



VERIFICATION REPORT

ENGENHEIRO ERNESTO JORGE DREHER
AND ENGENHEIRO HENRIQUE KOTZIAN
SHPS VCS PROJECT (JUN1120)



Document Prepared by Earthood Services Private Limited

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Summary:

Summary of the project activity

The project activity consists in two SHPs (SHP Engenheiro Ernesto Jorge Dreher with installed capacity of 17.95 MW and SHP Engenheiro Henrique Kotzian with installed capacity of 13.23 MW), which generate electricity avoiding power generation from fossil fuel sources. The plants are connected to the Brazilian National Interconnected System (SIN).

The project applies the CDM approved methodology ACM0002 – Grid-connected electricity generation from renewable sources – version 12.1.0.

Scope of verification

BME Rincão do Ivaí Energia S.A. has contracted ESPL to conduct the verification of the project "Engenheiro Ernesto Jorge Dreher and Engenheiro Henrique Kotzian SHPs VCS Project (JUN1120)" for the period from 01/01/2016 to 30/06/2019 (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 4.1;
- 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.

There are no new instances to be included at the present monitoring period.

Conclusion

ESPL has performed the verification of the VCS project “Engenheiro Ernesto Jorge Dreher and Engenheiro Henrique Kotzian SHPs VCS Project (JUN1120)”, with VCS Project ID 708, for the monitoring period from 01/01/2016 to 30/06/2019 (both days included).

During the present VCS verification, 03 CLs and 03 CARs were raised and successfully closed.

The verification team has confirmed the implementation of the grouped project as per description in the VCS-PD, the monitoring plan of the PD and the application of the monitoring methodology (ACM0002 – version 12.1.0). 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 **196,522 tCO₂e** in the above-mentioned monitoring period.

CONTENTS

1	Introduction	5
1.1	Objective	5
1.2	Scope and Criteria	5
1.3	Level of Assurance.....	5
1.4	Summary Description of the Project	5
2	Verification Process.....	9
2.1	Method and Criteria.....	9
2.2	Document Review	9
2.3	Interviews	10
2.4	Site Inspections.....	11
2.5	Resolution of Findings	11
2.6	Eligibility for Validation Activities	11
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.....	13
4.1	Project Implementation Status	13
4.2	Safeguards	13
4.3	AFOLU-Specific Safeguards	14
4.4	Accuracy of GHG Emission Reduction and Removal Calculations	14
4.5	Quality of Evidence to Determine GHG Emission Reductions and Removals	17
4.6	Non-Permanence Risk Analysis.....	17
5	Verification Conclusion.....	17
	APPENDIX I: References	20
	APPENDIX II: Abbreviations.....	21
	APPENDIX III: Findings	22
	APPENDIX IV: Competence of Team Members and Technical Reviewers.....	25

1 INTRODUCTION

1.1 Objective

BME Rincão do Ivaí Energia S.A. has contracted ESPL to conduct the verification of the 3rd verification of the project “Engenheiro Ernesto Jorge Dreher and Engenheiro Henrique Kotzian SHPs VCS Project (JUN1120)” for the period from 01/01/2016 to 30/06/2019 (both days included) according to the requirements of the Verified Carbon Standard Version 4.1.

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.

1.4 Summary Description of the Project

The project activity consists in two SHPs – SHP Engenheiro Ernesto Jorge Dreher and SHP Engenheiro Henrique Kotzian, which generate electricity avoiding power generation from fossil fuel sources. The plants are connected to the Brazilian National Interconnected System (SIN). Thus, GHG emission reduction is achieved.

