




**Verification and certification report form for  
CDM project activities  
(Version 04.0)**

*Complete this form in accordance with the instructions attached at the end of this form.*

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the project activity</b>	SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL UNFCCC Ref. Number 8500		
<b>Scale of the project activity</b>	<input type="checkbox"/> Large-scale <input checked="" type="checkbox"/> Small-scale		
<b>Version number of the verification and certification report</b>	1.1Aa		
<b>Completion date of the verification and certification report</b>	05/10/2021		
<b>Monitoring period number and duration of this monitoring period</b>	1 <sup>st</sup> monitoring period; 01/02/2013 to 31/01/2020		
<b>Version number of the monitoring report to which this report applies</b>	2		
<b>Crediting period of the project activity corresponding to this monitoring period</b>	Renewable – 7 years (renewal no longer possible) From 01/02/2013 to 31/01/2020		
<b>Project participants</b>	Itaguaçu Energia S/A CarbotraderAssessoria e Consultoria em Energia Eireli		
<b>Host Party</b>	Brazil		
<b>Applied methodologies and standardized baselines</b>	AMS-I.D: Grid connected renewable electricity generation, version 17		
<b>Mandatory sectoral scopes</b>	Sectoral Scope: 1 - Energy industries (renewable - / non-renewable sources)		
<b>Conditional sectoral scopes, if applicable</b>	N/A		
<b>Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD</b>	103,725 tCO <sub>2</sub> e (adjusted to the monitoring period)		
<b>Certified amount of GHG emission reductions or GHG removals for this monitoring period</b>	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
	-	184,364 tCO <sub>2</sub> e	-
<b>Name and UNFCCC reference number of the DOE</b>	RINA Services S.p.A. (RINA), UNFCCC reference number of the DOE E-0037		
<b>Name, position and signature of the approver of the verification and certification report</b>	<b>Laura Severino</b> Head of Sustainability Compliance & New Scheme Development Coordination 		

## SECTION A. Executive summary

### General description and purpose of the project activity

The project activity consists of a small hydro power plant operating with Francis turbines for generation of electricity which partly displaces electricity generation based on fossil fuels in the Brazilian Interconnected System (SIN). The project is located at Pitanga municipality in Paraná State, Brazil.

The project has a total installed capacity of 14.22 MW consisting of two sets of 7.324 MW.

The project started test operation on 23/07/2013 and commercial operation on 21/08/2013 /20/.

The GHG emission reductions were calculated on the basis of the monitoring methodology AMS-I.D – Grid connected renewable electricity generation, version 17 of 03/06/2011 /9/ and the monitoring plan included in the registered Project Design Document, version 2 of 20/08/2012 /3/.

The project was validated by Incontec (validation report No. CDM-VAL12-015-00 issued on 06/09/2012) /4/ and was registered on 11/02/2013 under the CDM registration reference number 8500.

### Scope of verification

Itaguaçu Energia S/A has commissioned RINA to carry out the verification and certification of emission reductions reported for the CDM project activity 8500 “SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL” in Brazil (the project) for the period from 01/02/2013 to 31/01/2020. This report contains the findings from the verification and a certification statement for the certified emission reductions.

Verification is the periodic independent review and *ex-post* determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The scope of the verification is to verify that:

- The project activity has been implemented and operated in accordance with the registered PDD or any approved revised PDD;
- The actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- The GHG emission reduction data and calculation have been assessed to correctly support the emission reductions being claimed and that the reported GHG emission reduction data is free from material misstatement;
- To verify that reported GHG emission data is sufficient supported by evidence.

The verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable UNFCCC criteria for CDM in order to be certified.

### Verification process

Verification was conducted using RINA procedures in line with the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB

The verification consisted in the following three phases:

- Desk review;
- On-site assessment;
- issuance of verification findings;
- The resolution of outstanding issues and the issuance of the final verification report and certification.
- Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

### Conclusion

RINA Services S.p.A. (RINA), commissioned by Itaguaçu Energia S/A, verified the greenhouse gas emission reductions reported for the project activity “SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL” in Brazil, CDM Registration Reference N° 8500, for the period 01/02/2013 to 31/01/2020, with regard to the relevant requirements for CDM activities. In conclusion, it is RINA's opinion that the project activity “SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL”, in Brazil, as described in the Monitoring Report version 2 of 17/09/2021, meets all relevant requirements for CDM activities and all relevant host Party criteria and correctly applies the baseline and monitoring AMS-I.D – Grid connected renewable electricity generation, version 17. In our opinion the GHG emission reductions reported for the project in the monitoring report are fairly stated.

**SECTION B. Verification team, technical reviewer and approver****B.1. Verification team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader/ Verifier/ Technical Expert TA 1.1, 13.1	E R	Leiroz	Andrea	RINA Brazil	x	-	x	x

**B.2. Technical reviewer and approver of the verification and certification report**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Principe Branco Saettoni	Geisa Maria	RINA BRASIL
2.	Approver	IR	Severino	Laura	RINA Head Office

**SECTION C. Application of materiality****C.1. Consideration of materiality in planning the verification**

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	The qualification and capability of the human resources	L	Personnel qualified to monitor the project activity. Procedure available.	Interview personnel during the remote audit.
2	Raw data collection, transfer and storage process	H	Data is automatically measured and transferred manually to the CERs calculation spreadsheet. Errors in the data transference have direct impact in the CERs calculation.	Check all the input for monitored parameters. Check raw data to confirm the correct data transference.
3	Measuring and recording method	L	Data is measured and recorded automatically.	Check all input for monitored parameters. Cross checked raw data.
4	Calibration records for monitoring equipment	L	Calibration is conducted.	Check calibration certificates. Confirm if calibrations were conducted by Accredited persons/companies.
5	Metering records	L	Check the meters.	Check all the inputs for monitored parameters. Verify installed equipment's and its accuracy.

## C.2. Consideration of materiality in conducting the verification

In accordance with CDM VVS for project activities – paragraph 326 /5/, the threshold applied activity is (d) 5.0% of the emission reductions or removals for small-scale project activities.

A remote site inspection has been performed on 13/09/2021 and it is confirmed that the monitoring arrangements in the monitoring plan are feasible within the project design. The monitoring is based only on data measured. The CERs calculation /2/ is based only in data obtained through the monitoring. The data presented in the monitoring report /1/ were assessed by reviewing in detail project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. Verified during the remote site visit, that the roles and responsibilities are in accordance with the registered PDD. Therefore, it is RINA's opinion that the claimed emission reductions are free from material errors, omissions or misstatements, with reasonable level of assurance.

## SECTION D. Means of verification

### D.1. Desk/document review

In addition to the monitoring report /1/ (version 2 dated 17/09/2021 and previous version), RINA reviewed:

- The PDD for the project activity (version 2 of 20/08/2012) /3/;
- Baseline and monitoring methodology AMS-I.D, version 17 /9/;
- The validation report, Report No. CDM-VAL12-015-00, dated 06/09/2012 /4/.

Besides the above mentioned documents, RINA also assessed other additional documents that were required to assess the accuracy of the emission reduction calculations presented in the monitoring report /2/, /12/ – /22/. The monitoring report version 1 of 28/06/2021 /1/ was made publicly available on the CDM UNFCCC website on 09/08/2021. The Appendix 3 lists the documents that was reviewed during the verification.

