



VERIFICATION REPORT LARIMAR WIND FARM PROJECT



Document Prepared By Earthood Services Private Limited

Project Title	<i>Larimar Wind Farm Project</i>
Version	2
Report ID	VCS.VER.22.127

Report Title	<i>Verification Report – Larimar Wind Farm Project</i>
Client	<i>Empresa Generadora de Electricidad Haina S.A (EGE Haina)</i>
Pages	31
Date of Issue	20-August-2022
Prepared By	<i>Earthood Services Private Limited</i>
Contact	409-410, Tower B4, Spaze I-Tech Park, Sector 49, Gurugram 122018, India

	kaviraj.singh@earthhood.in www.espl-india.com
Approved By	 Kaviraj Singh
Work Carried Out By	Marcelo Sebben (Team Leader) Sergio Cruz (Technical Reviewer)

Summary:

Brief summary of the project activity

"Larimar Wind Farm Project" is a project activity that consists in the implementation and operation of two wind power plants in Dominican Republic. The plants supply clean electricity to the Dominican Republic National Interconnected System (SENI).

The wind power plants comprehend Larimar I which has 15 wind turbines with 3.3 MW each totalizing 49.5 MW and Larimar II, which has 14 wind turbines with 3.45 MW each totalizing 48.3 MW. The total installed capacity of the project activity is equal to 97.8 MW.

The project applies the CDM approved methodology ACM0002 – Grid-connected electricity generation from renewable sources – version 17.0.

The project activity reduces the GHG emissions through dispatching GHG-free electricity to the National Interconnected System of Dominican Republic.

The start date the project and of the crediting period was 01/08/2016 which corresponds to the Electricity Purchase Contract Start date signed between EGE Haina and Corporación Dominicana de Empresas Eléctricas Estatales (CDEEE)^{/09-1/}. It is important to point out that the operation start date of the 1st turbine in the Larimar I Wind Power Plant was on 22/07/2016^{/09-2/} and Larimar II Wind Power plant on 11/10/2018^{/09-3/}.

Scope of verification

EGE Haina S.A. has contracted ESPL to conduct the 2nd verification of the project "Larimar Wind Farm Project" for the period from 01/01/2020 to 31/12/2021 (both days included).

The scope of the verification is to establish/verify that:

- the latest available MR template was used and correctly filled up;

- the project activity has been implemented and operated as per the registered PD and that all physical features (technology and monitoring equipment) of the project are in place;
- the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VCUs, verifiable, and in accordance with applicable requirements of the Verified Carbon Standard Version 4;
- the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and approved methodology;
- the data are recorded and stored as per the monitoring methodology.

This project does not refer to a grouped project and therefore, there are no new instances to be included at the present monitoring period.

Conclusion

ESPL has performed the verification of the VCS project "Larimar Wind Farm Project", with VCS Project ID 1644, for the monitoring period from 01/01/2020 to 31/12/2021 (both days included).

During the present VCS verification, 01 CL and 01 CARs were raised and successfully closed.

The verification team has confirmed the implementation of the project as per description in the VCS-PD, the monitoring plan of the PD and the application of the monitoring methodology (ACM0002 v.17.0). In addition, it was confirmed that the monitoring system is in place and the emission reductions are calculated without material misstatements.

The verified emission reductions amount to **456,432 tCO₂e** in the above-mentioned monitoring period.

1	Introduction	6
1.1	Objective	6
1.2	Scope and Criteria	6
1.3	Level of Assurance.....	6
1.4	Summary Description of the Project	6
2	Verification Process	7
2.1	Method and Criteria.....	7
2.2	Document Review	8
2.3	Interviews	8
2.4	Site Inspections.....	9
2.5	Resolution of Findings	11
2.5.1	Forward Action Requests	12
2.6	Eligibility for Validation Activities	12
3	Validation Findings	12
3.1	Participation under Other GHG Programs	12
3.2	Methodology Deviations.....	12
3.3	Project Description Deviations.....	12
3.4	Grouped Project	12
4	Verification Findings	12
4.1	Project Implementation Status	12
4.2	Safeguards	17
4.2.1	No Net Harm	17
4.2.2	Local Stakeholder Consultation	18
4.3	AFOLU-Specific Safeguards	19
4.4	Accuracy of GHG Emission Reduction and Removal Calculations	19
4.5	Quality of Evidence to Determine GHG Emission Reductions and Removals	22
4.6	Non-Permanence Risk Analysis.....	23
5	Verification conclusion	24
	APPENDIX I: References	25
	APPENDIX II: Abbreviations	29

Appendix III: Findings	30
APPENDIX IV: Competence of Team Members and Technical Reviewers	33

1 INTRODUCTION

1.1 Objective

EGE Haina S.A. has contracted ESPL to conduct the 1st verification of the project "Larimar Wind Farm Project" for the period from 01/01/2020 to 31/12/2021 (both days included) according to the requirements of the Verified Carbon Standard Version 4.

1.2 Scope and Criteria

The scope of the verification is to establish/verify that:

- the project activity has been implemented and operated as per the registered PD and that all physical features (technology, project equipment and monitoring and metering equipment) of the project are in place;
- the monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of VCUs, verifiable, and in accordance with applicable VCS Version 4 requirements;
- the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;
- the data are recorded and stored as per the monitoring methodology.

The verification of this monitoring period is based on the registered VCS-PD, MR and GHG emission reduction calculation spreadsheet and supporting documents.