The project is listed at VCS and can be accessed by the following link:

<https://registry.verra.org/app/projectDetail/VCS/708>

Some of the characteristics of the project activity are described below:

- Project Proponents: BME Rincão do Ivaí Energia S.A. and BME Capão da Convenção Energia S.A.
- Other Entities involved in the Project: Carbotrader Assessoria e Consultoria em Energia Eireli;
- Project Category: Project ($\leq 300,000$ tCO₂e/y);
- Methodology: ACM0002: Grid-connected electricity generation from renewable sources – version 12.1.0;
- Start Date: 01/07/2009 – date when the generating units (UGs 1, 2 and 3) of SHP Engenheiro Ernesto Jorge Dreher started inputting energy into the National grid;
- Crediting Period: from 01/07/2009 to 30/06/2019 – 10 years – renewable;
- Project Location:
 - o SHP Engenheiro Ernesto Jorge Dreher – Municipalities of Júlio de Castilhos and Salto Jacuí – State of Rio Grande do Sul – Brazil – geographical coordinates are: 29° 07' 13" S and 53° 22' 04" W;
 - o SHP Engenheiro Henrique Kotzian – Municipalities of Júlio de Castilhos and Salto Jacuí – State of Rio Grande do Sul – Brazil – geographical coordinates are: 29° 07' 34" S and 53° 19' 06" W.
- Technical Data:

SHP Engenheiro Ernesto Jorge Dreher		
Installed Capacity		17.95 MW
Assured capacity		12.24 MW _{avg}
PLF		68.18%
Reservoir area		0.83 km ²
Power density		21.63 W/m ²
Turbines	Turbine # 1	Serial # 2054
	Turbine # 2	Serial # 2055
	Turbine # 3	Serial # 2056
	Manufacturer	HISA
	Type	Francis
	Quantity	03
	Nominal capacity (per unit)	5,912 kW
	Turbine # 4	Serial # 1240

	Manufacturer	BEE Wirz
	Type – Model	Francis – T.B.S. 2x38/57
	Quantity	01
	Nominal capacity	315.43 kW
	Turbine # 5	Serial # KR01/11
	Manufacturer	Rischbieter
	Type – Model	Kaplan
	Quantity	01
	Nominal capacity	480 kW
Generators	Generator # 1	Serial # 1002920435
	Generator # 2	Serial # 1002284713
	Generator # 3	Serial # 1002492272
	Manufacturer	WEG
	Model / Type	Synchronous – three phase – SPD 900
	Quantity	03
	Nominal capacity (per unit)	6,350 kVA
	Power factor	0.9
	Generator # 4	Serial # 16425
	Manufacturer	Equacional
	Model / Type	Synchronous – three phase – EGT1.1.450M/12
	Quantity	01
	Nominal capacity	375 kVA
	Power factor	0.87
	Generator # 5	Serial # 1010973699
	Manufacturer	WEG
	Model / Type	HGF
	Quantity	01
	Nominal capacity	480 kW
	Power factor	0.81

SHP Engenheiro Henrique Kotzian	
Installed Capacity	13.23 MW
Assured capacity	8.67 MW _{avg}
PLF	65.53%

Reservoir area		0.66 km ²
Power density		20.05 W/m ²
Turbines	Turbine # 1	Serial # 2059
	Turbine # 2	Serial # 2057
	Turbine # 3	Serial # 2058
	Manufacturer	HISA
	Type	Francis
	Quantity	03
	Nominal capacity (per unit)	4,529 kW
Generators	Generator # 1	Serial # 1001523429
	Generator # 2	Serial # 1001901747
	Generator # 3	Serial # 1001901746
	Manufacturer	WEG
	Model	SPD900
	Model / Type	Synchronous – three phase – SPD 900
	Quantity	03
	Nominal capacity (per unit)	4,900 kVA
	Power factor	0.9

- Sustainable development contribution: the advantage of small hydropower plants is that their installation and operation do not cause impacts as a large hydroelectric plant and as run-of-river power plants, they preserve the flow upstream that is the same downstream. Several environmental programs were implemented: program to maintain the sanitary flow (ecological flow) of the river, to clean the reservoir (before filling it to prevent the proliferation of vectors), rescue of ichthyofauna and terrestrial fauna, program to recover degraded areas, riparian forests and legal reserve areas (including slope stabilization and erosion control), conservation and use of the reservoir surroundings and environmental education program; programs for monitoring water quality and monitoring the area (to avoid hunting and predatory fishing). The accomplishment with those programs is essential for the renewal of operation licenses.

