



Verification Report

ACR191 MS Renováveis Wind Power Complex: Mar e Terra, Areia Branca, Embuaca and Icaraí

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1 INTRODUCTION

Embrasca, Inc. (Embrasca) contracted Ruby Canyon Environmental, Inc. (RCE) to perform the verification of the ACR191 MS Renováveis Wind Power Complex: Mar e Terra, Areia Branca, Embuaca and Icaraí (Project) for the reporting period August 11, 2015 through December 31, 2019 under the American Carbon Registry (ACR) voluntary offsets program.

The Project generates renewable electricity from wind and includes four wind power plants. All of the wind power plants are located in northeastern Brazil in Ceará and Rio Grande do Norte states. The plants deliver electricity to the Brazil electric grid. The project activity results in the reduction of greenhouse gases (GHG) by displacing CO₂ emissions from fossil fuel combustion for electricity generation.

The goal of the verification is to ensure that the GHG assertion is materially correct, that the data provided to RCE is well documented and that if Embasca has made any material errors, that these errors be corrected.

2 PROJECT SUMMARY

2.1 REPORTING PERIOD

The reporting period covered by this verification is August 11, 2015 to December 31, 2019.

2.2 ORGANIZATIONAL BOUNDARIES

The project boundary includes the wind power plants—Mar e Terra, Areia Branca, Embuaca and Icaraí—physically connected to the Brazil interconnected national electricity system.

2.3 INFRASTRUCTURE, TECHNOLOGIES, PROCESSES

The Project activity occurs at four wind power plants: Mar e Terra (23.1 MW), Areia Branca (27.3 MW), Embuaca (27.3 MW), and Icaraí (16.8 MW), with a total installed capacity of 94.5 MW. The plants deliver electricity to the Brazil electric grid. Two electricity generation meters for each wind power plant measure electricity generation at the substation. The meters are owned by Brazil's Electricity Trading Chamber, Câmara de Comercialização de Energia Elétrica (CCEE), and generation data is transmitted directly to CCEE.

2.4 GHG SOURCES AND SINKS

The GHG emission source included in the project boundary is baseline CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. CO₂ is the only GHG included. Project emissions for this project are 0.

3 OBJECTIVE

The purpose of the verification is to ensure that the Project meets the requirements of the ACM0002 Methodology, the validated Project Plan, the ACR Standard, and the ACR Validation and Verification Standard. Furthermore, verification evaluates whether the reported Project emission reductions are materially correct and accurate, complete, consistent, and transparent.

4 RESPONSIBLE PARTIES

4.1 PROJECT OWNER

MS Participações Societárias S.A.
Av. Senador Virgílio Távora
1701 - Sala 1302
60170-251
Fortaleza, Ceara, Brazil

Parent Company
Cubico Sustainable Investments
Av. Sen. Virgílio Távora
nº 1701 Terreo
60170-079
Fortaleza, Ceará, Brazil

4.2 TECHNICAL EXPERT

Embrasca, Inc.
4040 Circle Dr. Suite 200
San Rafael, CA 94903

4.3 VERIFICATION BODY

RCE selected the verification team according to its GHG Verification Policies & Procedures to ensure team members are qualified to perform verification activities pertaining to the Project. The verification team consisted of the following individuals:

Lead Verifier: Nina Pinette

Team Members: Paulina Fernández, Garrett Heidrick, Minerva López

Internal Reviewer: Phillip Cunningham

5 VERIFICATION CRITERIA AND SCOPE

5.1 VERIFICATION STANDARDS, GUIDELINES, AND TOOLS

- ACR Standard Version 3.0, February 2014
- ACM0002: Grid-connected electricity generation from renewable sources version 15.0
- Validated Project Plan “MS Renováveis Wind Power Complex: Mar e Terra, Areia Branca, Embuaca and Icaraí”, November 2014
- MS Renováveis Wind Power Complex: Mar e Terra, Areia Branca, Embuaca and Icaraí Monitoring Report, May 31, 2021
- ACR Validation and Verification Standard Version 1.1, May 2018
- ISO 14064-3:2006 Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions

5.2 LEVEL OF ASSURANCE

The verification was conducted to a reasonable level of assurance.

5.3 MATERIALITY

The verification was conducted to ACR’s required materiality threshold of +/-5% of the GHG project’s emission reductions or removal enhancements.

5.4 VERIFICATION SCOPE

The scope of the verification consisted of the following independent and objective activities:

- Select a verification team;
- Perform a Conflict of Interest review;
- Conduct a kick-off meeting with Embrasca;
- Review the validated Project Plan;
- Review the Validation Report;
- Review the Monitoring Report;
- Develop a verification plan and risk-based sampling plan;
- Review the Project information control systems and quality control procedures;
- Review the Project’s emission reduction calculations;
- Issue corrective action requests, additional documentation requests, and clarification requests as necessary;
- Issue a verification report and verification statement; and
- Conduct an exit meeting with Embrasca.