1.3 Level of Assurance

The verification of this monitoring period has achieved a reasonable level of assurance. The only monitored parameter is EG_{facility} and it has been checked 100%. The information has been duly cross-checked with official data^{/18/}. No sampling has been applied. Moreover, all information could be duly checked along the verification process and therefore, the reasonable level of assurance was achieved.

1.4 Summary Description of the Project

"Larimar Wind Farm Project" is a project activity that consists in the implementation and operation of two wind power plants in Dominican Republic. The plants supply clean electricity to the Dominican Republic National Interconnected System (SENI).

The project consists in the installation of 15 wind turbines with 3.3 MW each totalizing 49.5 MW for Larimar I and 14 wind turbines with 3.45 MW each totalizing 48.3 MW for Larimar II. The total installed capacity of the project activity is equal to 97.8 MW. The power factor is estimated in 47.4%^{/08-1/} for Larimar I and 35.5% for Larimar II ^{/08-2/}.

The plant will be interconnected to the National System through Los Cocos Substation^{/12/} located 5 km distant.

The expected lifetime of wind turbines is 20 years^{/11/}.

The project activity achieves GHG emission reduction through replacing the carbon intensive electricity from the national grid by renewable electricity generated by the wind power plant.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification process is conducted as per internal CDM Quality Manual and in accordance with criteria laid down by VCS. It includes the following steps:

- contract with PP for the scope and appointment of verification team and technical review team;
- completeness check of Monitoring Report;
- desk review of Monitoring Report and corresponding ER sheet by verification team and planning of onsite audit (including sampling approach to be applied);
- virtual inspection by verification team;
- follow up activities e.g., interviews;
- reporting and closure of findings (CARs/CLs/FARs) and preparation of draft verification report;
- independent technical review of the draft verification report and final/revised documentation (e.g., Monitoring Report, corresponding ER sheet and evidences);
- reporting and closure of TR comments/findings (CARs/CLs/FARs) and final approval for the decision made;
- issuance of final verification report to contracted PP (or authorized representatives).

2.2 Document Review

A desk review was conducted by the verification team that included:

- a review of the data and information presented to verify its completeness;
- a review of the registered monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- an evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;
- supporting documents.

A complete list of documents/evidences reviewed is included as Appendix I.

2.3 Interviews

#	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1	Santana	Karla	EGE Haina	08/06/2022	CDM Project description Community relationship Environmental Permit	Marcelo Sebben
2	Esteves	Ricardo	EGE Haina	08/06/2022	Project description, and operations	Marcelo Sebben
3	Fuentes	Antonio	EGE Haina	08/06/2022	Site visit, technical description, technical information and Substation site visit	Marcelo Sebben
4	Pérez	Wilson	EGE Haina	08/06/2022	Extraction of generation raw data and cross-check measures	Marcelo Sebben

5	Then	Ramón	EGE Haina	08/06/2022	Environmental Permit	Marcelo Sebben
6	Correa	Juliana	MGM Innova (consultant)	08/06/2022	ER calculations Data aggregation, MR description	Marcelo Sebben

The objective of the above interviews was to understand the implementation and operation of the project activity, calculation of emission reductions as well as the control of meters responsible for measuring the parameters.

Moreover, the interviews clarified the social and environmental monitoring carried out due to the project activity and their outcome, interaction of project activity with stakeholders and procedure of continuous communication with community.

The interviews carried out as well as each topic addressed are detailed in table above.

The verification team concluded that the interviews carried out provided a good understanding of the project activity operation as well as their results in GHG emission reductions achieved and social/environmental monitoring.

2.4 Site Inspections

Duration of virtual audit: 08/06/2022				
#	Activity performed on-site	Site location	Date	Team member
1	Opening Meeting: Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.	Video call	08/06/2022	Marcelo Sebben
2	Implementation and operation of project activity (project boundary, project location, technology, project equipment, monitoring and metering equipment) as per registered PDD/previous verification.	Video call	08/06/2022	Marcelo Sebben

3	- Grievance mechanism - Sustainable Development Goals - Environmental License (annual monitoring as per No net harm assessment)	Video call	08/06/2022	Marcelo Sebben
4	- Video call - Physical inspection of the project activity - Site visit to one wind turbine for confirmation of its installed capacity and interview of monitoring personnel	Video call	08/06/2022	Marcelo Sebben
5	- Video call - substation to which electricity is delivered to the SIN): - Check of electricity meters which dispatch electricity to the grid and access to its Serial Number. - Site visit and interview of monitoring personnel	Video call	08/06/2022	Marcelo Sebben
6	Video Call - Download of monitored data during the call, from original source, related to all monitoring period.	Video call	08/06/2022	Marcelo Sebben
7	Management and operational system: Documentation, allocation of responsibilities, qualification and training, data recording & archiving, internal audit and management review and emergency procedures.	Video call	08/06/2022	Marcelo Sebben
8	Verification checklist: compliance of monitoring procedures followed at project site with registered PDD and monitoring methodology.	Video call	08/06/2022	Marcelo Sebben
9	Review of monitored data and relevant document in accordance with registered monitoring plan and applied monitoring methodology.	Video call	08/06/2022	Marcelo Sebben

10	Review of ER calculations in accordance with applied methodology and relevant tools.	Video call	08/06/2022	Marcelo Sebben
11	Compilation of the audit findings.	Video call	08/06/2022	Marcelo Sebben
12	Closing Meeting: Submission of the audit findings to the client and agreement on the issues raised and agreement on timelines.	Video call	08/06/2022	Marcelo Sebben

The on-site inspection was not conducted during this verification process. The alternative means of conducting an audit process have been considered in accordance with VCS Standard and requirements.