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
	Name	Affiliation				
1	Fabiano Souza	BME Rincão do Ivaí Energia S.A. and BME Capão da Convenção Energia S.A. / Operation and Maintenance Supervisor	17/06/2021	Project management Virtual tour Project operations and monitoring	Remote site visit / Direct questions and evidences presentation	Sergio Cruz
2	Arthur Moraes	Carbotrader / Consultant	17/06/2021 13/07/2021	VCS aspects ER calculations	Remote site visit / Direct questions and evidences presentation	Sergio Cruz
3	Jeniffer Bosa	Electra / Commercialization Assistant	13/07/2021	Extraction of raw data of electricity generation and consumption	Call / Direct questions	Sergio Cruz
4	Julio César Vieira	Electra /Analyst of Client's Management	13/07/2021	Extraction of raw data of electricity generation and consumption	Call / Direct questions	Sergio Cruz
5	Alaís Nogueira Lauxen	BME Rincão do Ivaí Energia S.A. and BME Capão da Convenção Energia S.A. / Administrative Assistant	13/07/2021	Extraction of raw data of electricity generation and consumption	Call / Direct questions	Sergio Cruz

2.4 Site Inspections

Duration of virtual audit: -				
#	Activity performed on-site	Site location	Date	Team member
-	-	-	-	-

A site visit has not been performed for the validation of the renewal of the crediting period, as Brazil is facing the 3rd wave of COVID and is one of the epicenters of the pandemic with lockdown in several states and emergency phase in almost the entire country. Therefore, flights throughout the country are totally not recommended at the present time.

In addition, as the remote site visit was performed in 17/06/2021 for the validation of the renewal of the crediting period, which had a deadline for submission in 30/06/2021, all efforts and means from PPs and audit team were combined to also perform the present verification. In addition, in 13/07/2021, a videoconference was performed for the extraction of raw data of electricity generation and consumption to be monitored remotely checked by the verifier.

In addition, the PPs have provided evidences to show the facilities and equipment (e.g., pictures, equipment manuals and virtual tour) and PPs' representatives have been interviewed and operation personnel have provided all necessary information for a clear and precise understanding of the project activity, which has been considered sufficient by the validation 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, 03 CLs and 03 CARs were raised and successfully closed.

The list of findings and their resolution are presented at Appendices IV and V of this report.

2.5.1 Forward Action Requests

No FAR was raised.

2.6 Eligibility for Validation Activities

ESPL holds the accreditation for validation of the sectoral scope.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is also registered as a CDM project activity (Reference Number 8018 – <https://cdm.unfccc.int/Projects/DB/RWTUV1351891991.08/view?cp=1>).

During the first VCS crediting period, it was issue CDM CERs for the period from 01/01/2013 to 31/12/2015 (including both days). The information is available at: <https://cdm.unfccc.int/Projects/DB/RWTUV1351891991.08/iProcess/RINA1467367619.57/view>.

3.2 Methodology Deviations

The project activity complies with the applied methodology ACM0002 – Grid-connected electricity generation from renewable sources – version 12.1.0.

No deviations were observed.

3.3 Project Description Deviations

According to information gathered during the site visit, the verification team has confirmed that all physical features (technology, project equipment, monitoring and biomasses) of the registered VCS project activity were in place and that the project participants have been, in general, operating the project activity as per the approved VCS-PD during the monitoring period.

Nevertheless, to be in line with national standards^{14/} regarding the calibration frequency of electricity meters, from two to five years, a deviation is being requested during this monitoring period. This deviation is from 01/01/2017 onwards when the Brazilian national standard started to be applicable in Brazil and it does not negatively impact the calculation of GHG emission reductions.

3.4 Grouped Project

The project activity is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity consists in two SHPs, which generate electricity avoiding power generation from fossil fuel sources. The plants are connected to the Brazilian National Interconnected System (SIN).

As per the remote site assessment, observations, interviews and collected evidences, it was possible to assess that, in general, the project activity has been implemented as described in the 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.

In addition, the GHG emission reductions generated by the project for the present monitoring period have not become 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 validation or previous verification.

