

SALTO PILÃO HYDROPOWER PLANT PROJECT ACTIVITY



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Document Prepared By RINA Services S.p.A. (RINA)

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Report Title	Verification report: "Salto Pilão Hydropower Plant Project Activity"
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Summary:

RINA Services S.p.A. (RINA), commissioned by Consórcio Empresarial Salto Pilão - CESAP is verifying the greenhouse gas emission reductions reported for the project activity "Salto Pilão Hydropower Plant Project Activity" in Brazil, VCS project ID 513, for the period 01/08/2013 to 31/12/2017. The verification includes confirming the implementation of the monitoring plan of the revised VCS PD (Project ID 513) and the application of the monitoring methodology as per ACM0002, version 11 dated 12/02/2010. A site visit was conducted to verify the data submitted in the monitoring report.

Salto Pilão project activity consists of the implementation of a hydropower plant with 191.88 MW installed capacity and 0.15 km² reservoir area. The plant is located between the cities of Lontras, Ibirama and Apiúna, state of Santa Catarina, Southern region of Brazil and is connected to the Brazilian grid.

The objective of the verification is to have an independent review ex post determination of the monitored reductions in GHG emission reductions. Verification was conducted using RINA procedures in line with the requirements specified in the VCS Version 3.7 Requirements, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques. The verification consisted of desk review, on-site assessment and the resolution of outstanding issues and the issuance of the final verification report and certification

The verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable VCS / CDM requirements in order to be certified.

In conclusion, it is RINA's opinion that the project activity "Salto Pilão Hydropower Plant Project Activity" in Brazil, VCS project ID 513, meets all relevant requirements for VCS standard and guidelines and correctly applies the baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version 11 of 12/02/2010. The monitoring system is in place and the emission reductions are calculated without material misstatement. Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/08/2013 to 31/12/2017 amount to 1,980,116 tCO₂e

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1 INTRODUCTION

1.1 Objective

RINA is commissioned by “Consórcio Empresarial Salto Pilão - CESAP” to perform an independent verification of its VCS project, “Salto Pilão Hydropower Plant Project Activity” in Brazil, already registered under VCS with Project ID.513 for the reported GHG emission reductions for the given monitoring period 01/08/2013 to 31/12/2017. The VCS projects must undergo independent third party verification and certification of emission reductions as the basis for issuance of Voluntary Emission Reductions (VERs/VCUs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The project activity has been implemented and operated as per the project description (PD) and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.
- To confirm that the monitoring system is implemented and fully functional to generate Voluntary Emission Reductions (VERs/VCUs) without any double counting, and

To establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification scope is:

- to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- to evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement;
- to verify that reported GHG emission data is sufficiently supported by evidence.

The project is assessed against the requirements of VCS version 3.7 and related rules and guidance. RINA has, based on the recommendations in the latest version of CDM Validation and Verification Manual, and employed a rule-based approach (as criteria) in the verification, focusing on the identification of significant reporting rules and the reliability of project monitoring.

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.

1.3 Level of Assurance

The draft final verification report before being submitted to the client were subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent RINA instructions, with reasonable level of assurance.

The verification team and the technical reviewers consist of the following personnel.

Role	Last Name	First Name	Country
Team Leader, Verifier, Technical Expert	Carvalho	Thaís	Brazil
Financial expert	Rocha	Mayra	Brazil
Technical reviewer	Liu	Hui Feng	RINA China

1.4 Summary Description of the Project

Salto Pilão project activity consists of the implementation of a hydropower plant with 191.88 MW (Generator tag: $106.600\text{kVA} \times 0.9 = 95,940 \text{ kW} \times 2$ generating units = 191.880MW) installed capacity and reservoir area 0.15 km² under 319m water level. The plant is located between the cities of Lontras, Ibirama and Apiúna, state of Santa Catarina, Southern region of Brazil and is connected to the Brazilian grid.

Salto Pilão hydropower plant (from Portuguese *Usina Hidrelétrica Salto Pilão - UHESP*) is owned by an association of several companies called *Consórcio Empresarial Salto Pilão*. The current consortium structure is as follows:

- Companhia Brasileira de Alumínio (CBA): 60%;
- Companhia Geração de Energia de Pilão (CGEP): 20%; and
- DME Energética Ltda. (DMEE): 20%.

Project Participant(s)	Consórcio Empresarial Salto Pilão - CESAP
Project Title	Salto Pilão Hydropower Plant Project Activity
Location of the project	The project is located in Itajaí-Açú River, between the cities of Lontras, Ibirama and Apiúna, Santa Catarina State, Southern region of Brazil
Methodology(ies)	ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version 11 of 12/02/2010

Sectoral Scope(s)	1	Technical Area(s)	1.2
Registered PDD	Version 6 of 22/06/2010		
Revised PDD due to project changes	Version 7.1 of 22/05/2019		
Starting date of the crediting period	19/01/2010		
Project's crediting period	19/01/2010- 18/01/2020		
Project documentation link	VCS database: http://www.vcsprojectdatabase.org/#/project_details/513		

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification was conducted using RINA procedures in line with the requirements specified in the VCS Requirements, i.e. VCS Program Guide, VCS Version 3 (v3.7) of 21/06/2017, and VCS Standard, VCS Version 3 (v3.7) of 21/06/2017. The GHG emission reductions are on the basis of the approved Baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version 11 of 12/02/2010.

The verification consisted of the following three phases

- Document review;
- On-site assessment including Interviews and Site Inspections;
- Resolution of Any Material Discrepancy and the issuance of the final verification report and certification.

The following sections outline each step in more detail.

2.2 Document Review

The monitoring report (MR), version 03/07/2019 and previous versions /01/, the emission reduction calculations spreadsheet ""20180703_Salto Pilao_VERs_v.2.xls" version 2 of 03/07/2019 and previous version /03/, were assessed as part of the verification. In addition a the revised Project Design Document due to project changes is submitted , version 7.1 of 22/05/2019/02/ in particular the additionality, the baseline estimations and the monitoring plan for the project were reviewed.

The following table lists the documentation that were reviewed during the verification

/01/	Ecopart Assessoria em Negócios Empresariais Ltda.: VCS monitoring report for the project activity “Salto Pilão Hydropower Plant Project Activity”, version 1.0 of 09/01/2018 , version 2 of 09/02/2018, version 03/07/2019
/02/	Ecopart Assessoria em Negócios Empresariais Ltda.: VCS project description for project activity “Salto Pilão Hydropower Plant Project Activity version 6 of 22/06/2010 (registered); Post registration changes: version 7 of 20/12/2018 and version 7.1 of 22/05/2019 and VCUs estimative updated: 20181220_UHESP_Estimated VCUs.xls
/03/	Ecopart Assessoria em Negócios Empresariais Ltda.: Emission Reduction spreadsheet “20180109_Salto Pilao_VERs_v.1.xls” version 1 of 09/01/2018, “20180209_Salto Pilao_VERs_v.2.xls” version 2 of 09/02/2018; 20190703_Salto Pilao_VERs_v.2.xls of 03/07/2019 (updated due to the verification timeline)
/04/	VCS: VCS Program Guide, VCS Version 3.7 of 21/06/2017
/05/	VCS: VCS Standard, VCS Version 3.7 of 21/06/2017
/06/	CDM Executive Board: Approved consolidated baseline and monitoring methodology ACM0002, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” version 11 of 12/02/2010
/07/	Website: http://database.v-c-s.org/rina-spa VCS: List of sectoral scopes RINA S.p.A is accredited Language: English Retrieved on: 15/01/2018
/08/	Brazilian DNA web site, data for the emission factor available in Portuguese at < http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.htm > , accessed on 05/07/2019
/09/	Bureau Veritas verification report BRAZIL-VER/BR.1464238 version 2.1 of 07/02/2014 for the third verification of Salto Pilão Hydropower Plant Project Activity; and previous periods: First Verification: 19 January 2010 to 28 February 2011 Second Verification: 01-March-2011 to 31-March-2012 Available at: https://mer.markit.com/br-reg/public/project.jsp?project_id=100000000000518 , accessed on 17/05/2019
/10/	Bureau Veritas validation report of Salto Pilão Hydropower Plant Project Activity, BRAZIL-VAL/05286/2010 – VERSION 02 dated 23/06/2010
/11/	FATMA operation license number 4055-2012, issued on 31/05/2012 valid for 96 months (CESAP - LAO Nº 4055-2012_31.05.12 (RENOVAÇÃO).pdf)
/12/	EAM-CMMS service order number 21872, for the meters substitution on 17/04/2013
/13/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0082-15 for the energy meter serial number - PT-0812A276-01, calibrated on 14/04/2015 (Medidor PT-0812A276-01 - Bruta UG1.pdf)
/14/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0033-13 for the energy meter serial number - PT-0811A790-01, calibrated on 04/03/2013 (Medidor Energia Bruta UG2.pdf)
/15/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0081-15 for the energy meter serial number - PT-0811A790-01, calibrated on 22/05/2015 (Medidor PT-0811A790-01 - Bruta UG2.pdf)
/16/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0031-13 for the energy meter serial number - PT-0902A536-01, calibrated on 04/03/2013 (Medidor Energia Fat. Princ. UG1.pdf)
/17/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0085-15 for the energy meter serial number - PT-0902A536-01, calibrated on 14/04/2015 (PT-0902A536-01 - Líquida Principal UG1.pdf)

