 04538-110 https://fastcarbon.com.br

A.4. References to methodologies and standardized baselines >>

SECTORAL SCOPE: 01 – Energy industries (Renewable/Non-renewable sources)
TYPE: II - Larger renewable energy or energy efficiency projects. (Biomass Energy)
CATEGORY: CDMUNFCCC Methodology ACM0006: Electricity and heat generation from biomass (Ver.16) &UCR Standard for Emission Factor

Applied Standardized Baselines:
The project follows the UCR Standard for Emission Factor, using the combined margin emission factor for the Brazilian electricity grid, as defined by the UNFCCC methodology:

Tool to calculate the emission factor for an electricity system (Version 7.0)
The grid emission factor is calculated as per the methodology defined in this tool.
Reference: UNFCCC CDM Tool.
(https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf)

Applicability of Methodologies and Standardized Baselines
The project meets all applicability conditions of the selected methodology.
The project activity is a biomass (bagasse)-based cogeneration system, generating both electricity and process heat, and exporting surplus electricity to the grid.
The biomass used (sugarcane bagasse) is a residue from the sugar and ethanol production process and does not come from dedicated plantations.
The project does not involve co-firing of fossil fuels beyond the allowed limit (⩽25%) as per UCR protocol.

The project displaces grid electricity that would otherwise be generated using fossil fuels, thus contributing to GHG emission reductions.
The total installed capacity of 120 MW qualifies under the large-scale methodology ACM0006, and the emissions are capped accordingly.
The project fully complies with UCR and UNFCCC methodologies, ensuring robust and transparent emission reduction calculations.

A.5. Crediting period of project activity >>

Length of the crediting period corresponding to this monitoring period: 12 years – Jan 01, 2013-Dec 31, 2024

A.6. Contact information of responsible persons/entities >>

Name: Fábio Bressani Ribeiro
Company (Aggregator): FastCarbon
Mobile: +55 11 99884 6428
E-mail: fabio.bressani@fastcarbon.com.br

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity >>

a) Provide information on the implementation status of the project activity during this monitoring period in accordance with UCR PCN>>

CARGILL Bioenergia is operational since 2006 when it received the clearance (Operation License) from the Environmental Entity from the State of Goiás. The authorization for grid power injection from the National Electrical Energy Agency (ANEEL) for the first Generator Unit in November 22, 2007 for UTE Quirinópolis (USF) and January 19, 2013 for UTE Cachoeira Dourada (URD). Now operating under licenses LF 739.2017 and LF 86_2022.

Below are the orders, ordinances and resolutions that were obtained in chronological order, documents that are public and available for verification:

PRT - PORTARIA 301_2006 – ANEEL Authorization for USF
PRT - PORTARIA 084_2007 – Capacity Expansion Authorization for USF
DSP - DESPACHO 3448_2007 – Authorization for Start of Commercial Operation of USF
PRT - PORTARIA 046_2009 – ANEEL Authorization for URD
DSP - DESPACHO 2798_2011 – Authorization for Start of Commercial Operation of USF
REA - RESOLUÇÃO AUTORIZATIVA 3691_2012 – Transfer of USJ to SJC Quirinópolis
REA - RESOLUÇÃO AUTORIZATIVA 3829_2012 – Transfer of USJ to SJC Cachoeira Dourada
DSP - DESPACHO 119_2013 – Authorization for Start of Commercial Operation of URD
DSP - DESPACHO 2876_2016 – Reduction of Installed Capacity of URD

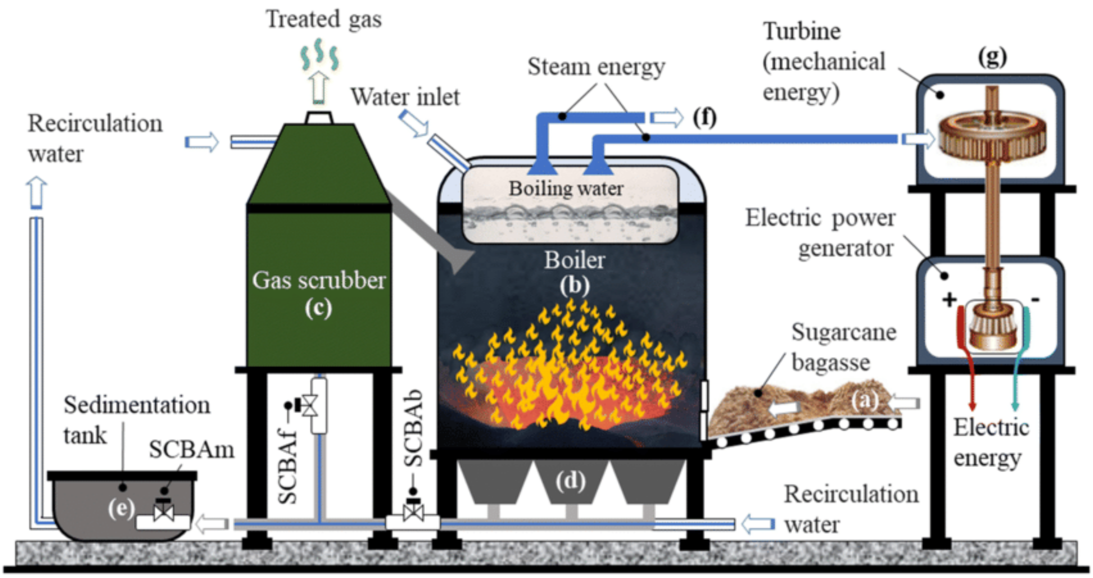
b) For the description of the installed technology(ies), technical process and equipment, include diagrams, where appropriate>>

The UCR project activity is a grid-connected bagasse-based cogeneration power plant with a high-pressure steam-turbine configuration. The UCR project activity is the electricity generation capacity and the installation of facilities for allowing captive use and export of electricity to the electricity grid.

The primary technology for the project activity is direct combustion of biomass residues, and power generation using the Rankine cycle technology. Power generation through this method involves combustion of biomass residues directly in the boiler, which is capable to generate high-pressure high-temperature steam, which is fed to a steam turbine that drives a generator.

The main elements of the power plant are as follows.
- A boiler unit which converts the energy available in the fuels into thermal energy;
- A steam turbine unit which converts thermal energy into mechanical energy;
- An alternator unit, which converts mechanical energy into electrical power.

A number of other equipment components, as listed below, also form part of the biomass power plant.
- Fuel and ash handling equipment
- Water cooled condenser system for cooling the exhaust steam
- DM Water system and Air Compressor Plant
- Electrical systems and Automation system



São Francisco Plant – USF (UTE Quirinópolis):

Power Generator 1

Power Generator 2

Thermal Generation Center

Automation System

Electrical Systems

Thermal Generation Center

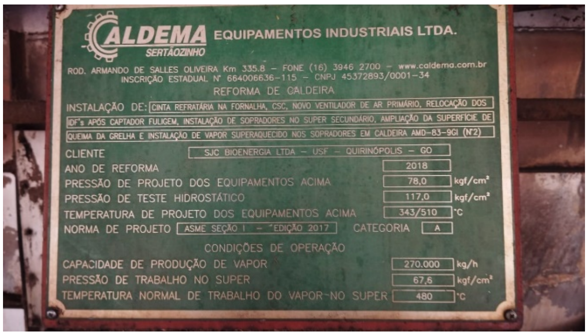
Thermal Generation Center

Thermal Generation Center

Thermal Generation Center

Boiler	Nº 1	Nº 2
Manufacturer	Caldema	Caldema
Capacity (Tons/h)	270	270
Pressure (kgf/cm^2)	67.6	67.6
Degree of super heat °C (Steam)	480	480

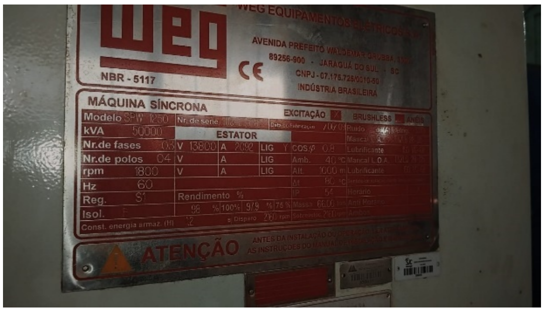
Boiler nº 1



Boiler nº 2

Alternator	Nº 1	Nº 2
Year of manufacturer	2020	2009
Manufacturer	WEG	WEG
Power Rated (kW)	50,000	50,000
Voltage (V)	13,800	13,800
Current (Amps)	2,092	2,092
Power Factor (cos φ)	0.80	0.80
Efficiency (25%, 50%, 75%, 100% of load)	75%, 97.9%, 100%, 98%	75%, 97.9%, 100%, 98%
Generator Rated Speed (rpm)	1,800	1,800
Frequency (Hz)	60	60
Generator Model	ST40-1250	SPW 1250