The main sustainable development contributions are that, besides the electricity generation, as small hydropower plants, the installation and operation of the plants do not cause impacts as a large hydroelectric plant, and as run-of-river power plants, they preserve the flow upstream that is the same downstream. In addition, several environmental programs were implemented: program to maintain the sanitary flow (ecological flow) of the river, to clean the reservoir (before filling it to prevent the proliferation of vectors), rescue of ichthyofauna and terrestrial fauna, program to recover degraded areas, riparian forests and legal reserve areas (including slope stabilization and erosion control), conservation and use of the reservoir surroundings and environmental education program; programs for monitoring water quality and monitoring the area (to avoid hunting and predatory fishing). The accomplishment with those programs is essential for the renewal of operation licenses.

4.2 Safeguards

4.2.1 No Net Harm

During the environmental licensing, which is a legal requirement in Brazil for the type of plants of the project activity, an environmental impact assessment was conducted. During construction phases, some impacts were identified, and

monitoring programs were designed to mitigate them, which are developed during all lifetime of the project and are essential part of renewal of operation licenses.

4.2.2 Local Stakeholder Consultation

The stakeholder consultation was correctly performed at the original validation of the project activity, in accordance with VCS rules.

In addition, social programs are periodically developed and there are open channels available for stakeholder's interaction with representatives of projects (<https://www.coprel.com.br/contato> or through the phone number # 116).

No comments/complaints have been observed during the monitoring period.

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 CDM methodology ACM0002 – Grid-connected electricity generation from renewable sources – version 12.1.0 is applied to the project activity;
- the project emissions are considered for the project activity, in accordance with the applied methodology;
- no leakage is considered for this kind of project, in accordance with the applied methodology;
- all methods and formulas used in the calculations of emission reductions have been followed in accordance with the applied methodology and monitoring plan of the validated at VCS-PD;
- all monitored data is traceable.

Fixed parameter – as per the registered VCS-PD, the only parameter fixed ex-ante is:

- EF_{Res} (Default emission factor for emission from reservoirs): 90 kgCO₂e/MWh (as per Section 3.3 of VCS-PD).

Monitored parameters:

- $EG_{Engenheiro Ernesto Jorge Dreher,y}$ (Quantity of net electricity generation supplied by the SHP Engenheiro Ernesto Jorge Dreher to the grid in year y): 327,303.79 MWh/y;
- $EG_{Engenheiro Henrique Kotzian,y}$ (Quantity of net electricity generation supplied by the SHPP Engenheiro Henrique Kotzian to the grid in year y): 260,679.87 MWh/y;

- $EF_{grid,CM,y}$ (Combined factor of margin CO₂ emission for grid-connected power generation in year y): 0.3904 tCO₂/MWh (for 2016), 0.2955 tCO₂/MWh (for 2017), 0.3380 tCO₂/MWh (for 2018) and 0.3100 tCO₂/MWh (for 2019);
- $EF_{grid,BM,y}$ (Build margin CO₂ emission factor in year y): 0.1581 tCO₂/MWh (for 2016), 0.0028 tCO₂/MWh (for 2017), 0.1370 tCO₂/MWh (for 2018) and 0.1020 tCO₂/MWh (for 2019);
- $EF_{grid,OM-DD,y}$ (CO₂ Operating Margin emission factor of the grid, in a year y): 0.6228 tCO₂/MWh (for 2016), 0.5882 tCO₂/MWh (for 2017), 0.5390 tCO₂/MWh (for 2018) and 0.5181 tCO₂/MWh (for 2019);
- CAP_{PJ} – Ernesto Jorge Dreher SHP (Installed capacity of SHP Henrique Kotzian after the implementation of the project activity): 17,950,000 W;
- CAP_{PJ} – Henrique Kotzian SHP (Installed capacity of SHP Henrique Kotzian after the implementation of the project activity): 13,230,000 W;
- AP_J – Ernesto Jorge Dreher SHP (Area of the single or multiple reservoirs measured in the water surface, after the implementation of the project activity, when the reservoir is full): 830,000 m²;
- AP_J – Henrique Kotzian SHP (Area of the single or multiple reservoirs measured in the water surface, after the implementation of the project activity, when the reservoir is full): 660,000 m².