6 VERIFICATION PROCESS

6.1 VERIFICATION ACTIVITIES

The verification process consisted of the following activities as outlined in the verification plan:

- RCE completed a Conflict of Interest (COI) Attestation on December 23, 2020 to identify any potential conflict of interest with the Project or Project Developer. ACR approved the COI form on December 23, 2020.
- RCE and Embrasca held a verification kick-off meeting on December 23, 2020. During the kick-off meeting RCE reviewed the verification objectives and process, reviewed the verification schedule, and submitted an initial document request.
- RCE performed a strategic review and risk assessment of the received data and support documents to understand the scope and areas of potential risk in the GHG emissions reductions.
- RCE developed a risk-based sampling plan based upon the strategic review and risk assessment. The verification plan and sampling plan were used throughout the verification and were revised as needed based upon additional risk assessments. In response to the COVID-19 pandemic, ACR approved RCE to conduct the site visit virtually. RCE assessed the risk of conducting a virtual site visit instead of an onsite visit as part of its risk assessment, and the risk of not detecting material errors was determined to be low.
- RCE conducted a virtual site visit to the Project wind power plants in Ceará and Rio Grande do Norte states on March 16-17, 2021 using the real-time video web meeting and screen sharing platform Microsoft Teams. During the site visit RCE interviewed plant operators and other key personnel, observed the onsite data management systems and plant control panels, reviewed data gathering, monitoring, and handling practices, and observed electricity generation meters. RCE met with the following personnel during the site visit:
 - Elisa Guida – Associate Consultant, Embrasca
 - Erinaldo Araujo – Wind Farm Operator, Cubico Sustainable Investments
 - Luciano da Silva – Associate Consultant, Embrasca
 - Edimar Silva – Wind Farm Operator, Cubico Sustainable Investments
 - Marcelo Jardim – Environmental Engineer, Embrasca
 - Wilson Costa – O&M Coordinator, Cubico Sustainable Investments
- Following completion of the virtual site visit, RCE evaluated the effectiveness of the virtual site visit and use of Microsoft Teams and concluded that the verification site visit objectives were achieved.
- RCE performed a risk-based desktop review of the submitted verification documents. The desktop review included an assessment of the GHG calculation methods and inputs, source data completeness, GHG management and monitoring systems and eligibility documentation.
- RCE submitted material findings, requests for additional documentation, and requests for clarifications to Embrasca throughout the verification.
- RCE's internal reviewer conducted a review of the verification sampling, report, and statement.
- RCE issued a final verification report, verification statement, and list of findings.
- RCE held an exit meeting with Embrasca.

6.2 DATA MANAGEMENT SYSTEM AND MONITORING PLAN

RCE reviewed the project proponent's processes for data collection and management and determined that they are sufficient to meet all ACR and Methodology requirements. The verification team gained an understanding of the data collection procedures for data inputs to the emission reduction calculations through interviews with key personnel, the virtual site visit to the Project wind power plants, and the review of all documentation provided by Embrasca. The review also assessed monitoring and measurement methods and the Project's conformance with the monitoring plan in the validated Project Plan; RCE verified that the Project was implemented according to the monitoring plan.

6.3 GHG EMISSION REDUCTION ASSERTION

RCE reviewed the GHG assertion calculation as well as supporting data and documentation. The calculations were confirmed to be accurate and commensurate with their reported GHG equations and methods. Appendix A lists the results of the quantitative uncertainty assessment and analysis of the quantification methodologies and applicable data sets and sources.

6.3.1 Baseline Emissions

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. Emissions are calculated by multiplying the quantity of net electricity generation that is produced and fed into the grid because of the implementation of the Project by the combined margin CO₂ emission factor for grid connected power generation.

Annual quantity of net electricity generation is obtained from reports published by Brazil's Electricity Trading Chamber, Câmara de Comercialização de Energia Elétrica (CCEE). These official reports contain monthly net generation for each wind power plant. For 2015 to 2017 the reports contain monthly net generation delivered to the grid in megawatt-hours (MWh), and for 2018 and 2019 the reports contain average hourly megawatts (MW) for each month. Embrasca identified this as a deviation from the Project Plan in the Monitoring Report for this reporting period. The Project Plan states that net electricity generated by each power plant is measured in MWh obtained from the official generation reports; however because the 2018 and 2019 official reports contain average hourly MW for each month, total MWh generated is calculated by multiplying the average hourly MW for each month by the total hours in each month. CCEE still monitors MWh generation for each wind power plant but calculates an average MW production rather than reporting net generation. RCE approved this deviation because it has no impact on the calculated emission reductions.