Alternator nº 1



Alternator nº 2

Turbine	Nº 1	Nº 2
Year of manufacturer	2005	2008
Manufacturer	TGM Turbinas	TGM Turbinas
Power Rated (kW)	42,163	41,438
Live Steam Pressure (Bar)	65	65
Live Steam Temperature (ºC)	480	480
Steam Pressure at Outlet (Bar)	22	16
Steam Exhaust Pressure (Bar)	2.5	2.5
Turbine Rated Speed (rpm)	6,000	6,000
Turbine Disarm Speed (rpm)	6,600	6,600
Turbine Model	TME 35000 A	TM 35000 A

Turbine nº 1

Turbine nº 2

Rio Dourado Plant – URD (UTE Cachoeira Dourada):


Power Generator

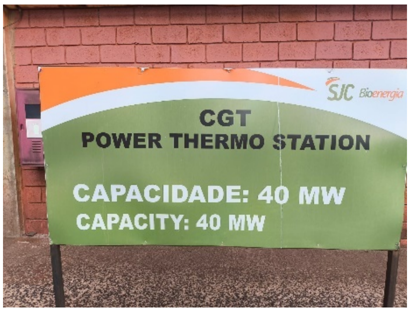

Turbine


Alternator


Power Generator


Power Generator

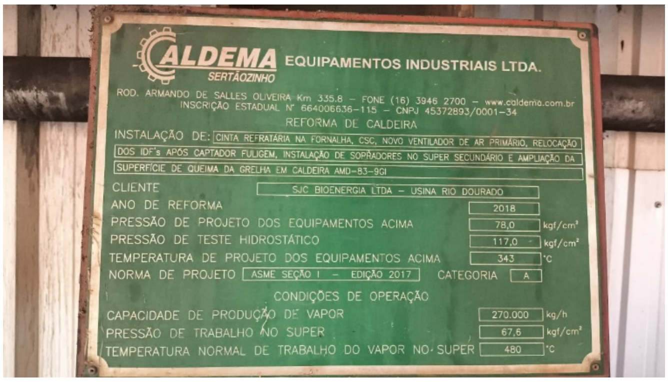

Automation System



Thermal Generation Center


Electrical Systems

Boiler	**Nº 1**
Manufacturer	Caldema
Capacity (Tons/h)	270
Pressure (kgf/cm^2)	67.6
Degree of super heat °C (Steam)	480



Boiler nº 1

Alternator	**Nº 1**
Year of manufacturer	2008
Manufacturer	WEG
Power Rated (kW)	50,000
Voltage (V)	13,800
Current (Amps)	2,092
Power Factor (cos φ)	0,80
Efficiency (25%, 50%, 75%, 100% of load)	75%, 97.9%, 100%, 98%
Generator Rated Speed (rpm)	1,800
Frequency (Hz)	60
Generator Model	SPW 1250

Alternator nº 1

Turbine	Nº 1
Year of manufacturer	2012
Manufacturer	TGM Turbinas
Power Rated (kW)	41,438
Live Steam Pressure (Bar)	65
Live Steam Temperature (ºC)	480
Steam Pressure at Outlet (Bar)	16
Steam Exhaust Pressure (Bar)	2.5
Turbine Rated Speed (rpm)	6,000
Turbine Disarm Speed (rpm)	6,600
Turbine Model	TM 35000 A

Turbine nº 1

B.2 Do no harm or Impact test of the project activity>>

There are social, environmental, economic and technological benefits which contribute to sustainable development.

- **Social benefits:**
- The project activity contributes to employment generation in the local area. Currently, the Rio Dourado and São Francisco plants together employ more than 4 thousand people in the agricultural, industrial and administrative areas and operate under values that encourage commitment to safety, ethics and personal and professional development.
- CARGILL Bioenergia is committed to life, applies workplace safety policies in all processes, aiming for the well-being of employees, and invests in renewable energy alternatives, as well as being committed to protecting the privacy and personal data of everyone who interacts with the Company, whether employees or third parties, through systems, website, social networks, applications and even physically in our facilities.

- **Environmental benefits:**
- Avoids global and local environmental pollution, leading to reduction of GHG emissions.
- CARGILL Bioenergia has a nursery for the production of seedlings native to the region with a production capacity of 25 thousand seedlings/year. To collect the seeds, produce and guide the plants to the planting phase, the company has six employees. Until 2016, approximately 335 thousand seedlings were planted, enabling the recovery of 220 hectares, between Permanent Preservation Areas (APP) and Legal Reserve. During the same period, more than 10 thousand seedlings were donated to partners, sugarcane suppliers, schools, among other institutions. At the beginning of 2017, the nursery underwent a revitalization, increasing production capacity.
- The company has a project that is “Think Green”. The project is developed by a multidisciplinary professional team, involving the areas of sustainability, communication, agriculture and industry. The initiative seeks to guide employees, partners/suppliers, students and the community in general about the importance of preserving the environment and the sustainable use of natural resources in daily activities. Furthermore, it disseminates knowledge about the programs carried out by the company focusing on environmental education. The project has already been carried out in 16 schools and reached an audience of approximately 3 thousand people from the municipalities that make up CARGILL Bioenergia's area of influence.
- Waste Management: Ash is the residue resulting from the burning of sugarcane bagasse in the process of cogeneration of electricity and steam. CARGILL Bioenergia uses this residue as fertilizer in its sugarcane fields, as it is a product rich in nutrients. Furthermore, it helps reduce soil acidity, which guarantees benefits for sugarcane planting.
- Composting is a process of transforming organic matter, which normally goes to waste, into organic fertilizer, in order to eliminate the disposal of waste generated in cafeterias and take care of the soil of your plantations. The process is extremely important for the environment, which is why it is a practice of CARGILL Bioenergia.
- Fertigation: the procedure is carried out by reusing the vinasse generated in the alcohol manufacturing process and also using waste water, which is obtained after cleaning the industry equipment. CARGILL Bioenergia uses this fertilization technique in the cultivation of sugar cane because it is rich in organic matter and potassium, in addition to reducing the application of chemical fertilizers and the use of water collected from springs.

- CARGILL Bioenergia produces ethanol derived from sugar cane and from corn. Since our products are all plant-based, our biofuel is renewable and sustainable. In addition to the socio-economic benefits, ethanol is less harmful to the environment than fossil fuels, such a gasoline. That is why carbon emissions are lower, both in the manufacturing process and in final use. Nowadays, CARGILL Bioenergia produces 500 million liters of fuel per year (500,000 m^3), distributed into anhydrous ethanol, used as an additive for gasoline, and hydrated ethanol, which is commercialized as final fuel for vehicles.

- CARGILL Bioenergia is certified by Renovabio, which is Brazilian National Biofuels Program, created to encourage the production and use of sustainable biofuels, such as ethanol and biodiesel, replacing gasoline and diesel, which are more polluting fossil fuels. It certifies companies based on the environmental efficiency of production, allowing them to issue CBios (Decarbonization Credits), which can be sold.

- **Economic benefits:**
- Greater supply of cheap energy, ensuring the development of the region.
- Ensure the growth of region where the plants were installed, providing clean and cheaper energy, ensuring the creation of jobs and business opportunities.
- Low-cost energy to consumers.
- Clean technology development in Brazil.
- Investments in new technologies.
- Investment in responsible consumption and production actions.

The CARGILL Bioenergia contribute significantly to economic, environmental and social matters, however, it´s notable for contributing to all 17 SDGs.