The parameters $TEG_{Engenheiro Ernesto Jorge Dreher,y}$ and $TEG_{Engenheiro Henrique Kotzian,y}$ were not used during the present as the power densities of both plants are higher than 10 W/m².

It is important to note that calibration certificates for the entire monitoring period were presented to the verification team. No delayed calibrations have been observed.

The monthly aggregated values of monitored electricity generation and consumption of the entire period were crosschecked with public data from CCEE (Infomercado). The lower values among electricity meters and CCEE were used in the calculations.

The emission reduction spreadsheet is transparent, traceable and correct, with no manual transposition errors.

Baseline emissions (BE_y)

The 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 CDM project activity in year y ;
$EF_{grid,CM,y}$	Combined margin CO_2 emission factor for grid connected power generation in year y , calculated using the latest version of the "Tool to calculate the emission factor for an electricity system".

So, **$BE_y = 196,522 \text{ tCO}_2\text{e}$** .

Project emissions (PE_y)

As per ACM0002, project emissions are calculated the power density of the single or multiple reservoirs (PD) is higher than 4W/m^2 and lower than or equal to 10W/m^2

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

PD	Power density of the project activity;
Cap_{PJ}	Installed capacity of the hydro power plant after the implementation of the project activity;
Cap_{BL}	Installed capacity of the hydro power plant before the implementation of the project activity;
A_{PJ}	Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full;
A_{BL}	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full.

For SHP Engenheiro Ernesto Jorge Dreher, $PD = 21.63 \text{ W/m}^2$ and for SHP Engenheiro Henrique Kotzian, $PD = 20.05 \text{ W/m}^2$.

Thus, as the power densities of both plants are higher than 10 W/m^2 , project emissions of the project activity are zero. So, **$PE_y = 0 \text{ tCO}_2\text{e}$** .

Leakage emissions (LE_y)

No leakage is considered for this kind of project. Thus, **$LE_y = 0 \text{ tCO}_2\text{e}$** .

Emission Reductions (ER_y)

Therefore, according to the applied methodology, as PE_y and $LE_y = 0 \text{ tCO}_2\text{e}$, $ER_y = BE_y$.

Thus, $ER_y = BE_y$. So, **$ER_y = 196,522 \text{ tCO}_2\text{e}$** .

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

- records were submitted by the project proponent as evidences to determine emission reduction;
- the records, data and information provided were found valid for the current verification period. The documents were verified during site visit and when possible, were checked directly from its source;
- interviews were performed during site visit with involved personnel and PP's representatives;
- 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.

4.6 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION CONCLUSION

ESPL, contracted by BME Rincão do Ivaí Energia S.A., has performed the independent verification of the emission reductions of the VCS project "Engenheiro Ernesto Jorge Dreher and Engenheiro Henrique Kotzian SHPs VCS Project (JUN1120)", with VCS Project ID 708, for the monitoring period 01/01/2016 to 30/06/2019 (both days included).

Carbotrader Assessoria e Consultoria em Energia Eireli 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 –version 12.1.0 and the monitoring plan contained in the VCS-PD – version 03 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:

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

In our opinion, the GHG emissions reductions reported for the project activity for the period from 01/01/2016 to 30/06/2019 (including both days) 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 ACM0002 –version 12.1.0 and the monitoring plan contained in the VCS-PD.

Therefore, ESPL can certify that the emission reductions from the VCS project “Engenheiro Ernesto Jorge Dreher and Engenheiro Henrique Kotzian SHPs VCS Project (JUN1120)” as follows:

Verification period: From 01-January-2016 to 30-June-2019 (including both days).