/18/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0032-13 for the energy meter serial number - PT-0903A301-01, calibrated on 04/03/2013 (Medidor Energia Faturamento Retaguarda UG1.pdf)
/19/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0087-15 for the energy meter serial number - PT-0903A301-01, calibrated on 14/04/2015 (PT-0903A301-01 - Líquida Retaguarda - UG1.pdf)
/20/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0029-13 for the energy meter serial number - PT-0903A335-01, calibrated on 04/03/2013 (Medidor Energia Faturamento Principal UG2.pdf)
/21/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0084-15 for the energy meter serial number - PT-0903A335-01, calibrated on 14/04/2015 (PT-0903A335-01 - Líquida principal UG2.pdf)
/22/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0030-13 for the energy meter serial number - PT-0903A346-01, calibrated on 04/03/2013 (Medidor Energia Faturamento Retaguarda UG2.pdf)
/23/	Metrum Equipamentos de Medição e teste Calibration certificate CC-0086-15 for the energy meter serial number - PT-0903A346-01, calibrated on 14/04/2015 (PT-0903A346-01 - Líquida Retaguarda - UG2.pdf)
/24/	Progressul Engenharia calibration certificate PT-0812A276-01, calibrated on 02/06/2011
/25/	ONS procedure 12.3 «Manutenção do sistema de medição para faturamento» revision 2016.12 valid from 01/01/2017
/26/	CCEE data for the net energy generation for the UHE Salto Pilão, consolidated by PP UHSP_Geracao horaria_Ago 2013 a Out 2017.rar
/27/	Ecopart Assessoria em Negócios Empresariais Ltda. Revised financial analysis spreadsheets: FCF_Realized v.2 and Cash Flow_Salto Pilão_revised_v.3, version 03 of 07/06/2019
/28/	Ecopart Assessoria em Negócios Empresariais Ltda. 12nd CESAP (Conselho Empresarial Salto Pilão) Board meeting held in for CAPEX Estimate - 2018 a 2037, Capex/Opex: CESAP - Ata da 27ª Reunião Diretoria - 09_11_2018 – resumo.pdf; July 2006
/29/	Contract n 12/2002 for assured energy is base in the concession
/30/	MME Ordinance n 35 of 22/05/2012 assured energy from 2012 to 2017
/31/	MME ordinance n 178 of 03/05/2017: assured energy from 2018 – onwards
/32/	CCEAR: PPA for DME from the signature of the contract up to 2018.
/33/	CCEE: PPA for CGEP energy price: CGEP_Resultado_Consolidado_Publicacao_abril19. Xlsx
/34/	CBA: CBA_RES RES Evidencias Salto do Pilão.msg
/35/	Focus_Bulletin: Market Report – Focus Bulletin: Previsão de inflação: 20190513_Focus_Bulletin.pdf
/36/	CDM Executive Board: Tool for the demonstration and assessment of additionality, version 7 of 23/11/2012
/37/	CDM Executive Board: GUIDELINES ON THE ASSESSMENT OF INVESTMENT ANALYSIS, version 5 of 15/07/2011
/38/	CESAP: Annual financial statements: • 2009-2010_CESAP_DF • 2011-2010_CESAP_DF • 2012-2011_CESAP_DF • 2013-2012_CESAP_DF • 2014-2013_CESAP_DF

	• 2015-2014_CESAP_DF • 2016-2015_CESAP_DF • 2017-2016_CESAP_DF 2009 to 2017
/39/	CESAP: OPEX CAPEX Forecast - 2018 a 2037, 12/03/2019

2.3 Interviews

	Date	Name and Role	Organization	Topic
/a/	22/01/2018	J. Humberto Marçal- Operation supervisor	CESAP	Project installed Monitoring equipment's Environmental license
/b/	22/01/2018	Karen Midori Nagai- consultant	EQAO	Monitoring report VERs spreadsheet/calculations
/c/	22/01/2018	Luis Claudio Ribeiro- Manager	CESAP	Project installed Calibration certificates Monitoring equipment's Environmental license

2.4 Site Inspections

On 22-23/01/2018, RINA visited the project site of UHE Saltão Pilão, located in Santa Catarina state to check the technology employed and monitoring arrangement as part of project activity. During the on-site assessment of the project RINA assessed the implementation and operation of the proposed project activity, accessed the installed equipment directly, interviewed key personnel of the plant to confirm the operation information.

2.5 Resolution of Findings

The objective of this phase of the verification is to resolve any outstanding issues which need to be clarified for RINA's positive conclusion on the project description. To guarantee transparency any findings raised during the verification are incorporated in the Appendix A to this report. A corrective action request (CAR) is raised if one of the following occurs:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions.
- The VCS Version 3.7 requirements have not been met.
- There is a risk that the emission reductions cannot be monitored or calculated.

A clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable VCS Version 3.7 requirements have been met.

2.5.1 Forward Action Requests

N/A.

2.6 Eligibility for Validation Activities

RINA is accredited for validating and verifying GHG emission reduction project activities falling under sectoral scope 01 Energy industries (renewable/non-renewable sources) /07/.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

N/A.

3.2 Methodology Deviations

N/A

3.3 Project Description Deviations

During the onsite visit RINA verified that there were project design description deviations. As a result PP has provided a new version of the PD (version 7.1 of 22/05/2019) to describe the changes, that were assessed during the verification process. During the current verification, the PD was revised to reflect changes in the installed capacity and assured energy already indicated in the Monitoring Report from previous verifications of the project. Revisions in energy assured and installed capacity are due to lower loss load than estimated given the expansion of the headrace tunnel during the construction period. It causes a decrease in the pressure drop and, consequently, an increase in the net head, allowing the increase in the electricity generation and, consequently, in installed capacity and assured energy. Specifications of the equipment installed in the plant allowed this power increase.

Additionally, the installed capacity of the project increased from 182.3 MW to 191.88 MW¹ and assured energy increased from 106.7MW-ave to 109MW-ave and, later, to 114.1MW-ave due to underestimated historic of river flow rate.

Assured Energy	Legislation
106.7MW-ave	Concession contract # 15/2002

¹ Regarding the installed capacity, the Project Proponent – through a VCS advisory company – exchanged e-mails with the VCS Team requesting procedures in this case. Then, an official letter was sent by the VCS Team on March 30th, 2012 stating that the Project Proponent should include project changes in the Monitoring Report (monitoring deviation section) as changes did not result in modification or retrofit.

109MW-ave	MME Ordinance #35 issued on 22/05/2012
114.1MW-ave	MME Ordinance #178 issued on 3/05/2017

Detailed description on project changes is presented in CNEC Technical Report which was presented to ANEEL. ANEEL approved the project changes, including installed capacity, as can be seen in ANEEL Resolution #3,303 issued on 17/01/2012. Regarding the revision of assured energy, it was approved by the Brazilian Mines and Energy Ministry ("MME" from the Portuguese Ministério de Minas e Energia) as can be seen in MME Ordinance #35 issued on 22/05/2012 (109MW-ave) /30/ and MME Ordinance #178 issued on 03/05/2017 (114.1MW-ave) /31/.

In order to demonstrate that changes do not impact applicability of the methodology, additionality and the appropriateness of the baseline scenario, the Project Participant analyzed each criteria based on ACM0002 (v.11) as follows.

1) Applicability of the Methodology

The project was registered under ACM0002 (v. 11), which is applicable under the following conditions:

- ✓ *The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;*

Changes in the project do not impact on the conclusion in the registered PD, i.e. UHESP continues to be a hydropower plant ("UHE" from the Portuguese Usina Hidrelétrica de Energia) located in Santa Catarina State, Southern region of Brazil, with the purpose of renewable electricity generation to the National Interconnected Grid.