Instead, the DOE used other standard auditing techniques for verification, as follows:

- Confirmation from PP that no changes occurred in the installed technology, monitoring plan, measuring equipment, obtained from interview with PPs
- Current pictures of main equipment/^{18/}.
- Document review
- Real time videoconference overview of wind power plant and installed wind turbines
- Real time Videoconference with demonstration of installed electricity meters and with directly demonstration of raw data extraction of electricity generation.

These audit techniques used have been considered sufficient and credible by the verification team for the purpose of the present verification.

2.5 Resolution of Findings

The findings may be of following types: CAR – Corrective Action Request, CL – Clarification Request and FAR – Forward Action Request.

During the present verification, 01 CL and 01 CAR were raised and successfully closed.

The list of findings and their resolution are presented at Appendix III of this report.

2.5.1 Forward Action Requests

No FAR was raised.

2.6 Eligibility for Validation Activities

ESPL holds the accreditation for verification of the sectoral scope.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity has no participation under any other GHG program.

3.2 Methodology Deviations

The project activity complies with the applied methodology ACM0002 – Grid-connected electricity generation from renewable sources – version 17.0 and all applicable tools.

No deviations were observed.

3.3 Project Description Deviations

For the present monitoring period, no change is being requested. A VCS-PD typo correction has been requested during the previous monitoring period and this correction (EF_{grid} value) has been duly reflected in the currently valid version of the VCS-PD^{/03/}

3.4 Grouped Project

Not applied. This project does not correspond to a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity involves the construction and operation of two wind power-plants implemented called Larimar I and Larimar II Wind power Plant. The project

activity achieves GHG emission reduction through replacing the carbon intensive electricity from the National grid (SENI) by renewable electricity generated by the wind power plant.

As it could be observed during the virtual on-site inspection through document review^{/08/}, interviews conducted to the project proponents and official information, the project's characteristics are as follows:

The project consists in the installation of 15 wind turbines with 3.3 MW each totalizing 49.5 MW for Larimar I and 14 wind turbines with 3.45 MW each totalizing 48.3 MW for Larimar II. The total installed capacity of the proeject activity is equal to 97.8 MW. The power factor is estimated in 47.4%^{/08-1/} for Larimar I and 35.5% for Larimar II ^{/08-2/}.

The plant is interconnected to the National System through Los Cocos Substation^{/12/} located 5 km distant.

The monitoring plan of the project activity consists in monitoring the electricity generated by both power plants (parameter $EG_{facility,y}$). This monitoing is given through installation of two electricity meters at the substation mentioned above. For details on their characteristics and calibration, refer to section 4.4 of this report. There is no discrepancy between the actual monitoring plan and the one registered in the VCS-PD.

The expected lifetime of wind turbines is 20 years^{/11/}.

The characteristics of the installed wind turbines are as follows^{/08/}:

Table 1: Technical description of the wind turbines from Larimar I/^{08-3/}

Characteristic	Unit	value
Model	-	Vestas V112-3.3MW/V112-3.45MW
Nominal power	MW	3.3
Wind class	-	IEC 2A/ IEC 3A
Rated wind speed	m/s	11.4
Operating wind range	m/s	3-25
Blade length	m	54.65
Generator type	-	Siemens - Induction Generator

Table 2: Technical description of the wind turbines from Larimar II/^{08-4/}

Characteristic	Unit	value
Model	-	Vestas V112-3.3MW/V112-3.45MW
Nominal power	MW	3.45
Wind class	-	IEC S

Rated wind speed	m/s	11.4
Operating wind range	m/s	3-25
Blade length	m	57.15
Generator type	-	Siemens - Three phase Induction Generator with squirrels cage rotor

The project activity achieves GHG emission reduction through replacing the carbon intensive electricity from the national grid by renewable electricity generated by the wind power plant.

The project is listed at VCS and can be accessed by the following link:
<https://registry.terra.org/app/projectDetail/VCS/1644>

- Project proponent and other entities involved in the project: the project proponent and also the project owner is Empresa Generadora de Electricidad Haina S.A- EGE Haina. MGM Innova Consulting is involved in the PA as consultant.
- Project Category: renewable energy single bundle project activity
- Methodology: ACM0002 – Grid-connected electricity generation from renewable sources – version 17.0
- Project Start Date: 01/08/2016 ^{/09-1/} determined by the Power Purchase Agreement signature: The operation start date of the 1st turbine in the Larimar I Wind Power Plant was on 03/05/2016^{/09-2/} and Larimar II Wind Power plant on 26/01/2019^{/09-3/}. However information was not clear in the MR and a CL has been raised. Refer to CL 01.
- Crediting Period: from 01/08/2016 to 31/07/2026 – 10 years – renewable;
- Project scale and Estimated GHG emission reductions: the PA is defined as a Project (< 300,000 tCO₂e/y).
- Project Location: Both Wind Power Plants are located in Enriquillo Municipality, Barahona Dominican Republic. Coordinates the plant is presented below (Coordinates_UTM (North)-WGS84 zone 19)^{/19/}: The values were duly checked at the environmental licenses^{/13-1 and 13-2/}

UTM Coordinates Wind turbines Larimar I		
Aero ID	X (Easting)	Y (Norting)
LM01	19Q259392.98	1983946.15
LM02	19Q259853.00	1983884.00
LM03	19Q260154.98	1983758.17

