



VTRM RENEWABLE ENERGY MONITORING REPORT

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Version	3
VCS Standard Version	VCS Standard, version 4.7
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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

VTRM Renewable Energy project activity (hereinafter referred as VTRM Renewable Energy) is a grouped project that consists on the implantation and operation of wind power plants (WPPs) in Brazil. All included WPPs supply clean electricity to the Brazilian National Interconnected System (SIN from the Portuguese “*Sistema Interligado Nacional*”).

VTRM Renewable Energy reduce greenhouse gases (GHG) emissions, avoiding electricity generation through fossil fuels sources. Clean and renewable electricity supply promotes an important contribution to environmental sustainability by reducing the GHG emissions that would occur in the absence of this project.

The baseline scenario is the same scenario existing before the implementation start of the project activity, which is: “the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin calculations according to “Tool to calculate the emission factor for an electric system””.

The single and unique project activity instance included in VTRM Renewable Energy grouped project is a complex called Ventos do Araripe III Complex, composed by fourteen wind power plants. The first wind power plant of the complex started operation in 09/12/2016.

This Monitoring Report refers to the fifth verification of VTRM Renewable Energy which covers the period from 01/01/2023 to 31/12/2023. Total GHG emission reductions generated in this monitoring period is 382,112 tCO₂e.

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/ Verification	09-December-2016 – 31-July-2018	Verified Carbon Standard	Earthood Services Private Limited	1.66 years (20 months)
Verification	01-August-2018 to 30-September-2020	Verified Carbon Standard	Rina Services S.p.A	2.16 (26 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
Verification	01-January-2023 to 31-December-2023	Verified Carbon Standard	Rina Services S.p.A	1 year

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	Alexsandro Antonio Cota
Title	Executive Sustainable Manager
Address	8501, Dra. Ruth Cardoso Av., 2nd Floor, São Paulo/SP, Brazil
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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

This section is not applicable because there are no other entities involved in the project.

Organization name	
Role in the project	
Contact person	
Title	
Address	
Telephone	
Email	

1.6 Project Start Date

Project start date	09-December-2016
Justification	According to the VCS Standard v4.0, the project starting date is the date on which the project began generating GHG emission reductions or removals. Therefore, the project start date of VTRM Renewable Energy is 09-December-2016, <i>i.e.</i> the operation startup of the first WTG of the Complex Ventos do Araripe III as can be checked in ANEEL Ordinance nr. 3,216 issued on 08-December-2016.

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)
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	According to the VCS Standard v4.0, 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	09-December-2016 to 08-December-2026

1.8 Project Location

Wind power plants of Ventos do Araripe III Complex are in Araripina (PE), Simões and 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 – UTM geographical Coordinates of Ventos do Araripe III Power Plants⁴

Wind Power Plant	Location	Geographical Coordinates	
		Latitude	Longitude
Ventos de Santo Estevão I	Araripina - PE	321255	9143642
Ventos de Santo Estevão II	Araripina - PE	320284	9143197
Ventos de Santo Estevão III	Araripina - PE	317101	9145380
Ventos de Santo Estevão IV	Araripina - PE	324189	9145598
Ventos de Santo Estevão V	Araripina - PE	315470	9141884
Ventos de São Virgílio I	Simões - PI	313781	9149811
Ventos de São Virgílio II	Simões and Curral Novo do Piauí - PI	309448	9138340
Ventos de São Virgílio III	Simões - PI	317237	9139278
Ventos de Santo Onofre IV	Simões - PI	309831	9143957
Ventos de Santo Augusto I	Simões - PI	315254	9143755
Ventos de Santo Augusto II	Simões - PI	314913	9140526
Ventos de Santo Augusto VI	Simões - PI	315140	9146958
Ventos de Santo Augusto VII	Simões - PI	314800	9145704
Ventos de Santo Augusto VIII	Simões - PI	314992	9140684

⁴ Location of the first WTG: datum SIRGAS 2000, UTM 24 S (MER -39). Available at: <https://sigel.aneel.gov.br/Down/>

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
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 reduction provided by the project activity, VTRM Renewable Energy project has brought many co-benefits including: (i) supporting families in social vulnerability through the construction of agroecological backyards to promote sustainable agriculture for food production; (ii) construction of systems for capturing and storing drinking water; (iii) and by promoting initiatives to ensure the availability of clean and affordable energy; (iv) donation of personal protective equipment to increase the cities capacity to deal with the COVID-19 pandemic situation and help to improve the project surroundings communities' health and the quality of life; (v) supporting for the improvement of children and adolescents' education in the Pernambuco and Piauí states by focusing on: Training school principals and professionals from the municipal education departments also considering the society mobilization and awareness regarding the value of education.