- ✓ *In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 10 to calculate the parameter $EG_{PJ,Y}$): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;*

Condition above remains not applicable since the project continues to not involve capacity additions, retrofits or replacements. No equipment was installed or replaced due to changes in the project.

- ✓ *In case of hydro power plants, one of the following conditions must apply:*
 - *The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or*
 - *The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m²; or*

- The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m².

Considering the project revised installed capacity, its power density is 1,279.2 W/m² (191.88 MW ÷ 0.15km² = 1,279.2 MW/km² or 1,279.2 W/m²), i.e. continues to be higher than 4W/m².

2) Re-assessment of Additionality

Regarding the project additionality, changes in the project installed capacity and energy assured do not impact on the alternatives to project activity or the common practice results since project scale, location and generated products remained the same. In spite of post-changes have no impact on the timing of the investment decision nor assumptions available and considered at that time, a re-assessment of additionality was conducted in section 2.5 of the revised PD. As presented in section 2.5 of the revised PD, the project activity remains additional.

Investment analysis

Choice of approach: Project participants applied the Option III Benchmark Analysis, in line with the applied additionality tool /36/ and with the “Guidelines on the Assessment of Investment Analysis” /37/. The simple cost analysis is not applicable because the project will generate financial and economic benefits other than CDM related income. The financial/economic indicator used for the proposed project activity is the Internal Rate of Return (IRR).

Benchmark selection. The weighted-average cost of capital (WACC) is a rate used to discount business cash flows and takes into consideration the cost of debt and the cost of equity of a typical investor in the sector of the project activity. The benchmark can be applied to the cash flow of the project as a discount rate when calculating the net present value (NPV) of the same, or simply by comparing its value to the internal rate of return (IRR) of the project. The WACC considers that shareholders expect compensation towards the projected risk of investing resources in a specific sector or industry in a particular country.

The WACC calculation is based on parameters that are standard in the market, considers the specific characteristics of the project type, and is not linked to the subjective profitability expectation or risk profile of this particular project developer. The WACC as of the project’s financial analysis decision date was of 9.36%. For the WACC calculation, the following equation was used:

$$WACC = Wd \times Kd + We \times Ke, \text{ where:}$$

We and **Wd** are, respectively, the weights of equity and debt typically observed at the sector. **We** is of 35%, and **Wd** of 65%. These numbers derive from the typical leverage of similar projects in the sector in Brazil, based on the rules for available long term loans from Brazilian Development Bank (from the Portuguese *Banco Nacional de Desenvolvimento Econômico e Social - BNDES*).

Kd is the cost of debt, which is observed in the market related to the project activity, and which already accounts for the tax benefits of contracting debts. **Kd** is of 5.02%, and also derives from long term loans applied to the sector in Brazil, and therefore is based on BNDES financing endeavour credit line’s interest rates.

Ke is the cost of equity, estimated through the Capital Asset Pricing Model (CAPM). **Ke** is of 17.43%. **Ke** derives from a risk free rate plus the market risk premium adjusted to the sector through Beta. The risk-free rate, the market risk premium, and the Beta have been calculated based on publicly available data and presented to the DOE.

Plugging these numbers into WACC formulae:

$$\text{WACC} = 65\% \times 5.02\% + 35\% \times 17.43\% = 9.36\%$$

The WACC is the same as the registered PD version 06 of 19 November 2010. /01/

The input parameters used in the financial analysis were cross-checked and all the data sources used for crosschecking were checked during the validation process. The following is carried out:

Input value	Assessment								
Benchmark: 9.36%	WACC was defined in the registered PD version of 22/06/2010 /01/.								
Updated Installed Capacity: 191.880 MW	PD version of 22/06/2010 /01/ was updated including the revision in the assured energy and installed capacity of the project. RINA verified the Generator tag: 106.600kVA x 0.9 = 95,940 kW x 2 generating units = 191.880MW.								
Energy Price: BRL 115/MWh	RINA verified that the energy price for CGEP and DME was based on the power purchase agreements adjusted to the Extended Consumer Price Index (IPCA) from the signature of the contract up to 2018 /32/ /33/. From 2019 onwards, expected inflation on average term from the Focus Bulletin was used /35/. For the CBA energy price /34/, DCIDE market curve is used from 2019 to 2023, before 2019 year energy price is deflated to IPCA and from 2024 onwards is inflated based on the average term from the Focus Bulletin /35/.								
Assured Energy:	RINA verified the following evidences: From 2010 – 2011: assured energy is base in the concession contract n 12/2002 /29/ From 2012 – 2017: assured energy based on MME Ordinance n 35 of 22/05/2012 /30/ From 2018 – onwards: assured energy based on MME ordinance n 178 of 03/05/2017 /31/								
Monitored electricity generation according to previous verifications:	Rina verified the electricity generation in previous three monitoring reports /09/.								
<table><tr><td>2010</td><td>2011</td><td>2012</td><td>2013</td></tr><tr><td>1.006.919</td><td>1.137.150</td><td>901.464</td><td>1.002.838</td></tr></table>	2010	2011	2012	2013	1.006.919	1.137.150	901.464	1.002.838	
2010	2011	2012	2013						
1.006.919	1.137.150	901.464	1.002.838						

<table><tr><td>2014</td><td>2015</td><td>2016</td><td>2017</td></tr><tr><td>1.157.972</td><td>1.310.327</td><td>1.247.996</td><td>827.062</td></tr></table>	2014	2015	2016	2017	1.157.972	1.310.327	1.247.996	827.062	
2014	2015	2016	2017						
1.157.972	1.310.327	1.247.996	827.062						
CAPEX: R\$ 459.258.286	Rina verified the value for expected investment on the 12nd CESAP (Conselho Empresarial Salto Pilão) Board meeting held in July 2006. /29/								

The analysis resulted in the following Internal Rates of Return:

Project IRR analysis

Scenario	IRR (%)
a) Investment decision timing	7.25
b) Revision of assured energy	7.64
c) Monitored electricity	8.22

Comparison between the Project's IRR and the investor's WACC:

Project	IRR (%)	WACC (%)
a) Investment decision timing	7.25	9.36
b) Revision of assured energy	7.64	
c) Monitored electricity	8.22	

These results presented in the table above shows that any of the project's IRR is lower than the benchmark. Both scenarios (b and c) presented above demonstrate that the project is still additional with the revision of the assured energy or electricity monitored during previous verifications Hence; the project activity is still not financially attractive to the investor.

The updated sensitivity analysis, was conducted as established by the "Guidelines on the Assessment of Investment Analysis" considering variables that constitute more than 20% of either total project costs or total project revenues, including initial investment costs. In addition, it suggests that variations should cover a range of +10% and -10%. Hence, variations were done increasing project's revenues (varying the energy price and plant load factor) and, reducing investment expenses and operation and maintenance costs. The results are presented below.

Salto Pilão	Investment decision timing (%)	Revision of assured energy (%)	Monitored electricity(%)
Original	7.25	7.64	8.22
Price Sensitivity	8.94	9.36	10.07
PLF Sensitivity	8.14	8.54	8.65

Investment Sensitivity	8.24	8.64	9.29
Costs Sensitivity	8.08	8.48	9.12

Under the scenarios analyzed, the only scenario which IRR surpasses the benchmark is when the energy price increase 10% while considering the verified electricity generation during verifications.

According to the “Guidelines on the assessment of investment analysis”, the probability of the occurrence of scenario which IRR surpasses the benchmark shall be analyzed. However, as the project is already implemented, a reasonable approach was to analyze incurred revenues (energy generation and price), as well as incurred costs (investment and operational costs). Therefore, PP conducted another analysis as follows:

Scenario	IRR (%)	Benchmark (%)
D) Realized values	8.82	9.36

Rina verified the values presented in the annual financial statements /38/ where from 2009 to 2017, the realized investment and operating expenses considered in the cash flow revision were based on.

The energy price considered was verified from the actual prices of Cia. Geração de Energia Pilão (CGEP) /33/, DME Energética companies /32/ and Companhia Brasileira de Alumínio (CBA) /34/ deflated to incurred inflation in the period,.