LM04	19Q260481.98	1983647.18
LM05	19Q260845.98	1983520.19
LM06	19Q260923.38	1983515.19
LM07	19Q261015.68	1982926.20
LM08	19Q261069.58	1982633.20
LM09	19Q260972.08	1982305.20
LM10	19Q261003.18	1981986.20
LM11	19Q261050.48	1981708.20
LM12	19Q261133.98	1981422.20
LM13	19Q261166.38	1981122.20
LM14	19Q261230.78	1980844.20
LM15	19Q261187.18	1980554.20

UTM Coordinates Wind turbines Larimar II		
Aero ID	X (Easting)	Y (Norting)
LMII01	19Q264208	1981174
LMII02	19Q264069	1981382
LMII03	19Q263896	1981562
LMII04	19Q263736	1981754
LMII05	19Q263593	1981960
LMII06	19Q263466	1982174
LMII07	19Q263366	1982404
LMII08	19Q263167	1981151
LMII09	19Q262984	1981321
LMII10	19Q262807	1981502

LMII11	19Q262635	1981689
LMII12	19Q262622	1981956
LMII13	19Q262124	1982155
LMII14	19Q262133	1982405

- Conditions prior to project initiation: The project is a greenfield wind power plant and prior to the project installation the electricity would be generated by Power Plants connected to the National Grid.
- Project compliance with applicable laws, statutes and other regulatory frameworks: The project currently operating as per registered VCS-PD^{/03/}. The compliance with the applicable laws and regulations can be evidenced through Environmental Licenses issued by Ministry of Environment and Natural Resources (MIMARENA) on 20/06/2020^{/13-1/} for Larimar I and 17/03/2022^{/13-2/} for Larimar II.
- Ownership and other programs: Empresa Generadora de Electricidad Haina, S.A. is the project owners. The ownership is confirmed through environmental licenses^{/13-1 and 13-2/} and PPA signed between EGE Haina and CDEEE^{/10/}. In addition, the GHG emission reductions generated by the project have not been included in any emissions trading program or any other mechanism that includes GHG allowance trading. Moreover, the project has not received nor sought any other form of environmental credit, and neither has become eligible to do so since validation or previous verification. Finally, the project has not participated nor been rejected under any other GHG programs since its validation or previous verification.
- Eligibility criteria for grouped projects: this project does not correspond to grouped project, thus this section is not applicable
- Leakage management for AFOLU projects: this project is not an AFOLU project, thus, the leakage management is not applicable. The applied methodology does not make reference to AFOLU projects.
- Commercially sensitive information: the commercial information has not been excluded from the documents made public by the PP.
- Sustainable development Goals: two SDGs have been defined in the MR as required by VCS, taking into account the Sustainable Development contributions defined in the VCS-PD
- SDG Indicator: 7.2.1: Renewable energy share in the total final energy consumption. It refers to the amount of renewable energy dispatched to the grid (refer to Parameter EG_{facility,y} in section 4.4 below)
- SDG Indicator: 13.2: Tonnes of greenhouse gas emissions avoided or removed. It refers to the amount of Emission Reductions achieved during this monitoring period (refer to total ERs achieved stated in section 5 below)

The project activity corresponds to the installation of two Greenfield wind power plant in Dominican Republic. The project description is complete, accurate and

reflect the information stated in the evidences provided, as well as in the registered VCS-PD.

There are no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology. Moreover, the project is being implemented and operating in accordance with description provided in the registered VCS-PD.

In addition, the GHG emission reductions generated by the project have not become included in an emissions trading program or any other mechanism that includes GHG allowance trading. Moreover, the project has not received nor sought any other form of environmental credit, and neither has become eligible to do so since validation or previous verification. Finally, the project has not participated nor been rejected under any other GHG programs since validation or previous verification.

No methodology deviations from validation phase or previous verification were observed.

As per the virtual on-site assessment, interviews and collected evidences, it was possible to assess that the project activity has been implemented as described in the VCS-PD.

4.2 Safeguards

4.2.1 No Net Harm

As per environmental analysis carried out during construction phase, some potential negative impacts were mapped which comprehended the following: Impact on birdlife, Impacts on soil and water, socioeconomic Impact employment generation, impact in flora and alteration of air quality.

As per environmental licenses/¹³⁻² and ¹³⁻³/, some programmes were implemented and are constantly monitored. These have to be reported every six months to the Environmental Agency (MIMARENA). The programmes comprehend the following:

- Impact on Birdlife: Loss of individuals due to collision
- Impact on soil and water: generation of solid hazardous and non-hazardous waste
- Impact on soil and water: Generation of liquid hazardous waste
- Impact to soil and water: Fuel storage
- Impact on soil and water: Generation of domestic residuals
- Impact to soil and water: Pest and weed control
- Socio-economic impact: Risk of occupational accidents
- Socioeconomic Impact Employment generation
- Impact on flora: loss of vegetation
- Alteration to air quality

All these monitoring sectors are part of the environmental licensing are constantly monitored and reported to the Environmental entity. Therefore, by applying these measures, it can be concluded that any possible negative impact caused by project activity is mitigated of the project activity. The MR states the main programmes and the results were duly provided to the verification team^{14/}.

4.2.2 Local Stakeholder Consultation

The local stakeholder consultation or public audience are one of the phase of the Environmental Impact Assessment. This consultation occurred during the construction phase of the project activity and was a requirement for obtaining the operational license. The consultation was validated during the validation phase of this project activity.