In this monitoring period, 125 teachers of Simões/PI and Araripina/PE were awarded by initiatives to improve public education.

Table below shows the Sustainable Development Contributions over the project lifetime e 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[1]	Implemented activities to decrease hunger	No contribution during this monitoring period.	41 agroecological backyards implemented benefiting 41 families (166 people) in situations of social vulnerability received agroecological backyards to promote sustainable agriculture
2)	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.	504,315 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.

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
3)	4.c	User-defined indicator: Number of teachers awarded with initiatives to improve public education	Implemented activities to increase	125 teachers of Simões/PI and Araripina/PE were awarded by initiatives to improve public education in 2023.	258 teachers of Simões/PI and Araripina / PE were awarded by initiatives to improve public education over the Project lifetime.
4)	6.1	User-defined indicator Proportion of population using safely managed drinking water services	Implemented activities to increase	No contribution during this monitoring period.	The company provided 17 systems for storing and capturing drinking water, benefiting 68 people, helping needy communities in the vicinity of the operations.
5)	6.1	User-defined indicator Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	Implemented activities to increase	No contribution during this monitoring period.	The company provided 29 sanitation systems, including hand-washing facility with soap and water, helping with basic sanitation for needy communities in the vicinity of the operations. 116 people of 29 families were benefited.

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
6)	8.6	User-defined indicator: % of students hired after technical training.	Implemented activities to increase	83 graduated students. 5 students hired by the company.	The company provided technical training to generate jobs in renewable energy. 83 students graduated. 5 students hired by the company and 60% of the students obtained a job.
7)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	The operation of this project activity during this monitoring period avoided 382,112 tCO ₂ e.	The project achieved 3,235,472 tCO ₂ e over the lifetime. 2,853,360 tCO ₂ e was achieved in the first four monitoring period already verified. At this current monitoring period, the project avoided 382,112 tCO ₂ e during the whole monitored period.

1.13 Commercially Sensitive Information

There is no commercially sensitive information which has been excluded from the 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 Internal Operational Procedure for Strategy, Planning, and Management of Social Investment and Stakeholder Relations – PO.AUREN.SUT.0005.

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 Ararape III Complex**, 309 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,
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	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
In the Open Dialogue Program, the Project treats Grievance raised by stakeholders. In 06/09/2023, one grievance was raised by M.E.C from community Serra do Azulão in Simões city/PI. The complaint was about a run over a pet dog in Serra do Azulão. There was a suspicion that the pet dog was run over by vehicles working for the project.	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, 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, 189 contacts were made via Open Dialogue Program for all wind enterprises of the company. Just one grievance was related to Ventos do Araripe III. In the same day, a home visit was carried out to evaluate the complaint. The complainant found that there were no witnesses or evidence of who had run over the animal. It was not possible to verify the possible culpability of the incident. 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.
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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 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 ⁵	Mitigation or preventative measure(s) taken
Discrimination	No risk identified.	Regarding discrimination, Auren has formal commitments defined

⁵ 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 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.
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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 VAIll 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 Araripe III 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 Araripe III 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 Araripe III 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 Araripe III 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.
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3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The single and unique project activity instance included in VTRM Renewable Energy grouped project is Ventos do Araripe III Complex. The complex is operational since 09-December-2016.

Table below presents the main technical characteristics of power plants according to the Brazilian Power Regulatory Agency (ANEEL from the Portuguese *Agência Nacional de Energia Elétrica*). The average lifetime of the equipment is 20 years⁶.

Table 3 – Technical Description of Ventos do Araripe III Power Plants

Wind Power Plant	Installed Capacity (MW)	Assured Energy (MW-ave)	Plant Load Factor (%)
Ventos de Santo Estevão I	25.3	12.40	49.0%
Ventos de Santo Estevão II	25.3	11.90	47.0%
Ventos de Santo Estevão III	29.9	14.20	47.5%
Ventos de Santo Estevão IV	29.9	14.20	47.5%
Ventos de Santo Estevão V	27.6	13.60	49.3%
Ventos de São Virgílio I	29.9	15.20	50.8%
Ventos de São Virgílio II	29.9	16.70	55.9%
Ventos de São Virgílio III	20.7	9.20	44.4%
Ventos de Santo Onofre IV	27.6	13.60	49.3%
Ventos de Santo Augusto I	18.4	9.00	48.9%

⁶ 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.

Wind Power Plant	Installed Capacity (MW)	Assured Energy (MW-ave)	Plant Load Factor (%)
Ventos de Santo Augusto II	27.6	14.10	51.1%
Ventos de Santo Augusto VI	29.9	16.00	53.5%
Ventos de Santo Augusto VII	18.4	9.40	51.1%
Ventos de Santo Augusto VIII	18.4	9.00	48.9%

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.