For 2018 year, actual values on energy price were considered. In the case of operating expenses, it was considered the 2018 expected forecast cost approved by the Board /39/. For the upcoming years, 2018 values were considered for the energy price. In the case of operating expenses, the 2019 expected forecast cost approved by the Board was considered /14/, i.e. 2019 expenses were considered to estimate expenses up to the end of the project lifetime; the same occurred to capex. Due to the forecast investment inclusion, the fair value of the project was included in the end of the assessment period following the “Guidelines on the assessment of investment analysis”.

The IRR of the project at the time of the investment decision was 7.25%, which is lower than the benchmark of 9.36%. Even if the increase in the assured energy and installed capacity were considered at the time of the investment decision, the project attractiveness (7.64%) remains below the benchmark. Under the sensitivity analysis, the project is not financially attractive to the investor even when variables change in favor of the project; the only possible scenario which IRR is higher than then benchmark is when applying +10% in energy price for scenario c) monitored electricity. However, while assessing the realized values incurred to the project, it can be concluded that the project remains financially not attractive to investor.

The assured energy increase does not change the initial conclusion of the project additionality. For this reason, the most plausible alternative to the project continues to be the electricity supply by other grid-connected power plants (alternative 1).

While analyzing the realized scenario (operational project), the IRR remains lower to the benchmark. Rina concluded that, in spite of the assured energy revision and a higher energy price, investment and costs also increased.

3) Applicability of the Baseline Scenario

According to the registered PD, the baseline scenario is the one described in ACM0002 (v.11):

“Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

RINA verified that the baseline was not affected. The revised PD updated the VERs estimatives, based on the updated assured energy:

Years	Net energy generation (MWh)	Days of operation	Baseline emissions (tCO ₂ e)
2010	950,225	347	295,710
2011	999,516	365	311,049
2012	999,516	365	311,049
2013	999,516	365	311,049
2014	999,516	365	311,049
2015	999,516	365	311,049
2016	999,516	365	311,049
2017	999,516	365	311,049
2018	999,516	365	311,049
2019	999,516	365	311,049
2020	49,291	18	15,339
TOTAL	9,995,160	3,650	3,110,494

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
Year 2010	295,710	0.00	0.00	295,710
Year 2011	311,049	0.00	0.00	311,049
Year 2012	311,049	0.00	0.00	311,049
Year 2013	311,049	0.00	0.00	311,049
Year 2014	311,049	0.00	0.00	311,049
Year 2015	311,049	0.00	0.00	311,049
Year 2016	311,049	0.00	0.00	311,049
Year 2017	311,049	0.00	0.00	311,049
Year 2018	311,049	0.00	0.00	311,049
Year 2019	311,049	0.00	0.00	311,049
Year 2020	15,339	0.00	0.00	15,339
Total	3,110,494	0.00	0.00	3,110,494

Moreover, in the monitoring plan, the calibration periodicity was updated in accordance with the current ONS requirements. Previous to 2017 year, calibration should be conducted each 2 years. However, according to updated ONS procedures² valid on 01/01/2017 onwards, energy meter calibration shall be conducted in a 5-year period. All meters calibration will be made following the necessary requirements and the established calibration frequency by ONS

As concluded in the re-assessment of the investment analysis, the baseline scenario identified to the project activity remained the same.

² ONS procedures. "Sub-module 12.3 Maintenance of the metering system for invoicing" (in a free translation from the Portuguese *Submódulo 12.3. Manutenção do sistema de medição para faturamento*). Available at ONS's website: <<http://ons.org.br/pt/paginas/sobre-o-ons/procedimentos-de-rede/vigentes>>

3.4 Grouped Project

The verification team confirms that the project is not a grouped project and hence this is not applicable to the project activity

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

RINA confirms that the project implementation is in line with the description in the revised VCS-PD **version 7.1 of 22/05/2019 /02/** by site visit. RINA performed a physical site visit on 22-23/01/2018 to verify the actual implementation of the project against the description in its registered VCS-PD **/02/** and found that all the units 1 and 2 are in operation and the installed capacity of each unit is 95.94 MW summing the installed capacity of 191.88 MW, in accordance with the equipments' plate verified during the onsite inspection. The capacity and model of the turbines and generators were cross checked with the nameplates. (Please, refer to the revised PD).

The following equipments' were confirmed during the onsite visit:

Turbines (2)

Manufacturer: Voith

Type: Francis

Power: 97.65 MW each

Serial Number: 19238 and 19239

Generators (2)

Manufacturer: Voith

Type: Vertical-shaft

Nominal power: 106.6 MVA

Capacity factor: 0.9

Serial number: SP0600233201 and SP0600233202

The following environmental license applicable was provided:

FATMA operation license number 4055-2012, issued on 31/05/2012 valid for 96 months /11/

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

According to the methodology ACM0002, version 11.0, the emissions reductions are calculated as follows:

Emission Reduction (ERy):

$$ERy = BEy - PEy$$

Where:

ER_y = Emission reductions in year y (tCO₂e/yr);
 BE_y = Baseline emissions in year y (tCO₂e/yr);
 PE_y = Project emissions in year y (tCO₂e/yr).

Baseline Emissions (BE_y):

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

Where:

BE_y = Baseline emissions in year y (tCO₂/yr);
 $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr);
 $EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO₂/MWh).

For Greenfield projects installed at a site where no electricity generation occurred previously, as it is the case of the proposed project activity, the calculation of $EG_{PJ,y}$ is as follows:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr);
 $EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr).

During the onsite visit, RINA cross checked data in the VERs spreadsheet against data from CCEE /26/

The total energy delivered to the grid during the monitoring period is 5,025,094 MWh.

CO₂ emission factor of the grid (EF_y)

The CO₂ emission factor of the grid is the result of a weighted average of two emission factors pertaining to the electricity system: the “operating margin” (OM) and the “build margin” (BM). In the case of this project activity, parameters were calculated in accordance with the “Tool to calculate the emission factor for an electricity system” and were determined *ex-post*, as presented in the registered PD.

The Brazilian DNA made available the emission factor calculation based on information of the grid power plants only /08/.

Considering 0.5 as the weights for OM and BM emission factors available for renewable energy projects, excluding solar and wind power projects, the CO₂ emission factors considered in this monitoring period are as follows:

2013: 0.4290; 2014: 0.4395; 2015: 0.4079; 2016: 0.3904; 2017: 0.5846

Project emissions (PE_y)

New hydro electric power projects resulting in new reservoirs, shall account for CH₄ and CO₂ emissions from reservoirs, estimated as follows:

- a) If the power density (PD) of power plant is greater than 4 W/m² and less than or equal to 10 W/m²:

$$PE_y = EF_{res} \times TEG_y / 1000$$

Where:

PE_y = Emission from reservoir expressed as tCO₂e/year;

EF_{Res} = Default emission factor for emissions from reservoirs, and the default value as per EB23 is 90 Kg CO₂e/MWh;

TEG_y = Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (MWh)

b) If power density (PD) of the project is greater than 10W/m², $PE_y = 0$.

The power density of the project activity is calculated as follows:

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

Where:

PD = Power density of the project activity (W/m²)

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

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 (m²)

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 (m²). For new reservoirs, this value is zero.

Capacity of the project = 191.89 MW

Reservoir area = 0.15 km²

Power density = 191.88 / 0.15 = 1,279.20 W/m², so **$PE_y = 0$**

Leakage

In accordance with the applied methodology, Leakage is zero.

Parameters available at the time of validation: not applicable. All the parameters are monitored ex-post

Data and parameters monitored ex-post:

The following parameters are monitored :

Data/Parameter	EG _{facility,y}
Data Unit	MWh/year
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data to be used	Project sponsor and the power utility/CCEE
Value of monitored parameter for the monitoring period	Value: 01/08/2013-31/12/2013: 481,736 01/01/2014-31/12/2014: 1,157,972 01/01/2015-31/12/2015: 1,310,327 elay)(Discounting the meter's accuraccy due to the calibration d 01/01/2016-31/12/2016: 1,247,996 01/01/2017- 31/12/2017: 827,062 Cross check: RINA has cross checked the information against the PP internal control (verified directly in the PP data base) and information from CCEE, consolidated by PP /26/. Moreover, during the onsite visit, PP accessed the online CCEE interface to confirm data in the monitoring report. No error was found.

Monitoring equipment	The following meters are applicable to the project activity: Power Plants (gross energy) RINA verified that the gross energy is only used for internal control of the UHE, not used in the VERs calculation: PT-0812A276-01 (installed on 17/04/2013, in accordance with the service order number 21872 /12/ Progressul Engenharia calibration certificate PT-0812A276-01, calibrated on 02/06/2011 /24/ RINA verified that the energy meter was installed on 17/04/2013 Metrum Equipamentos de Medição e teste Calibration certificate CC-0082-15 for the energy meter serial number - PT-0812A276-01, calibrated on 14/04/2015 /13/ PT-0811A790-01 - Metrum Equipamentos de Medição e teste Calibration certificate CC-0033-13 for the energy meter serial number - PT-0811A790-01, calibrated on 04/03/2013 /14/ - Metrum Equipamentos de Medição e teste Calibration certificate CC-0081-15 for the energy meter serial number - PT-0811A790-01, calibrated on 22/05/2015 /15/ Substation (net energy) PT-0902A536-01 (principal) - Metrum Equipamentos de Medição e teste Calibration certificate CC-0031-13 for the energy meter serial number - PT-0902A536-01, calibrated on 04/03/2013 /16/ - Metrum Equipamentos de Medição e teste Calibration certificate CC-0085-15 for the energy meter serial number - PT-0902A536-01, calibrated on 14/04/2015 /17/ PT-0903A301-01 (backup) - Metrum Equipamentos de Medição e teste Calibration certificate CC-0032-13 for the energy meter serial number - PT-0903A301-01, calibrated on 04/03/2013 /18/ - Metrum Equipamentos de Medição e teste Calibration certificate CC-0087-15 for the energy meter serial number - PT-0903A301-01, calibrated on 14/04/2015 /19/ PT-0903A335-01 (principal) -Metrum Equipamentos de Medição e teste Calibration certificate CC-0029-13 for the energy meter serial number - PT-0903A335-01, calibrated on 04/03/2013 /20/ - Metrum Equipamentos de Medição e teste Calibration certificate CC-0084-15 for the energy meter serial number - PT-0903A335-01, calibrated on 14/04/2015 /21/ PT-0903A346-01 (backup) - Metrum Equipamentos de Medição e teste Calibration certificate CC-0030-13 for the energy meter serial number - PT-0903A346-01, calibrated on 04/03/2013 /22/ - Metrum Equipamentos de Medição e teste Calibration certificate CC-0086-15 for the energy meter serial number - PT-0903A346-01, calibrated on 14/04/2015 /23/
Accuracy of the monitoring	Class D (0.2 %), in accordance with ONS requirements /25/ .

equipment	
Measuring/Reading/Recording frequency	Hourly measurement and monthly recording. Verified during the onsite visit that the parameter is continuously monitored.
Calculation method (if applicable)	Not applicable.
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PD?	The calibration periodicity was updated in accordance with the current ONS requirements. Previous to 2017 year, calibration should be conducted each 2 years. However, according to updated ONS procedures³ valid on 01/01/2017 onwards, energy meter calibration shall be conducted in a 5-year period. All meters calibration will be made following the necessary requirements and the established calibration frequency by ONS. For the monitoring period, while considering the 2-year period for calibration frequency for energy meters located at the substation (which measures net electricity), there is a period uncovered by calibration. In spite of the updated ONS procedures (a 5-year frequency calibration), the last calibrations were conducted on 14/04/2015, but it should be conducted on 04/03/2015 as the updated ONS procedures are valid on 01/01/2017 onwards only. Verified that the error of the delayed calibration test is lower than the maximum permissible error of equipment (0.2%). For a conservative approach, the maximum accuracy of equipment was applied in the measured values of the uncovered period of calibration (04/03/2015 – 14/04/2015), i.e. 0.2%. Discount is presented in the VCU spreadsheet ("EF 2015" sheet, "BL and BQ" columns).

Data/Parameter	CapPJ
Data Unit	W
Description	Installed capacity of the hydro power plant after the implementation of the project activity.
Source of data to be used	Project site and official data source
Value of monitored parameter for the monitoring period	191,880,000 Cross check: Confirmed in the equipments specification during the onsite visit.
Monitoring equipment	Not applicable
Accuracy of the monitoring	Not applicable

³ ONS procedures. "Sub-module 12.3 Maintenance of the metering system for invoicing" (in a free translation from the Portuguese *Submódulo 12.3. Manutenção do sistema de medição para faturamento*). Available at ONS's website: <<http://ons.org.br/pt/paginas/sobre-o-ons/procedimentos-de-rede/vigentes>>

equipment	
Measuring/Reading/Recording frequency	Data will be archived in paper format and will be monitored yearly
Calculation method (if applicable)	Not applicable
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PD?	Not applicable

Data/Parameter	A_{PJ}
Data Unit	m ²
Description	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Source of data to be used	Project site and official data source.
Value of monitored parameter for the monitoring period	Value: 150,000 Cross check: Value is in accordance with the valid operation license /11/.
Monitoring equipment	N/A
Accuracy of the monitoring equipment	N/A
Measuring/Reading/Recording frequency	Monthly measurement and recording.
Calculation method (if applicable)	Measured from topographical surveys, maps, satellite pictures, etc. (once at the time of the project conception) and water levels (during the project crediting period).
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PD?	N/A

Data/Parameter	EF_{grid,CM,y}
Data Unit	tCO ₂ /MWh
Description	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".
Source of data to be used	Brazilian DNA (Comissão Interministerial de Mudança Global do Clima – CIMGC). /08/
Value of monitored parameter for the monitoring period	Value: 2013: 0.4290; 2014: 0.4395; 2015: 0.4079; 2016: 0.3904; 2017: 0.2937

	Cross check: RINA has cross the information presented in the MR and VERs spreadsheet against data publicity available by the Brazilian DNA /08/
Monitoring equipment	Not applicable
Accuracy of the monitoring equipment	Not applicable
Measuring/Reading/Recording frequency	-
Calculation method (if applicable)	Not applicable
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PD?	Not applicable

Data/Parameter	EF_{grid,OM,y}
Data Unit	tCO ₂ /MWh
Description	Operating 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".
Source of data to be used	Brazilian DNA (Comissão Interministerial de Mudança Global do Clima – CIMGC). /08/
Value of monitored parameter for the monitoring period	Value: 2013: 0.5868; 2014: 0.5827; 2015: 0.5604; 2016: 6226; 2017: 0.5846 Cross check: RINA has cross the information presented in the MR and VERs spreadsheet against data publicity available by the Brazilian DNA /08/
Monitoring equipment	Not applicable
Accuracy of the monitoring equipment	Not applicable
Measuring/Reading/Recording frequency	-
Calculation method (if applicable)	Not applicable
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PD?	Not applicable

Data/Parameter	EF_{grid,BM,y}
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Data Unit	tCO2/MWh
Description	Building margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system".
Source of data to be used	Brazilian DNA (Comissão Interministerial de Mudança Global do Clima – CIMGC). /08/
Value of monitored parameter for the monitoring period	Value: 2013: 0.2713; 2014: 0.2963; 2015: 0.0.2553; 2016: 0.1581; 2017: 0.0028 Cross check: RINA has cross the information presented in the MR and VERs spreadsheet against data publicity available by the Brazilian DNA /08/
Monitoring equipment	Not applicable
Accuracy of the monitoring equipment	Not applicable
Measuring/Reading/Recording frequency	-
Calculation method (if applicable)	Not applicable
Calibration	
Calibration frequency/interval Is the calibration interval in line with the monitoring plan of the PD?	Not applicable

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

As presented in the section above, data for the net energy delivered to the grid is measured by means of calibrated meters. RINA has cross checked data against the PP internal control (verified directly in the PP data base) and information from CCEE, consolidated by PP /26/. Moreover, during the onsite visit, PP accessed the online CCEE interface to confirm data in the monitoring report. No error was found. The emission factor is publicity available by Brazilian DNA. During the on site visit it was checked that all the monitored data is available and records needed for monitoring are archived in line with the requirements of the registered monitoring plan.

4.4 Non-Permanence Risk Analysis

N/A

5 SAFEGUARDS

5.1 No Net Harm

The project does not result to any net harm as the project has complied with the National requirements. As described in the registered PD /02/, the Project Environmental Impact Study

was prepared by Ambiental Consultoria e Planejamento Ltda. in September 1997 – Environmental impact assessment and environmental impact report (EIA/RIMA)

Considering the results of the EIA/RIMA conclusions, Environmental Basic Project (“PBA” from the Portuguese Projeto Básico Ambiental) was prepared in order to reduce the negative impacts and potentiate the positive ones identified during the project planning, construction and operation. The project PBA was prepared based on the Reference Term of the project EIA and conditionings established by the environmental agency.

RINA verified that the project has a valid operation license, issued by the Environmental agency from Santa Catarina: FATMA operation license number 4055-2012, issued on 31/05/2012 valid for 96 months /11/

5.2 Local Stakeholder Consultation

The stakeholder consultation conducted by PP during registration of the project activity has been outlined in the updated VCS PD and no actions are required during the verification.

6 VERIFICATION CONCLUSION

RINA Service S.p.A (RINA) has performed verification of the emission reductions reported for the project activity “Salto Pilão Hydropower Plant Project Activity” in Brazil, VCS Registration Reference ID - 513, for the VCS monitoring period from 01/08/2013 to 31/12/2017, with regard to the relevant requirements for VCS and CDM rules.

The project participants Consórcio Empresarial Salto Pilão - CESAP of the project “Salto Pilão Hydropower Plant Project Activity” 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 registered VCS Registration Reference ID – 513 and revised PD version 7.1 of 22/05/2019 submitted with this verification, for the VCS monitoring period from 01/08/2013 to 31/12/2017.
- 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 VCS requirements 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 VCS PD;
- The monitoring plan in the registered VCS-PD is as per the applied baseline and monitoring methodology.
- The monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS and CDM requirements

It is RINA's opinion that the GHG emission reduction stated in the VCS monitoring report version 03/07/2019 for the “Salto Pilão Hydropower Plant Project Activity” in Brazil for the period 01/08/2013 to 31/12/2017 are fairly stated. The GHG emission reductions were calculated correctly on the basis of the baseline and monitoring methodology, ACM0002, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” version 11 of 12/02/2010.

Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/08/2013 to 31/12/2017 amount to 1,980,116 tCO₂eVerification period:

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)
01/08/2013 - 31/12/2013	206,679	0	0	206,679

01/01/2014 - 31/12/2014	508,895	0	0	508,895
01/01/2015 - 31/12/2015	534,441	0	0	534,441
01/01/2016 - 31/12/2016	487,181	0	0	487,181
01/01/2017 - 31/12/2017	242,920	0	0	242,920
Total	1,980,116	0	0	1,980,116

APPENDIX A: ABBREVIATIONS

Abbreviations	Full texts
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH ₄	Methane
CR	Clarification Request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
COD	Chemical Oxygen Demand
CRT	Coordination and Technical Control Staff
DCI	Certification Division of RINA Services Spa
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EF	Emission Factor
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MoV	Means of Verification
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document
PE	Project Emission
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services Spa
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Verified Carbon Unit
VER	Voluntary Emission Reductions
VVS	Validation and Verification Standard

APPENDIX B: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUEST

Table 1. FAR from the previous validation

FAR ID	Section no.	Date: DD/MM/YYYY
Description of FAR		
N/A		
Project participant response		Date: DD/MM/YYYY
Documentation provided by project participant		
DOE assessment		Date: DD/MM/YYYY

Table 2. CR from this verification

CR ID	Section no.	Date
1	3.3	31/01/2018
Description of CR		
PP is requested to clarify the difference between the energy generation estimative in the registered PD and the energy generation during the monitoring period		
Project participant response		Date: 05/02/2018
In fact, the registered PD was prepared considering 106.7MW-ave assured energy, which results in 934,692MWh/yr. While considering 109MW-ave, it results in 954,840MWh/yr (around 2.2% increase). The revision of assured energy is due to an expansion of the headrace tunnel during the project construction. A higher diameter of the headrace tunnel allowed an increase in the installed capacity and reduction of nominal loss. Detailed description on project changes is presented CNEC Technical Report which was presented to the Brazilian Power Regulatory Agency ("ANEEL" from the Portuguese Agência Nacional de Energia Elétrica). ANEEL approved the project changes, including assured energy, as can be seen in ANEEL Resolution #3,303 issued on 17/01/2012. In fact, changes in assured energy are according to Art.21, §4, Decree 2,655 issued on 02/07/1998. Decree 2,655/1998 states that assured energy can be revised in a 5-year period or at the time of relevant occurrences. Considering the assured energy increase, a re-assessment of the investment analysis was conducted in order ensure that the project remains additional. Investment analysis was included in section 2.2.2 of the MR together with explanation regarding compliance with the methodology applicability. All documentation, including benchmark and project cash flow spreadsheet, is attached to this response. According to section 3.6.1, item 2), from the VCS Standard: <i>"2) Where the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology, the deviation shall be described and justified in the monitoring report. This shall include a description of when the changes occurred and the reasons for the changes. The deviation shall also be described in all subsequent monitoring reports. Examples of such deviations include changes in the procedures for measurement and monitoring, or project design</i>		

changes that do not have an impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario”.

Following the statement of the VCS Standard above, project changes were described and justified in the MR. Please refer to 2.2.2 of the revised version of the MR.

Changes in the estimated emission reductions and the quantity checked during this verification were included in Appendix 1 of the MR.

Documentation provided by project participant

- Technical Report issued by CNEC dated 24/05/2011: it presents explanations regarding revision of the installed capacity of ID513 project;
- MME Ordinance #35 issued on 22/05/2012: increase in the assured energy from 106.7MW-ave to 109MW-ave;
- Benchmark (WACC) spreadsheet;
- Project cash flow (original and revised versions) spreadsheet.

DOE assessment

Date:06/03/2018

PP has provided an analysis for the for the difference between the assured energy presented in the registered PD and the current assured energy approved by MME. However, for the monitoring period, the energy generation is higher than the updated assured energy and its impact on additionality was not evaluated. Moreover, please, refer to CAR 1 below.

This CR remains open.

Project participant response

Date:13/07/2018

Please refer to the Project Participant's response in CAR1.

DOE assessment

Date:13/03/2019

PP has revised the PD and presents three scenarios for additionality, including the current energy generation.

This CR is closed (specific CRs for revised additionality are raised, please, refer to the tables below).

CR ID	2	Section no.	3.3	Date:31/01/2018
Description of CR				
During the onsite visit, verified that the ONS procedures has changed and the calibration periodicity described in the registered PD is not in accordance with the current requirement (from 2017 calibration periodicity is 5 years).				
Project participant response				Date:05/02/2018

According to the registered PD:

According to ONS procedures²⁶, these meters have to be calibrated every two years after operation starts. All meters calibration will be made following the necessary requirements.

Footnote 26: Submodulo 12.3 "Manutenção do sistema de medição para faturamento" (revision 1). Available at ONS's website: <http://www.ons.org.br/download/procedimentos/modulos/Modulo_12/Submodulo%2012.3_Rev_1.0.pdf>

However, the ONS procedures were revised in December 2016 and shall be applied on 01/01/2017 onwards. This revision predicts a 5-year calibration frequency instead of the 2-year period previously considered.

Then, although the registered PD states that a 2-year calibration frequency, it also states that all meters "calibration will be made following the necessary requirements". Then, the Project Proponent is following the Brazilian power sector requirements. The revision of energy meters calibration period indicates that equipment has low level of uncertainty and a calibration period lower than five years is not required. This information was included in section 2.2.2 of the MR. Please refer to revised MR and CAR 2 below.

Documentation provided by project participant

- Monitoring Report, version 2
- VER (VCU) spreadsheet, version 2
- Sub-module ONS 12.3, which presents current required calibration frequency for energy meters (page 7);

DOE assessment

Date: 06/03/2018

RINA verified that the MR was revised in accordance with the new requirements of ONS: 2 years until 2017 and from 01/01/2017 calibration shall be conducted in a 5-year period.

This CR is closed

CR ID	3	Section no.	4.2	Date:	31/01/2018
Description of CR					
PP is requested to confirm the project monitoring period.					
Project participant response					Date: 05/02/2018
The Project Proponent confirms that this 4 th monitoring period comprises 01-August-2013 to 31-December-2017. Then, the MR and VCU spreadsheet were revised to include the latest two missing months of 2017 year.					
Documentation provided by project participant					
• Monitoring Report, version 2; • VER (VCU) spreadsheet, version 2.					
DOE assessment					Date: 06/03/2018
PP has provided the documents and evidences considering the monitoring until 31/12/2017					
This CR is closed					

CR ID	4	Section no.	4.2	Date:	31/01/2018
Description of CR					
RINA verified that data for the operating margin for the month October 2017 is not in accordance with DNA web site. Moreover, the link described in the report is not working.					
Project participant response					Date: 05/02/2018
The operating margin (OM) EF for October 2017 and reference link were updated in the MR and ER					

spreadsheet. Furthermore, data from November and December 2017 was included in calculations. Please refer to CR 3 and the revised version of both documents.

It is important mentioning that OM EF for December 2017 and BM (build margin) EF of 2017 are not available at the Brazilian DNA's website. For this reason, EF BM 2016 and EF OM of December 2016 were used in 2017.

Documentation provided by project participant

- Monitoring Report, version 2;
- VER (VCU) spreadsheet, version 2;
- The updated Brazilian DNA's website presenting the emission factor of the grid:
http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.html

DOE assessment

Date: 06/03/2018

RINA verified that the revised documents consider latest data available by the Brazilian DNA.

This CR is closed

CR ID	5	Section no.	3.3	Date: 12/03/2019
Description of CR				
RINA was not able to reproduce the calculation of the energy prices used in the sheet FCF_Realized. Please clarify from which evidence the energy prices used for 2018 (Cia. Geração de Energia Pilão (CGEP); DME Energética; Companhia Brasileira de Alumínio (CBA) were taken from.				
Project participant response				Date: 22/05/2019
Documented evidence to the energy price presented in "FCF_Realized" sheet is attached to this response. The energy is commercialized differently among the companies of the consortium. CGEP and DME have signed power purchase agreements and CBA uses electricity for self-consumption. In this last case, energy market analysis is used for reference. Based on this information, the energy price was revised as follows: The energy price for CGEP and DME was revised to consider the power purchase agreements adjusted to the Extended Consumer Price Index (IPCA) from the signature of the contract up to 2018. From 2019 onwards, expected inflation on average term from the Focus Bulletin is used. For the CBA energy price, DCIDE market curve is used from 2019 to 2023, before 2019 year energy price is deflated to IPCA and from 2024 onwards is inflated based on the average term from the Focus Bulletin				
Documentation provided by project participant				

- CGEP energy price: CGEP_Resultado_Consolidado_Publicacao_abril19. xlsx;
- DME Energética energy price: DME_CCEAR 4013 – Celg.pdf;
- CBA energy price: CBA_RES RES Evidencias Salto do Pilão.msg;
- 20190513_Focus_Bulletin.pdf;
- Cash Flow_Salto Pilão_revised_v.3.xls;
- PD version 7.1, dated 22/05/2019.

DOE assessment**Date:**

PP revised the energy price for CGEP and DME to consider the power purchase agreements adjusted to the Extended Consumer Price Index (IPCA) from the signature of the contract up to 2018 and the energy price is according to the evidences provided.

This CR is closed.

CR ID	6	Section no.	3.3	Date:	12/03/2019
Description of CR					
In the sheet FCF_Realized please clarify, since it is stated that the values used from 2009 to 2017 are based on yearly financial statements, however the energy prices for 2018 where deflacionated using inflation index from 2017 to deflacionate the energy price for the entire series backwards from 2017 to 2010.					
Project participant response					Date: 22/05/2019
Operating expenses, depreciation and investment incurred up to 2017 are based on the financial statements of the company already sent to DOE. Financial statements do not present the energy price. Cia. Geração de Energia Pilão (CGEP) and DME Energética companies commercialize energy in different markets and Companhia Brasileira de Alumínio (CBA) does not commercialize energy, but it uses for self-consumption. Please refer to the PPs response in CAR5.					
Documentation provided by project participant					
• Cash Flow_Salto Pilão_revised_v.3.xls; • PD version 7.1, dated 22/05/2019.					
DOE assessment					Date:
PP clarified that the energy is commercialized differently among the companies of the consortium. CGEP and DME have signed power purchase agreements and CBA uses electricity for self-consumption, where the energy market analysis was used for reference.					
This CR is closed.					

CR ID	7	Section no.	3.3	Date:12/03/2019
Description of CR				
In the sheet FCF_Realized please provide rationale for the values used for Operating expenses from 2010 onwards, the values are typed and it is not possible to reproduce or find the values in the evidences provided.				
Project participant response				Date: 22/05/2019
Up to 2017, operating expenses were based on yearly financial statements (operating expenses including taxes for the water resources use to the electricity generation – “UPB” from the Portuguese Uso do Bem Público), except depreciation. Financial statements were already sent to DOE. From the 2018 to 2019 operating expenses were revised to consider the forecast budget approved on the 27th Minutes of Meeting of the Consortium Board (page 2). From 2020 onwards, operating expenses were inflated based on the expected inflation on average term from the Focus Bulletin. Documented evidence for operating expenses from 2018 onwards are attached to this response. Regarding capex, the 2017 financial statement is considered on cell “C46” and from 2018 onwards, the forecast budget from 2018 to 2023 approved on the 27th Minutes of Meeting of the Consortium Board (page 3). From 2024 onwards, estimative is based on 0.3% of total assets.				
Documentation provided by project participant				
- Operating expenses: CESAP - Ata da 27ª Reunião Diretoria - 09_11_2018 – resumo.pdf (page 2); - Capex: CESAP - Ata da 27ª Reunião Diretoria - 09_11_2018 – resumo.pdf (page 3); 20190513_Focus_Bulletin.pdf; - Cash Flow_Salto Pilão_revised_v.3.xls; - PD version 7.1, dated 22/05/2019.				
DOE assessment				Date:
PP revised From the operating expenses for 2018 to 2019 to consider the forecast budget approved on the 27th Minutes of Meeting of the Consortium Board X. From 2020 onwards, operating expenses were inflated based on the expected inflation on average term from the Focus Bulletin. This CR is closed.				

CR ID	8	Section no.	3.3	Date:12/03/2019
Description of CR				
In the sheet FCF_Realized please provide rationale for the values used for Depreciation, the values are typed and it is not possible to reproduce or find the values in the evidences provided.				
Project participant response				Date: 22/05/2019
Up to 2017, depreciation is based on yearly financial statements. From 2018 onwards, depreciation is based on the annual average depreciation incurred for 2010 to 2017 period. Please refer to cell “M32”.				
Documentation provided by project participant				
- Cash Flow_Salto Pilão_revised_v.3.xls; - PD version 7.1, dated 22/05/2019				

DOE assessment	Date:
PP clearly justified that the depreciation is based on yearly financial statements that were checked by RINA.	
This CR is closed.	

Table 3. CAR from this verification

CAR ID	1	Section no.	3.3	Date:31/01/2018
Description of CAR				
During the onsite visit, RINA verified that the installed capacity is different from the registered PD. PP is requested to follow the provisions of the VCS project standard, version 3.7, section 3.6 PROJECT DESCRIPTION DEVIATIONS. Moreover, the installed capacity is not in accordance with the definition in the applied methodology (Installed power generation capacity (or installed capacity or nameplate capacity): The installed power generation capacity of a power unit is the capacity, expressed in Watts or one of its multiples, for which the power unit has been designed to operate at nominal conditions. The installed power generation capacity of a power plant is the sum of the installed power generation capacities of its power units.				
Project participant response				Date:05/02/2018
Section 2.2.2 of the MR was revised to include explanations regarding changes in the project installed capacity following provisions from the VCS Project Standard (section 3.6.1).				
The project activity has lower loss load than estimated due to an expansion of the headrace tunnel during the construction period. It causes a decrease in the pressure drop and, consequently, an increase in the net head, allowing the increase of the electricity generation and, consequently, the installed capacity. Detailed description on project changes is presented CNEC Technical Report which was presented to the Brazilian Power Regulatory Agency ("ANEEL" from the Portuguese Agência Nacional de Energia Elétrica). ANEEL approved the project changes, including installed capacity, as can be seen in ANEEL Resolution #3,303 issued on 17/01/2012.				
Considering the increase in the installed capacity, the Project Proponent – through a VCS advisory company – exchanged e-mails with the VCS Team requesting procedures in this case. Then, an official letter was sent by the VCS Team on March 30 th , 2012 stating that the Project Proponent should include project changes in the Monitoring Report (monitoring deviation section) as changes did not result in modification or retrofit.				
In spite of the project changes, it does not impact in the ACM0002 (v. 11) applicability (above the 4W/m ² power density criteria) and additionality (as no new equipment was purchased and, thus, no additional investment was made). Explanations regarding changes in the assured energy of the project are addressed on CR 1 above. Section 2.2.2 of the Monitoring Report was revised to include the above information on "project deviations" section.				
While analyzing equipment tag, installed capacity of the project activity is $106.600\text{kVA} \times 0.9 = 95,940\text{kW} \times 2 \text{ generating units} = 191.880\text{MW}$. However, all project official documentation refers to the rounded installed capacity, as can be seen in ANEEL Ordinances of operation startup, Operation License and other public and official information available. In spite of the project documentation, the installed capacity considered in the MR is 191.88MW (and not 191.89MW). Please refer to revised MR and ER spreadsheet.				