As explained by project participants, the company keeps an active communication with surrounding communities. Continuously, the company team promotes sustainable communitarian development (Enriquillo Barahona Community) to improve their life quality. Moreover, the company provides open channel through telephone for all members of community, employees, and stakeholders^{/20/}. It could be observed by interviews to the project proponents and by report provided to the verification team ^{/20-2/}, and also through the Grievance Mechanism Procedure^{/20-1/} that the grievance mechanism is currently in place and active. The results of this mechanisms are all detailed in the Monitoring report.

4.3 AFOLU-Specific Safeguards

Not applicable, as it is not an AFOLU project.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The approved VCS methodology ACM0002 – Grid-connected electricity generation from renewable sources – version 17.0 is applied to the project activity;

GHG emission reduction is calculated as baseline emissions only. No project emissions and leakage are considered for this kind of project;

Baseline emissions are calculated as follows:

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

Where:

BE_y: Baseline emissions in year y;

EG_{PJ,y}: Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y;

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”.

$$EF_{grid,CM,y} = W_{OM} \times EF_{OM} + W_{BM} \times EF_{BM}$$

As the project activity is the installation of a greenfield power plant: $EG_{PJ,y} = EG_{facility,y}$ (quantity of net electricity generation supplied by the project plant/unit to the grid in year y). The $EG_{facility,y}$ comprehends the sum of electricity dispatched by Larimar I and Larimar II.

Moreover, the value of parameter $EF_{grid,CM,y}$ has been fixed ex-ante and it is equal to **0.7173 tCO₂/MWh**

The results are as follows for BE calculations:

The BEy calculations are as follows:

$$BE_{2020} = 303,049 \text{ MWh} \times 0.7173 \text{ tCO}_2\text{e/MWh} = 217,377.3 \text{ tCO}_2\text{e}$$

$$BE_{2021} = 333,270 \text{ MWh} \times 0.7173 \text{ tCO}_2\text{e/MWh} = 239,054.9 \text{ tCO}_2\text{e}$$

$$BE_{total} = 456,432 \text{ tCO}_2\text{e}$$

For project emissions, $PE = 0$ for wind power plants as per VCS-PD and applied methodology.

There are no leakage emissions as per the applied methodology. So: $Ly = 0$.

Fixed parameters: The following parameter was kept fixed along the crediting period and is being used for calculation of emission reductions

- **$EF_{grid,CM,y}$** : 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". The applied value is **0.7173 tCO₂/ MWh** for the whole crediting period.

Monitored parameters: The following parameters were monitored along the monitoring period and are being used for calculation of emission reductions

- **$EG_{facility}$, (Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr))**: the parameter was monitored continuously through two electricity meters per wind power plant (main and backup) in the substation Los Cocos which is the connection point with the National Grid ^{/12/}. The meters used are standard and regulated by the OC, which is the National Electric System Coordinator. Their calibration is determined by the National regulations^{/15-4/} to be carried out every two years and are under control PP. The monitored values (meter data)^{/16/} have been compared with the ones provide by OC ^{/17/}. Nevertheless, this comparison could not be observed in the ER calculations and therefore a finding has been raised. Refer to CAR 01.

The applied values are the following (MWh)¹:

- 2020:
 - Larimar I: 178,148.33
 - Larimar II: 124,901.09
 - TOTAL for 2020: 303,049.41
- 2021:
 - Larimar I: 194,244.77

¹ Values already accounting for the calibration delays

- Larimar II: 139,025.68
- TOTAL for 2021: 333,270.45

The following meters were used for measuring the parameter

Parameter	Electricity meter type and S/N	Calibration company ^{/21/}	Accuracy class	Calibration dates (frequency required 2 years ^{/15-4/}	Delays
EG _{facility,h,} Larimar I	Main Schneider electric – ION 8650 S/N MW-1507A003-02	OC	0.2	08/02/2018 25/02/2020	Yes: from 08/02/2020 to 25/02/2020
	Backup Schneider electric – ION 8650 S/N MW-1507A002-02	OC	0.2	08/02/2018 25/02/2020	Yes: from 08/02/2020 to 25/02/2020
EG _{facility,h,} Larimar II	Main Schneider electric – ION 8650 S/N MW-1507A001-02	OC	0.2	08/02/2018 25/02/2020	Yes: from 08/02/2020 to 25/02/2020
	Backup Schneider electric – ION 8650 S/N MW-1507A009-02	OC	0.2	08/02/2018 25/02/2020	Yes: from 08/02/2020 to 25/02/2020

After findings resolution, it could be observed that the emission reduction spreadsheet is transparent, traceable and correct, with no manual transposition errors.

The spreadsheet calculation has been provided to the verification team and it is considered accurate, and its formulae in accordance with the ones mentioned above and in accordance with applied methodology and VCS-PD.

In order to conclude that, the verification team has compared all hourly Electricity generation provided in the spreadsheets (from both meters and from OC) and found to be correctly reported.

The verification team also concludes that the methods and formulae set out in the project description for calculating baseline emissions, project emissions and leakage have been followed.

All calibration certificates have been provided and a gap in calibration have been observed during the monitoring period. To the delayed period, maximum permissible error (0.2%) has been applied in accordance with VVS for PA para 366)a)/^{24/} as the calibration certificate provided demonstrated an error smaller in the measurements when comparing to the maximum permissible error. The VVS for PA (Validation and Verification Standard from CDM Project Activities) have been used as a best international practice.