### D.2. On-site inspection

Duration of on-site inspection: 13/09/2021 (remote audit)				
No.	Activity performed on-site	Site location	Date	Team member
1.	Implementation and operation of the proposed project activity. Checked the monitoring equipment, interviewed key personnel of the plant to confirm the operational and data collection procedures, cross-checked between information provided in the monitoring report and data plant.	Itaguaçu SHP / Pitanga substation (check energy meters-net energy)	13/09/2021	Andrea Leiroz
2.	Reviewed the information flows for generating, aggregating and reporting the monitoring parameters.	Itaguaçu SHP	13/09/2021	Andrea Leiroz
3.	Checked calibration performance, reviewed calculations and assumptions made in determining the GHG data and emission reductions.	Itaguaçu SHP	13/09/2021	Andrea Leiroz
4.	Checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.	Itaguaçu SHP	13/09/2021	Andrea Leiroz
5.	Cross-checked between information Maracanã SHP provided in the monitoring report and data evidence.	Itaguaçu SHP	13/09/2021	Andrea Leiroz

A complete desk review of the submitted MR (version 1) /1/ and supportive evidences have been checked by the Verification Team.

In addition, audit team has conducted a remote site inspection via videoconference (Google Meet) with PP on different topics as mentioned under section D.3 of this report.

Based on the videoconference, MR review, as the review of UNFCCC procedures and guidelines, RINA Verification team has proceeded to skip the presential site visit due to the COVID-19 pandemic /18/. As per para 339 of CDM Validation and Verification Standard for project activities version 02.0 /5/, Verification team

has used the following alternative means for its assessment and to justify that they are sufficient for the purpose of verification.

- By review of MR;
- By taking follow up actions by conducted interview with PP, to gather information about knowledge of project design, current situation via videoconference. Cross-checked evaluation under the scope of all information and references provided in MD. Details of interviewees, topics covered and additional information presented in the below section “C.3 – Interviews”.

Verification team has also checked the site visit requirements mentioned in the VVS for Project Activity version 02.0 /5/. The justification for the remote site visit requirements of VVS PA version 02.0 /5/ have been mentioned below.

VVS PA version 02.0 requirements	Verification team justification
<p>Para 338 (b)</p> <p>(b) On-site inspection taking into account paragraphs 339–341 below, involving:</p> <ul style="list-style-type: none"> <li>(i) An assessment of the implementation and operation of the registered CDM project activity as per the registered PDD or any approved revised PDD;</li> <li>(ii) A review of information flows for generating, aggregating and reporting the monitoring parameters;</li> <li>(iii) Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the registered monitoring plan;</li> <li>(iv) Cross checks between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;</li> <li>(v) A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD, the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents;</li> <li>(vi) A review of calculations and assumptions made in determining the GHG data and GHG emission reductions or net anthropogenic GHG removals;</li> <li>(vii) An identification of quality control and quality assurance procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters.</li> </ul>	<p>Verification team has done the follow-up actions by:</p> <ol style="list-style-type: none"> <li>1. Teleconference with PP. Google Meet and WhatsApp were used with the video camera function. PP walk in the plant so that the verification team was able to check the installed equipment.</li> <li>2. Data for the net energy delivered to the grid are from the energy meters and it possible to cross check with third part evidences (CCEE public report – Infomercado /13/ and data downloaded during the remote onsite visit /17/).</li> <li>3. PP presented during the videoconference all documents related to monitoring and equipment calibration.</li> <li>4. The calculations and assumptions made in determining the CERs were reviewed and discussed with PP by videoconference.</li> </ol>
<p>Para 339</p> <p>It is mandatory for the DOE to conduct an on- site inspection at verification for the registered CDM project activity if:</p> <ul style="list-style-type: none"> <li>(a) It is the first verification for the DOE with regard to this project activity;</li> <li>(b) More than three years have elapsed since the last on-site inspection conducted for verification for the project activity; or</li> <li>(c) The project activity has achieved more than 300,000 tCO<sub>2</sub>eq of GHG emission reductions or net anthropogenic GHG removals since the last verification when an on-site inspection was conducted.</li> </ul>	<p>This is the first verification for RINA with regard to this project activity and it is the first verification for the project activity and the project activity has achieved less than 300,000 tCO<sub>2</sub>eq of GHG emission reductions. However, the presential site visit was not conducted due to the COVID-19 pandemic. The site visit cannot be postponed since a delay on performing the mandatory on-site visit for the project activity 8500 will impact on a delay in CERs negotiation /23/.</p>

**D.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Moraes	Arthur	Consultor - Carbotrader	13/09/2021	Project implementation, management, operation and monitoring, calibration requirements, environmental aspects, project monitoring and data analysis, energy registers CERs calculation.	Andrea Leiroz
2.	Maciel de Almeida	Adilson	O&M supervisor - Itaguaçu Energia			
3.	Maximovitz Neto	Alexandre	Consultor - AMEW			
4.	Waghetti Santos	Erick	Consultor - AMEW			

**D.4. Sampling approach**

Not applicable.

**D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised**

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	-	01	-
Compliance of the project implementation and operation with the registered PDD	-	-	-
Post-registration changes	-	-	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	-	01	-
Compliance of monitoring activities with the registered monitoring plan	01	01	-
Compliance with the calibration frequency requirements for measuring instruments	-	01	-
Assessment of data and calculation of emission reductions or net removals	01	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
<b>Total</b>	<b>02</b>	<b>04</b>	<b>-</b>

**SECTION E. Verification findings****E.1. Compliance of the monitoring report with the monitoring report form**

<b>Means of verification</b>	The monitoring report /1/ submitted by the PP has been the basis for starting the verification process. RINA confirms that the Monitoring report is based on the currently valid MR template (version 08.0) and "Instructions for completing the monitoring report form" /8/.
<b>Findings</b>	CAR 01 was raised and successfully closed. Refer to Appendix 4 for further details.
<b>Conclusion</b>	RINA verified that the monitoring report is based on the currently valid MR template (version 08.0) and complies "Instructions for completing the monitoring report form" /8/.

**E.2. Remaining forward action requests from validation and/or previous verifications**

This is the first verification. There are no FARs from validation /4/.