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)
2016	55,518	0	0	55,518
2017	45,942	0	0	45,942
2018	61,109	0	0	61,109
2019	33,953	0	0	33,953
Total	196,522	0	0	196,522

Approved by

Dr. Kaviraj Singh



Managing Director

Earthood Services Privated Limited

Date: 06-09-2021

Place: Gurugram, Haryana

APPENDIX I: references

#	Title	References
1	VCS Standard	version 4.1
2	Project design document	version 03 – April/2011
3	Monitoring Report – draft / revised	version 1 – 21/06/2021 version 2.1 – 29/07/2021
4	Monitoring Report – final	version 2.2 – 26/08/2021
5	ER Spreadsheet – draft / revised	version 1 version 2
6	ER Spreadsheet – final	version 2.2
7	<u>Methodology</u> ACM0002: Grid-connected electricity generation from renewable sources	version 12.1.0
8	<u>Methodological tool</u> TOOL07: Tool to calculate the emission factor for an electricity system	version 02
9	<u>Environmental licenses</u> - SHP Engenheiro Ernesto Jorge Dreher o LO # 01058 / 2019 – valid until 05/02/2024 - SHP Engenheiro Henrique Kotzian o AUTGER # 00206 / 2019 – valid until 03/09/2020 o Renewal Protocol # 1343 / 2019-DL	19/02/2019 02/09/2019 30/06/2020
10	<u>Starting date of Commercial operation</u> - SHP Engenheiro Ernesto Jorge Dreher: Dispatch # 3756 - SHP Engenheiro Henrique Kotzian: Dispatch # 1063	02/10/2009 04/03/2011
11	<u>Pictures (nameplates) and Virtual tour</u> - SHP Engenheiro Ernesto Jorge Dreher - SHP Engenheiro Henrique Kotzian	17/06/2021 17/06/2021
12	Electricity generation and consumption	2016, 2017, 2018 and 2019
13	<u>Calibration Certificates</u> - Serial # 90011045 o Certificate # 2015/303 – Prolux – valid until 07/04/2017 o Certificate # 048/2017 – 3C Services – valid until 14/03/2022 - Serial # 90011046	08/04/2015 15/03/2017 08/04/2015

	- o Certificate # 2015/304 – Prolux – valid until 07/04/2017 - o Certificate # 049/2017 – 3C Services – valid until 14/03/2022 - Serial # 90011049 - o Certificate # 2015/301 – Prolux – valid until 07/04/2017 - o Certificate # 046/2017 – 3C Services – valid until 14/03/2022 - Serial # 90011050 - o Certificate # 2015/302 – Prolux – valid until 07/04/2017 - o Certificate # 047/2017 – 3C Services – valid until 14/03/2022	15/03/2017 08/04/2015 15/03/2017 08/04/2015 15/03/2017
14	CCEE (Infomercado)	https://www.ccee.org.br
15	Submodule 12.3 – calibration frequency changed from 2 to 5 years – ONS	http://www.ons.org.br/%2FProcedimentosDeRede%2FM%C3%B3dulo%2012%2FSubm%C3%B3dulo%2012.3%2FSubm%C3%B3dulo%2012.3%202016.12.pdf
16	Emission Factor – accessed on 27/07/2021	http://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.html
17	DNA of Brazil	mctic.gov.br
18	IPCC publications	www.ipcc-nggip.iges.or.jp
19	UNFCCC	http://cdm.unfccc.int
20	VCS	https://verra.org/

APPENDIX II: ABBREVIATIONS

Abbreviations	Full texts
ACM	Approved Consolidated Methodology
BE	Baseline Emission
BM	Build Margin
CAR	Corrective Action Request
CCEE	Chamber of Commercialization of Electric Energy
CDM	Clean Development Mechanism
CL	Clarification Request
CM	Combined Margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CP	Crediting Period
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
FEPAM	Environmental Agency of the State of Rio Grande do Sul
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
kW	kilo Watt
MP	Monitoring Plan
MR	Monitoring Report
MW	Mega Watt
OM	Operating Margin
ONS	National Operator of the Electric System
PE	Project Emission
PLF	Plant Load Factor
SIN	Brazilian Interconnected Electricity System
SHP	Small Hydropower Plant
tCO ₂ e	Tons of Carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VVB	Validation and Verification Body
VCS-PD	VCS Project Design