Finally, the verification team concludes that GHG emission reductions have been quantified correctly in accordance with the project description and applied methodology.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

- the electricity generation was checked directly at the company's system (Schneider Electric System) and cross-checked with official information (UT and CNE), as evidences to determine emission reduction. This has been done by comparing values in the calculations spreadsheet with values provided by meters and by OC. This comparison can be done easily on excel.
- the records, data and information provided were found valid for the current verification period. The documents were verified during virtual site visit and when possible, were checked directly from its source. During the virtual call, both data from electricity meters and from OC has been downloaded and directly sent to verification team by email. The data provided is hourly aggregated. These data was compared to the ones applied in the ER calculations. For the calculations,

the data is aggregated monthly. After all finding's resolution, the data used in the Calculations was considered correct.

- The calibration frequency is duly determined by National regulations. For details, please refer to section 4.4 above. All calibration certificates were provided to the verification team. For the gaps in calibration observed, conservative correction factor were applied.
- interviews were performed during virtual site visit with involved personnel and PP's representatives. Their objective were to understand the project activity as well as conclude the correct operation, implementation and monitoring of the same. For details on the objective and outcome of the interviews conducted during the virtual site inspection, please refer to section 2.3 above.
- the GHG emission reduction calculations were check step by step with PP's representatives;
- the quality of evidences was found of adequate level by the verification team to ensure an accurate quantification of the emission reductions.

The verification team concludes that the quantity and quality of data is sufficient and appropriate for determining teh GHG reductions during this period.

4.6 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION CONCLUSION

ESPL, contracted by EGE Haina, has performed the independent verification of the emission reductions of the VCS project "Larimar Wind Farm Project", with VCS Project ID 1644, for the monitoring period 01/01/2020 to 31/12/2021 (both days included). The contractor is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

ESPL commenced the verification based on the baseline and monitoring methodology ACM0002 v.17.0 and the monitoring plan contained in the VCS-PD and draft Monitoring Report.

ESPL's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

The verification team confirms, based on final revised MR, that:

1. the project activity was found completely implemented as per the description given in the registered VCS-PD; and
2. the actual operation conforms to the description in the registered VCS-PD.

In our opinion, the GHG ERs reported for the project activity for the period mentioned above are correct in the final version of the Monitoring Report. The GHG emission reductions were calculated correctly based on the approved baseline and monitoring methodology and the monitoring plan contained in the VCS-PD.

Therefore, ESPL can certify that the emission reductions from the VCS project "Larimar Wind Farm Project" as follows:

Verification period informed above.

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2020	217,377	0	0	217,377
2021	239,055	0	0	239,055
Total	456,432	0	0	456,432

APPENDIX I: REFERENCES

No.	Title	References
1.	<u>Methodology</u> ACM0002 – Grid-connected electricity generation from renewable sources	version 17.0
2.	<u>Tools</u> • TOOL01: Tool for the demonstration and assessment of additionality; • TOOL07: Tool to calculate the emission factor for an electricity system;	Version 7.0.0 version 05.0;
3.	Registered VCS-PD	Version 3.1 29/05/2020
4.	Monitoring report – draft / revised	version 1 30/03/2022
5.	Monitoring report - final	version 2 15/06/2022 version 2.1 02/08/2022
6.	ER Spreadsheet – draft / revised	version 1
7.	ER Spreadsheet – final	version 2.1
8.	<u>Technical information</u> 1. Energy Production Assessment EPA_Larimar I issued by DNV-GL - Plant load factor - Total annual generation (estimative) 2. Energy Production Assessment EPA_Larimar II issued by DNV-GL - Plant load factor - Total annual generation (estimative) 3. Larimar I: Type Certificate of wind turbine Vestas V112-3.3MW/V112-3.45MW # TC-230903-A-2 issued by DNV 4. Larimar II: Type Certificate of wind turbine Vestas V117-3.3MW/V117-3.45MW # TC-DNV-DSS-904-00820-1230903-A-2 issued by DNV	06/10/2015 15/09/2015 16/04/2015 08/10/2015
9.	<u>Start date of project activity</u> 1. Electricity Purchase Contract # FM-CO-14-2016 establishing the Start date of electricity purchase signed between EGE Haina and Corporación Dominicana de Empresas Eléctricas Estatales (CDEEE), stating that the Contract will start from 01/08/2016 2. Operatinal start date of Larimar I: Resolution SIE-053-2016-PS issued by Electricity Superintendence	25/07/2016 22/07/2016 11/10/2018