3.2.2 Project Description Deviations

In this monitoring period, there are no deviation from the Monitoring Plan.

However, in previous monitoring periods, there were. In this monitoring period, there are a deviation from the monitoring plan. 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.

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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	10.4%
Justification of choice of data or description of measurement methods and procedures applied	Data provided by Electricity National Agency – ANEEL, available at the registered VCS Project Description.
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	12,537,943
Justification of choice of data or description of measurement methods and procedures applied	Data provided by ANEEL, available at the registered VCS Project Description.
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	<table><tr><th>Year</th><th>EG_{facility,y}</th></tr><tr><td>01 Jan 2023 - 31 Dec 2023</td><td>1,292,721</td></tr><tr><td>TOTAL</td><td>1,292,721</td></tr></table>			Year	EG _{facility,y}	01 Jan 2023 - 31 Dec 2023	1,292,721	TOTAL	1,292,721															
Year	EG _{facility,y}																							
01 Jan 2023 - 31 Dec 2023	1,292,721																							
TOTAL	1,292,721																							
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: Meters information after 12/04/2022 <table><tr><th>Data</th><th>Principal Meter 01</th><th>Rear Meter 01</th></tr><tr><td>Serial Number</td><td>MW-2103A656-02</td><td>MW-1401A235-01</td></tr><tr><td>Type</td><td>ION 8650</td><td>ION 8650</td></tr><tr><td>Class</td><td>D</td><td>D</td></tr><tr><td>Accuracy</td><td>0.20%</td><td>0.20%</td></tr><tr><td>Supplier</td><td>Schneider Electric</td><td>Schneider Electric</td></tr><tr><td>Calibration 2021</td><td>- 06/05/2021</td><td>05/02/2021</td></tr></table> Class, precision, and calibration procedures of the meters follow ONS and National Authorities Guidelines and Procedures.			Data	Principal Meter 01	Rear Meter 01	Serial Number	MW-2103A656-02	MW-1401A235-01	Type	ION 8650	ION 8650	Class	D	D	Accuracy	0.20%	0.20%	Supplier	Schneider Electric	Schneider Electric	Calibration 2021	- 06/05/2021	05/02/2021
Data	Principal Meter 01	Rear Meter 01																						
Serial Number	MW-2103A656-02	MW-1401A235-01																						
Type	ION 8650	ION 8650																						
Class	D	D																						
Accuracy	0.20%	0.20%																						
Supplier	Schneider Electric	Schneider Electric																						
Calibration 2021	- 06/05/2021	05/02/2021																						

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.
Comments	CCEE - Entity responsible for measurements, accounting and settlement on Brazilian electric energy market.

Data / Parameter	$EF_{Grid,CM,y}$
Data unit	tCO ₂ e/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 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-2023 – 31-Dec-2023</td><td>0.2956</td></tr></table>	Year	EF _{Grid,CM,y}	01-Jan-2023 – 31-Dec-2023	0.2956	
Year	EF _{Grid,CM,y}					
01-Jan-2023 – 31-Dec-2023	0.2956					
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:

- EG_{facility,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 (EF_{Grid,CM,y}).

Monitoring of EG_{facility,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 stores all measurement data.

Data is collected in real time and is available at web platform. Commercial team is responsible for monitoring and analysing EG_{facility,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:

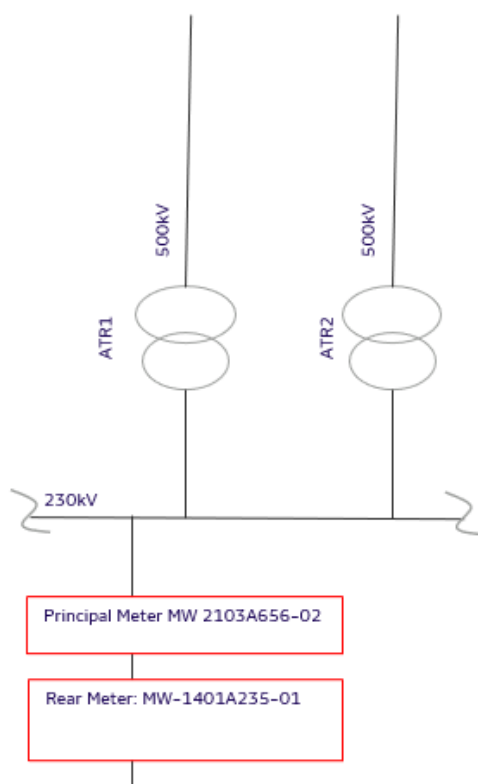


Figure 1 – Project measurement scheme.