Documentation provided by project participant	
- Monitoring Report, version 2; - VER (VCU) spreadsheet, version 2; - ANEEL Resolution #3,303 issued on 17/01/2012: approval of changes in the installed capacity from 182.3MW to 191.89MW (rounded value); - Technical Report issued by CNEC dated 24/05/2011: it presents explanations regarding revision of the installed capacity of ID513 project; - E-mail exchange between the project consultant and the VCS Team dated Feb-Mar/2012: regarding changes due to increase in the installed capacity of ID513 project; - VCS Official Letter dated March 30th, 2012: regarding changes due to increase in the installed capacity of ID513 project;	
DOE assessment	Date:06/03//2018
PP has provided an analysis for the for the difference between the assured energy presented in the registered PD and the current assured energy approved by MME. However, for the monitoring period, the energy generation is higher than the updated assured energy and its impact on additionaly was not evaluated. (please, refer to CL 1) Moreover, as is discussed in Section 3.6.1 of the VCS Standard, v3.7, project description deviations should be determined and conducted consistent with the CDM Guidelines on assessment of different types of changes from the project activity as described in the registered PDD Per paragraphs 6 guidance, as the project has not been implemented as described in the PD, the increased capacity may impact the additionality and must be re-assessed following the guidance in paragraph 8. The project proponent must therefore include the increased capacity as project description deviation as required by Section 3.6.1 of the VCS Standard, updating the PD where appropriate as required by the VCS rules.	
Project participant response	Date:06/03/2019
Based on the DOE comments, the PD was updated including the revision in the assured energy and installed capacity of the project. Please refer to the revised version of the PD and VCU spreadsheet attached to this response. The MR was also revised to exclude information regarding the project deviation as the PD was already revised.	
DOE assessment	Date:13/03/2019
PP has provided updated PD including the assessment for changes the assured energy and installed capacity of the project This CAR is closed	

CAR ID	2	Section no.	4.2	Date: 31/01/2018
Description of CAR				
Calibration dates in 2015 are not in accordance with the certificates, except for the meter PT-0811A790-01, that the calibration in 2013 is not correctly presented. Moreover, it is not described the installation date of the meter PT-0812A276-01				
Project participant response				Date: 05/02/2018
Table 3 of the Monitoring Report was revised to present the date of meters calibration instead of the issuance date of calibration certificates. The PPs also clarify that, at the power plant (gross electricity), there is always one backup meter which is put in place of the operational meter to be calibrated. Then, the operational meter is replaced by the one calibrated and remains operational up to the next calibration. This procedure ensures that a calibrated meter is always available when operational meters				

shall be calibrated, avoiding lack of measurement. Then, meter PT-0812A276-01 was calibrated in 02/06/2011, but it was put in operation on 17/04/2013. Date of calibration and installation of PT-0812A276-01 was included in table 3.

While considering the 2-year period for calibration frequency for energy meters located at the substation (which measures net electricity), there is a period uncovered by calibration. In spite of the updated ONS procedures (a 5-year frequency calibration), the last calibrations were conducted on 14/04/2015, but it should be conducted on 04/03/2015 as the updated ONS procedures are valid on 01/01/2017 onwards only. Results of the last calibration are presented below:

Measurement	% Error (+/-)			
	PT-0902A536-01	PT-0903A301-01	PT-0903A335-01	PT-0903A346-01
1	-0.069	-0.035	-0.089	-0.013
2	-0.077	-0.036	-0.096	-0.026
3	-0.076	-0.047	-0.096	-0.025
4	-0.101	-0.043	-0.102	-0.030
5	-0.072	-0.037	-0.091	-0.019
6	-0.084	-0.044	-0.101	-0.033
7	-0.08	-0.051	-0.101	-0.027
8	-0.101	-0.032	-0.102	-0.025
The highest diversion	-0.101	-0.051	-0.102	-0.033

As can be seen, error of the delayed calibration test is lower than the maximum permissible error of equipment (0.2%). For a conservative approach, the maximum accuracy of equipment was applied in the measured values of the uncovered period of calibration (04/03/2015 – 14/04/2015), i.e. 0.2%. Please refer to the revised MR and VCU spreadsheet ("EF 2015" sheet, "BL and BQ" columns).

It is important mentioning that error was applied in net electricity (EGy) and electricity considered for emission factor calculation. Therefore, calculation of emission reductions is very conservative.

Furthermore, emission factor of 19/10/2014, hour 1, was corrected considering the sunlight Brazilian program. As can be seen in all other years, given the sunlight program, emission factor is zero and, therefore, emission reductions related to this hour.

Documentation provided by project participant

- Monitoring Report, version 2
- VER (VCU) spreadsheet, version 2
- Sub-module ONS 12.3, which presents required calibration frequency for energy meters (page 7);
- Sub-module ONS 12.2, which presents energy meter specification for measuring system for invoicing according to INMETRO Ordinance # 587/2012 (class D, page 15);
- INMETRO Ordinance # 587 issued on 05/11/2012, which presents accuracy class (0.2% for class D, page 6).

DOE assessment

Date: 06/03/2018

RINA verified that the spreadsheet was correctly revised as described in the PPs response.

This CAR is closed.



CERTIFICATO DI QUALIFICA PER GLI SCHEMI VOLONTARI*
QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES*

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

Talita Carvalho Beck

è qualificato come:
 is qualified as:

TEC, VAL, VER, TL
LOCAL EXPERT

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

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
13.1	Solid waste and wastewater	13
14.1	Forestry	14

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	19/07/2016	First issue with new template (this certificate is linked to CDM qualification)
1	14/08/2017	Update qualification in TA 14.1 and Local expert

Responsabile di schema
 Scheme Leader
 Laura Severino

*SCHEMI VOLONTARI/ VOLUNTARY SCHEMES: ACR American Carbon Registry, CCB The Climate, Community & Biodiversity Alliance, GS Gold Standard, JI Joint Implementation, SCS Social Carbon Standard, VCS Verified Carbon Standard.

TEC: Technical expert; VAL: Validator; VER: Verifier; TL: Team leader; FIN EXP: Financial Expert; ITRP: Independent technical reviewer

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UNFCCC	quali Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects
VCSA	per condurre la Validazione e la Verifica di Progetti VCS to carry out Validation and Verification of VCS Projects
GS Foundation	per condurre la Validazione e la Verifica di Progetti GS to carry out Validation and Verification of GS Projects
Ecologica Institute	per condurre la Validazione e la Verifica di rapporti SCS to carry out Validation and Verification of SCS Reports
American Carbon Registry ACR	per condurre la Validazione e la Verifica di Progetti ACR to carry out Validation and Verification of ACR projects
The Climate, Community & Biodiversity Alliance CCB	per condurre la Validazione e la Verifica di Progetti co-benefit CCB to carry out Validation and Verification of co-benefit CCB projects



CERTIFICATO DI QUALIFICA PER GLI SCHEMI VOLONTARI*
QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES*

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

Rocha Mayra

è qualificato come:
 is qualified as:

TEC, FIN EXP

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

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	19/07/2016	First issue with new template (this certificate is linked to CDM qualification)

Responsabile di schema
 Scheme Leader
 Rita Valeroso

*SCHEMI VOLONTARI/ VOLUNTARY SCHEMES: ACR American Carbon Registry, CCB The Climate, Community & Biodiversity Alliance, GS Gold Standard, JI Joint Implementation, SCS Social Carbon Standard, VCS Verified Carbon Standard.

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VCSA	per condurre la Validazione e la Verifica di Progetti VCS to carry out Validation and Verification of VCS Projects
GS Foundation	per condurre la Validazione e la Verifica di Progetti GS to carry out Validation and Verification of GS Projects
Ecologica Institute	per condurre la Validazione e la Verifica di rapporti SCS to carry out Validation and Verification of SCS Reports
American Carbon Registry ACR	per condurre la Validazione e la Verifica di Progetti ACR to carry out Validation and Verification of ACR projects
The Climate, Community & Biodiversity Alliance CCB	per condurre la Validazione e la Verifica di Progetti co-benefit CCB to carry out Validation and Verification of co-benefit CCB projects