	3. Operatinal start date of Larimar II: Resolution SIE-092-2018-PS issued by Electricity Superintendence	
10.	<u>Ownership of PA</u> - Electricity Purchase Contract # FM-CO-14-2016 establishing the Start date of electricity purchase signed between EGE Haina and Corporación Dominicana de Empresas Electricas Estatales (CDEEE),	30/03/2017
11.	<u>Lifetime</u> 1. Larimar I: Type Certificate of wind turbine Vestas V112-3.3MW/V112-3.45MW # TC-230903-A-2 issued by DNV 2. Larimar II: Type Certificate of wind turbine Vestas V117-3.3MW/V117-3.45MW # TC-DNV-DSS-904-00820-1230903-A-2 issued by DNV	16/04/2015 08/10/2015
12.	<u>Connection Point to National Grid System</u> 1. Resolution SIE-024-2016-PS PROVISIONAL issued on 03/05/2016 by Electricity Superintendence	30/03/2017
13.	<u>Environmental License</u> 1. Environmental Permit of Larimar I Wind Farm # 2597-15-RENOVADO, issued by Ministry of Environment and Natural Resources (MIMARENA) 2. Environmental Permit of Larimar II Wind Farm # 3103-16-RENOVADO, issued by Ministry of Environment and Natural Resources (MIMARENA)	20/06/2020 valid for 5 years 17/03/2022 valid for 5 years
14.	<u>No Net Harm:</u> 1. Larimar I: Environmental Compliance Report (ICA) issued by EGE Haina to MIMARENA. These reports are issued every 6 months and are part of environmental permit requirements. 2. Larimar II: Environmental Compliance Report (ICA) issued by EGE Haina to MIMARENA. These reports are issued every 6 months and are part of environmental permit requirements.	Every 6 months
15.	<u>Applicable legislation</u> 1. Law # 57-07 regarding Development of renewable energy sources 2. General Electricity Law 125-01, articles 342, 343, 344 and 345, regarding Calibration of electricity meters 3. Law 64-00 General Law on the environment and natural resources - Article 44 Regarding the environmental licensing 4. National regulation regarding calibration frequency: See Ley General de Electricidad. Número 125-01. Document: Reglamento.Ley_.No_.125-01 .pdf (See Article 342 – literal b.)	July/2012 18/08/2000 https://www.cne.gob.do/wp-content/uplo

		ads/2015/05/R eglamento.Le y .No .125- 01.pdf
16.	<u>Electricity Generation evidences</u> - Hourly report extracted directly from ION electricity meters (Schneider Electric ION Setup. Continuous monitoring and recording every 15 minutes.	2020 to 2021
17.	<u>Cross-check information</u> National Electric System Coordinator – OC Ventas LARIMAR I y II 2020_2021	https://www.o c.org.do/Infor mes/Administr aci%C3%B3n- del- MEM/Transac ciones- Econ%C3%B3 micas-y- C%C3%A1lcul os- Comerciales/ EntryId/174880
18.	<u>On site Evidences</u> - Pictures of wind turbines - Pictures of installed electricity meters - Pictures of unifilar diagram - Real time video extracting generation raw data - Real time video checking the electricity meters serial number - Real time video checking the installed wind turbines and its specifications	08/06/2022
19.	<u>Geographical location of Power Plant</u> 1. The geographical location of WTG01 of both plants have been plotted in Google Maps, which could be evidenced through following link. <u>Larimar I 1st wind turbine</u> https://www.google.com.br/maps/place/17%C2%B055'49.0%22N+71%C2%B016'17.2%22W/@17.9302661,-71.2736267,886m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0xea0c03c9ed857036!8m2!3d17.9302661!4d-71.271438?hl=pt-BR	-

	<u>Larimar II 1st Wind turbine</u> https://www.google.com.br/maps/place/17%C2%B054'20.7%22N+71%C2%B013'32.5%22W/@17.908156,-71.2347729,5794m/data=!3m1!1e3!4m5!3m4!1s0x0:0xcd751ef0eb49e63!8m2!3d17.9057542!4d-71.2256948?hl=pt-BR 2. The Unit conversion from UTM to geographical coordinates have been carried out through website from DPI/INPE (http://www.dpi.inpe.br/calcula/)-	
20.	<u>Grievance Mechanism</u> 1. Grievance mechanism Procedure – L-L104 Procedimiento Reclamaciones Rurales Parque Eolicos.pdf 2. <u>Form of Grievance Mechanism N-P02.F0 (Formulario Reclamos Final)</u> 3. Social responsibility Report	15/05/2018 2020 and 2021
21.	<u>Calibration Certificates</u> 1. Calibration certificates provided by OC	-
22.	Validation and Verification Standard for CDM Project Activities	Version 3.0
23.	IPCC publications	https://www.ipcc-nggip.iges.or.jp/public/2006gl/
24.	VCS 1. VCS Standard V.4.1 2. VCS Program Guide V.4.2 3. VCS-V4-Summary-of-Effective-Dates	https://verra.org/

APPENDIX II: ABBREVIATIONS

Abbreviations	Full texts
BE	Baseline Emission
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CNE	National Council of Energy
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CL	Clarification Request
DOE	Designated Operational Entity
ER	Emission Reduction
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse gas(es)
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PBA	Environmental Basic Project
PE	Project Emission
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
SPC	Special Purpose Company
UNFCCC	United Nations Framework Convention on Climate Change
UT	Transaction Unit (National Electric System Operator)
VCS	Verified Carbon Standard
VCS-PD	VCS – Project Description
VCU	Verified Carbon Unit
XLS	Emission Reduction Calculation Spread Sheet
WPP	Wind Power Plant
WPT	Wind Power Turbine