**E.3. Compliance of the project implementation and operation with the registered project design document**

<b>Means of verification</b>	<p>During the remote site visit, RINA checked the implementation status of the project activity as well as the monitoring equipment. The interview with personnel were done by videoconference.</p> <p>The project activity consists a small hydro power plant with a total installed capacity of 14.22 MW.</p> <p>The main equipment used at the project activity is given below:</p> <ul style="list-style-type: none"> <li>• 02 Francis turbines manufactured by Semi Industrial Ltda with installed capacity of 7.324 MW each one – serial numbers 1233/12-025 and 1233/12-026.</li> <li>• 02 group generators manufacturer by GE, model 271R767, with installed capacity of 7900 KVA (cos <math>\phi</math> 0.9) each one – serial numbers DFH 227001735 and EFH 227001736.</li> <li>• Two electricity meters manufactured by Landis + Gyr – model Saga1000– serial number 1112132 (main) and serial number 1112133 (backup).</li> </ul> <p>The project started test operation on 23/07/2013 and commercial operation on 21/08/2013 /20/.</p> <p>The Operational License /19/ issued by the Paraná Environmental Institute were assessed by RINA. Therefore, it was confirmed that the project activity has operated in accordance to the requirements of the environmental legislation in the host country.</p> <p>Verified during the remote audit that technology, project equipment and monitoring and metering equipment is implemented and operational in accordance with the registered PDD /3/.</p> <p>The project location described in the PDD was cross checked through Google Earth.</p>
<b>Findings</b>	N/A
<b>Conclusion</b>	It is RINA's opinion, based on the remote site visit, that the technology, project equipment and monitoring and metering equipment is implemented and operational in accordance with the revised registered PDD /3/.

**E.4. Post-registration changes****E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents<sup>1</sup>**

Not applicable.

**E.4.2. Corrections**

Not applicable.

**E.4.3. Changes to the start date of the crediting period**

Not applicable.

<sup>1</sup> Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

**E.4.4. Inclusion of a monitoring plan**

Not applicable

**E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents**

Not applicable.

**E.4.6. Changes to the project design**

Not applicable.

**E.4.7. Changes specific to afforestation and reforestation project activities**

Not applicable.

**E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents**

<b>Means of verification</b>	The project applies the approved small-scale methodology AMS-I.D – Grid connected renewable electricity generation, version 17 /9/. The registered PDD /3/ also refers to the following tools: <ul style="list-style-type: none"> <li>• TOOL07 Methodological tool: Tool to calculate the emission factor for an electricity system (Version 02.2.1) /10/.</li> </ul> The monitoring plan of the approved PDD /3/ was reviewed against the monitoring requirements of the applied methodology and applicable tools.
<b>Findings</b>	CAR 02 was raised and successfully closed. Refer to Appendix 4 for further details.
<b>Conclusion</b>	RINA is able to confirm that the monitoring plan contained in the PDD (version 2 of 20/08/2012) /3/ is in accordance with the approved methodology applied by the project activity, i.e. AMS-I.D (version 17) /9/ including the applicable tool /10/.

**E.6. Compliance of monitoring activities with the registered monitoring plan****E.6.1. Data and parameters fixed ex ante or at renewal of crediting period**

<b>Means of verification</b>	The parameters were available at the validation stage, which do not need to monitor during the crediting period, as per the registered PDD version 2 of 20/08/2012 /3/. <ul style="list-style-type: none"> <li>• CapItaguacu,y – SHP installed Power after the implementation of the project activity. This value is 14.22 MW for the plant as described in the registered PDD /3/;</li> <li>• Altaguacu,y – Area of the reservoir measured in the water surface, after the implementation of the project activity, when the reservoir is full. This value is 340,000 m<sup>2</sup> as described in the registered PDD /3/.</li> </ul>
<b>Findings</b>	N/A
<b>Conclusion</b>	RINA confirms that the parameters listed above are fixed ex-ante and used for the baseline and project emissions calculation in accordance with the applied methodology /9/ and methodology tool /10/ and they are the same used at the validation stage /4/ in accordance with the registered PDD /3/.

**E.6.2. Data and parameters monitored**

<b>Means of verification</b>	The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD of 20/08/2012 /3/. The below tables describe for each parameter, which is to be measured according to the monitoring plan, how RINA has verified that i) the actual monitoring complies
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with the monitoring plan and that ii) data have been assessed to correctly support the emission reductions being claimed.

	Assessment/ Observation																		
Data / Parameter: (as in monitoring plan):	EF <sub>grid,CM,y</sub> – CO <sub>2</sub> emission factor of the grid electricity in year y																		
Source of data to be used:	Data provided by the Brazilian DNA /12/.																		
Value(s) of monitored parameter:	RINA cross checked the values. Presented in the CERs spreadsheet /2/ are in accordance values provided by the Brazilian DNA /12/.																		
	<table border="1"> <thead> <tr> <th>Year</th> <th>CM (tCO<sub>2</sub> / MWh)</th> </tr> </thead> <tbody> <tr> <td>2013</td> <td>0.4316</td> </tr> <tr> <td>2014</td> <td>0.4400</td> </tr> <tr> <td>2015</td> <td>0.4075</td> </tr> <tr> <td>2016</td> <td>0.3904</td> </tr> <tr> <td>2017</td> <td>0.2955</td> </tr> <tr> <td>2018</td> <td>0.3380</td> </tr> <tr> <td>2019</td> <td>0.3100</td> </tr> <tr> <td>2020</td> <td>0.3303</td> </tr> </tbody> </table>	Year	CM (tCO <sub>2</sub> / MWh)	2013	0.4316	2014	0.4400	2015	0.4075	2016	0.3904	2017	0.2955	2018	0.3380	2019	0.3100	2020	0.3303
Year	CM (tCO <sub>2</sub> / MWh)																		
2013	0.4316																		
2014	0.4400																		
2015	0.4075																		
2016	0.3904																		
2017	0.2955																		
2018	0.3380																		
2019	0.3100																		
2020	0.3303																		
Measuring / Reading / Recording frequency:	Annually.																		
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.																		
Type of monitoring equipment:	N/A																		
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A																		
How were the values in the monitoring report verified? If applicable, has the reported data been cross-checked with other available data?	Data in the monitoring report was cross checked against the Brazilian DNA website /12/.																		
Calculation method (if applicable):	Calculated as the weighted average ( $w_{OM} = 0.5$ and $w_{BM} = 0.5$ ) of the dispatch data analysis Operating Margin (OM) and Build Margin (BM) from the Brazilian DNA /12/.																		

	Assessment/ Observation		
Data / Parameter: (as in monitoring plan):	EF <sub>grid,OM,y</sub> – CO <sub>2</sub> Operating margin emission factor of the grid, in a year y		
Source of data to be used:	Data provided by the Brazilian DNA /12/.		
Value(s) of monitored parameter:	RINA cross checked the values. Presented in the CERs spreadsheet /2/ are in accordance values provided by the Brazilian DNA /12/.		
	<table border="1"> <thead> <tr> <th>Year</th> <th>OM (tCO<sub>2</sub> / MWh)</th> </tr> </thead> <tbody> </tbody> </table>	Year	OM (tCO <sub>2</sub> / MWh)
Year	OM (tCO <sub>2</sub> / MWh)		

		<table border="1"> <tr><td>2013</td><td>0.5919</td></tr> <tr><td>2014</td><td>0.5837</td></tr> <tr><td>2015</td><td>0.5597</td></tr> <tr><td>2016</td><td>0.6228</td></tr> <tr><td>2017</td><td>0.5882</td></tr> <tr><td>2018</td><td>0.5390</td></tr> <tr><td>2019</td><td>0.5181</td></tr> <tr><td>2020</td><td>0.5627</td></tr> </table>	2013	0.5919	2014	0.5837	2015	0.5597	2016	0.6228	2017	0.5882	2018	0.5390	2019	0.5181	2020	0.5627	
	2013	0.5919																	
	2014	0.5837																	
	2015	0.5597																	
	2016	0.6228																	
	2017	0.5882																	
	2018	0.5390																	
	2019	0.5181																	
	2020	0.5627																	
	Measuring / Reading / Recording frequency:	Annually.																	
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.																		
Type of monitoring equipment:	N/A																		
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A																		
How were the values in the monitoring report verified? If applicable, has the reported data been cross-checked with other available data?	Data in the monitoring report was cross checked against the Brazilian DNA website /12/.																		
Calculation method (if applicable):	N/A																		
	Assessment/ Observation																		
Data / Parameter: (as in monitoring plan):	EF <sub>grid,BM,y</sub> – CO <sub>2</sub> Build margin emission factor of the grid, in year y																		
Source of data to be used:	Data provided by the Brazilian DNA /12/.																		
Value(s) of monitored parameter:	RINA cross checked the values. Presented in the CERs spreadsheet /2/ are in accordance values provided by the Brazilian DNA /12/. <table border="1"> <tr> <th>Year</th> <th>BM (tCO<sub>2</sub> / MWh)</th> </tr> <tr><td>2013</td><td>0.2713</td></tr> <tr><td>2014</td><td>0.2963</td></tr> <tr><td>2015</td><td>0.2553</td></tr> <tr><td>2016</td><td>0.1581</td></tr> <tr><td>2017</td><td>0.0028</td></tr> <tr><td>2018</td><td>0.1370</td></tr> <tr><td>2019</td><td>0.1020</td></tr> <tr><td>2020</td><td>0.0979</td></tr> </table>	Year	BM (tCO <sub>2</sub> / MWh)	2013	0.2713	2014	0.2963	2015	0.2553	2016	0.1581	2017	0.0028	2018	0.1370	2019	0.1020	2020	0.0979
Year	BM (tCO <sub>2</sub> / MWh)																		
2013	0.2713																		
2014	0.2963																		
2015	0.2553																		
2016	0.1581																		
2017	0.0028																		
2018	0.1370																		
2019	0.1020																		
2020	0.0979																		
Measuring / Reading / Recording frequency:	Annually.																		
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.																		

	Type of monitoring equipment:	N/A																		
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A																		
	How were the values in the monitoring report verified? If applicable, has the reported data been cross-checked with other available data?	Data in the monitoring report was cross checked against the Brazilian DNA website /12/.																		
	Calculation method (if applicable):	N/A																		
		Assessment/ Observation																		
	Data / Parameter: (as in monitoring plan):	EG <sub>Itaguaçu,y</sub> – net electricity delivered to the grid in year y																		
	Source of data to be used:	Electricity meter at output of substation.																		
	Value(s) of monitored parameter:	<table border="1"> <thead> <tr> <th></th> <th>EG<sub>Itaguaçu,y</sub> (MWh)</th> </tr> </thead> <tbody> <tr> <td>2013</td> <td>21,894.02</td> </tr> <tr> <td>2014</td> <td>77,734.04</td> </tr> <tr> <td>2015</td> <td>97,320.29</td> </tr> <tr> <td>2016</td> <td>95,575.15</td> </tr> <tr> <td>2017</td> <td>78,462.68</td> </tr> <tr> <td>2018</td> <td>60,577.52</td> </tr> <tr> <td>2019</td> <td>56,998.55</td> </tr> <tr> <td>2020</td> <td>7,304.65</td> </tr> </tbody> </table>		EG <sub>Itaguaçu,y</sub> (MWh)	2013	21,894.02	2014	77,734.04	2015	97,320.29	2016	95,575.15	2017	78,462.68	2018	60,577.52	2019	56,998.55	2020	7,304.65
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2017	78,462.68																			
2018	60,577.52																			
2019	56,998.55																			
2020	7,304.65																			
Measuring / Reading / Recording frequency:	Continuously measured and monthly recorded.																			
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes.																			
Type of monitoring equipment:	Bidirectional electricity meters manufactured by Landis + Gyr, model Saga 1000, accuracy class 0.2% /16/. <ul style="list-style-type: none"> <li>Serial number # 1112132 (main);</li> <li>Serial number # 1112133 (backup).</li> </ul>																			
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The accuracy of the electricity meter is in accordance with national standards /21/ /22/ and as per manufacturer's specification /16/.																			
How were the values in the monitoring report verified? If applicable, has the reported data been cross-checked with other available data?	Data from CERs spreadsheet have been cross checked against CCEE's official data of the electricity delivered to the grid downloaded during the remote onsite inspection /17/. PP has also provided data from InfoMercado report (CCEE)* /13/ to cross check data. RINA verified that a conservative approach is considered by PP for the CER calculation. In the case there is a																			

	<p>difference between CCEE's official data and InfoMercado /13/, the minimum value is used for the CERs calculation.</p> <p>* InfoMercado is a monthly publication that brings the main results of the operations accounted for within the scope of the CCEE. Data is publicly available /13/.</p>
	<p>Calculation method (if applicable). N/A</p>
<b>Findings</b>	CAR 03 and CL 01 were raised and successfully closed. Refer to Appendix 4 for further details..
<b>Conclusion</b>	<p>RINA confirms that:</p> <ul style="list-style-type: none"> <li>• All necessary parameters stated in the registered PDD have been monitored;</li> <li>• The responsibilities and authorities for monitoring and reporting are in accordance with those stated in the registered PDD;</li> <li>• The monitoring results are consistently recorded as per the approved frequency;</li> <li>• Quality assurance and quality control procedure have been applied in accordance with the registered PDD.</li> </ul>

### E.6.3. Implementation of sampling plan

<b>Means of verification</b>	Interview with PP was performed and the documents were checked in order to verify if a sampling plan was used.
<b>Findings</b>	N/A
<b>Conclusion</b>	Not applicable as no sampling plan was used.

### E.7. Compliance with the calibration frequency requirements for measuring instruments

<b>Means of verification</b>	<p>The calibration certificates were checked in order to verify the compliance and the calibration frequency of each measuring equipment.</p> <ul style="list-style-type: none"> <li>• Electricity meter # 1112132 (main) – calibrated on 19/02/2013 by Copel and valid until 18/02/2015 /14/, calibrated on 12/03/2015 and valid until 11/03/2020 and on 03/05/2017 and valid until 02/05/2022 by Institutos Lactec Cehpar Lac Lame Leme /15/. There is a delay in the calibration for the period from 19/02/2015 to 11/03/2015. The error showed in calibration certificate is 0.08% /15/;</li> <li>• Electricity meter # 1112133 (backup) – calibrated on 19/02/2013 by Copel and valid until 18/02/2015 /14/ and calibrated on 12/03/2015 by Institutos Lactec Cehpar Lac Lame Leme and valid until 11/03/2020 /15/. There is a delay in the calibration for the period from 19/02/2015 to 11/03/2015. The error showed in calibration certificate is 0.288% /15/.</li> </ul> <p>The calibration frequency for electricity meters is 2 years for the period until 31/12/2016 /21/ and 5 years from 01/01/2017 onwards /22/ as per national standards.</p> <p>For the periods with delay in the calibration, an error has been applied in the calculations in accordance with paragraph 366 of VVS for project activities /5/. Since the error showed in the calibration certificate of the backup meter (0.288%) /15/ was greater than the maximum permissible error of the meter (0.2%), the error showed in the calibration certificate was discounted from the values for the period from 19/02/2015 to 11/03/2015. For the period with delay in the calibration, an error has been applied in the calculations in accordance with paragraph 366 (b) of VVS for project activities /5/.</p>
<b>Findings</b>	CAR 04 was raised and successfully closed. Refer to Appendix 4 for further details.

<b>Conclusion</b>	It is RINA's opinion that the equipment's calibration applicable to the project activity followed the frequency described in the registered PDD /3/ and provisions described in the CDM validation and verification standard for project activities /5/ in the case of delay.
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## E.8. Assessment of data and calculation of emission reductions or net removals

### E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

<b>Means of verification</b>	<p>Baseline emissions (<math>BE_y</math> in <math>tCO_2</math>) are the product of the baseline emission factor (<math>EF_{grid,CM,y}</math> in <math>tCO_2/MWh</math>) times the net electricity supplied by the project activity to the grid (<math>EG_y</math> in MWh).</p> $BE_y = EG_{Itaguaçu,y} \times EF_{grid,CM,y}$ <p>Where:  <math>BE_y</math> – Baseline emissions in year <math>y</math> (<math>tCO_{2e}/y</math>);  <math>EG_{Itaguaçu,y}</math> – total net electricity supplied to the grid (MWh/y);  <math>EF_{grid,CM,y}</math> – <math>CO_2</math> emission factor of the grid (<math>tCO_{2e}/MWh</math>);</p> <p>The Brazilian grid emission factor has been published by the DNA of Brazil /12/. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid in the years from 2013 to 2020. RINA can confirm the data source is reliable, and the calculation and result are correct.</p> <p>The OM emission factor (<math>EF_{grid,OM,y}</math>) is calculated <i>ex-post</i> by the Dispatch Data Analysis by the Brazilian DNA /12/.</p> <p>The BM emission factor (<math>EF_{grid,BM,y}</math>) is calculated <i>ex-post</i> for the grid system by the Brazilian DNA /12/.</p> <p>Therefore, the CM emission factor, expressed in <math>tCO_{2e}/MWh</math>, is established as:</p> <table border="1"> <thead> <tr> <th>Year</th><th>CM (<math>tCO_2 / MWh</math>)</th></tr> </thead> <tbody> <tr><td>2013</td><td>0.4316</td></tr> <tr><td>2014</td><td>0.4400</td></tr> <tr><td>2015</td><td>0.4075</td></tr> <tr><td>2016</td><td>0.3904</td></tr> <tr><td>2017</td><td>0.2955</td></tr> <tr><td>2018</td><td>0.3380</td></tr> <tr><td>2019</td><td>0.3100</td></tr> <tr><td>2020</td><td>0.3303</td></tr> </tbody> </table> <p><math>EG_{Itaguaçu,y}</math> is the net electricity generation supplied to the grid, which is determined by the electricity supplied to the grid minus the imported electricity from the grid. The resulting total net electricity generated by the project for this 1<sup>st</sup> monitoring period is after applying the discount due to delay in the calibration:</p> <table border="1"> <thead> <tr> <th></th><th><math>EG_{Itaguaçu,y}</math> (MWh)</th></tr> </thead> <tbody> <tr><td>2013</td><td>21,894.02</td></tr> <tr><td>2014</td><td>77,734.04</td></tr> <tr><td>2015</td><td>97,320.29</td></tr> <tr><td>2016</td><td>95,575.15</td></tr> <tr><td>2017</td><td>78,462.68</td></tr> <tr><td>2018</td><td>60,577.52</td></tr> <tr><td>2019</td><td>56,998.55</td></tr> <tr><td>2020</td><td>7,304.65</td></tr> </tbody> </table> <p>RINA verified that the total baseline emissions in the monitoring period is equal to 184,364 <math>tCO_{2e}</math>.</p>	Year	CM ( $tCO_2 / MWh$ )	2013	0.4316	2014	0.4400	2015	0.4075	2016	0.3904	2017	0.2955	2018	0.3380	2019	0.3100	2020	0.3303		$EG_{Itaguaçu,y}$ (MWh)	2013	21,894.02	2014	77,734.04	2015	97,320.29	2016	95,575.15	2017	78,462.68	2018	60,577.52	2019	56,998.55	2020	7,304.65
Year	CM ( $tCO_2 / MWh$ )																																				
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<b>Findings</b>	<p>Refers to CL 01 and CAR 03 raised and closed in section E.6.2 and CAR 04 raised and closed in section E.7.</p> <p>CL 02 was raised and successfully closed. Refer to Appendix 4 for further details..</p>																																				

<b>Conclusion</b>	RINA verified that the baseline emissions were calculated in accordance with the formulae and methods described in the registered PDD /3/, the applied methodology /9/ and methodology tool /10/.
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### E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

<b>Means of verification</b>	In accordance with registered PDD /3/, considering the installed capacity of the Itaguaçu SHP (14.22 MW) and reservoir area (0.340 km <sup>2</sup> ), project emissions, PE <sub>y</sub> are considered to be zero as the power density of the project activity is greater than 10 W/m <sup>2</sup> (41.82 W/m <sup>2</sup> ).
<b>Findings</b>	N/A
<b>Conclusion</b>	RINA verified that the project emissions were calculated in accordance with the formulae and methods described in the registered PDD /3/, the applied methodology /9/ and methodology tool /10/.

### E.8.3. Calculation of leakage GHG emissions

<b>Means of verification</b>	In accordance with the methodology /9/ and registered PDD /3/, leakage is not applicable.
<b>Findings</b>	N/A
<b>Conclusion</b>	N/A

### E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

<b>Means of verification</b>	<p>According to the applied methodology AMS-I.D /9/, the emission reductions have been calculated based on the following formula:</p> $ER_y = BE_y = EG_{PJ, facility, y} \times EF_{grid, CM, y}$ <p>Where,</p> <p>ER<sub>y</sub> – Emission reductions in year y (tCO<sub>2e</sub>/y);</p> <p>BE<sub>y</sub> – Baseline emissions in year y (tCO<sub>2e</sub>/y);</p> <p>EG<sub>PJ, facility, y</sub> – total net electricity supplied to the grid;</p> <p>EF<sub>grid, CM, y</sub> – baseline emission factor.</p> <p>The emission reductions from the project for the monitoring period is equivalent to 184,364 tCO<sub>2e</sub> considering.</p> <p>The CERs calculation is based only on data available. RINA has cross checked the CERs spreadsheets /2/ against CCEE's data downloaded during the remote onsite visit /17/ and data public available /13/. As the monitoring period starts on 01/02/2013, the pro-rata approach is not applicable.</p> <p>It is RINA's opinion that appropriate methods and formulae for calculating emission reductions have been followed in accordance with the requirements of the monitoring methodology and tools as described above.</p>
<b>Findings</b>	Refers to CL 01 and CAR 03 raised and closed in section E.6.2, CAR 04 raised and closed in section E.7 and CL 02 raised and closed in section E.8.1.
<b>Conclusion</b>	The emission reductions calculation provided in the spreadsheet ref have been verified to be correct and in line with the registered PDD /3/ and the applied methodology /9/.

### E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

<b>Means of verification</b>	The reported emission reductions presented are greater than the estimated emission reduction for the period as per the registered PDD /3/.
<b>Findings</b>	N/A
<b>Conclusion</b>	RINA verified that the comparison of actual values of the monitoring period with the estimates in the revised PDD /3/ is properly described in the MR /1/.

### E.8.6. Remarks on difference from estimated value in registered PDD

<b>Means of verification</b>	The difference between the ex-ante estimative /3/ and CERs applicable to the monitoring period is mainly due to the higher emission factor monitored during the monitoring period (85.7% higher than the estimate ex-ante).
<b>Findings</b>	N/A

<b>Conclusion</b>	RINA verified that MR provides sufficient information to properly justify the increase of the CERs generated when compared to the ex-ante estimate.
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### E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

<b>Means of verification</b>	The emission reductions from the project for the monitoring period as reported in the final monitoring report /1/ is equivalent to: <table border="1"> <tr> <td>Before 01/01/2013</td><td>From 01/01/2013</td></tr> <tr> <td>-</td><td>184,364 tCO<sub>2e</sub></td></tr> </table>	Before 01/01/2013	From 01/01/2013	-	184,364 tCO <sub>2e</sub>
Before 01/01/2013	From 01/01/2013				
-	184,364 tCO <sub>2e</sub>				
<b>Findings</b>	N/A				
<b>Conclusion</b>	The emission reductions calculation provided in the spreadsheet /2/ have been verified to be correct and in line with the registered PDD. The total amount of GHG emission reductions have been generated from 01/01/2013 onwards.				

### E.9. Assessment of reported sustainable development co-benefits

<b>Means of verification</b>	The project participants have not monitored sustainable development co-benefits of the registered CDM project activity.
<b>Findings</b>	N/A
<b>Conclusion</b>	N/A

### E.10. Global stakeholder consultation

<b>Means of verification</b>	The monitoring report has been made public available at UNFCCC website on 09/08/2021. No comments have been received.
<b>Findings</b>	N/A
<b>Conclusion</b>	No comments were received after the publication of the monitoring report for global stakeholder consultation.

## SECTION F. Internal quality control

The final draft revision of the verification report before being submitted to the UNFCCC is subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent RINA instructions.

The technical review is performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for CDM validation and verification.

## SECTION G. Verification opinion

RINA Services Spa (RINA) has performed verification of the emission reductions reported for the project activity SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL in Brazil, CDM Registration Reference N° 8500, for the period 01/02/2013 to 31/01/2020, with regard to the relevant requirements for CDM activities.

The project activity was correctly implemented according to selected monitoring methodology and monitoring plan. The monitoring equipment was installed, calibrated and maintained in a proper manner, while collected monitoring data are allowed to verify the amount of achieved GHG emission reductions.

In conclusion, it is RINA's opinion that the project activity SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL, in Brazil, as described in the Monitoring Report version 2 of 17/09/2021, meets all relevant requirements for CDM activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology AMS-I.D – Grid connected renewable electricity generation, version 17 of 03/06/2011. The verification is conducted in-line with the VVS requirements. Hence RINA is able to issue a positive opinion in accordance with the certificate statement.

## SECTION H. Certification statement

RINA Services Spa (RINA) has performed verification of the emission reductions reported for the project activity SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL in Brazil, CDM Registration Reference N° 8500, for the period 01/02/2013 to 31/01/2020, with regard to the relevant requirements for CDM activities.

The project participants of the SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL are responsible for:

- the preparation of greenhouses gas emissions data and the reported greenhouse gas emission reductions from the project on the basis set out in the monitoring plan contained in the revised project design document PDD (version 2 of 20/08/2012);
- the development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of greenhouse gas emission reductions of the project.

It is the responsibility of RINA to express an independent verification opinion about the project's conformity with the requirements of paragraph 62 of the CDM modalities and procedures and on the reported greenhouse gas emission reductions from the project.

Based on documented evidence and corroborated by an on-site assessment RINA can confirm that:

- the project has been implemented and operated as per the registered PDD;
- the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable CDM requirements;
- the monitoring is in place as per the applied baseline and monitoring methodology;
- the monitoring complies with the monitoring plan the registered PDD;
- the monitoring plan in the registered PDD is as per the applied baseline and monitoring methodology.

It is RINA's opinion that the GHG emission reduction stated in the monitoring report version 2 of 17/09/2021 for the SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL in Brazil for the period 01/02/2013 to 31/01/2020 are fairly stated. The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology AMS-I.D – Grid connected renewable electricity generation, version 17 of 03/06/2011 and the monitoring plan contained in the revised PDD.

The breakdown of the emission reductions for the monitoring period has also been clearly demonstrated, with emission reduction for third commitment period calculated using the latest GWPs and the following is verified to be correct:

- Actual emission reduction for the monitoring period 01/02/2013 to 31/01/2020: 184,364 tCO<sub>2e</sub>.

Hence RINA is able to certify that the emission reductions from the project during the monitoring period 01/02/2013 to 31/01/2020 amount to 184,364 tCO<sub>2e</sub>.



## Appendix 1. Abbreviations

Abbreviations	Full texts
ANEEL	Brazilian Electricity Energy Agency
BE	Baseline Emissions
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide Equivalent
DNA	Designated national Authority
DOE	Designated Operational Entity
EB	Executive Board
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse Gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MR	Monitoring Report
OM	Operating Margin
PDD	Project Design Document
PE	Project Emissions
PP	Project Participant
RINA	RINA Services S.p.A.
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
tCO <sub>2</sub> e	Tonnes of Carbon Dioxide Equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

## Appendix 2. Competence of team members and technical reviewers



### CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:  
We declare that Mr/Mrs/Ms:

TEIXEIRA LEIROZ ANDREA

è qualificato come<sup>1</sup>:  
is qualified as:

TL, VAL, VER and TEC

per le seguenti aree tecniche:  
for the following technical areas:

1.1, 1.2, 5.1, 13.1, 13.2

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.1	Thermal Energy Generation	1
1.2	Renewables	1
5.1	Chemical industry	5
13.1	Solid waste and wastewater	13
13.2	Manure	13

in accordo alle istruzioni della Unità Certification Innovation and Sustainability.  
in accordance with the instructions of the Certification Innovation and Sustainability Unit.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	17/09/2019	First Issue
1	15/11/2019	Update qualification with "Sampling and surveys for CDM PAs and PoAs"

Il Resp. CEINS  
Head of CEINS

#### <sup>1</sup> Legend:

VAL: Validator  
VER: Verifier  
TEC: Technical Expert  
TL: Team Leader  
FIN-EXP: Financial Expert  
DET: Determiner

CDM: Clean Development Mechanism  
VCS: Verified Carbon Standard  
GS4GG: Gold Standard For Global Goals  
SCS: SocialCarbon Standard  
JI: Joint Implementation

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VGSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VGSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS4GG Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

GHG\_QUAL\_CERT\_EN(07-2018)

Page 1 of 1



## CERTIFICATO DI QUALIFICA QUALIFICATION CERTIFICATE

Si attesta che il sig./sig.ra:

Geisa Maria Principe BRANCO SAETTONI

We declare that Mr/Mrs/Ms:

è qualificato come<sup>1</sup>:  
is qualified as:

CDM-TEC, VAL, VER, TL, ITRP, REG-EXP<sup>2</sup>

per le seguenti aree tecniche:  
for the following technical areas:

1.1, 1.2, 13.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.1	Thermal Energy generation	1
1.2	Energy generation from renewable energy sources	1
13.1	Waste Handling and Disposal	13

in accordo alle istruzioni della Unità Certification Innovation and Sustainability.  
in accordance with the instructions of the Certification Innovation and Sustainability Unit.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	27-08-2009	-
10	31-03-2017	Added qualification as ITRP
11	07/12/2018	Added qualification as REG-EXP
12	15/11/2019	Update qualification with "Sampling and surveys for CDM PAs and PoAs"

Il Resp. CEINS  
Head of CEINS

<sup>1</sup> Legend:

VAL: Validator  
VER: Verifier  
TEC: Technical Expert  
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CDM: Clean Development Mechanism  
VCS: Verified Carbon Standard  
GS: Gold Standard  
SCS: Social Carbon Standard  
JI: Joint Implementation

<sup>2</sup> Argentina, Perú, Colombia, Mexico, Honduras, Panama, Dominican Republic, Guatemala

RINA Services S.p.A. è accreditato da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RINA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

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### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
/1/	Itaguaçu Energia S/A	Monitoring report for Project activity "SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL" in Brazil.	Version 1 of 28/06/2021 Version 2 of 17/09/2021	Project participant
/2/	Itaguaçu Energia S/A	Emission reduction spreadsheets for the project activity "SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL" in Brazil: <ul style="list-style-type: none"> <li>• CERs 1st MR.xls;</li> <li>• CERs 1st MR_rev2.xlsx.</li> </ul>	Corresponding to MR version 1 Corresponding to MR version 2	Project participant
/3/	Itaguaçu Energia S/A	Registered CDM-PDD for Project activity "SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL" in Brazil.	Version 2 of 20/08/2012	Other
/4/	Incontec	Validation report for Project activity "SHP ITAGUACU CDM PROJECT (JUN 1146), BRAZIL".	Report No. CDM-VAL12-015-00 of 05/09/2012	Other
/5/	CDM Executive Board	Clean Development Mechanism Validation and Verification Standard for project activities.	Version 02.0 of 29/11/2018	Other
/6/	CDM Executive Board	Clean Development Mechanism Project Standard for project activities.	Version 02.0 of 29/11/2018	Other
/7/	CDM Executive Board	Clean Development Mechanism Project Cycle Procedure for project activities.	Version 02.0 of 29/11/2018	Other
/8/	CDM Executive Board	CDM-MR-FORM: Monitoring report form.	Version 08.0 of 06/04/2021	Other
/9/	CDM Executive Board	Small-scale Methodology AMS-I.D – Grid connected renewable electricity generation.	Version 17 of 03/06/2011	Other
/10/	CDM Executive Board	TOOL07: Methodological tool: Tool to calculate the emission factor for an electricity system.	Version 02.2.1 of 29/09/2011	Other
/11/	CDM Executive Board	Guideline: Application of materiality in verifications.	Version 2 of 20/02/2015	Other
/12/	Interministerial Commission in Global Climate Change (DNA of Brazil)	Carbon Emission Factor for the National Grid. Available at: <a href="https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.html">https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.html</a> .	Assessed on 09/09/2021	Other
/13/	CCEE	InfoMercado spreadsheets downloaded from <a href="https://www.ccee.org.br/portal/faces/pages_publico/o-que-fazemos/infomercado?_afz.ctrl-state=guldheezq_1&amp;_afzLoop=80088889330865#!%40%40%3F_afzLoop%3D80088889330865%26_afz.ctrl-state%3Dguldheezq_5">https://www.ccee.org.br/portal/faces/pages_publico/o-que-fazemos/infomercado?_afz.ctrl-state=guldheezq_1&amp;_afzLoop=80088889330865#!%40%40%3F_afzLoop%3D80088889330865%26_afz.ctrl-state%3Dguldheezq_5</a> .	Assessed on 13/09/2021	Project participant

/14/	Copel	Electricity meter calibration certificate. <ul style="list-style-type: none"> <li>Serial number # 1112132 (main) – Calibration certificate # 1036;</li> <li>Serial number # 1112133 (backup) – Calibration certificate # 1037.</li> </ul>	19/02/2013 and valid until 18/02/2015	Project participant
/15/	Institutos Lactec Cehpar Lac Lame Leme	Electricity meter calibration certificate. <ul style="list-style-type: none"> <li>Serial number # 1112132 (main) – Calibration certificate # CCR 174/15;</li> <li>Serial number # 1112132 (main) – Calibration certificate # CCR 397/17;</li> <li>Serial number # 1112133 (backup) – Calibration certificate # CCR 175/15;</li> <li>Serial number # 1112133 (backup) – Calibration certificate # CCR 398/17.</li> </ul>	12/03/2015 and valid until 11/03/2020  03/05/2017 and valid until 02/05/2022  12/03/2015 and valid until 11/03/2020  03/05/2017 and valid until 02/05/2022	Project participant
/16/	Landis + Gyr	Technical description of electricity meter available at: <a href="https://www.academia.edu/40070188/Manual_do_Usuário_SAGA_1000_Medidor_Eletrônico_Multifunção_Medidores_Eletrônicos_Industriais">https://www.academia.edu/40070188/Manual_do_Usuário_SAGA_1000_Medidor_Eletrônico_Multifunção_Medidores_Eletrônicos_Industriais</a> .	-	Project participant
/17/	CCEE	Data downloaded during the remote onsite inspection from CCEE SCDES/SINERCOM system: exportacao_alemax0g0_351861_Itaguacu_Auditoria.csv.	Assessed on 13/09/2021	Project participant
/18/	CDM Executive Board	CDM Executive Board agrees to relax mandatory site visits by DOEs for a period of three months (23 March to 23 June 2020) because of COVID-19. The Executive Board of the Clean Development Mechanism (CDM) agreed on 23 June 2020 to, on an exceptional basis, considering the COVID-19 pandemic, to extend the period in which CDM Designated Operational Entities (DOEs) may apply alternative measures of validation/verification to mandatory on-site inspections until 31 December 2020. The Executive Board of the Clean Development Mechanism (CDM), as its 108 <sup>th</sup> meeting, agreed to further extend the period in which DOEs may apply alternative measures of validation/verification to mandatory on-site inspections until 30 June 2021.	23/03/2020 23/06/2020 14/12/2020	Other
/19/	Paraná Environmental Institute (IAP)	Environmental license No. 29276 valid until 09/08/2021.	09/08/2017	Project participant
/20/	Brazilian Electricity Energy Agency (ANEEL)	Dispatch #2499 authorizing the beginning of test operation on 23/07/2013.	22/07/2013	Project participant

**Table 1. No remaining FAR from validation and/or previous verifications**

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<b>DOE assessment</b>	<b>Date: DD/MM/YYYY</b>

Table 2. CL from this verification

<b>CL ID</b>	01	<b>Section no.</b>	E.6.2	<b>Date:</b> 16/09/2021
<b>Description of CL</b>				
Regarding to the values applied from InfoMercado report, it is not clear that a conservative approach was used for the determination of the total net electricity delivered to the grid for the years 2018 to 2020. In addition, InfoMercado data presented in the CERs spreadsheet for the whole monitoring period is rounded.				
<b>Project participant response</b>				<b>Date:</b> 17/09/2021
The values applied in spreadsheet was revised accordingly (not rounded). Also a conservative approach was used in line with Project standard (error of 0.288% was applied to the period between 19/02/2015 to 11/03/2015).				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> 21/09/2021
RINA verified that documents were revised without rounding the numbers and a conservative approach was used for the determination of the total net electricity delivered to the grid. This CL is closed.				

<b>CL ID</b>	02	<b>Section no.</b>	E.8.1	<b>Date:</b> 16/09/2021
<b>Description of CL</b>				
From the review of the CERs spreadsheet and dispatch from ANEEL (start date of operation), Verification team has found that the electricity export and import values mentioned under the CERs spreadsheet are not consistent with the start date of operation.				
<b>Project participant response</b>				<b>Date:</b> 17/09/2021
The project activity has start date on 01/02/2013, but due to the delay in project construction the start date operation was on 23/06/2013 (as per ANEEL' dispatch number #2,499 of 22/07/2013).				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> 21/09/2021
As per ANEEL dispatch #2921 dated 20/08/2013, the project started commercial operation on 21/08/2013. However, values of electricity export and import were considered under the CERs spreadsheet from 09/08/2013 to 31/01/2020. Thus, PP is requested to explain the dates. This CL is open.				
<b>Project participant response</b>				<b>Date:</b> 24/09/2021
The credit period starts on 01/02/2013 (CDM). As per ANEEL dispatch #2499 dated 22/07/2013, the project has been authorized test operation on <b>23/07/2013</b> . So since the date above, 23/07/2013, the project activity is authorized to export renewable electricity to the grid (SIN).				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> 24/09/2021
RINA has checked the mentioned dispatch and verified that the electricity export and import values mentioned under the CERs spreadsheet are consistent with the operation test start date. This CL is closed.				

Table 3. CAR from this verification

<b>CAR ID</b>	01	<b>Section no.</b>	E.1	<b>Date:</b> 16/09/2021
<b>Description of CAR</b>				
From the review of the hosted MR, Verification team has found that PP has used futuristic language in sections B.1, C, D.2 of the Monitoring report. The verification is for the monitoring period for which monitoring is already done.				
<b>Project participant response</b>				<b>Date:</b> 17/09/2021
The sections B.1, C, D.2 were revised accordingly (no futuristic language).				
<b>Documentation provided by project participant</b>				



<b>DOE assessment</b>	<b>Date:</b> 21/09/2021
RINA verified the revised MR and confirmed that language used in the document is appropriate. This CAR is closed.	

<b>CAR ID</b>	02	<b>Section no.</b>	E.5	<b>Date:</b> 16/09/2021
<b>Description of CAR</b>				
As per "Instructions for completing the monitoring report form", section A.4 should refer to the UNFCCC CDM website for the exact reference of the applied methodologies, methodological tools and standardized baselines.				
<b>Project participant response</b>				<b>Date:</b> 17/09/2021
The section A.4 was revised accordingly (was included the UNFCCC CDM website links).				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> 21/09/2021
RINA verified that documents were revised and the UNFCCC CDM website for the exact reference of the applied methodologies, methodological tools and standardized baselines was included. This CAR is closed.				

<b>CAR ID</b>	03	<b>Section no.</b>	E.6.2	<b>Date:</b> 16/09/2021
<b>Description of CAR</b>				
Regarding to the CO <sub>2</sub> emission factor of the grid electricity the following issues were identified: <ul style="list-style-type: none"> <li>Identified inconsistent for the value of CO<sub>2</sub> operating margin emission factor between MR and CER spreadsheets and data provided by the Brazilian DNA for the year 2020;</li> <li>Identified inconsistent for the value of CO<sub>2</sub> build margin emission factor between MR and CER spreadsheets and data provided by the Brazilian DNA for the year 2020.</li> </ul>				
<b>Project participant response</b>				<b>Date:</b> 17/09/2021
The CO <sub>2</sub> emission factor values, year 2020 (operating and build margin) were revised accordingly (on spreadsheet and also MR).				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> 21/09/2021
RINA verified that documents were revised and the value of CO <sub>2</sub> operating margin emission factor and CO <sub>2</sub> build margin emission factor was correctly applied as per data provided by the Brazilian DNA. This CAR is closed.				

<b>CAR ID</b>	04	<b>Section no.</b>	E.7	<b>Date:</b> 16/09/2021
<b>Description of CAR</b>				
Calibrations described in the published MR do not cover the whole monitoring period.				
<b>Project participant response</b>				<b>Date:</b> 17/09/2021
The calibrations described on section B.1 (Table 2) was revised accordingly.				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> 21/09/2021
RINA verified that MR was revised to present the calibration certificates applicable to the monitoring period. An error has been applied in the calculations in accordance with paragraph 366 of VVS for project activities from 19/02/2015 to 11/03/2015. However, the error was not applied for all periods with delay in the calibration. This CAR is open.				
<b>Project participant response</b>				<b>Date:</b> 24/09/2021
The initial meters calibration was on <b>19/02/2013</b> valid until 18/02/2015 (2 years). Since the upcoming calibration was on <b>12/03/2015</b> a gap period between 19/02/2015 until 11/03/2015 occurred and was properly addressed in accordance with VVS para 366. The next calibration date (after 12/03/2015) suffered adjustment issued by the national standard agency. The calibration frequency was changed from 2 to 5 years (valid on 01/01/2017 onwards). So exclusively for the Project activity, the calibration considering 2 years shall be valid until 11/03/2017, but since 01/01/2017 the frequency become 5 years, so extending the calibration date validation to <b>11/03/2020</b> . The information above, (frequency exchange) was included in the MR version 2 (Page 5 , footnote 3).				



Documentation provided by project participant	
<b>DOE assessment</b>	<b>Date:</b> 24/09/2021
<p>RINA verified that the calibration frequency for electricity meters is 2 years for the period until 31/12/2016 /21/ and 5 years from 01/01/2017 onwards /22/ as per national standards. Thus, the only delay in the calibration is for the period from 19/02/2015 to 11/03/2015.</p> <p>This CAR is closed.</p>	

Table 4. No FAR from this verification

<b>FAR ID</b>	<b>xx</b>	<b>Section No.</b>	<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>			
<b>Project participant response</b>			<b>Date:</b> DD/MM/YYYY
<b>Documentation provided by project participant</b>			
<b>DOE assessment</b>			<b>Date:</b> DD/MM/YYYY

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	6 April 2021	Revision to: <ul style="list-style-type: none"> <li>• Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).</li> </ul>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN);</li> <li>• Make structural and editorial improvements.</li> </ul>
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		