SDG	Target	How was it achieved?
1 NO POVERTY	1.1 - By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day	Income generation through the creation of more than 4,500 jobs and training of workers to the job.
2 ZERO HUNGER	2.4 - By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	Engebio program, which focuses on the production of biological inputs for fertilizer and pesticides, for pest control, avoiding chemicals fertilizers/ pesticides, with less impact on the environment
3 GOOD HEALTH AND WELL-BEING	3.8 - Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	Provides health plans for all employees, promotes flu vaccination campaigns annually, as well as information campaigns against other diseases
4 QUALITY EDUCATION	4.3 - By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, at affordable prices, including university	Offers a discount plan to employees, through as agreement with educational institutions, such as SENAC, SESI and SENAI, encouraging employees to study. Provides professional courses in partnership with the Goiás State Government
5 GENDER EQUALITY	5.1 - End all forms of discrimination against all women and girls everywhere	Implementation of the Code of Ethics Program with a focus on encouraging diversity, gender equality and female empowerment.
6 CLEAN WATER AND SANITATION	6.3 - By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	Investments in monitoring water quality of effluents, using the fertigation process, sewage treatment stations and carries out application of vinasse and wastewater in sugarcane fields, helping to minimize the demand for water use.

7 AFFORDABLE AND CLEAN ENERGY	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix.	Clean Energy Generation
8 DECENT WORK AND ECONOMIC GROWTH	8.3 - Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services. 8.8 - Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	Generation of 4,500 jobs. Occupational Health and Safety program, which focuses on the safety of everyone at work, providing and monitoring the use of PPE
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	9.1 - Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all 9.5 - Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.	Innovative practices for improving products, processes, and business models: use of drones to monitor crops, release of wasps to combat leafhoppers, vehicles monitored by GPS, 100% automated harvesting
10 REDUCED INEQUALITIES	10.4 - Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality.	Investments in the municipalities where the power plants where installed, including through taxation, contributing to the positive increase of its economy.
11 SUSTAINABLE CITIES AND COMMUNITIES	11.4 - Strengthen efforts to protect and safeguard the world's cultural and natural heritage	Preservation and rescue of archaeological sites

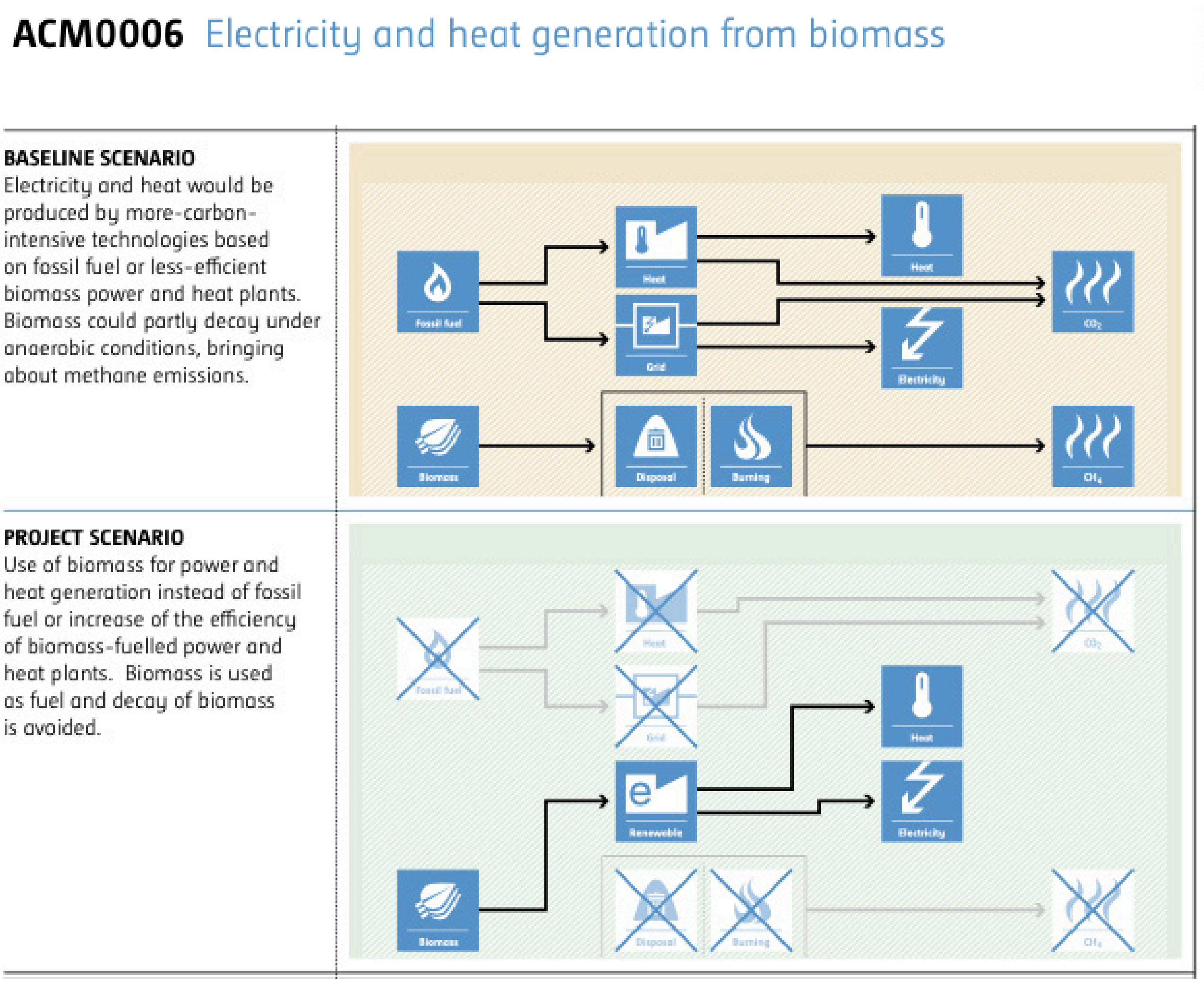
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	12.2 - By 2030, achieve the sustainable management and efficient use of natural resources 12.4 - By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment 12.5 - By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	Investment in responsible consumption and production actions. Implementation of waste monitoring programs in plants for correct destination, recycling or disposal of waste. Solid waste management plan, identification, segregation, storage, collection, transportation, transshipment, treatment and final disposal, environmentally adequate disposal of solid waste
13 CLIMATE ACTION	13.2 – Integrate climate change measures into national policies, strategies and planning.	Reduction of GHG emissions through renewable energy generation, monitors gas emissions and uses gas screbber
14 LIFE BELOW WATER	14.5 - By 2020, conserve at least 10 per cent of coastal and marine areas, consistente with national and international law and based on the best available scientific information	Analyses of water sources, monitoring of aquatic fauna and water management plan
15 LIFE ON LAND	15.1 - By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements. 15.2 - By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. 15.a – Mobilize significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystemas	Margin Verde Project, which has a nursery for the production of seedlings native to the region with a production capacity of 25 thousand seedlings/ year Monitoring the terrestrial fauna Biodiversity plan

16 PEACE, JUSTICE AND STRONG INSTITUTIONS	16.5 – Substantially reduce corruption and bribery in all their forms. 16.6 - Develop effective, accountable and transparent institutions at all levels 16.7 – Ensure responsive, inclusive, participatory, and representative decision-making at all levels.	The company adopts good corporate governance practices, aligning interests and ensuring transparency and integrity in management Code of Ethics and Conduct and a Reporting Channel CARGILL Bioenergia maintains governance, ethics, and integrity policies, ensuring compliance with regulatory standards and fostering a responsible corporate environment The company follows a governance model that involves different stakeholders in the decision-making process, promoting engagement and continuous dialogue
17 PARTNERSHIPS FOR THE GOALS	17.16 – Enhance the global partnership for sustainable development. 17.17 - Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	CARGILL Bioenergia collaborates with research institutions and organizations to implement sustainable energy and agricultural solutions, such as a Technical and Financial Cooperation Agreement with Embrapa Agroenergia and the Arthur Bernardes Foundation (Funarbe) to develop the project "Fungal Bioinput Obtained from Corn Vinasse for Application in Sugarcane Cultivation." This project aims to create a biofertilizer using fungi cultivated in corn vinasse, promoting more sustainable agricultural practices. The company engages with local communities, educational institutions, and government initiatives to drive economic growth and environmental responsibility.

B.3. Baseline Emissions>>

The baseline scenario identified in this Monitoring Report of the project activity is:

• The project activity involves generating clean energy from biomass source and supply it to the national grid. In the absence of the project activity, the equivalent amount of power would have been supplied by national grid-connected power plants and by the addition of other-more-GHG-intensive generation sources.



Thus, this project activity was a voluntary investment which replaced equivalent amount of electricity from the Brazilian grid. The project proponent was not bound to incur this investment as it was not mandatory by national and sectoral policies. Thus, the continued operation of the project activity would continue to replace fossil fuel-based power plants and fight against the impacts of climate change. The Project Proponent hopes that carbon revenues from 2013-2024 accumulated as a result of carbon credits generated will help repay the investments and help in the continued maintenance of this project activity.

B.4. Debundling>>

This “120 MW Sugarcane Bagasse based co-generation Energy SJC BIOENERGIA” project is not a debundled component of a larger project activity.
There is no registered large-scale UCR project activity or a request for registration by another small-scale project activity:

- By the same project participants;
- In the same project category and technology/measure; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

SECTION C. Application of methodologies and standardized baselines

C.1. References to methodologies and standardized baselines >>

SECTORAL SCOPE - 01 Energy industries (Renewable/Non-renewable sources)

TYPE II - Larger renewable energy or energy efficiency projects. (Biomass Energy)

CATEGORY - ACM0006: “Electricity and heat generation from biomass” Version 16.0 & UCR Standard for Emission Factor

C.2. Applicability of methodologies and standardized baselines >>

This methodology is applicable to project activities that operate biomass (co-gen) fired power and heat plants.

The project activity is a power generation project using a biomass (bagasse) and displaces CO2 emissions from electricity generation in power plants that are displaced due to the project activity. Since the project activity utilizes biomass (bagasse) for the generation of power and supplies it to the local grid, it displaces fossil fuel, and hence it meets the primary applicability criteria of the methodology.
The project activity is a power plant that encompasses cogeneration plants, i.e. power plant in which at least one heat engine simultaneously generates both process heat and power. The total installed capacity of project activity is 120 MW which is acceptable as per the applied large scale methodology.
The installation of a new biomass residue fired power generation unit, which are places existing power generation capacity fired with fossil fuel as in the project plant (power capacity expansion projects) is also included in this methodology.
For the purposes of this methodology, heat does not include waste heat, i.e. heat that is transferred to the environment without utilization, for example, heating flue gas, heat transferred to cooling towers or any other heat losses.

The biomass used by the project plant is not stored for more than one year. The biomass used by the project plant is not processed chemically or biologically (e.g. through esterification, fermentation, hydrolysis, pyrolysis, bio-or chemical degradation, etc.) prior to combustion.
The Project Activity uses biomass residues from a production process (e.g. production of sugar and ethanol), and the implementation of the project does not result in an increase of the processing capacity of (the industrial facility generating the residues) raw input (e.g. sugar and ethanol) or in other substantial changes (e.g. product change) in this process.
The project activity unit does not co-fire fossil fuel and/or does not exceed the limit of 25% co-firing fossil fuel criteria as per the UCR Protocol for such projects.
Bio-mass generated power is used for direct grid supply and for meeting the captive need facility. The project activity is involving the grid-connected bagasse based electricity generation capacity involving the installation of facilities for all owing the export of electricity to the regional grid.
Bio-mass is not sourced from dedicated plantations. The existing installed turbo-generators are fired by bagasse, a by-product of the sugarcane processing and ethanol, a biomass residue
Bagasse is burnt in boilers as generated from the sugar mill and does not require any specific technology for its preparation before combustion. No fuel preparation equipment has been installed at site for preparation of bagasse. Hence no significant energy quantities are required to prepare the biomass residues for fuel combustion.
The project activity also does not include any GHG emissions related to the decomposition or burning of biomass. The baseline heat emissions for the project activity are not included in the project boundary nor does it claim for emission reductions from heat.

C.3 Applicability of double counting emission reductions >>

The project is not registered in any other GHG mechanism. Hence, there will not be any double counting possibility.

The biomass-based boiler and turbine have unique serial numbers which are visible on the units. The generated electricity is measured using energy meters who also has unique serial numbers. The Monitoring Report will have the details of the same and will be provided to the UCR verifier during the verification process.

The UTE Quirinópolis and UTE Cachoeira Dourada are qualified for i-RECs certification (UTEQTHER001 and UTECTHER003). But only UTE Quirinópolis issued i-RECs (May, 2022: 18,000 MWh – Reference: UTEQTHER001). To be conservative and avoid double counting, the amount of MWh converted into i-RECs was deducted from the total MWh available for issuing carbon credits, resulting in a reduction of 2,488 CoUs.

UTE Quirinópolis and UTE Cachoeira Dourada are also certified by Renovabio, which is the Brazilian National Biofuels Program, created to encourage the production and use of sustainable biofuels, such as ethanol and biodiesel, replacing gasoline and diesel, which are more polluting fossil fuels. The lower the carbon intensity of the biofuel, the greater the difference in relation to fossil fuels, resulting in certificates called CBIOs, which can be traded. The impact of exported energy on the number of CBIOs is very small compared to other factors such as agricultural and industrial efficiency, and it's not the focus of Renovabio certification. Exported energy is just one of many factors considered.

Although RenovaBio and the carbon credit certification system have similar objectives with regard to decarbonization, they are different programs and work in different ways, with their own regulations and mechanisms. However, to adopt a conservative position and avoid double counting, the percentage of Carbon Credits will be deducted here in this program, in the same proportion in which the exported energy boosted the generation of CBIOs, in the respective periods in which they were generated:

UTE Quirinópolis: May, 2020 to December, 2024: resulting in a reduction of 7,698 CoUs.

UTE Cachoeira Dourada: May, 2020 to December, 2024: resulting in a reduction of 11,758 CoUs.

C.4. Project boundary, sources and greenhouse gases (GHGs)>>

The project boundary includes the physical, geographical site(s) of:

- All plants generation power located at the project site.
- All power plants connected physically to the electricity system (grid) that the projects plant is connected to.
- The means of transportation of biomass to the project site if the feedstock is biomass residues, the site where the biomass residues would have been left for or dumped.

Leakage Emissions (LE_y)

Leakage emissions is not applicable as the project activity does not use technology or equipment transferred from another activity.

Hence $LE_y = 0$

Scenario	Source	GHG	Included?	Justification/Explanation
Baseline	Grid Connected Electricity Generation	CO_2	Yes	Main emission source
		CH_4	No	Not identified in the baseline methodology
		N_2O	No	Not identified in the baseline methodology
Project Activity	Sugarcane Bagasse based co-generation Activity	CO_2	No	Zero-emissions grid connected electricity generation from renewable energy
		CH_4	No	Zero-emissions grid connected electricity generation from renewable energy
		N_2O	No	Zero-emissions grid connected electricity generation from renewable energy

Project Emissions (PE_y)
The project emissions (PEy) under the methodology may include;

N_2O Excluded simplification. conservative

This is

- CO_2 emissions from transportation of biomass residue to the project site
- CO_2 emissions from on-site consumption of fossil fuels due to project activity
- CO_2 emissions from electricity consumption at the project site that is attributable to the project activity and
- CH_4 emissions from combustion of biomass.

Where,

PET_y = are the CO_2 emissions during the year y due to transport of the biomass to the project plant in tons of CO_2,

$PEFF_{CO2,y}$ = are the CO_2 emissions during the year y due to fossil fuels co-fired by the generation facility in tons of CO_2,

PEEC,y = are the CO_2 emissions during the year y due to electricity consumption at the project site that is attributable to the project activity in tons of CO2,

GWPCH4 = is the Global Warming Potential for methane valid for the relevant commitment period and,

$PE_{Biomass,CH4,y}$ = are the CH_4 emissions from the combustion of biomass during the year y. The proposed project activity does not have any CO_2 emissions due to off-site transportation of biomass, or from fossil fuel co-firing and from electricity consumption at site. The project activity also doesn't include CH_4 emissions from the combustion of biomass.

Hence,
$PET_y = 0$, $PEFF_{CO2,y} = 0$, $PEEC_{,y} = 0$ and, $PE_{Biomass,CH4,y} = 0$.

Therefore, $PE_y = 0$.

C.5. Establishment and description of baseline scenario (UCR Protocol) >>

The baseline scenario identified at the PCN stage of the project activity is:

Renewable energy technology that displaces technology using fossil fuels, wherein the simplified baseline is the fuel consumption of the technology that would have been used in the absence of the project activity, times an emission factor for the fossil fuel displaced.

The baseline emissions due to displacement of electricity are determined by net quantity of electricity generation as a result of the project activity (incremental to baseline generation) during the year y in MWh times the CO_2 emission factor for the electricity displaced due to the project activity during the year y in tCO_2/MWh.

Given that power generation for internal consumption is part of the present project activity, emission reductions are only claimed from on-site incremental power generation that is injected to the grid. Therefore, the baseline scenario is the emission of GHG from the present electricity generation mix of the electricity grid.

The actual emission reduction achieved during the first issuing period shall be submitted as a part of monitoring and verification. For an ex-ante estimation for the period from 2013 to 2024, the following calculation has been submitted:

Emission Reductions are calculated as follows:

ERy = BEy – PEy – LEy Where:
ERy = Emission reductions in year y (tCO_2/y)
BEy = Baseline Emissions in year y ($t\ CO_2/y$)
PEy = Project emissions in year y (tCO_2/y)
LEy = Leakage emissions in year y (tCO_2/y)

Estimated Annual Baseline Emission Reduction: $BEy = EG_{PJ,y} \times EF_{grid,y}$

BEy = Baseline emissions in year y ($t\ CO_2$)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{grid,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" ($t\ CO_2/MWh$)

As determined by “Tool to calculate the emission factor for an electricity system – Version 7.0” for Brazil (am-tool-07-v7.0), the combined margin should be calculated using the “Weighted average CM”, as it follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times wOM + EF_{grid,BM,y} \times wBM \quad \text{Equation (16)}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (t CO_2/MWh)
$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (t CO_2/MWh)
wOM = Weighting of operating margin emissions factor (per cent)
wBM = Weighting of build margin emissions factor (per cent)

Since the project is a biomass co-generation project:

$wOM = 0.5$
$wBM = 0.5$

Since the project is a biomass co-generation project:

$PEy = 0$
$LEy = 0$

So as result $ERy = BEy$

For the Build and Operation margin emission factor, was considered the public data for the years from 2013 to 2024 available in the Ministry of Science, Technology and Innovation website: (https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/sirene/dados-e-ferramentas/fatores-de-emissao).

EMISSION FACTOR OF THE MONITORING PERIOD - EFgrid,CM						
Month	2013	2014	2015	2016	2017	2018
	tCO2eq/MWh	tCO2eq/MWh	tCO2eq/MWh	tCO2eq/MWh	tCO2eq/MWh	tCO2eq/MWh
January	0.439600	0.455900	0.425300	0.376700	0.272350	0.351100
February	0.433550	0.447600	0.416850	0.380650	0.258800	0.346450
March	0.430450	0.433100	0.416000	0.393100	0.294750	0.356000
April	0.436150	0.436750	0.400900	0.393600	0.296650	0.321400
May	0.427150	0.428400	0.401100	0.396850	0.305700	0.341550
June	0.439650	0.432050	0.416900	0.397450	0.293700	0.403050
July	0.424500	0.431850	0.411950	0.393450	0.304000	0.367950
August	0.414050	0.441250	0.404900	0.396250	0.306500	0.365900
September	0.431150	0.447850	0.393050	0.399150	0.304400	0.354400
October	0.430200	0.443200	0.399350	0.388050	0.301250	0.357600
November	0.439750	0.442400	0.403300	0.389900	0.302350	0.251200
December	0.440750	0.439400	0.400150	0.380150	0.305300	0.239650

EMISSION FACTOR OF THE MONITORING PERIOD - EFgrid,CM						
Month	2019	2020	2021	2022	2023	2024
	tCO2eq/MWh	tCO2eq/MWh	tCO2eq/MWh	tCO2eq/MWh	tCO2eq/MWh	tCO2eq/MWh
January	0.228000	0.330300	0.327047	0.274800	0.169218	0.234330
February	0.329650	0.311850	0.328147	0.257638	0.142219	0.213642
March	0.304750	0.241100	0.309847	0.216516	0.171215	0.165105
April	0.305750	0.197150	0.303097	0.121441	0.193484	0.123467
May	0.290700	0.227700	0.322447	0.153626	0.170904	0.167863
June	0.259750	0.286850	0.323997	0.233720	0.284879	0.208541
July	0.346700	0.245550	0.318197	0.222800	0.270277	0.301296
August	0.316600	0.248650	0.337697	0.241800	0.232837	0.326885
September	0.331300	0.213300	0.344547	0.258218	0.195022	0.328852
October	0.319500	0.335100	0.338797	0.246976	0.216998	0.349990
November	0.337000	0.319000	0.343568	0.215184	0.267454	0.302327
December	0.350850	0.354250	0.317738	0.160342	0.236986	0.275043

The official power generation data of the UTE Quirinópolis (USF) and UTE Cachoeira Dourada (URD) during the Monitoring Period, was informed by CCEE (Electric Energy Trading Chamber) digitally through their website/system:

ELECTRICITY GENERATED IN THE MONITORING PERIOD
UTE Quirinópolis (USF):

ELECTRICITY GENERATED IN THE MONITORING PERIOD - EG						
Month	2013	2014	2015	2016	2017	2018
	MWh	MWh	MWh	MWh	MWh	MWh
January	0	0	0	0	2,260	9,587
February	0	0	0	3,500	6,036	9,272
March	98	109	10,459	9,730	10,012	1,748
April	19,804	18,033	23,459	27,544	17,608	12,412
May	30,989	38,192	34,958	35,542	32,408	25,789
June	32,451	31,648	36,677	33,273	33,294	35,889
July	35,736	32,197	38,128	31,516	32,725	35,385
August	35,822	39,024	36,517	30,114	33,085	34,874
September	32,667	30,795	27,282	32,743	31,038	31,759
October	34,250	37,675	32,291	29,941	31,284	30,238
November	24,520	27,105	24,509	27,820	20,826	14,049
December	13,697	20,723	17,644	15,822	17,059	9,377
Total	260,035	275,500	281,924	277,544	267,634	250,378

ELECTRICITY GENERATED IN THE MONITORING PERIOD - EG						
Month	2019	2020	2021	2022	2023	2024
	MWh	MWh	MWh	MWh	MWh	MWh
January	2,482	11,870	6,235	5,182	2,192	542
February	3,418	4,989	5,733	2,775	2,424	910
March	3,831	2,873	4,688	4,859	1,916	704
April	21,894	28,001	19,573	8,972	2,510	15,543
May	32,813	34,138	30,946	27,152	17,681	28,991
June	35,412	36,516	28,711	24,725	23,416	28,305
July	33,674	36,684	27,937	30,225	22,153	30,177
August	32,103	31,006	28,887	26,410	16,805	26,413
September	29,091	31,611	23,824	21,651	22,646	24,708
October	29,894	23,087	17,415	14,380	20,832	19,443
November	22,989	7,831	12,042	14,167	19,757	16,936
December	13,601	6,606	5,164	2,742	13,017	11,152
Total	261,203	255,213	211,155	183,240	165,348	203,824

i-RECs issued UTE Quirinópolis (USF):

i-REC's - UTE Quirinópolis	
Month	2022
	MWh
May	18,000

Considering the subtraction of the MWh that were converted into i-REC:

ELECTRICITY GENERATED IN THE MONITORING PERIOD - EG						
Month	2019	2020	2021	2022	2023	2024
	MWh	MWh	MWh	MWh	MWh	MWh
January	2,482	11,870	6,235	5,182	2,192	542
February	3,418	4,989	5,733	2,775	2,424	910
March	3,831	2,873	4,688	4,859	1,916	704
April	21,894	28,001	19,573	8,972	2,510	15,543
May	32,813	34,138	30,946	**9,152**	17,681	28,991
June	35,412	36,516	28,711	24,725	23,416	28,305
July	33,674	36,684	27,937	30,225	22,153	30,177
August	32,103	31,006	28,887	26,410	16,805	26,413
September	29,091	31,611	23,824	21,651	22,646	24,708
October	29,894	23,087	17,415	14,380	20,832	19,443
November	22,989	7,831	12,042	14,167	19,757	16,936
December	13,601	6,606	5,164	2,742	13,017	11,152
Total	261,203	255,213	211,155	165,240	165,348	203,824

The impact of exported energy on the amount of CBIOs UTE Quirinópolis (USF):

		may/2020 to mar/2023		apr/2023 to mar/2026	
		Anhydrous	Hydrated	Anhydrous	Hydrated
CBIOs	NEEA with exported eletricity	58,50	58,20	68,84	68,49
	NEEA without exported eletricity	56,80	56,50	67,78	67,43
	Increase	2,993%	3,009%	1,564%	1,572%
	Average	3,001%		1,568%	
	Factor	0,96999		0,98432	

Exported Eletricity less proportion of CBIOs:

ELECTRICITY GENERATED IN THE MONITORING PERIOD - EG					
Month	2020	2021	2022	2023	2024
	MWh	MWh	MWh	MWh	MWh
January	11,870	6,048	5,026	2,126	533
February	4,989	5,561	2,692	2,351	896
March	2,873	4,547	4,713	1,858	693
April	28,001	18,986	8,703	2,470	15,299
May	33,114	30,018	8,877	17,404	28,536
June	35,421	27,849	23,983	23,049	27,861
July	35,583	27,099	29,318	21,805	29,704
August	30,076	28,020	25,617	16,541	25,999
September	30,662	23,109	21,001	22,291	24,321
October	22,394	16,892	13,948	20,505	19,138
November	7,596	11,680	13,742	19,448	16,671
December	6,408	5,009	2,660	12,813	10,977
Total	248,986	204,819	160,281	162,662	200,629

Since ERy = BEy = EG x EFgrid, it is achieved the following results for the emissions reductions ERy:

EMISSION REDUCTION - ERy						
Month	2013	2014	2015	2016	2017	2018
	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq
January	0	0	0	0	616	3,366
February	0	0	0	1,332	1,562	3,212
March	42	47	4,351	3,825	2,951	622
April	8,638	7,876	9,405	10,841	5,223	3,989
May	13,237	16,362	14,022	14,105	9,907	8,808
June	14,267	13,674	15,291	13,224	9,779	14,465
July	15,170	13,904	15,707	12,400	9,948	13,020
August	14,832	17,219	14,786	11,933	10,140	12,760
September	14,084	13,791	10,723	13,069	9,448	11,255
October	14,734	16,698	12,895	11,619	9,424	10,813
November	10,783	11,991	9,885	10,847	6,297	3,529
December	6,037	9,105	7,060	6,015	5,208	2,247
Total	111,825	120,667	114,124	109,210	80,503	88,088

EMISSION REDUCTION - ERy						
Month	2019	2020	2021	2022	2023	2024
	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq
January	566	3,921	1,978	1,381	360	125
February	1,127	1,556	1,825	694	334	191
March	1,167	693	1,409	1,020	318	114
April	6,694	5,520	5,755	1,057	478	1,889
May	9,539	7,540	9,679	1,364	2,974	4,790
June	9,198	10,160	9,023	5,605	6,566	5,810
July	11,675	8,737	8,623	6,532	5,893	8,950
August	10,164	7,478	9,462	6,194	3,851	8,499
September	9,638	6,540	7,962	5,423	4,347	7,998
October	9,551	7,504	5,723	3,445	4,450	6,698
November	7,747	2,423	4,013	2,957	5,201	5,040
December	4,772	2,270	1,592	426	3,037	3,019
Total	81,838	64,343	67,043	36,098	37,810	53,124

ELECTRICITY GENERATED IN THE MONITORING PERIOD
UTE Cachoeira Dourada (URD):

ELECTRICITY GENERATED IN THE MONITORING PERIOD - EG						
Month	2013	2014	2015	2016	2017	2018
	MWh	MWh	MWh	MWh	MWh	MWh
January	2,926	0	0	0	0	7,741
February	0	0	0	0	0	0
March	0	0	0	1,815	8,442	10,321
April	0	14,234	11,724	18,623	17,216	17,484
May	5,667	19,344	19,126	19,125	19,077	18,869
June	12,156	18,246	20,128	18,875	18,096	19,346
July	14,511	19,884	20,359	19,544	19,828	19,376
August	16,767	21,094	20,045	19,439	19,641	17,911
September	17,603	17,318	19,608	19,400	18,695	19,054
October	18,346	19,653	19,326	18,510	18,543	19,086
November	15,704	19,342	19,283	17,704	17,420	20,238
December	15,357	19,010	18,853	12,050	15,640	4,802
Total	119,038	168,125	168,451	165,087	172,597	174,227

ELECTRICITY GENERATED IN THE MONITORING PERIOD - EG						
Month	2019	2020	2021	2022	2023	2024
	MWh	MWh	MWh	MWh	MWh	MWh
January	0	3,013	0	0	0	717
February	0	7,917	0	0	1,248	0
March	692	18,542	7,548	54	5,093	13,681
April	17,593	18,110	17,452	11,564	15,547	17,101
May	19,988	20,511	19,412	19,650	18,618	20,163
June	19,979	19,832	18,960	18,855	19,212	20,487
July	20,066	20,502	20,783	19,213	19,980	20,148
August	17,966	20,282	20,938	17,556	18,855	19,726
September	18,040	19,034	19,597	18,056	19,299	19,479
October	16,885	19,123	20,368	17,855	19,249	19,542
November	16,404	22,045	17,746	14,101	19,363	17,807
December	15,416	14,938	10,171	5,040	14,360	18,367
Total	163,030	203,850	172,976	141,944	170,825	187,218

No i-REC was issued during the monitoring period for UTE Cachoeira Dourada (URD).

The impact of exported energy on the amount of CBIOs UTE Cachoeira Dourada (URD):

		may/2020 to mar/2023		apr/2023 to mar/2026	
		Anhydrous	Hydrated	Anhydrous	Hydrated
CBIOs	NEEA with exported eletricity	58,70	58,40	58,23	57,88
	NEEA without exported eletricity	55,30	55,00	55,07	54,72
	Increase	6,148%	6,182%	5,738%	5,775%
	Average	6,165%		5,757%	
	Factor	0,93835		0,94243	

Exported Eletricity less proportion of CBIOs:

ELECTRICITY GENERATED IN THE MONITORING PERIOD - EG					
Month	2020	2021	2022	2023	2024
	MWh	MWh	MWh	MWh	MWh
January	3,013	0	0	0	676
February	7,917	0	0	1,171	0
March	18,542	7,082	50	4,779	12,894
April	18,110	16,377	10,851	14,652	16,116
May	19,247	18,215	18,439	17,547	19,003
June	18,610	17,791	17,692	18,106	19,308
July	19,238	19,502	18,029	18,830	18,988
August	19,032	19,647	16,474	17,770	18,591
September	17,861	18,389	16,943	18,188	18,357
October	17,944	19,112	16,754	18,141	18,417
November	20,686	16,652	13,231	18,249	16,782
December	14,017	9,544	4,729	13,533	17,310
Total	194,216	162,312	133,193	160,965	176,441

Since ERy = BEy = EG x EFgrid, it is achieved the following results for the emissions reductions ERy:

EMISSION REDUCTION - ERy						
Month	2013	2014	2015	2016	2017	2018
	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq
January	1,286	0	0	0	0	2,718
February	0	0	0	0	0	0
March	0	0	0	714	2,488	3,674
April	0	6,217	4,700	7,330	5,107	5,619
May	2,421	8,287	7,671	7,590	5,832	6,445
June	5,344	7,883	8,391	7,502	5,315	7,797
July	6,160	8,587	8,387	7,690	6,028	7,129
August	6,942	9,308	8,116	7,703	6,020	6,553
September	7,590	7,756	7,707	7,743	5,691	6,753
October	7,892	8,710	7,718	7,183	5,586	6,825
November	6,906	8,557	7,777	6,903	5,267	5,084
December	6,769	8,353	7,544	4,581	4,775	1,151
Total	51,310	73,657	68,011	64,938	52,108	59,749

EMISSION REDUCTION - ERy						
Month	2019	2020	2021	2022	2023	2024
	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq
January	0	995	0	0	0	158
February	0	2,469	0	0	167	0
March	211	4,471	2,194	11	818	2,129
April	5,379	3,570	4,964	1,318	2,835	1,990
May	5,810	4,382	5,873	2,833	2,999	3,190
June	5,190	5,338	5,764	4,135	5,158	4,027
July	6,957	4,724	6,205	4,017	5,089	5,721
August	5,688	4,732	6,635	3,983	4,138	6,077
September	5,977	3,810	6,336	4,375	3,547	6,037
October	5,395	6,013	6,475	4,138	3,937	6,446
November	5,528	6,599	5,721	2,847	4,881	5,074
December	5,409	4,966	3,033	758	3,207	4,761
Total	51,544	52,069	53,201	28,415	36,775	45,609

EMISSION REDUCTION – Ery: UTE Quirinópolis (USF) plus UTE Cachoeira Dourada (URD):

EMISSION REDUCTION - ERy						
Month	2013	2014	2015	2016	2017	2018
	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq
January	1,286	0	0	0	616	6,084
February	0	0	0	1,332	1,562	3,212
March	42	47	4,351	4,539	5,439	4,296
April	8,638	14,092	14,105	18,172	10,331	9,609
May	15,658	24,648	21,693	21,694	15,739	15,253
June	19,611	21,557	23,682	20,726	15,093	22,263
July	21,330	22,491	24,094	20,090	15,976	20,149
August	21,775	26,527	22,902	19,635	16,160	19,314
September	21,674	21,548	18,430	20,813	15,139	18,008
October	22,627	25,408	20,613	18,801	15,010	17,638
November	17,689	20,548	17,662	17,750	11,564	8,613
December	12,806	17,458	14,604	10,595	9,983	3,398
Total	163,135	194,325	182,135	174,148	132,611	147,836

EMISSION REDUCTION - ERy						
Month	2019	2020	2021	2022	2023	2024
	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq
January	566	4,916	1,978	1,381	360	283
February	1,127	4,025	1,825	694	501	191
March	1,378	5,163	3,603	1,031	1,136	2,243
April	12,073	9,091	10,718	2,375	3,313	3,879
May	15,349	11,922	15,553	4,196	5,973	7,980
June	14,388	15,499	14,787	9,740	11,724	9,837
July	18,632	13,461	14,828	10,549	10,983	14,671
August	15,852	12,211	16,097	10,178	7,989	14,576
September	15,615	10,350	14,298	9,798	7,894	14,035
October	14,946	13,517	12,198	7,583	8,386	13,144
November	13,276	9,022	9,734	5,804	10,082	10,114
December	10,181	7,236	4,624	1,185	6,244	7,780
Total	133,382	116,412	120,244	64,514	74,585	98,732

For the current monitoring period no biomass residue was collected from outside, thus for this monitoring period, the value of this parameter is zero (*PEy*), however, using the UCR principles of conservativeness in emission reductions quantification, prevention of over-generation of credits and based on stakeholder comments on project emissions, transport emissions are calculated by applying a net-to-gross adjustment of 10%, i.e. multiply the emission reductions determined based on the applied methodology by 0.9 to determine the final amount of emission reductions.

	2013	2014	2015	2016	2017	2018
	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq
Total	146,821	174,892	163,921	156,732	119,350	133,052

	2019	2020	2021	2022	2023	2024
	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq	tCO2eq
Total	120,043	104,770	108,219	58,062	67,126	88,859

Total amount of emission reductions was 1,441,847 tCO2eq for the monitoring period, **already considering the deduction of MWh that were converted into i-RECs and the proportion of CBIOs.**

Total emission reductions: *ERy* = 1,441,847 tCO_2 / year (1,441,847 CoUs /year)

C.6. Prior History>>

The project activity has not applied to any other GHG program for generation or issuance of carbon offsets or credits for the said crediting period.

The UTE Quirinópolis and UTE Cachoeira Dourada are qualified for i-RECs certification (UTEQTHER001 and UTECTHER003). But only UTE Quirinópolis issued i-RECs (May, 2022: 18,000 MWh – Reference: UTEQTHER001). To be conservative and avoid double counting, the amount of MWh converted into i-RECs was deducted from the total MWh available for issuing carbon credits.

UTE Quirinópolis and UTE Cachoeira Dourada are also certified by Renovabio, which is Brazilian National Biofuels Program, created to encourage the production and use of sustainable biofuels, such as ethanol and biodiesel, replacing gasoline and diesel, which are more polluting fossil fuels. It certifies companies based on the environmental efficiency of production, allowing them to issue CBIOs (Decarbonization Credits), which can be sold. Although RenovaBio and the carbon credit certification system have similar objectives when it comes to decarbonization, they are different programs and work in different ways, with their own regulations and mechanisms.

The CBIO is a financial instrument generated **exclusively** by the production **of biofuels**, in this case, **ethanol**. On the other hand, the carbon credits proposed in this project are generated by surplus **renewable energy exported** to the electricity grid.

- Law No. 13,576/2017 (RenovaBio Law, https://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/lei/l13576.htm): Establishes the National Biofuels Policy, **focusing on the production and use of biofuels**, without mentioning the generation of carbon credits for surplus energy.

- ANP Resolution No. 758/2018 (https://atosoficiais.com.br/anp/resolucao-n-758-2018-regulamenta-a-certificacao-da-producao-ou-importacao-eficiente-de-biocombustiveis-de-que-trata-o-art-18-da-lei-no-

13-576-de-26-de-dezembro-de-2017-e-o-credenciamento-de-firmas-inspetoras?origin=instituicao&q=Resolu%C3%A7%C3%A3o%20ANP%20n%C2%BA%20758/2018): Regulates the certification of efficient production of biofuels, treating electrical energy as a co-product, **but not as a direct source of CBIOs**.

- Technical Note nº 62/2018/SBQ/ANP: Details the methodology for calculating CBIOs, reaffirming that exported electrical energy is considered only as a co-product.

In the Renovabio program, the RenovaCalc tool is used, which uses exported energy as one of the factors to calculate the plant's Energy-Environmental Efficiency Rating (NEEA), that is an indicator of the efficiency of the production process, specifically in the industrial phase. A higher NEEA indicates a more efficient process, which generally results in a lower carbon intensity. Impact on CBIOs: the amount of CBIOs generated is based on the difference between the carbon intensity of the biofuel and that of the equivalent fossil fuel. The lower the carbon intensity of the biofuel, the greater the difference compared to fossil fuel, resulting in more CBIOs generated.

Role of Exported Energy in generating CBIOs:

Exported electrical energy is considered a beneficial co-product. It "credits" the process, effectively reducing the carbon intensity attributed to the biofuel. This is because exported renewable energy replaces potentially more carbon-intensive energy on the grid.

If a plant exports more renewable energy, its NEEA tends to improve. A better NEEA generally results in a lower carbon intensity for the ethanol produced. With lower carbon intensity, the gap with fossil fuel increases. Consequently, more CBIOs are generated per unit of biofuel produced.

Whereas the impact of exported energy on the amount of CBIOs is generally marginal compared to other factors such as agricultural and industrial efficiency, exported energy is just one of the many factors considered in the NEEA calculation. However, to adopt a conservative position and avoid double counting, percentage of Carbon Credits was deducted here in this program, in the same proportion in which the exported energy boosted the generation of CBIOs, in the respective periods in which they were generated:

$$NEEA = \left(\frac{EF_{fossil} - EF_{bio}}{EF_{fossil}} \right) \times 100$$

Where:

- EF_{fossil} = **Emission Factor of the reference fossil fuel** (gCO_2eq/MJ)
- EF_{bio} = **Emission Factor of the assessed biofuel** (gCO_2eq/MJ)

The $\boldsymbol{EF_{bio}}$ is obtained by considering all emissions from the biofuel's life cycle, including:

- Biomass production
- Transportation
- Industrial processing
- Distribution

Since the NEEA formula depends on the difference between EF_{fossil} and EF_{bio}, any reduction in EF_{bio} (through fossil fuel replacement or clean energy exports) boosts the efficiency score and allows for the issuance of more CBIOs per liter of ethanol.

The number of CBIOs (Decarbonization Credits) generated by a biofuel producer is calculated using the following formula:

$$CBIOs = \frac{V_{bio} \times \text{LCV} \times \text{NEEA} \times D}{10^3}$$

Where:

- V_{bio} = **Volume of biofuel** produced and sold (in cubic meters, m^3)
- **LCV** = **Lower Calorific Value** of the biofuel (MJ/L)
- **NEEA** = **Energy-Environmental Efficiency Score** (%)
- **D** = **Density** of the biofuel (kg/L)

Therefore, it can be concluded that the NEEA is directly proportional to the generation of CBIOs. Since exported energy is one of the factors that improves the NEEA score, and in order to adopt a conservative approach, we calculated the extent to which exported energy contributed to the increase in the NEEA score. This percentage was then deducted from the carbon credits generated under this program, during the same period in which CBIOs were issued, for the purpose of carbon credit issuance.

NEEA with exported eletricity	X
NEEA without exported eletricity	Y
Increase (%)	$\frac{(X - Y)}{Y}$
Adjustment Factor	$1 - \frac{(X - Y)}{Y}$

The table shows the calculation of the adjustment factor to account for the impact of exported electricity on the NEEA score and, consequently, on CBIOs.

- **NEEA with exported electricity (X)** → Efficiency score considering exported electricity.

- **NEEA without exported electricity (Y)** → Efficiency score without considering exported electricity.

- **Increase (%)** → The impact of exported electricity on NEEA is given by:

This represents **how much the** $\frac{(X - Y)}{Y}$ **exported electricity increased the NEEA score**.

Adjustment Factor → To adjust the exported electricity for carbon credit generation without double counting with CBIOs, we apply the factor:

$$1 - \frac{(X - Y)}{Y}$$

This factor was applied to discount the portion of carbon credits linked to exported energy that had already contributed to an increase in NEEA and, consequently, to the issuance of CBIOs.

The percentage calculation was applied to the corresponding months and years in which the CBIOs were issued.

C.7. Monitoring period number and duration>>

First Monitoring Period: 12 years – Jan 01, 2013 to Dec 31, 2024

C.8. Changes to start date of crediting period >>

There is no change in the start date of crediting period.

C.9. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

There are no permanent changes from registered PCN monitoring plan and applied methodology.

C.10. Monitoring plan>>

All energy generation data is acquired through CCEE meters installed in CARGILL Bioenergia substation. In PCN version 1.0, some inaccuracies were identified in the metering data. These have been reviewed and corrected in the current version.

Meter	Serial Number	Specification
USF 1	MW-2402A230-02 (Main)	Schneider Power Logic ION8650 3 Phases 57.7 ~ 220 V 1.0 / 5.0 A (max 20 A) 60 Hz Class D kh 1,8 Wh-varh/impulso Calibration year: 2024
USF 1	MW-2308A568-02 (Check)	Schneider Power Logic ION8650 3 Phases 57.7 ~ 220 V 1.0 / 5.0 A (max 20 A) 60 Hz Class D kh 1,8 Wh-varh/impulso Calibration year: 2023
USF 2	PT-1010A661-01 (Main)	Schneider Power Logic ION8600 3 Phases 57.7 ~ 220 V 5.0 A (max 20 A) 60 Hz Class D kh 1,8 Wh-varh/impulso Calibration year: 2024
USF 2	PT-1010A681-01 (Check)	Schneider Power Logic ION8600 3 Phases 57.7 ~ 220 V 5.0 A (max 20 A) 60 Hz Class D kh 1,8 Wh-varh/impulso Calibration year: 2024
URD	PT-1205A487-01 (Main)	Schneider Power Logic ION8600 3 Phases 57.7 ~ 220 V 5.0 A (max 10 A) 60 Hz Class D kh 1,8 Wh-varh/impulse Calibration year: 2025
URD	PT-1205A488-01 (Check)	Schneider Power Logic ION8600 3 Phases 57.7 ~ 220 V 5.0 A (max 10 A) 60 Hz Class D kh 1,8 Wh-varh/impulse Calibration year: 2025

Meter USF 1 (Main)

Meter USF 1 (Check)

Meter USF 2 (Main)

Meter USF 1 (Check)

Meter URD (Main)

Meter URD (Check)

The meters are locked and can be manipulated only under CCEE or ONS authorization. All generation data is available digitally and can be checked by the CARGILL Bioenergia personnel through CCEE system at CCEE website.

Parameters being monitored or used in emission reductions determination:

Data/Parameter	EF $_{grid,y}$
Data unit	tCO2e/MWh
Description	CO_2 emission factor of the grid electricity in year y
Source of data Value(s) applied	https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/sirene/dados-e-ferramentas/fatores-de-emissao
Measurement methods and procedures	As per the requirements in "Tool to calculate the emission factor for an electricity system"
Monitoring frequency	Monthly
Purpose of data	To estimate baseline emissions

Data / Parameter:	EG $_{pj,y}$
Data unit:	MWh
Description:	Quantity of net electricity generation and export supplied by the project plant/unit to the grid in year y
Source of data:	The data provided by the Câmara de Comercialização de Energia Elétrica – CCEE (Electric Energy Trading Chamber)
Measurement procedures (if any):	This parameter is monitored using bidirectional energy meter
Monitoring frequency:	Continuous monitoring, hourly measurement and at least monthly recording
QA/QC procedures:	The meters and current transformers will be subjected to periodic calibrations/audits from ANEEL and CCEE to certify that electric energy injected in the grid data is reliable and precise, in a way to guarantee the reliability of the national grid and energy supply. As determined by government entity ONS (National Electric System Operator), in the "Submodule 6.16 - Maintenance of the billing measurement system" item 1.1.2, the calibration of the meters must occur every 5 years.

ANNEX I – Emission Factor

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**
2013	0.2713

OPERATION MARGIN

	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2013	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.6079	0.5958	0.5896	0.6010	0.5830	0.6080	0.5777	0.5568	0.5910	0.5891	0.6082	0.6102

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**
2014	0.2963

OPERATION MARGIN

	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2014	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.6155	0.5989	0.5699	0.5772	0.5605	0.5678	0.5674	0.5862	0.5994	0.5901	0.5885	0.5825

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**
2015	0.2553

OPERATION MARGIN

	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2015	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.5953	0.5784	0.5767	0.5465	0.5469	0.5785	0.5686	0.5545	0.5308	0.5434	0.5513	0.5450

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**
2016	0.1581

OPERATION MARGIN

	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2016	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.5953	0.6032	0.6281	0.6291	0.6356	0.6368	0.6288	0.6344	0.6402	0.6180	0.6217	0.6022

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**
2017	0.0028

OPERATION MARGIN

	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2017	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.5419	0.5148	0.5867	0.5905	0.6086	0.5846	0.6052	0.6102	0.6060	0.5997	0.6019	0.6078

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**											
2018	0.1370											
OPERATION MARGIN												
	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2018	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.5652	0.5559	0.5750	0.5058	0.5461	0.6691	0.5989	0.5948	0.5718	0.5782	0.3654	0.3423

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**											
2019	0.1020											
OPERATION MARGIN												
	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2019	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.3540	0.5573	0.5075	0.5095	0.4794	0.4175	0.5914	0.5312	0.5606	0.5370	0.5720	0.5997

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**											
2020	0.0979											
OPERATION MARGIN												
	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2020	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.5627	0.5258	0.3843	0.2964	0.3575	0.4758	0.3932	0.3994	0.3287	0.5723	0.5401	0.6106

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**											
2021	0.0540											
OPERATION MARGIN												
	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2021	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.6001	0.6023	0.5657	0.5522	0.5909	0.5940	0.5824	0.6214	0.6351	0.6236	0.6331	0.5815

CONSTRUCTION MARGIN

	Average Emission Factor (tCO_2/MWh) - **ANNUAL**											
2022	0.0270											
OPERATION MARGIN												
	Average Emission Factor (tCO_2/MWh) - **MONTHLY**											
2022	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.5226	0.4883	0.4060	0.2159	0.2803	0.4404	0.0419	0.4566	0.4894	0.4670	0.4034	0.2937

CONSTRUCTION MARGIN

Average Emission Factor (tCO_2/MWh) - **ANNUAL**												
2023	0.0467											
OPERATION MARGIN												
Average Emission Factor (tCO_2/MWh) - **MONTHLY**												
2023	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.2917	0.2377	0.2957	0.3403	0.2951	0.5231	0.4939	0.4190	0.3433	0.3873	0.4882	0.4273

CONSTRUCTION MARGIN

Average Emission Factor (tCO_2/MWh) - **ANNUAL**												
2024	0.0523											
OPERATION MARGIN												
Average Emission Factor (tCO_2/MWh) - **MONTHLY**												
2024	MONTH											
	January	February	March	April	May	June	July	August	September	October	November	December
	0.4164	0.3750	0.2779	0.1946	0.2834	0.3648	0.5503	0.6015	0.6054	0.6477	0.5524	0.4978