APPENDIX III: FINDINGS

CL from this verification

CL ID	01	Section no.	1.4	Date: 09/06/2022
Description of CL				
The information regarding start date of project activity is not clear in the MR section 1.5. The operation start date of each Wind power plant is not in accordance with evidences provided.				
Project participant response				Date: 15/06/2022
The information regarding start date and operation starting date of project activity is clarified in the MR section 1.5. adding the respective evidence.				
Documents provided by Project Participant				
MR version 2.0: VCS-MR_Larimar 2020-2021_v2.0 15 06 2022.doc RESOLUCION_SIE-053-2016- PS__AUTORIZACION_PS_PROYECTO_PARQUE_EOLICO_LARIMAR.pdf SIE-092-2018-PS_-PERMISO_INTERCONEXION_PROVISIONAL_PARQUE_EOLIC_LARIMAR II.pdf OC-2019-000336-GG-EGEHAINE-Certificaciones de Fechas de las Primeras Inyecciones_LARIMAR II.pdf				
DOE assessment				Date: 13/07/2022
It is now clear in the MR that the operation start date of the 1st turbine in the Larimar I Wind Power Plant was on 22/07/2016 ^{/09-2/} and Larimar II Wind Power plant on 11/10/2018 ^{/09-3/} . The start date of crediting period was 01/08/2016 which corresponds to the Electricity Purchase Contract Start date signed between EGE Haina and Corporación Dominicana de Empresas Electricas Estatales (CDEEE) ^{/09-1/} . All evidences were duly provided to the verification team.				
CL is closed				

CAR from this verification

CAR ID	01	Section no.	4.4	Date: 09/06/2022
Description of CAR				
It could not be evidenced in the ER calculations spreadsheet whether the electricity data measured by the electricity meters have been cross-checked with electricity reported by public entity, unlike required by monitoring plan.				
Project participant response				Date: 15/06/2022

Excel file updating the worksheet: **Generation** showing the balance between the generation data given by the electricity meters with electricity reported by public entity. It can be confirmed that the electricity meters present a higher generation value than the electricity reported by the public entity, meeting the principle of conservativeness.

Excel file adding the worksheet: **SMC LARIMAR 2020 2021** showing the generation data given by the electricity meters.

Documents provided by Project Participant

ER_LARIMAR_MR2_v2.0_Rev MGM.xls

DOE assessment

Date: 13/07/2022

The application of most conservative data for ER calculations is not clear in the spreadsheet: at tab generation, there is a table stating that net generation is being applied in the ER calculations. Nevertheless, this Net generation is being compared to the generation from meters without application of penalties due to calibration delay. And in the end, the actual electricity used in the Er calculations is the one with generation delays. Therefore, the information is not clear in the ER calculations.

Also, in the same tab "generation", it is not clear the source of information from net generation, considering that the values are pasted and not traceable from other spreadsheet.

CAR remains open

Project participant response

Date: 02/08/2022

Please refer to updated ER xls spreadsheet - ER_LARIMAR_MR2_v2.1_Rev MGM.xls

As evidenced in the two comparison tables for Larimar I and Larimar II (worksheet **Generation Comparison** of spreadsheet ER_LARIMAR_MR2_v2.1_Rev MGM), the value presented as **Larimar Net** (invoiced generation data), is always less than the recorded by the project meters **Larimar Meters**, due to transmission losses are already included in the Net Generation.

This cross-check exercise was carried out to show that the data to be used to calculate the emission reductions, effectively corresponds to the most conservative.

Having this clear, the data present in the "**Larimar Net**" worksheet was taken and penalized considering the delay in calibrations, giving rise to the "**Larimar Net Penalized**" worksheet.

Then it is the data present in the "**Larimar Net Penalized**" worksheet that is used to calculate the project emission reductions.

In the Worksheet "**Generation**" now recalled "**Generation Comparison**", it is presented the source of information from **Larimar Net** Gen in order to be traceable from another spreadsheet.

Documents provided by Project Participant

ER_LARIMAR_MR2_v2.1_Rev MGM.xlsx

Ventas LARIMAR I y II 2020_2021.xlsx

DOE assessment

Date: 19/08/2022

It is clear now that, in the ER calculations spreadsheet, first it is carried out the comparison between Net generation (invoices) and electricity from meters, where it is concluded that Net generation (invoices) are more conservative. Then, in tab "Larimar Net Penalized", correction factor due to delays in calibration are applied to these conservative data. Therefore, it is confirmed that most conservative data have been applied and correction factors have been also duly applied as per CDM VVS para 366 (used as a good international practice).

CAR is closed

APPENDIX IV: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Competence Statement			
Name	Marcelo Sebben		
Country	Brazil		
Education	M.Sc. (Sustainable Energy System) B. Eng. (Chemical Engineering)		
Experience	+12.5 Years		
Field	Chemical process industry, CDM, Energy, Climate Change		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	ACM0001, ACM0002, ACM0006, AM0065, AMS ID, AMS-I.E, AMS-I.C, AM0026, AMS-I.A, AMS-I.F, AMS-III.H, AMS-III.I.		
Local expert	Brazil, Chile, Honduras, Colombia		
Financial Expert	Yes		
Technical Reviewer	Yes		
TA Expert	1.1, 1.2, 4.1, 5.1, 9.1, 13.1		
Reviewed by	Shreya Garg	Date	01/03/2018
Approved by	Anshika Gupta	Date	01/03/2018

Competence Statement	
Name	Sergio Bonanno Cruz
Country	Brazil
Education	Post Graduate Diploma in Environment
Experience	+25 Years
Field	Environmental Law, CDM, Energy, Climate Change
Approved Roles	
Team Leader	Yes
Validator	Yes
Verifier	Yes
Methodology Expert	ACM0001, ACM0002, AM0026, ACM0006, AMS ID
Local expert	Brazil, Chile, Colombia
Financial Expert	Yes
Technical Reviewer	Yes
TA Expert	1.2, 13.1

Reviewed by	Shreya Garg	Date	29/08/2019
Approved by	Anshika Gupta	Date	29/08/2019