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.

Monitoring of EFG_{Grid,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 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions are calculated as follows:

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

Where:

- BE_y = Baseline emissions in year y (t CO₂/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 CO₂ 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” (tCO₂/MWh)

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

$$EG_{PJ,y} = EG_{facility,y} \quad \text{Equation 02}$$

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-2023 to 31-December-2023) was measured according to monitored plan. $EG_{facility,2022} = 1,292,721$ 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 CO₂ 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 ($EF_{grid,OM-DD,y}$) 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 ($EF_{grid,OM-DD,y}$) 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 $EF_{grid,OM-DD,y}$. As consequence it is calculated ex-post. The $EF_{grid,OM-DD,y}$ 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 CO₂ emission factor in year y (tCO₂/MWh)

$EG_{PJ,h}$ = Electricity displaced by the project activity in hour h of the year y (MWh)

$EF_{EL,DD,h}$ = CO₂ emission factor for power units in the top of the dispatch order in hour h in year y (tCO₂/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 $EF_{grid,OM-DD,y}$ 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 ($EG_{PJ,h}$), $EF_{grid,OM-DD,y}$ was calculated as follows:

Table 5 – Operating Margin Emission Factor (tCO₂e/MWh)

Year	$EF_{grid,OM,y}$ (tCO ₂ e/MWh)
2023	0.3785

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 CO₂ build margin emission factor published by Brazilian DNA is from 2023 as follows:

Table 6 –Build Margin Emission Factor (tCO₂e/MWh)

Year	$EF_{grid,BM,y}$
2023	0.0467

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 ($EF_{grid,CM,y}$) 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:

$$EF_{grid,CM,y} = W_{OM} * EF_{grid,OM,y} + W_{BM} * EF_{grid,BM,y} \quad \text{Equation 04}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/ MWh)

$EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/ 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 (tCO₂e/MWh)

Year	$EF_{grid,OM,y}$ (tCO ₂ e/MWh)	$EF_{grid,BM,y}$ (tCO ₂ e/MWh)	W_{OM}	W_{BM}	$EF_{grid,CM,y}$ (tCO ₂ e/MWh)
2023	0.3785	0.0467	0.75	0.25	0.2956

Applying equation 01, $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$. Therefore, $BE_y = 1,292,721 \text{ MWh} \times 0.2956 \text{ tCO}_2\text{e/MWh} = 382,112 \text{ tCO}_2\text{e}$.

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, $PE_y = 0$. This is applied to grid-connected wind power plants as the enterprises of VTRM Renewable Energy.

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:

$$ER_y = BE_y - PE_y \quad \text{Equation 5}$$

Where:

- ER_y = Emission reductions in year y (t CO₂e/yr)
- BE_y = Baseline emissions in year y (t CO₂/yr)
- PE_y = Project emissions in year y (t CO₂e/yr)

Where, BEy = 382,112 tCO₂e and PEy = 0.

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU (tCO ₂ e)	Removal VCU (tCO ₂ e)	Total VCUs (tCO ₂ e)
01-Jan-2023 to 31-Dec-2023	382,112	0	0	382,112	0	382,112
Total	382,112	0	0	382,112	0	382,112

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 ₂ e, 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 ₂ e, the expected total GHG benefit to date.	
If a loss occurred (including a loss event or reversal), state the amount of tCO ₂ e lost:	

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Buffer pool allocation (tCO ₂ e)	Reductions VCU (tCO ₂ e)	Removals VCU (tCO ₂ e)	Total VCU issuance (tCO ₂ e)
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-2023 to 31-Dec-2023	675,590 tCO ₂ e	382,112 tCO ₂ e	-43.4%	Achieved emissions reductions were 43.4% lower than ex ante estimated due to the fact that $E_{g, facility, y}$ and $E_{f, grid, CM}$ achieved were lower than estimated as follows. $E_{g, facility, y}$ ex ante estimated was 1,529,112 MWh⁷ per year. $E_{g, facility, 2023}$ was 1,292,721 MWh. Therefore $E_{g, facility, 2023}$ achieved was 15.4% lower than estimated. $E_{f, grid, CM}$ ex ante estimated was related to 2017 which was 0.4418 tCO₂/MWh⁸ and $E_{f, grid, CM}$ of 2023 was 0.2956. Therefore, $E_{f, grid, CM}$ achieved was 33% lower than estimated.
Total	675,590 tCO ₂ e	382,112 tCO ₂ e	-43.4%	

⁷ Pages 39 of the Joint Project Description & Monitoring Report registered under VCS.

⁸ Page 39 of the Joint Project Description & Monitoring Report registered under VCS.

APPENDIX 1: COMMERCIALY 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