APPENDIX III: FINDINGS

CL from this verification

CL ID	01	Section no.	1.1.3	Date: 22/07/2021
Description of CL				
It is not clear the statement on Section 2.2 if there was any kind of complaints, suggestions and/or comment during the present monitoring period.				
Project participant response				Date: 29/07/2021
The section 2.2 was revised accordingly. Focusing the main channels opened for stakeholders and if comments received or not.				
DOE assessment				Date: 31/07/2021
It is now clear that there were no complaints, suggestions and/or comment during the present monitoring period. CL is closed				

CL ID	02	Section no.	4.3	Date: 22/07/2021
Description of CL				
At Section 4.2 – parameters $EG_{Engenheiro\ Ernesto\ Jorge\ Dreher,y}$; $EG_{Engenheiro\ Henrique\ Kotzian,y}$ and $EG_{Total\ (Engenheiro\ Ernesto\ Jorge\ Dreher/Henrique\ Kotzian),y}$, it is missing the information about the meters used for the monitoring and their calibrations. In addition, it is not clear if all meters have been calibrated in accordance with registered monitoring plan, as just calibration certificates dated on 08 and 09/04/2015 have been presented to the verification team. Nevertheless, no calibration errors have been applied in the ERs calculations for the entire monitoring period.				
Project participant response				Date: 29/07/2021
The information about the meters used for the monitoring and calibration was included in the section 4.2. Also, the calibration certificates are being provided to the VVB.				
DOE assessment				Date: 31/07/2021
All calibration certificates were presented and cover the monitoring period in accordance with deviation requested. Refer to Section 3.3 above. CL is closed				

CL ID	03	Section no.	4.3	Date: 22/07/2021
Description of CL				
At Section 4.3, the information given about calibration frequency is not clear, as is not in accordance with registered monitoring plan and it is based on the Brazilian national standard valid from 01/01/2017.				
Project participant response				Date: 29/07/2021

Since the credit period covered by this MR is for 2016 to 2019 years only, the new ONS standard apply after 01/01/2017. So, the section 4.3 was adjusted accordingly (prior ONS procedure module 12 sub-module 12.2 calibration each 2 years and ONS sub-module 12.3 item 5.1.2.2 calibration each 5 years).

DOE assessment	Date: 31/07/2021
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The information given about calibration frequency is divided in two periods: the first one considering the calibration frequency of 2 years and from 01/01/2017, when the national standards changed the calibration frequency to 5 years. For this change, a project deviation is being requested.

CL is closed

CAR from this verification

CAR ID	01	Section no.	4.3	Date: 22/07/2021
Description of CAR				
There are fixed parameters presented at Section 4.1 of the MR, that are not part of the registered monitoring plan.				
Project participant response				Date: 29/07/2021
The section 4.1 was adjusted accordingly. Excluded the not related fixed parameters.				
DOE assessment				Date: 31/07/2021
The parameters listed in Section 4.1 of the MR are now in accordance with monitoring plan of the registered VCS-PD.				
CAR is closed				

CAR ID	02	Section no.	4.3	Date: 22/07/2021
Description of CAR				
Not all parameters of the registered PD that are necessary for the monitoring of the project activity have been presented at Section 4.2 of the MR.				
Project participant response				Date: 29/07/2021
The section 4.2 was adjusted accordingly. Included information about TEGy parameters.				
DOE assessment				Date: 31/07/2021
The parameters listed in Section 4.2 of the MR are now in accordance with monitoring plan of the registered VCS-PD.				
CAR is closed				

CAR ID	03	Section no.	4.3	Date: 22/07/2021
Description of CAR				
At the Excel, the values calculated of:				
a. Infomercado for both plants of 2019 are not correct as they are considering 182.5 days, instead of 181 days;				
b. EG _y for SHP Henrique Kotzian for 2017.				

Project participant response	Date: 29/07/2021
The excel values were adjusted accordingly.	
DOE assessment	Date: 31/07/2021
The values were properly revised and are considering the correct period and in accordance with evidences presented to the verification team. CAR is closed	

FAR from this verification

Not applicable

APPENDIX IV: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

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

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