RCE reviewed the CCEE official reports as a check on Embrasca's emission reduction calculations. RCE also compared generation data provided by Cubico, the owner and operator of the wind power plants, which was obtained from the same metering system and should be consistent with the CCEE official reports; however, there were some small discrepancies. RCE verified that use of the data from the official generation reports is the most appropriate method and is consistent with the Project's monitoring plan in the validated Project Plan.

The Project electricity generation meters are owned by CCEE and are used for billing purposes. Brazil regulations define that meters must be calibrated every five years; the Project meters are calibrated every two years. The monitoring plan in the validated Project Plan does not include meter calibration procedures

and frequency; however, to ensure accuracy of the generation data, the verification team reviewed a sample of calibration reports from 2017 and 2018.

Embrasca calculates annual combined margin CO₂ emission factors using the official country operating and build margin emission factors calculated and published annually by Brazil's Science, Technology and Innovations Ministry, Ministério de Ciência, Tecnologia e Inovação (MCTI). Per the validated Project Plan, the operating margin emission factor is weighted 75% and the build margin emission factor is weighted 25%. The verification team reviewed the annual published emission factors and verified that Embasca appropriately calculated the annual combined margin factors per the validated Project Plan. Finally, RCE verified that the calculation of annual baseline emissions was appropriate and free of material misstatement.

6.3.2 Project Emissions

The Project has no project emissions. This is consistent with the validated Project Plan and the Methodology.

6.3.3 Uncertainty Assessment

Per the Methodology, no uncertainty calculation is necessary as emission reductions from this activity are permanent and all relevant parameters are measured using calibrated equipment.

6.3.4 Emission Reductions

RCE calculated emission reductions for the reporting period according to the methods described in the validated Project Plan and the Methodology and found the final assertion to be free of material misstatement.

7 SUMMARY OF FINDINGS

RCE developed a List of Findings notifying Embasca of corrective action requests, non-material findings, additional documentation requests, and clarifications. Embasca sufficiently responded to all requests as required to close out the verification. Appendix B contains the complete List of Findings and responses.

8 VERIFICATION RESULTS AND CONCLUSION

RCE conducted a risk-based verification of the MS Renováveis Wind Power Complex: Mar e Terra, Areia Branca, Embuaca and Icaraí project for the reporting period August 11, 2015 to December 31, 2019 that included a strategic review of the project data, documentation, and emission reduction calculations. The objective of the verification activities was to conduct an independent assessment of the project reporting period and ex-post GHG emission reductions resulting from the Project.

Based on the review and the historical evidence collected, RCE concludes to a reasonable level of assurance that the GHG assertion is free of material misstatement. The emission reductions resulting from generation of renewable wind power for the reporting period August 11, 2015 to December 31, 2019 can be considered in conformance with the:

- ACR Standard, Version 3.0 (February 2014)

- ACR Validation and Verification Standard Version 1.1 (May 2018)
- ACM0002: Grid-connected electricity generation from renewable sources version 15.0
- Validated Project Plan “MS Renováveis Wind Power Complex: Mar e Terra, Areia Branca, Embuaca and Icaraí” (November 2014)
- ISO 14064-3:2006 “Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions”

Table 1 provides a summary of the verified emission reductions.

Table 1. Verified Emission Reductions for Reporting Period August 11, 2015 to December 31, 2019

Vintage	Baseline Emissions (mtCO ₂ e)	Project Emissions (mtCO ₂ e)	Leakage Emissions (mtCO ₂ e)	Emission Reductions (mtCO ₂ e)
2015	85,320	0	0	85,320
2016	166,534	0	0	166,534
2017	113,242	0	0	113,242
2018	112,457	0	0	112,457
2019	109,511	0	0	109,511
Reporting Period Total	587,065	0	0	587,065

Note: Values might not sum due to rounding.

Lead Verifier Signature



Nina Pinette

Internal Reviewer Signature



Phillip Cunningham

APPENDIX A - QUANTITATIVE UNCERTAINTY ASSESSMENT & ANALYSIS OF SSRs

[illegible]

