

PROJECT REVIEW REPORT

Project ID	896
Project Name	<i>Foz do Chapecó</i>
Program(s)	VCS
Verification Period	<i>01 July 2012 – 14 October 2020</i>
Project Proponent	<i>Foz do Chapecó Energia S.A.</i>
Methodology	<i>ACM0002: Consolidated methodology for grid-connected electricity generation from renewable sources, v13.0.0</i>
Sectoral Scope(s)	<i>01: Energy (renewable/non-renewable)</i>
Validation/Verification Body (VVB)	<i>RINA Services S.p.A. (RINA)</i>
Assessment Criteria	<i>VCS Standard, v4.1.</i>
Date of First Issue	<i>20 December 2021</i>
Date of Final Issue	<i>06 February 2022</i>

Summary:

An accuracy review of the *Foz do Chapecó* verification approval request has been conducted by Verra in accordance with Section 4.3 of the *Registration and Issuance Process*.

The accuracy review has raised 11 assessment findings and 07 minor findings, detailed below. The VVB, in coordination with the project proponent, is hereby required to provide a response to the assessment findings presented in Section 1. The 18 assessment findings must be addressed to the satisfaction of Verra. This project review report will be made publicly available. Confidential information may be provided as separate attachments.

1. ASSESSMENT FINDINGS

Finding 1

In line with Section 3.4.3 of the VCS Program Standard v4.1, the project proponent shall use the VCS Monitoring Report Template or an approved combined monitoring report template available on the Verra website, as appropriate, and adhere to all instructional text within the template.

In the title page of the Monitoring Report version 2.0, dated 14 September 2021, the project title is indicated as Foz do Chapecó Hydro Power Plant, and Foz do Chapecó Project. The VVB's submitted report v1.1, dated 29 September 2021 reflects the same throughout the VR.

In the approved MR for MPI v4.0, dated 19 November 2012, the project title is Foz do Chapecó Hydro Power Plant.

In the approved VCS Project Description Document v3.0, dated 15 September 2012, the project title is given as Foz do Chapecó. The registry name also appears to be different.

- a) In light of the inconsistencies above, the PP shall clarify the project title of the implemented VCS project activity.
- b) The VVB is required to clarify how it validated the correctness/consistency of the project title in the documents

VVB Response:

MR and verification report were revised to consider the project name "Foz do Chapecó" as per the registered VCS Project Description Document v3.0, dated 15 September 2012.

Verra Response:

The Monitoring and the Verification Reports have been revised to have a consistent title 'Foz do Chapecó'. The finding is closed, and no further action is required.

Finding 2

In line with Section 3.4.3 of the VCS Program Standard v4.1, the project proponent shall use the VCS Monitoring Report Template or an approved combined monitoring report template available on the Verra website, as appropriate, and adhere to all instructional text within the template.

In the Section 1.3 of the Monitoring Report version 1.1 indicates only one project proponent Foz do Chapecó Energia S.A.

However, the registered VCS Project Description Document and the Monitoring Report for MPI v4.0, dated 19 November 2012, and the approved VCS PD v3.0, dated 15 September 2012, the PPs are indicated as Foz do Chapecó Energia S.A & Enerbio Consultoria Ltda.

The PP is required to clarify the actual and existing project participant (s). Any changes to the PPs shall also be reflected and explained in section 3.1 as required by the VCS MR template v4.0. The VVB to validate the same with appropriate supporting documentation and include the assessment in a revised VR.

VVB Response:

MR and verification report were revised to consider the project participants as per the registered VCS Project Description Document v3.0, dated 15 September 2012. (Foz do Chapecó Energia S.A and Enerbio Consultoria Ltda.)

Verra Response:

The Monitoring Report and the Verification Report have been revised to reflect that the project proponents are 'Foz do Chapecó Energia S.A and Enerbio Consultoria Ltda.', consistent with the registered VCS PD. The finding is closed, and no further action is required.

Finding 3

In line with Section 3.4.3 of the VCS Program Standard v4.1, the project proponent shall use the VCS Monitoring Report Template or an approved combined monitoring report template available on the Verra website, as appropriate, and adhere to all instructional text within the template.

In Section 4.1 of the Monitoring Report version 2.0, dated 14 September 2021, the description of the parameter A_{BL} is not consistent with the description in the approved VCS Project Description Document v3.0, dated 15 September 2012

The PP is requested to clarify what is the correct value. Further the. VVB should assess the accuracy of the value and confirm in the assessment report.

VVB Response:

RINA verified that MR was revised in accordance with the registered VCS Project Description Document v3.0, dated 15 September 2012.

Verra Response:

The description of the fixed parameter A_{BL} has been updated and the validated value is still zero. The finding is closed, and no further action is required.

Finding 4

In line with Section 3.4.3 of the VCS Program Standard v4.1, the project proponent shall use the VCS Monitoring Report Template or an approved combined monitoring report template available on the Verra website, as appropriate, and adhere to all instructional text within the template.

Section 4.2 of the Monitoring Report, concerning monitoring of the parameter: ' **$EF_{grid,CM,y}$ - Combined Margin CO₂ Emission Factor**'.

The Monitoring Report states under the row Calculation Method: '*The combined margin emission factor considers the default value of 0.5 for each Emission factor as recommended by the methodology*'.

The PP is required to clarify this statement, as the applied CDM methodology does not appear to have this provision.

The VVB shall explain how it verified the calculation of the combined margin grid emission factor, in light of the default 0.5 stated in the MR

VVB Response:

MR and verification report were revised: The combined margin emission factor considers the default value of 0.5 for each emission factor as recommended by the “tool to calculate the emission factor for an electricity system”.

Verra Response:

The combined margin emission factor prescribes the default weight value of 0.5 for each emission factor as recommended by the “*TOOL07: Tool to calculate the emission factor for an electricity system*”. The finding is closed, and no further action is required.

Finding 5

In line with Section 3.4.3 of the VCS Program Standard v4.1, the project proponent shall use the VCS Monitoring Report Template or an approved combined monitoring report template available on the Verra website, as appropriate, and adhere to all instructional text within the template.

Monitoring Report Section 4.2 Concerning the monitoring of the parameter ‘ A_{PJ} ’.

The measurement of this parameter is 'yearly' from 'Topographical measurement to measure the area of the reservoir'. However, a fixed calculated value from the approved Project Description Document and Monitoring Report from the first monitoring period (MPI) has been indicated. No vintage-wise measurement data is included.

The PP shall clarify how this approach complies with the registered monitoring plan. An assessment by the verifying VVB shall be included in the relevant section of the Verification Report

VVB Response:

MR and verification report were revised to include additional information.

The minimum operational height of UHE Foz do Chapecó is 264 m and the maximum operational height is 265 m. Due to the above and characteristic of the point where the hydroelectric dam is located, the reservoir area does not change, always remaining (perennially) as a full river. Therefore, the area values remain constant during (continuous) monitoring. Through Google Earth itself (point “UHE Fóz do Chapecó”) it is possible to check the above.

Additionally, according to Ibama's Environmental License, it is necessary to:

“2.1.18. Program 18 (PA-18): Inspection of the Reservoir and its Surroundings” Based on the above, the environmental agency already annually inspects the area of the reservoir and its surroundings (APP, land, bathymetry, etc).

Evidences are described in the revised verification report.

Verra Response:

Verra has checked the revision and the explanation on the constant value of A_{PJ} . The clarification is accepted. The finding is closed, and no further action is required.

Finding 6

In line with Section 3.4.3 of the VCS Program Standard v4.1, the project proponent shall use the VCS Monitoring Report Template or an approved combined monitoring report template available on the

Verra website, as appropriate, and adhere to all instructional text within the template.

Section 5.1 of the MR template states as follows: -

Quantify the baseline emissions and/or removals, providing sufficient information to allow the reader to reproduce the calculation. Attach electronic spreadsheets as an appendix or separate file to facilitate the verification of the results.

- a) The PP is requested to submit ER spreadsheet

It is also noted that emission reductions achieved during the current monitoring period is twice the ex-ante values. The PP has not provided a comparison and justification of the realized emission reductions in Section 5.4 of the monitoring report. Further the VVB is required to address how the increased emission reductions would impact the additionality and eligibility of this particular project.

VVB Response:

MR and verification report were revised. The emission reduction verified ex-post is twice the ex-ante values (12,450,836 tCO_{2e}- verified x 6,206,005 tCO_{2e}- estimated). The ex ante estimative calculation is based on 31,220,640 MWh (total electricity supplied to the grid) and emission factor of 0.1988 tCO₂/MWh.

In the ex-post monitored period the total electricity achieved was 33,224,412 (6.42% only over) but the average emission factor for the monitored period has achieved 0.3630 tCO₂/MWh (82.60% over) resulting in a total of 12,450,836 VCU (100.63% over).

Based on the numbers above is it possible to conclude that the emission factor was very higher during the ex-post period (due to major use of fossil fuelled Power plants in Brazil).

RINA verified that the difference is mainly due to the difference in the emission factor, not under PP control, based on official data from Brazilian DNA. The higher energy generation of 6.42 % does not impact in the additionality of the project activity (As per the registered PD, Sensitivity analysis shows that to reach the benchmark, the amount of electricity should be 18.6% higher than the assured energy during all concession period) nor eligibility of the project activity (there is not impact in the scale nor monitoring of the project activity).

Verra Response:

The explanation has been accepted that the main reason for much higher is the calculated ex-post average grid emission factor, and that the additionality of the project activity is not impacted, based on the sensitivity analysis in the approved VCS PD.

Nonetheless, the following issues arise

- a) The PP has not included this explanation in Section 5.1 of the revised Monitoring Report v3.1, dated 10 January 2022.
- b) The values in row 13 and row 28 of the tab 'Overview' are not internally consistent.

VVB/PP Response:

- a) The explanation was included in Section 5.1 of the monitoring report v3.2.
- b) Also the values in row 13 and 28 were adjusted accordingly (tb 'Overview').

Verra Response:

- a) The PP has revised Section 5.4 and included the explanation as to the significant difference in the ex-post value. This explanation is found to be sufficient.
- b) The submitted excel workbook has been checked and found to be corrected as required

The finding is closed and no further action is required

Finding 7

In line with Section 4.1.14 of the VCS Program Standard v4.1: The validation/verification body shall use the VCS Verification Report Template or an approved combined verification report template available on the Verra website, and adhere to all instructional text within the template.

Section Summary of the VVB Verification Report v1.1, dated 29 September 2021 does not include the method and criteria, and the number of findings as required by the VCS Verification Report template.

The VVB shall include the omitted information accordingly

VVB Response:

Summary of Verification report was revised to include the method and criteria, and the number of findings as required by the VCS Verification Report template.

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 4.0 of 19/09/2019, and VCS Standard, VCS Version 4.1 of 22/04/2021. 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 13.0.0 of 11/05/2012.

The verification consisted of the following three phases

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

The following sections outline each step in more detail.

Verra Response:

The VVB has revised the Verification Report v2.0, dated 12 January 2022 and included the method and criteria as well as the number of audit findings. The finding is closed, and no further action is required.

Finding 8

In line with Section 4.1.14 of the VCS Program Standard v4.1: The validation/verification body shall use the VCS Verification Report Template or an approved combined verification report template available on the Verra website, and adhere to all instructional text within the template.

Identify and discuss any potential negative environmental and socio-economic impacts identified by the project proponent. Discuss whether reasonable steps have been taken to mitigate such impacts.

Section 4.2.1 of the VVB Verification Report v1.1, dated 29 September 2021 does not include all the

required information as required by the template

The VVB shall include the omitted information accordingly

VVB Response:

Verification report was revised to add more information.

RINA verified that impacts and the programs listed in the Monitoring report is in accordance with registered PD and are based on The EIA (from portuguese Estudo de Impacto Ambiental, Environmental Impact Studies) and RIMA (from portuguese Relatório de Impacto Ambiental, Environmental Impact Document) developed for the Project Activity highlight the environmental impacts of the hydroelectric plant and the actions to minimize the adverse impacts.

RINA verified that the valid Operational License issued by IBAMA /11/ lists the following environmental and social programs, that are monitored by the environmental agency:

2.1.1 Program 1 (PA-01): Monitoring and Control of Erosive Processes

2.1.2 Program 2 (PA-02): Restoration of Degraded Areas

2.1.3 Program 3 (PA-03): Climatological Monitoring

2.1.4 Program 4 (PA-04): Monitoring Hydrossedimentological Conditions

2.1.5 Program 5 (PA-05): Seismological Monitoring

2.1.6. Program 6 (PA-06): Monitoring of Surface Water and Sediment Quality 2.1.7.

2.1.7 Program 7 (PA-07): Cold and Thermal Aquifer Monitoring

2.1.8. Program 8 (PA-08): Monitoring and Control of Aquatic Macrophytes

2.1.9 Program 9 (PA-09): Monitoring and Conservation of Terrestrial Fauna in the Reservoir's APP

2.1.10. Program 10 (PA-10): Program for Monitoring and Management of Ichthyofauna and Fishing

2.1.11. Program 11 (PA-11): Environmental Education

2.1.12. Program 12 (PA-12): Social Communication

2.1.13. Program 13 (PA-13): Monitoring of Human Health Problems

2.1.14. Program 14 (PA-14): Support to Agricultural Activities - Biofactory

2.1.15. Program 15 (PA-15): Restoration of the Permanent Preservation Area of the Reservoir

2.1.16. