VTRM RENEWABLE ENERGY 2 MONITORING REPORT

Project title	VTRM Renewable Energy 2
Project ID	Verra Project ID 1903
Monitoring period	01-January-2024 to 31-December-2024
Original date of issue	13-Nov-2025
Most recent date of issue	13-Nov-2025
Version	3
VCS Standard Version	VCS Standard - Version 4.7
Prepared by	GSS Impact Development Company

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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The VTRM Renewable Energy 2 project activity consists of the implementation and operation of a project, currently represented by the "*Ventos do Piauí I*" Complex, which comprises seven onshore Wind Power Plants (WPPs) located in Brazil. All WPPs supply renewable electricity to the Brazilian National Interconnected System (SIN – "*Sistema Interligado Nacional*").

The project was registered under the VCS Standard on April 6, 2020, and the first WPP of the complex began operations on August 2, 2017, as documented by ANEEL Ordinance No. 2,328.

By displacing electricity that would otherwise be generated by fossil fuel-based power plants, the project contributes to the reduction of greenhouse gas (GHG) emissions and supports the transition toward a low-carbon energy matrix. The generation of renewable electricity plays a key role in promoting environmental sustainability by avoiding emissions that would have occurred in the absence of the project activity.

The baseline scenario reflects the electricity generation that would have taken place in the absence of the project, based on existing grid-connected power plants and the addition of new fossil fuel-based generation sources. This is accounted for using the combined margin emission factor, calculated in accordance with the Tool to calculate the emission factor for an electricity system.

This Monitoring Report covers the sixth verification period, from January 1, 2024 to December 31, 2024. During this period, the project activity supplied **772,074 MWh** renewable electricity to the SIN and achieved a total GHG emission reduction of **279,596 tCO_2e**.

1.2 Audit History

The audit history of the project is presented in the table below:

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	25-July-2019	Verified Carbon Standard	Earthood Services Private Limited	-
Verification	02-August-2017 to 28-February-2019	Verified Carbon Standard	Earthood Services Private Limited	1.5 years (18 months)
Verification	01-March-2019 to 30-September-2020	Verified Carbon Standard	RINA Services s.p.A.	1.58 years (19 months)
Verification	01-October-2020 to 31-December-2021	Verified Carbon Standard	Rina Services S.p.A	1.25 years (15 months)

Verification	01-January-2022 to 31-December-2022	Verified Carbon Standard	Rina Services S.p.A	1 year (12 months)
Verification	01-January-2023 to 31-December-2023	Verified Carbon Standard	Rina Services S.p.A	1 year (12 months)
Verification	01-January-2024 to 31-December-2024	Verified Carbon Standard	Rina Services S.p.A	1 year (12 months)
Total	-	-	-	7,33 years (88 months)

1.3 Sectoral Scope and Project Type

Complete the table below with information relevant for non-AFOLU projects:

Sectoral scope[1]	1. Energy (Renewable/non-renewable)
Project activity type	Renewable Energy Project.

Sectoral scope	Not applicable. This is not an AFOLU Project
AFOLU project category[2]	Not applicable. This is not an AFOLU Project
Project activity type	Not applicable. This is not an AFOLU Project

1.4 Project Proponent

Organization name	AUREN ENERGIA S.A[3].
Contact person	José Guilherme Silva Amato
Title	Head of Energy and Carbon Trading
Address	8501, Dra. Ruth Cardoso Av., 2nd Floor, São Paulo/SP, Brazil
Telephone	+55 (11) 2874-2775
Email	jose.amato@aurenenergia.com.br

[1] *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*

[2] *See Appendix 1 of the* VCS Standard

[3] VTRM Energia Participações S.A. changed its name. The current name of the company is Auren Energia S.A.

1.5 Other Entities Involved in the Project

Not applicable. There are no other entities involved in the project.

Organization name	Not applicable
Role in the project	Not applicable
Contact person	Not applicable
Title	Not applicable
Address	Not applicable
Telephone	Not applicable
Email	Not applicable

1.6 Project Start Date

Project start date	02-August-2017
Justification	According to the VCS Standard v3.7, the project start date is defined as the date on which the project activity began generating GHG emission reductions or removals. Accordingly, the project start date of the VTRM Renewable Energy 2 activity is August 2, 2017, which corresponds to the commissioning date of the first wind turbine generator (WTG) of the Ventos de São Vicente 14. This date is substantiated by ANEEL Ordinance No. 2,328[4], issued on August 1, 2017.

1.7 Project Crediting Period

Crediting period	☐ *Seven years, twice renewable* ☐ *Ten years, fixed* ☒ *Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)*

[4] Available at: Despacho 2328/2017 (01/08/2017)

	According to the VCS Standard (Version 3.7)[5], version of the standard that the project was registered, the project crediting period shall be a maximum of ten years which may be renewed at most twice.
Start and end date of first or fixed crediting period	02-August-2017 to 01-August-2027

1.8 Project Location

Wind power plants of *Ventos do Piauí I Complex* are in Curral Novo do Piauí (PI), northeastern region of Brazil. Coordinates of each plant are presented as follows according to the Brazilian Power Regulatory Agency (ANEEL/SIGEL):

Table 1 – Geographical Coordinates of *the* Power Plants[6]

Wind Power Plant	Location	Geographical Coordinates (decimal degrees)	
		Latitude	Longitude
Ventos de São Vicente 08	Curral Novo do Piauí - PI	-8.0121	-40.6317
Ventos de São Vicente 09	Curral Novo do Piauí - PI	-8.0173	-40.6585
Ventos de São Vicente 10	Curral Novo do Piauí - PI	-8.0065	-40.6378
Ventos de São Vicente 11	Curral Novo do Piauí - PI	-7.9957	-40.6349
Ventos de São Vicente 12	Curral Novo do Piauí - PI	-8.0214	-40.6178
Ventos de São Vicente 13	Curral Novo do Piauí - PI	-8.0031	-40.6115
Ventos de São Vicente 14	Curral Novo do Piauí - PI	-7.9895	-40.5834

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	CDM methodology ACM0002	ACM0002: "Grid-connected electricity generation from renewable sources".	version 19.0
Tool	CDM TOOL01	TOOL01: Tool for the demonstration and assessment of additionality.	Version 07.0

[5] VCS Standard (Version 3.7)

[6] Location of the first WTG: Datum SIRGAS 2000 - UTM 24 S (MER -39). Available at: SIGEL ANEEL

Tool	CDM TOOL07	TOOL07: Tool to calculate the emission factor for an electricity system.	Version 07.0
Tool	CDM TOOL24	TOOL24: Methodological Tool "Common Practice".	Version 03.1
Tool	CDM TOOL27	TOOL27: Methodological Tool "Investment Analysis".	Version 08.0

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

If yes:

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

If yes:

Has the project proponent(s) or authorized representative posted a public statement on their website saying, "Carbon credits may be issued through the Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities]."

☐ Yes ☐ No

If yes to all:
Provide evidence of the public statement. Evidence must be provided in this section or in an appendix.

1.12 Sustainable Development Contributions

In addition to the emission reductions generated by the project activity, the VTRM Renewable Energy 2 Project has delivered several important co-benefits, contributing to the sustainable development of the surrounding communities. These include:

(i) Supporting families in situations of social vulnerability through the creation of agroecological backyards, promoting sustainable agriculture and enhancing food security;

(ii) Construction of drinking water collection and storage systems, improving access to drinking water in the region and improving access to water and sanitation;

(iii) Promotion of initiatives to expand access to clean and affordable energy, aligned with SDG 7;

(iv) The project contributes to this SDG in its operation, providing renewable and clean energy to the grid. By reducing the share of energy consumed from fossil fuels, it effectively decreases greenhouse gas emissions, aligned with SDG 13.

(v) Donation of personal protective equipment (PPE) to increase local capacity in responding to the COVID-19 pandemic, helping to improve community health and overall quality of life;

(vi) Training of school principals and professionals from municipal education departments, alongside efforts to mobilize society and raise awareness about the importance of education;

(vii) Development of programs aimed at promoting and stimulating new economic activities in communities within the semi-arid region, including initiatives for food production, commercialization, and sheep and goat breeding;

(viii) Construction and upgrading of educational facilities to ensure safe, gender-sensitive, nonviolent, inclusive, and effective learning environments for all;

(ix) Investment in education to ensure that all youth, and a significant proportion of adults—both men and women—achieve literacy and numeracy in the region;

(x) Support for the development and strengthening of municipal institutions to guarantee the rights and protection of children and adolescents.

The table below presents the Sustainable Development Contributions achieved both over the lifetime of the project and during this monitoring period.

Table 2: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	2.1	User-defined indicator: Hunger reduction through the implementation and maintenance of agroecological backyards	Implemented activities to decrease hunger	No contribution during this monitoring period.	108 agroecological backyards implemented benefiting 108 families in situations of social vulnerability received agroecological backyards to promote sustainable agriculture
3)	3.d	User-defined indicator: number of personal protective equipment donated to combat COVID-19	Implemented activities to increase	No contribution during this monitoring period.	842,201 personal protective equipment donated in 8 Brazilian municipalities as a measure to combat the COVID-19 pandemic, helping the local people and needy municipalities around the operations.
4)	4.a	User-defined indicator: Number of education facilities built or upgraded	Implemented activities to increase.	No contribution during this monitoring period.	To build and upgrade education facilities that are friendly to children with disability and provide safe, gender sensitive, nonviolent, inclusive and effective learning environments for all. Two schools upgraded impacting 556 children.

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
5)	4.6	User-defined indicator: Number of adults achieving literacy and numeracy	Implemented activities to increase.	Ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy. In 2024, 111 students were enrolled.	61 teachers qualified. 315 students impacted.
6)	4.c	User-defined indicator: Number of teachers awarded with initiatives to improve public education	Implemented activities to increase	Yes. 105 teachers, coordinators, pedagogues, and educational technicians from the public school system in the municipalities of Curral Novo do Piauí, Santa Filomena and Ouricuri through the PVE program.	1,132 teachers participated in the PVE "Program for Valuing Education" which seeks to improve public education based on management practices with social mobilization of communities and teachers in 6 municipalities where the project operates.
7)	6.1	Indicator 6.1.1: Proportion of population using safely managed drinking water services	Implemented activities to increase	Yes. 38 filters were delivered: 28 distributed to the family committee and 10 to the Ventos do Horizonte Project through the Pura Filtra initiative for the VDP communities. Four cisterns were also built and two renovated in the communities of Cajueiro and Ramada.	24 people (6 families) were benefited by the provision of systems for storing and capturing drinking water, helping needy communities in the vicinity of the operations.

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
8)	6.1	Indicator 6.2.1: Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	Implemented activities to increase	Eight bathrooms were built in VDP through the Rede Transformar partnership between Auren and VC, and three were renovated, with septic tanks installed in the communities of Cajueiro and Ramada.	96 people (23 families) were positively impacted with the provision of sanitation systems, including hand-washing facility with soap and water, helping with basic sanitation for needy communities in the vicinity of the operations.
9)	7.1	Indicator 7.1.1 Proportion of population with access to electricity	Implemented activities to increase	No contribution during this monitoring period.	28 people were positively impacted. These people received 7 solar energy systems in line with ODS 7 which aims at reliable, sustainable, and modern energy sources in Curral Novo city.
10)	7.2	Indicator 7.2.1 Renewable energy share in the total final energy consumption	Implemented activities to increase	The operation of this project activity during this monitoring period supplied 772,074 MWh renewable electricity.	The project injects renewable and clean energy into the Brazilian electricity grid, contributing to the achievement of Sustainable Development Goal (SDG). At this current monitoring period, this project activity during this monitoring period supplied 772,074 MWh renewable electricity.

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
11)	13.2	Indicator 13.2.2: Total greenhouse gas emissions per year	Implemented activities to increase	The operation of this project activity during this monitoring period avoided 279,596 tCO_2e.	The project achieved 2.205.894 tCO2e over the lifetime. • 1,926,298 tCO2e was achieved in the first five monitoring period already verified. • At this current monitoring period, the project avoided 279,596 tCO2e during the whole monitored period.
12)	16.6	User-defined indicator: number of organizations trained.	Implemented activities to increase.	In 2024, 31 people from eight organizations participated in the activities (Assistance Department; Administration Department; Education Department; Rural Development Council; Baptist Congregation; Parish; Health Department; Children's Ministry).	No contribution before this monitoring period.

1.13 Commercially Sensitive Information

There is no commercially sensitive information which has been excluded from this public version of the monitoring report.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	The stakeholder identification process is established by the Management Standard: Strategy, Planning, and Socio-Environmental Investment Management and Community Relations - NG.AUREN.DSP.101 (version 0). The identification, classification, and prioritization of stakeholders are carried out by mapping the interested parties from target locations, considering the impact of the units on each of them and their influence on the company's operations. With such information, it is possible to prioritize stakeholders. For this process, the Stakeholder Management Spreadsheet is used, where the actors that interface with the company are listed, classifying them according to their potential influence and impact. Currently, for the **Ventos do Piauí I Complex**, 249 stakeholders are mapped, divided into five major groups: **SOCIETY** Land grantors; Surrounding communities (villages, neighborhoods, hamlets, districts); Formal or informal leaderships; Relocated families and Complainants of noise and strobe effect.

	GOVERNMENT Environmental regulatory agencies and bodies; Regulatory bodies; State public power (executive, legislative, judicial); Municipal public power (executive, legislative, judicial) and Municipal secretariats. **NGOs, INSTITUTIONS, AND CSOs** Neighborhood or resident associations; Sectoral and employer associations; Municipal councils and committees; NGOs for socio-environmental causes; Human rights and traditional communities defense agencies; Local unions; Local socio-environmental technical partners; Educational institutions; Health institutions / hospitals, and Religious institutions. **LOCAL BUSINESSES** (Operation surroundings, players, partners) **PRESS AND LOCAL MEDIA**
Legal or customary tenure/access rights	There are no indigenous peoples, traditional communities, or communities with collective land rights mapped in our direct area of influence. The Environmental Impact Assessment, Basic Environmental Program and Operational Licenses are evidence for that. The local communities are inserted in a rural context, composed mainly of farming families.
Stakeholder diversity and changes over time	The groups are mainly formed by families residing in the rural communities around the area, rural associations grantors, and representatives of social, political, and religious institutions.
Expected changes in well-being	The demands from the communities are mostly related to water access and water security, productive strengthening, and infrastructure which are mostly demands to be treated by the local Government.

Location of stakeholders	There are no indigenous peoples, traditional communities, or communities with collective land rights mapped in our direct area of influence (AID). The communities in the AID are rural, located at the Serra do Inácio, between the states of Pernambuco and Piauí. They are communities of different sizes, some composed of a few families and others larger.
Location of resources	The region is situated in the Serra do Inácio between the states of Pernambuco and Piauí, in the Caatinga biome, characterized by sparse rainfall and an arid climate prevailing for most of the year. Mostly composed of rural producers, the families mainly produce food for subsistence and cassava for flour production, in addition to some small animal husbandry.

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	The project includes different stakeholder engagement strategies: - **Open Dialogue Channel:** this is a direct communication channel for the community, featuring WhatsApp and email for inquiries, complaints, and grievances, including a broadcast list for over 1,000 contacts aimed at sending various information and communications. - **Families Committee:** meetings are held in 8 communities four times a year for social dialogue, community listening, and dissemination of awareness and public interest information. Dozens of families gather in each committee campaign to discuss topics relevant to the territory. - **Direct Dialogue:** we have a social relationship analyst dedicated to engaging with stakeholders who conducts proactive visits to families, leaders, and communities and monitors relevant topics. - **Social Communication Plan**: the Plan includes communication materials such as Newsletters and cards,

	which are distributed via WhatsApp and, in the case of the Newsletter, posted in reference places within the communities, as well as communication campaigns focused on relevant topics and educational strategies.
Date(s) of stakeholder consultation	The process of consulting with stakeholders is ongoing and is part of the daily operations of the project, considering the multiplicity and dynamics of social relationships.
Communication of monitored results	The mapping of stakeholders consists of the identification, analysis, and classification of their interests and positions. After a technical analysis of the data, they are prioritized. The result generates a monitoring panel with linked action plans, when necessary.
Consultation records	Data and results are provided using an Excel tool, with listings, settings, charts, tables, and action plans.
Stakeholder input	The analyses and contributions are collectively evaluated with technical support and weighted for consideration in the tool.

2.1.3 Free, Prior, and Informed Consent

Consent	Not applicable. There are no indigenous peoples, traditional communities or communities with collective land rights mapped in influence direct area of the Project.
Outcome of FPIC	Not applicable. There are no indigenous peoples, traditional communities or communities with collective land rights mapped in influence direct area of the Project.

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
Through the Open Dialogue Program, the Ventos do Piauí I project received 103 contacts, including 41 Consults, 47 Solicitations, and 15 Grievances, respectively. Regarding Grievances filed by stakeholders: Ten concern access blockages, construction work, and machinery in area of influence. One concerns receipt of the Income Statement, one concerns receipt of the annual rent payment, one concerns non-payment for meals provided to a third-party company, one concerns health problems related to proximity to the towers, and one concerns the effects of noise on the residence.	Describe the steps taken to resolve the grievance including the outcomes of the resolution. Auren has relationship channels such as Open Dialogue, where queries, complaints and complaints are received via email and WhatsApp. Complaints are handled in accordance with PO.Auren.SGI.0006 (version 07), which establishes a system for identifying and treating non-conformities related to health, safety and sustainability, through corrective and preventive actions, in order to promote continuous improvement at Auren Energia. According to the PO, all grievances are registered in a specific Open Dialogue tool and those that require monitoring and/or action plans are registered in the Obrasoft system, where they are managed and processed. Throughout the year, several contacts were made via Open Dialogue Program for all wind enterprises of the company. Fifteen grievance was related to Ventos do Piauí I Complex. In the same day, the grievances was forwarded through the communication channel and forwarded to the appropriate department. All appropriate measures were taken until the grievances was effectively resolved. The complaint was therefore closed and the complainant informed.

2.1.5 Public Comments

Summary of comments received	Actions taken
The public hearing is not required by the environmental legislation applicable to the Project. The VCS PD was submitted for public comments to local stakeholders and also in the VCS website during the validation. However, no comment was made.	The project uses on-going communication mechanisms to communicate with stakeholders and adopt resolution actions

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

Auren, within its social action strategy, develops several relationship initiatives with local stakeholders, social dialogue, monitoring and risk mitigation.

Stakeholder mapping is carried out in accordance with the Engaja methodology, developed by the Votorantim Institute. The tool aims to manage risks and opportunities in the relationship with stakeholders through mapping, prioritization and identification of dialogue and relationship actions. In this way, this tool highlights the company's engagement practices, as well as its stakeholder relationship management activities, in addition to objectively reporting the results of the company's relationship with its stakeholders.

The identification of stakeholder prioritization takes place in four stages: (1) mapping and identification of stakeholders categories; (2) stakeholders prioritization; (3) assessment of stakeholder's positioning and level of engagement; and (4) survey of topics of interest.

Based on prioritization, a stakeholder engagement plan is created that represents the strategy to be adopted by the unit to relate to its stakeholders, through its engagement actions.

The plan aims to address the impacts and demands of the stakeholders identified in the previous stage. The plan is monitored based on the specific indicators defined for it through the same tool, which consolidates all stages and provides a monitoring panel to monitor the mapped stakeholders, as well as the status and effectiveness of the action plan.

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 environmental impact assessment and environmental licenses do not identify this risk for this project activity. Therefore, no mitigation or preventative measure is taken.
Risks to stakeholder participation	No risk identified.	The environmental impact assessment and environmental licenses do not identify this risk for this project activity. Therefore, no mitigation or preventative measure is taken.
Working conditions	No risk identified.	The environmental impact assessment and environmental licenses do not identify this risk for this project activity. Therefore, no mitigation or preventative measure is taken.
Safety of women and girls	No risk identified.	The environmental impact assessment and environmental licenses do not identify this risk for this project activity. Therefore, no mitigation or preventative measure is taken.
Safety of minority and marginalized groups, including children	No risk identified.	The environmental impact assessment and environmental licenses do not identify this risk for this project activity. Therefore, no mitigation or preventative measure is taken.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical	Noise emission. Stroboscopic Effect Generationf of Waste	The project carries out a quarterly noise monitoring according to Environmental Basic Program, through specialized consultancy. Works to mitigate noise impacts on surrounding residences.

pesticides and fertilizers)		(Provided for in the Noise and Stroboscopic Effect Mitigation Action Plan). Waste management program and Training.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Auren's Code of Conduct reflects international rules, guided by the Declaration Universal Human Rights of the of United Nations Organization ("UN"), expressed by the UN Guiding Principles about Companies and Rights Humans and the Declaration of Principles and Fundamental Rights at Work, of the International Labor Organization - ILO.

Auren is still part of the UN Global Compact in Brazil and it is committed to follow its ten universal principles based in human rights, labor, environment and anti-corruption.

Auren also has a formal internal rule of commitments to respect Human Rights, expressed both in the Code of Conduct and in the Company's corporate policies and guidelines. These commitments are centred on three axes: People, Communities and Business Partners. Such commitments guide daily management in all units and are disseminated throughout the entire supply chain, with the aim of stimulating commercial partners to adopt and disseminate these practices in their businesses and relationships.

Auren provides a confidential channel for receiving and processing reports and complaints, accessible to all audiences with whom the company works, respecting the confidentiality of information. Provide a confidential channel for reporting and handling complaints of situations of non-compliance with the Code of Conduct, policy and guidelines of the company, publicizing the mechanism in its supply chain, respecting the confidentiality of information.

	Risks identified[7]	Mitigation or preventative measure(s) taken
Discrimination	No risk identified.	Regarding discrimination, Auren has formal commitments defined

[7] 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.

		in its Code of Conduct and in the Company's corporate policies. One of the commitments is “to combat prejudice and discrimination as a result of race, origin, ethnicity, nationality, social status, age, religion, gender, orientation sexual, personal aesthetics, physical, mental or psychological condition, marital status, opinion, political conviction, gender identity or any other factor of individual differentiation” Other commitment is to “Boost diversity, ensuring respect for difference and equality of opportunities in access, remuneration and advancement in employment”.
Sexual harassment	No risk identified.	Auren has formal commitments to prevent and repress situations of physical, psychological and sexual violence in labor relations.
Gender equity in labor and work	No risk identified.	As previously stated, Auren has two formal commitments related to equity in labor and work as follows: - “To combat prejudice and discrimination as a result of race, origin, ethnicity, nationality, social status, age, religion, gender, orientation sexual, personal aesthetics, physical, mental or psychological condition, marital status, opinion, political conviction, gender identity or any other factor of individual differentiation”

		- "To Boost diversity, ensuring respect for difference and equality of opportunities in access, remuneration and advancement in employment".
Forced labor	No risk identified.	Its Code of Conduct and the Company's corporate policies has formal commitments "to Comply with legislation and best practices, as well as respect for principles of decent work, respect for the rights of children and adolescents, freedom association, combating degrading work practices as well as prohibiting forced labor, with the establishment of measures in case of violation. To reject child labor, slavery or labor in conditions analogous to slavery is one the principles stated in its Code of Conduct.
Child labor	No risk identified.	Its Code of Conduct and the Company's corporate policies has formal commitments "to Comply with legislation and best practices, as well as respect for principles of decent work, respect for the rights of children and adolescents, freedom association, combating degrading work practices as well as prohibiting forced labor, with the establishment of measures in case of violation. To reject child labor, slavery or labor in conditions analogous to slavery is one the principles stated in its Code of Conduct.
Human trafficking	No risk identified.	To respect labor legislation, national and international standards and guidelines focused

[redacted]		on employee migration is one the of the Auren commitments. Auren's Code of Conduct and the Company's corporate policies have formal commitments "to Comply with legislation and best practices, as well as respect for principles of decent work, respect for the rights of children and adolescents, freedom association, combating degrading work practices as well as prohibiting forced labor, with the establishment of measures in case of violation. There is no space for human trafficking in Auren's activity.

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified.	There are no indigenous peoples, traditional communities or communities with collective rights to land mapped in the direct influence area.

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
No risk identified.	There are no indigenous peoples, traditional communities or communities with collective rights to land mapped in the direct influence area.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified.	There are no indigenous peoples, traditional communities or communities with collective rights to land mapped in the direct influence area.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	Not applicable. Project does not affect property rights.
Benefit sharing during the monitoring period	Not applicable. Project does not affect property rights.

2.4 Ecosystem Health

Risk identified		Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	Fauna	The greatest risk to fauna in wind energy generation concerns flying fauna, which includes birds and bats. In this case, periodic monitoring of the presence of this faunal group near the Wind Complex is conducted. If large flocks, swarms, and/or nesting of these birds are observed, monitoring becomes continuous to ensure that there is no risk of bird mortality and to control potential impacts on this fauna.

Soil degradation and soil erosion	Erosive processes on slopes and access roads	Due to the business scope For the construction and operation of the VAIII complex, it was necessary to build access roads, embankments, slopes, etc. Although secondary, these areas with steep inclines undergo constant inspections to evaluate their stability and monitor the presence and evolution of erosive processes. These monitoring activities are carried out periodically with field inspections and the use of satellite images. Once the presence of erosive processes is identified, corrective actions are mobilized aimed at containing the process and restoring the area.
Water consumption and stress	No risk identified	According to the Aqueduct Water Risk Atlas from World Resources Institute (WRI), the project is located in an arid area with low water use and high water stress However, although the project is in this area, there is no risk of excessive consumption of water resources, since the nature of the operation is wind energy generation, and there is no production or industrial process that requires water for production. Water consumption in this operation is limited to the human consumption of the employees working on site.

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	The Ventos do Piauí I Wind Complex is located in the Caatinga biome, a biome with great resilience and also sensitive to anthropogenic changes. Therefore, regarding habitat, it is noteworthy that there is no risk of degradation of this habitat in the region due to the operation of the complex. Mainly due to the high degree of conservation that the areas are in, as well as the nature of the wind operation, which does not exert a high pressure on the environment, in addition to the preservation actions that the company carries out. Therefore, regarding species, it should be noted that biodiversity monitoring has not recorded the presence of threatened and/or endangered species at this site.
Areas needed for habitat connectivity	The Ventos do Piauí I Complex was designed to have the least possible impact on fauna and flora, as well as on the local ecosystem. Additionally, as it involves wind energy generation, the operational structures, such as the wind turbine towers, are strategically distributed with significant spacing between them within the Caatinga biome, not causing habitat intersections or fragmentation of existing habitats. Furthermore, in the region, the Caatinga matrix has a strong interconnection with the patches through functional corridors, such as the Permanent Preservation Area (PPA) on the edge of the Serra do Inácio, legal reserves, and native forest fragments.
...	...

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No risk identified	The Ventos do Piauí I Complex is in Chapada do Araripe, a place of

		great importance for the biodiversity of the Caatinga. The adjacent areas of the complex are areas with a high degree of preservation, such as Permanent Preservation Areas (APP) on the edges of Chapada do Araripe, legal reserves, in addition to forest remnants. Additionally, during monitoring, the occurrence of threatened species was not identified. Therefore, there is no relevant risk to threatened or non-threatened species in the region.
Areas for habitat connectivity	No risk identified	The Ventos do Piauí I Complex is in the Chapada do Araripe, a site of great importance for the biodiversity of the Caatinga. In these areas, the permanent preservation areas on the edge of the mountain have been maintained with high connectivity to the remaining Caatinga areas and legal reserves of condominiums, forming a large landscape matrix and interconnected patches through corridors, establishing the necessary connectivity within the concept of landscape ecology. Thus, there is no risk of habitat disconnection in this complex.

2.4.2 Introduction of species

The project did not introduce species and do not present risks of invasive species according to its Environmental Impact Assessment.

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

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	No risk identified.	The operation of the project does not pose a risk of introducing invasive species, as justified below. **Fauna**: For the operation of the project, no actions are taken to release animals into the environment, even native ones. Nevertheless, the company conducts periodic monitoring of the local native fauna, providing indicators of the presence or absence of invasive species, even though the occurrence of these invasive species is not associated with the installation and/or operation of the project. **Flora**: All compensatory planting actions are rigorously followed by specialists in plant taxonomy and systematics to ensure that all planted specimens correspond to native species of the Caatinga and with corresponding phytogeographic distribution.

2.4.3 Ecosystem conversion

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	Vegetation clearance for the installation of wind turbine towers, substations, and transmission lines	Firstly, it should be noted that due to the energy generation matrix being wind-based, the rate of ecosystem conversion is insignificant, as the wind turbine towers are installed at specific points without impacting large areas of the Caatinga Biome. Nevertheless, aiming to reduce ecosystem conversion, all structures of the project, such as wind turbines, transmission lines, and substations were designed to have the least possible impact on the ecosystem and minimal vegetation suppression. Although the impact is low, two priority measures were adopted by the company to mitigate ecosystem conversion: i) Plan for the Recovery of Degraded Areas (PRAD). In this case, all the area impacted by the construction of the project that is not an operational area was properly restored, with actions including soil re-composition, formation of litter, seed banks, and enrichment planting aimed at restructuring the ecosystem. ii) Forest Replacement and/or Preservation of external areas. For the operational areas, which cannot be recovered, environmental compensation actions such as forest replacement were executed.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The single and unique project activity instance included in VTRM Renewable Energy 2 grouped project is Ventos do Piauí I Complex. The complex is operational since 02-August-2017.

Table below presents the main technical characteristics of power plants according to the Brazilian Power Regulatory Agency (ANEEL form the Portuguese *Agência Nacional de Energia Elétrica*). The average lifetime of the equipment is 20 years[8]. The total installed capacity is available on the website of the ANEEL through the Generation Information System (SIGA[9]).

Table 3 – Technical Description of the Power Plants

Wind Power Plant	Installed Capacity (MW)	Assured Energy (MW-ave)	Plant Load Factor (%)
Ventos de São Vicente 08	29.4	15.20	51.7%
Ventos de São Vicente 09	29.4	15.20	51.7%
Ventos de São Vicente 10	29.4	15.20	51.7%
Ventos de São Vicente 11	29.4	15.00	51.0%
Ventos de São Vicente 12	29.4	15.00	51.0%
Ventos de São Vicente 13	29.4	15.40	52.4%
Ventos de São Vicente 14	29.4	15.30	52.0%

During the monitoring period, there were no events that may impact the GHG emission reductions or removals and monitoring.

3.2 Deviations

3.2.1 Methodology Deviations

Not applicable. No methodology deviations are applied to the project during the monitoring period.

[8] ANEEL (2009). Manual de Controle Patrimonial do Setor Elétrico. Annex of Normative Resolution nr. 367/2009, June 2nd, 2009. Available at: http://www.aneel.gov.br/cedoc/aren2009367_2_primeira_Ver.pdf. Last access on December 15th, 2020.

[9] SIGA

3.2.2 Project Description Deviations

During this monitoring period, there is a deviation from the Monitoring Plan, due to the integration of a hybrid solar power plant connected to the same transmission line as the "*Ventos do Piauí I*" Wind Power Plant.

The implementation and operation of the Sol do Piauí Photovoltaic Power Plant (UFV Sol do Piauí) was registered with ANEEL under the unique code UFV.RS.PI.046552-6 and started commercial operation on January 3, 2024[10] with an installed capacity of 48 MW. Located in the municipality of Curral Novo do Piauí, in the State of Piauí this solar plant operates in a hybrid configuration with the Ventos do Piauí I Wind Complex and shares the grid connection infrastructure with the "Ventos do Piauí I" Wind Complex.

In summary, the electricity generated by both "*Ventos do Piauí I*" and "*UFV Sol do Piauí*" plants are connected to the same 34.5 kV busbar, which feeds a 230 kV step-up substation at the Substation plant site. The 230 kV transmission line (single circuit, approximately 3.71 km long) transports the electricity to the Curral Novo do Piauí II substation, where it is further stepped up to 500 kV, the voltage level at which the net electricity is injected into the National Interconnected System (SIN), as illustrated in the figure below.

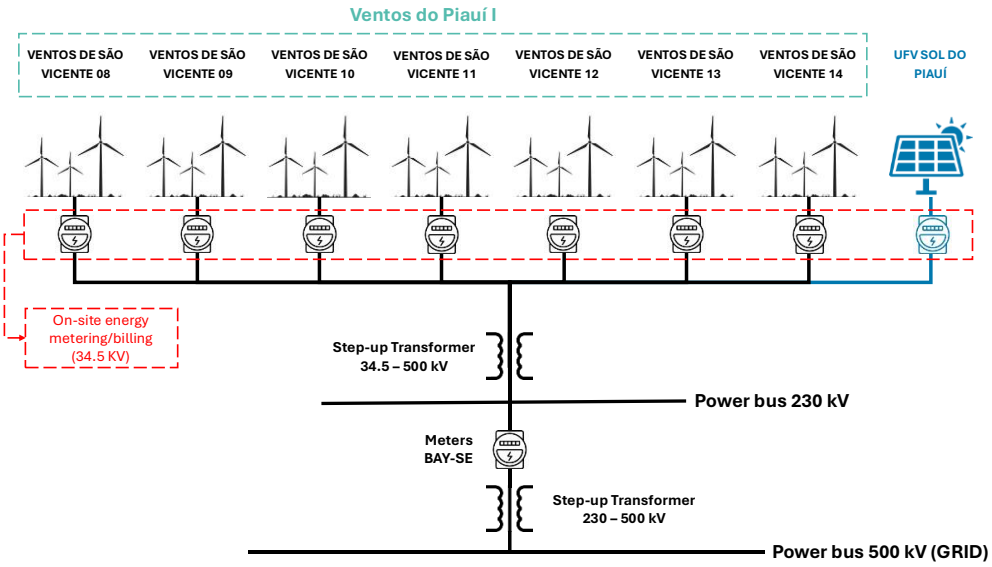

Figure 1 – Project scheme.

Therefore, for generation accounting purposes, since the transmission system used by the UFV Sol do Piauí shares the same busbar as the Ventos do Piauí I Wind Power Plant, it was necessary to apply a pro-rata allocation of the electricity generation measured at the BAY-SE meter. This pro-rata adjustment was carried out based on the Net Generation values reported by SCDE[11]/CCEE and DRI/CCEE, which were cross-checked to ensure that transmission losses up to the effective injection point into the SIN were excluded.

[10] Despacho Nº 007, de 2 de janeiro de 2024.

[11] Energy Data Collection System (SCDE)

In general terms, the SCDE data represents the direct readings from the energy meters, whereas the DRI/CCEE data reflects the final consolidated and validated figures used for energy accounting and settlement by CCEE. Accordingly, the lowest value between these two datasets, after excluding the generation from UFV Sol do Piauí, was considered for the emission reduction calculations in this Monitoring Report.

In summary, the data for this monitoring period were calculated as shown in the table below, with detailed information provided in the emission reduction estimation spreadsheet submitted together with this MR.

	Meter of BAY-SE (EOL + UFV)	Net electricity (EOL)	Net electricity (EOL + UFV)	% Energy for VDP I	VDP I Net electricity (SCDE)	VDP I Net electricity (DRI)	VDP I Net electricity (Adopted)
jan/24	26,593.26	18,272.17	26,754.91	68.3%	18,161.77	17,813	17,813
feb/24	53,127.89	46,156.95	53,429.53	86.4%	45,896.37	44,645	44,645
mar/24	40,958.80	32,006.41	41,182.23	77.7%	31,832.76	30,916	30,916
apr/24	63,594.89	56,257.49	63,927.88	88.0%	55,964.45	54,403	54,403
may/24	98,648.00	91,929.78	99,203.22	92.7%	91,415.28	89,008	89,008
jun/24	103,040.92	96,975.92	103,625.65	93.6%	96,428.71	94,138	94,138
jul/24	113,294.76	108,053.37	113,931.09	94.8%	107,449.87	104,872	104,872
aug/24	107,731.55	101,944.75	108,342.96	94.1%	101,369.44	98,891	98,891
sep/24	94,444.15	88,793.14	94,978.76	93.5%	88,293.35	86,036	86,036
oct/24	70,643.05	62,482.43	71,030.19	88.0%	62,141.88	60,588	60,588
nov/24	60,013.93	51,633.35	60,336.68	85.6%	51,357.16	50,023	50,023
dez/24	51,072.04	41,994.06	51,325.67	81.8%	41,786.54	40,739	40,739
Sum	**883,163.25**	**796,499.81**	**888,068.77**	-	**792,097.58**	**772,074**	**772,074**

This procedure is fully consistent with the provisions methodologys, which requires the use of conservative and verified data sources for monitored parameters, and is also in line with the measurement and accounting criteria established by CCEE for hybrid generation facilities connected to the same transmission infrastructure.

Furthermore, in previous monitoring periods, there were are a deviation from the monitoring plan about the measurement points where the net electricity generation supplied by the project plant/unit to the grid is measured was changed in 12/04/2022. This change happened because the company Simões Transmissora de Energia Elétrica S.A took over the operation of the 230kV sector of the connection substation Curral Novo do Piauí II.

With this change, the meters used for measurement of net electricity generation supplied by the project plant/unit to the grid were also changed. They are now located in the 230kV transmission line.

This deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in conformance with the applied methodology.

3.3 Grouped Projects

Not applicable. There are no new instances in this 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	The percentage share of total installed capacity of the specific technology
Data unit	%
Description	The percentage share of total installed capacity of the specific technology in the total installed grid connected power generation capacity in the host country
Source of data	ANEEL
Value applied	8.8 %
Justification of choice of data or description of measurement methods and procedures applied	Data provided by Electricity National Agency – ANEEL, Available at: ANEEL
Purpose of data	Calculation of baseline emissions
Comments	-

Data / Parameter	The total installed capacity of the technology
Data unit	MW
Description	The total installed capacity of the technology in the host country
Source of data	ANEEL
Value applied	14,390,293 MW
Justification of choice of data or description of	Data provided by Electricity National Agency – ANEEL, Available at: ANEEL

measurement methods and procedures applied	
Purpose of data	Calculation of baseline emissions
Comments	-

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{facility,y}$
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)
Source of data	Meters in the 230kV transmission line
Description of measurement methods and procedures to be applied	Electricity Meters
Frequency of monitoring/recording	Continuous measurement and at least monthly recording
Value monitored	
Monitoring equipment	In 12/04/2022, the measurement point, and the meters were changed as described in item 3.2.2 of this MR. From 12/04/2023, there are two meters (one principal and one rear) located in the transmission line which are responsible for measurement of net electricity supplied to the grid by the project. Information regarding meters used after 11/04/2022 are provided as follows:

Year	$EG_{facility,y}$
01 Jan 2024 - 31 Dec 2024	772,074
TOTAL	**772,074**

Meters information after 12/04/2022

Data	Principal Meter 01	Rear Meter 01
Serial Number	MW-1608A513-02	MW-1608A554-02
Type	ION 8650	ION 8650
Class	D	D
Accuracy	0.20%	0.20%
Supplier	Schneider Electric	Schneider Electric

	<table><tr><td>Calibration - 2021</td><td>05/02/2021</td><td>05/02/2021</td></tr></table> Class, precision, and calibration procedures of the meters follow ONS and National Authorities Guidelines and Procedures.
QA/QC procedures to be applied	The uncertainty level for these data is low. The electricity supplied to the grid is monitored by the project participants directly from the meters. Project proponents have an outsourced agent hired that support measurement data collection. Commercial team cross-checks monthly data collected from the meters available at outsourced agent's web platform and data provided by CCEE's Website (Electric Power Commercialization Chamber). According to procedures from the National Operator of the Electric System applied to the monitoring period, meters should be calibrated in 2-year frequency. From 2017 onwards, ONS Grid Procedures establishes calibration in a 5-year period.
Purpose of the data	Calculation of baseline emissions
Calculation method	This parameter is measured by the meters. No calculation is necessary. However, due to the deviations presented in Section 3.2.2 "Deviations in Project Description", for the purposes of accounting for generation ($EG_{facility,y}$), considering that the transmission system used by the UFV Sol do Piauí Photovoltaic Plant shares the same connection bus as the *Ventos do Piauí I* Wind Farm. A pro-rata approach of the electricity generation measured by the BAY-SE meter is applied, to account only for the generation of *Ventos do Piauí I*.
Comments	CCEE - Entity responsible for measurements, accounting and settlement on Brazilian electric energy market.

Data / Parameter	$EF_{Grid,CM,y}$
Data unit	tCO_2e/MWh
Description	Combined margin emission factor for the grid in year y
Source of data	The combined margin emission factor was determined by using procedures established in "Tool to calculate the emission factor for an electricity system", version 07.0. Data for the $EF_{grid,OM,y}$, calculation was made available by the Brazilian Designated

	National Authority of the CDM (the Brazilian DNA), as well as $EF_{grid,BM,y}$.
Description of measurement methods and procedures to be applied	As per the "Tool to calculate the emission factor for an electricity system". For this the first crediting period of the project, W_{OM} = 0.75 and W_{BM} = 0.25. As VTRM Renewable Energy 2 uses Dispatch data analysis OM method for operating margin emission factor, $EF_{grid,OM,y}$ is calculated ex post. For the first crediting period, the build margin emission factor shall be updated annually, ex-post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available
Frequency of monitoring/recording	Annually
Value monitored	<table><tr><th>Year</th><th>$EF_{Grid,CM,y}$</th></tr><tr><td>01-Jan-2024 – 31-Dec-2024</td><td>0.3485</td></tr></table>
Monitoring equipment	Not applicable
QA/QC procedures to be applied	As per the "Tool to calculate the emission factor for an electricity system".
Purpose of the data	Calculation of baseline emissions
Calculation method	As per the "Tool to calculate the emission factor for an electricity system" using Dispatch Data Analysis for OM Operating Margin Emission Factor.
Comments	Detailed description for the calculation choices is presented in section 5.

4.3 Monitoring Plan

The monitoring plan follows the Monitoring Methodology of consolidated baseline methodology for grid-connected electricity generation from renewable sources ACM0002, version 19.0. All data collected as part of monitoring should be archived electronically and be kept at least for two years after the end of the last crediting period. All measurements are conducted with calibrated measurement equipment according to Brazilian industry standards. The main parameters monitored are:

- EGfacility,y - Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr);

- Combined margin emission factor for the grid in year y (EFGrid,CM,y).

Monitoring of EGfacility,y parameter:

Operation and Maintenance (O&M) team is responsible for the operation and maintenance activities of the plants. Auren Energia Generation Operating Center (Centro de Operação da Geração da Auren Energia – COG, in Portuguese) is responsible for measurement activities. It collects and storages all measurement data.

Data is collected in real time and is available at web platform. Commercial team is responsible for monitoring and analysing EGfacility,y. information. It monitors data provided by COG and cross-check it with information provided by Chamber of Electricity Commercialization (CCEE). Each plant has two measurement instruments (meters) located in the plant (in the substation of each plant). One is the principal meter and the second is a backup meter. These meters register gross electricity generated by each plant. Substation CHAPADINHA (34.5 to 230kV), which the WPPs included in this project activity are connected to. This substation can also include energy generated by facilities outside the boundary project.

Until 11/04/2022, the measurement of net electricity supplied to the grid by the project happened through four meters (two principals and two rears) located in the substation Curral Novo do Piauí II (CNP2). From 12/04/2022, the measurement point, and the number of meters were changed as described in item 3.2.2 of this MR. From 12/04/2022, there are just 2 meters (one principal and one rear) to measure net electricity supplied to the grid and they are now located in the 230kV transmission line.

These meters which register net electricity supplied to the grid (EGfacility,y) by all plants that compose the initial project instance. These meters can also include energy generated by facilities outside the project boundary. The total amount dispatched to the SIN monitored by these meters will be prorated between each project facility according to the proportional amount of electricity generation measured in the electrical substation of each facility.

ONS Grid Procedures (Sub-module 6.16) defines the calibration frequency and other maintenance procedures. All meters of the plants are calibrated according to Brazilian Standards.

Diagram below shows the measurement scheme of VTRM Renewable Energy 2:

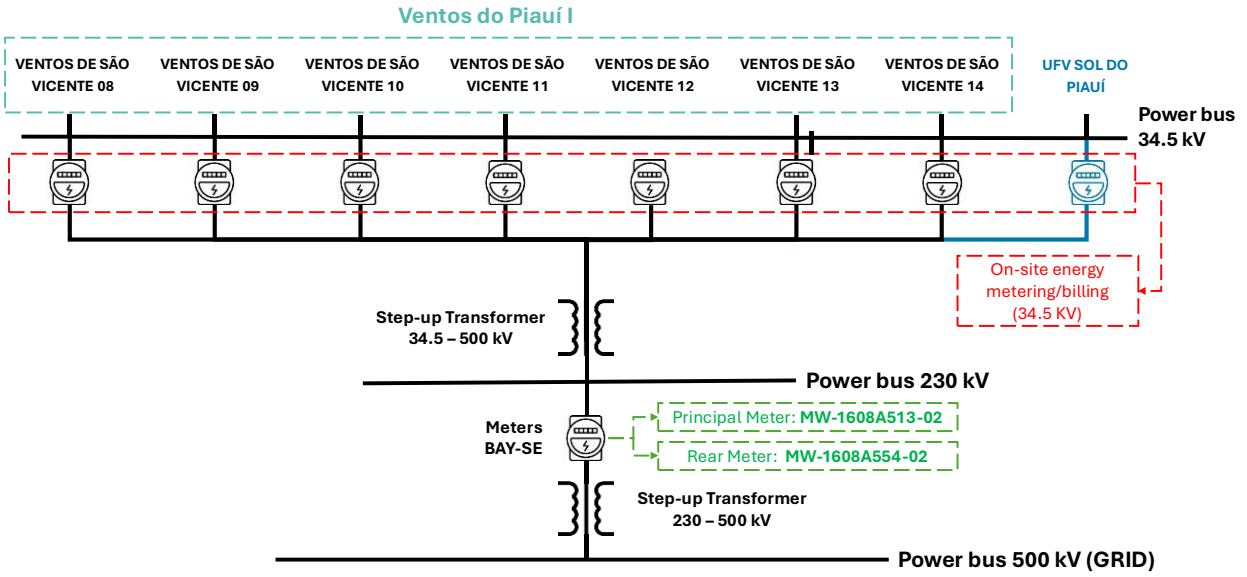

Figure 2 – Project measurement scheme.

It is important to say that net electricity supplied to the grid directly impacts the revenues of the plants once electricity is the main product of the project. Therefore, a straight control is performed about this information. Periodically, the Information Technology Area accomplishes an insurance backup for all plant data through backup tape.

Furthermore, as presented in Section 3.2.2 "Project Description Deviations", for generation accounting purposes, considering that the transmission system used by UFV Sol do Piauí shares the same connection bus as *Ventos do Piauí I* Wind Power Plant, a pro rata allocation of the electricity generation measured by the BAY-SE meter was applied.

This pro rata adjustment was carried out based on the Net Generation values reported by SCDE/CCEE and DRI/CCEE, which were verified to ensure the exclusion of transmission losses up to the effective injection point into the National Interconnected System (SIN).

Therefore, the Quality Assurance/Quality Control (QA/QC) procedures for the parameter EGfacility,y were not directly affected by the inclusion of UFV Sol do Piauí. The monitoring of this parameter remains fully consistent with the methodological requirements and accounts, on a pro rata basis, only for the energy corresponding to the Ventos do Piauí I Wind Power Plant.

Monitoring of EFGrid,CM,y:

The Combined margin emission factor for the grid in year y is calculated by consulting company hired by project proponents. Calculations follows Tool to calculate the emission factor for an electricity system, version 07.0. Data available by the Brazilian DNA is used.

5 IMQUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions are calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$ **Equation 01**

Where:

BE_y	=	Baseline emissions in year *y* (t CO_2/yr)
$EG_{PJ,y}$	=	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/yr)
$EF_{grid,CM,y}$	=	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" (tCO_2/MWh)

As **VTRM Renewable Energy 2** just comprises greenfield wind power plants, then:

$$EG_{PJ,y} = EG_{facility,y}$$ **Equation 02**

Where:

$EG_{PJ,y}$	=	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/yr)
$EG_{facility,y}$	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh/yr)

Quantity of net electricity generation supplied by the project plant/unit to the grid

The net electricity dispatched to the grid during the monitoring period (01-January-2024 to 31-December-2024) was measured according to monitored plan. $EG_{facility,2024}$ = 772,074 MWh.

Combined margin CO2 emission factor for grid connected power generation in year y

The CO2 emission factor of the grid is calculated by applying the following six steps of the "Tool to calculate the emission factor for an electricity system", version 07.0:

Step 1: Identify the relevant electricity systems

According to the tool, "if the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used. If such delineations are not available, project participants should define the project electricity system and any connected electricity system and justify and document their assumptions in the CDM-PDD".

The Brazilian Designated National Authority (DNA) defined in 2008, through the resolution nr. 8, that the National Interconnected System should be considered a unique electricity system and that this configuration is valid for calculating the CO_2 emission factors used to estimate the greenhouse gases emissions reductions electricity generation CDM projects.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

Project participants may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included in the calculation.

The option I was chosen for the project activity, once the operation margin and build margin emission factor calculated by the Brazilian DNA or alternatively calculated by the project developer are based on data of plants connected to the grid.

Step 3: Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

(a) Simple Operation Margin; or

(b) Simple adjusted Operation Margin; or

(c) Dispatch data analysis Operation Margin; or

(d) Average Operation Margin

The method chosen was dispatch data analysis operation margin.

Step 4: Calculate the operating margin emission factor according to the selected method;

The method chosen for the calculation of the operation margin emission factor of this project was the dispatch data analysis.

The calculation of the Operation Margin emission factor follows the method by dispatch data analysis ($EF_{grid,OM\text{-}DD,y}$) and it is calculated and defined by the Brazilian DNA in accordance with the dispatch data supplied by ONS - National System Operator.

The dispatch data analysis OM emission factor ($EF_{grid,OM\text{-}DD,y}$) is determined based on the power units that are actually dispatched at the margin during each hour h where the project is displacing electricity. This approach is not applicable to historical data and, thus, requires annual monitoring of $EF_{grid,OM\text{-}DD,y}$. As consequence it is calculated ex-post. The $EF_{grid,OM\text{-}DD,y}$ is calculated using the below formula:

$$EF_{grid,OM-DD,y} = \frac{\sum_h EG_{PJ,h} \cdot EF_{EL,DD,h}}{EG_{PJ,y}}$$ **Equation 03**

Where:

$EF_{grid,OM-DD,y}$	= Dispatch data analysis operating margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{PJ,h}$	= Electricity displaced by the project activity in hour h of the year y (MWh)
$EF_{EL,DD,h}$	= CO_2 emission factor for power units in the top of the dispatch order in hour h in year y (tCO_2/MWh)
$EG_{PJ,y}$	= Total electricity displaced by the project activity in year y (MWh)
h	= Hours in year y in which the project activity is displacing grid electricity
y	= Year in which the project activity is displacing grid electricity

The Brazilian DNA published $EF_{EL,DD,h}$ parameter for determination of $EF_{grid,OM\text{-}DD,y}$ using option c) dispatch data analysis OM. Detailed information on the methods and data applied can be obtained at the DNA's website:

https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/sirene/dados-e-ferramentas/fatores-de-emissao

Considering hourly data from the Brazilian DNA ($EF_{EL,DD,h}$) and hourly electricity generation of the project activity ($EG_{PJ,h}$), $EF_{grid,OM\text{-}DD,y}$ was calculated as follows:

Table 5 – Operating Margin Emission Factor (tCO_2e/MWh) by month in 2024

Month (2024)	*EFgrid,OM,y* (tCO_2e/MWh)
Jan	0.4164
Feb	0.3750
Mar	0.2779
Apr	0.1946
May	0.2834
Jun	0.3648
Jul	0.5503
Aug	0.6015
Sep	0.6054
Oct	0.6477
Nov	0.5524
Dec	0.4978

Step 5: Calculate the build margin emission factor

In terms of data vintage, project participants can choose between one of the following two options:

Option 1. For the first crediting period, calculate the build margin emission factor ex-ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

Option 2. For the first crediting period, the build margin emission factor shall be updated annually, ex-post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emission factor shall be calculated ex-ante, as described in option 1 above. For the third

crediting period, the built margin emission factor calculated for the second crediting period should be used.

The option that was chosen by project participants was Option 2.

The latest CO_2 build margin emission factor published by Brazilian DNA is from 2024 as follows:

Table 6 –Build Margin Emission Factor (tCO_2e/MWh) by month in 2024

Month (2024)	*EFgrid,BM,y (tCO_2e/MWh)*
Jan	0.0523
Feb	0.0523
Mar	0.0523
Apr	0.0523
May	0.0523
Jun	0.0523
Jul	0.0523
Aug	0.0523
Sep	0.0523
Oct	0.0523
Nov	0.0523
Dec	0.0523

More information can be found at: https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/sirene/dados-e-ferramentas/fatores-de-emissao

Step 6: Calculate the combined margin (CM) emission factor.

The calculation of the combined margin (CM) emission factor (EFgrid,CM,y) is based on one of the following methods:

(a) Weighted average Combined Margin; or

(b) Simplified Combined Margin.

This Project uses option (a) to calculate the combined margin emission factor. The combined margin emission factor is calculated according to the following equation:

$$EF_{grid,CM,y} = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$$ **Equation 04**

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2/ MWh)

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year *y* (tCO_2/ MWh)

W_{OM} = Weighting of operating margin emissions factor (%)

W_{BM} = Weighting of build margin emissions factor (%)

The "*Tool to calculate the emission factor for an electricity system*" recommends that the following default values should be used for W_{OM} and W_{BM}:

- Wind and Solar power generation project activities: W_{OM} = 0.75 and W_{BM} = 0.25 for the first crediting period and for subsequent crediting periods.
- All other projects: W_{OM} = 0.5 and W_{BM} = 0.5 for the first crediting period, and W_{OM} = 0.25 and W_{BM} = 0.75 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool.

This way, for the first crediting period of this project, it was adopted the following weights: W_{OM} = 0.75 and W_{BM} = 0.25.

Therefore, in accordance with the tool, the weights W_{OM} and W_{BM}, by default, are W_{BM} = 0.25 and W_{OM} = 0.75. The combined margin emission factor for each year of the monitoring period is as follows:

Table 7 –Combined Margin Emission Factor (tCO_2e/MWh) by month in 2024

Month (2024)	*EFgrid,OM,y* (tCO_2e/MWh)	*EFgrid,BM,y* (tCO_2e/MWh)	W_{OM}	W_{BM}	*EFgrid,CM,y* (tCO_2e/MWh)
Jan	0.4164	0.0523	0.75	0.25	0.3253
Feb	0.3750	0.0523	0.75	0.25	0.2943
Mar	0.2779	0.0523	0.75	0.25	0.2215
Apr	0.1946	0.0523	0.75	0.25	0.1591
May	0.2834	0.0523	0.75	0.25	0.2256
Jun	0.3648	0.0523	0.75	0.25	0.2867
Jul	0.5503	0.0523	0.75	0.25	0.4258
Aug	0.6015	0.0523	0.75	0.25	0.4642
Sep	0.6054	0.0523	0.75	0.25	0.4671
Oct	0.6477	0.0523	0.75	0.25	0.4988
Nov	0.5524	0.0523	0.75	0.25	0.4273
Dec	0.4978	0.0523	0.75	0.25	0.3864

Applying equation 01, $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$. Therefore:

Table 8 – Emission Factor (tCO_2e/MWh) by month in 2024

Month (2024)	*EFgrid,CM,y (tCO_2e/MWh)*	Energy (MWh/month)	*ER (tCO_2e/MWh)*
Jan	0.3253	17,813	5,795
Feb	0.2943	44,645	13,140
Mar	0.2215	30,916	6,848
Apr	0.1591	54,403	8,653
May	0.2256	89,008	20,084
Jun	0.2867	94,138	26,986
Jul	0.4258	104,872	44,654
Aug	0.4642	98,891	45,903
Sep	0.4671	86,036	40,190
Oct	0.4988	60,588	30,223
Nov	0.4273	50,023	21,377
Dec	0.3864	40,739	15,742
TOTAL	-	-	**279,596**

5.2 Project Emissions

According to ACM0002: "Grid-connected electricity generation from renewable sources" (version 19.0), for most renewable energy power generation project activities, PEy = 0. This is applied to grid-connected wind power plants as the enterprises of VTRM Renewable Energy 2.

5.3 Leakage Emissions

No other leakage emissions are considered. The emissions potentially arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport etc.) are neglected.

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$ **Equation 5**

Where:

ER_y = Emission reductions in year *y* (t CO_2e/yr)

BE_y = Baseline emissions in year *y* (t CO_2/yr)

PE_y = Project emissions in year *y* (t CO_2e/yr)

Where, BE_y= *477,186* tCO_2e and PE_y= 0.

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-Jan-2024 to 31-Dec-2024	279,596	0	0	279,596	*0*	279,596
Total	279,596	0	0	279,596	*0*	279,596

The two next tables below are not applied to this project because the project is not required to assess permanence risk.

State the non-permanence risk rating (%)	
Has the non-permanence risk report been attached as either an appendix or a separate document?	☐ Yes ☐ No
For ARR and IFM projects with harvesting, state, in tCO_2e, the Long-term Average (LTA).	
Has the LTA been updated based on monitored data, if applicable?	☐ Yes ☐ No If no, provide justification.
State, in tCO_2e, the expected total GHG benefit to date.	
If a loss occurred (including a loss event or reversal), state the amount of tCO_2e lost:	

Vintage period	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage emissions (tCO_2e)	Buffer pool allocation (tCO_2e)	Reductions VCUs (tCO_2e)	Removals VCUs (tCO_2e)	Total VCU issuance (tCO_2e)
Total							

The next table states the estimated ex-ante GHG emission reductions and the achieved reductions for the monitoring period. The percentage difference is explained.

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
01-Jan-2024 to 31-Dec-2024	465,101 tCO2e	279,596 tCO2e	-39,88%	Achieved emissions reductions were 39,88% lower than ex ante estimated due to the fact that $Eg_{facility,y}$ and $EF_{grid,CM}$ achieved were lower than estimated as follows. $Eg_{facility,y}$ ex ante estimated was 1,060,590 MWh[12] per year. $EG_{facility,\ 2024}$ was 772,074 MWh. Therefore $EG_{facility,2024}$ achieved was 27.20% lower than estimated. $EF_{grid,CM}$ ex ante estimated was related to 2018 which was 0.4385 tCO2/MWh[13] and $EF_{grid,CM}$ of 2024 was 0.3485 (Average of the months). Therefore, $EF_{grid,CM}$ achieved was 20,5% lower than estimated.
Total	465,101 tCO2e	279,596 tCO2e	-39,88%	

[12] Page 37 of the Joint Project Description & Monitoring Report registered under VCS.

[13] Page 38 of the Joint Project Description & Monitoring Report registered under VCS.

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Not applicable. There is no commercially sensitive information included in the monitoring report to be excluded in the public version.

Section	Information	Justification