APPENDIX B – LIST OF FINDINGS

Action item	Resolution	Status
Corrective Action Requests		
1. The verification team confirmed with ACR that the allowable period to generate credits is at maximum 11 Aug. 2015 to 31 Dec. 2020. The calculations include electricity generation from 1 Nov. 2014 to 31 Dec. 2019. Per ACR, the generation prior to 11 Aug. 2015 is not eligible for crediting and must be removed from the emission reduction calculations.	May 26, 2021: Embrasca updated the emission reduction calculations and the Monitoring Report to reflect the reporting period 11 August 2015 to 31 December 2019.	<input checked="" type="checkbox"/> Addressed <input type="checkbox"/> Pending
2. The project deviates from the validated project plan for the monitoring of the parameter $EG_{m,y}$ during 2018 & 2019. The monitoring table for the parameter in the plan says the unit of measurement in the official reports is MWh. For 2018 and 2019 the official reports provide average MW of electricity generated each month and generation in MWh is calculated based on average MW x total hours in the month. This deviation needs to be appropriately identified in the Monitoring Report.	May 26, 2021: Embrasca updated the Monitoring Report to reflect the deviation; however it notes only that 2018 was affected. June 1, 2021: Embrasca updated the Monitoring Report to reflect that the deviation applies to 2018 and 2019.	<input checked="" type="checkbox"/> Addressed <input type="checkbox"/> Pending
Additional Documentation Requests		
1. Please provide an updated Monitoring Report to address the following errors: a. Section II, 5, the end of the current reporting period listed (Dec. 31, 2020) is inconsistent with the date listed elsewhere in the Monitoring Report (Dec. 31, 2019). Also ensure the beginning of the reporting period is accurate.	May 26, 2021: Embrasca updated the Monitoring Report to reflect updates for all requests. The only pending items are noting the deviation applies to 2018 and 2019 (see Finding #1 above) and a signature on the final report. June 1, 2021: Embrasca provided the final Monitoring Report which is signed and has been updated to reflect both years for the deviation.	<input checked="" type="checkbox"/> Received <input type="checkbox"/> Pending

<ul style="list-style-type: none"> b. Section II, 6, the Project start date is required to be one date for the entire project, consistent with the start date defined in the validated Project Plan. c. Section II, 7, the current crediting period is required to be one date range for the entire project, beginning on the project start date and lasting for a duration of 7 years, consistent with the validated Project Plan. d. Section III, 3, identify the deviation noted in Material Finding #2, above. e. Section III, 5, ensure that all SDGs as automatically assigned within ACR's Registry system are addressed within this section: Affordable and Clean Energy, Sustainable Cities and Communities, and Climate Action. Also include the environmental and community impacts description for Mar e Terra and Areia Branca wind farms. f. Section V, for the parameter $EG_{m,y}$ and $EG_{k,y}$, the Methodology Section lists "Section 6. Tool to calculate the emission factor for an electricity system" which does not apply to quantity of net electricity generation. Include the relevant methodology section and equation number (or clarify the source of the equation numbers – they do not correspond to the Methodology, the Tool, or the Project Plan). g. Section V, 2, calibration frequency is stated as annual (which is inconsistent with what was reported to verification team during verification activities). Confirm frequency and update Monitoring Report if necessary. Also include any specific calibration procedures and the party responsible. h. Section VII, respond to the instructions: "State the date of the last full site visit verification" and "State the number of consecutive years the verification body has verified the project" even if the response is not applicable because this is the first verification. 		
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<ul style="list-style-type: none"> i. Section IX, include Project Proponent signature in the final version of the Monitoring Report. j. Include any revisions to the emission reduction calculations. 		
2. Provide the regulatory compliance attestation available as a separate file, as noted in the Monitoring Report.	June 1, 2021: Embrasca provided the attestation.	<input checked="" type="checkbox"/> Received <input type="checkbox"/> Pending
3. Provide the 2019 environmental documents for Mar e Terra and Areia Branca wind farms.	March 18, 2021: Embrasca provided the documents.	<input checked="" type="checkbox"/> Received <input type="checkbox"/> Pending
4. Provide relevant calibration certificates.	<p>May 18, 2021: Embrasca provided the calibration certificates.</p> <p>Please explain whether the calibration certificates identify the location of the meter (which plant). Embrasca requested additional information from Cubico.</p> <p>May 27, 2021: Embrasca provided additional calibration certificates that identify the wind plant.</p>	<input checked="" type="checkbox"/> Received <input type="checkbox"/> Pending
Clarification Requests		
1. Why are the electricity generation values used in the emission reduction calculations inconsistent with the CCEE official generation reports?	March 20, 2021: Embrasca explained that Cubico does not know why there are small discrepancies but that they agree that the official generation reports should be used as source data. This is also consistent with the monitoring plan in the validated Project Plan. Embrasca provided revised emission reduction calculations.	<input checked="" type="checkbox"/> Addressed <input type="checkbox"/> Pending <input type="checkbox"/> Ignore

APPENDIX C – DOCUMENTS REVIEWED

1. Validated Project Plan
2. Project Monitoring Report and updates
3. Assertion spreadsheet and updates
4. Regulatory compliance attestation
5. Calibration reports
6. CCEE Official Generation Reports
7. MCTI operating and build margin emission factors
8. Samples of environmental permits and inspection results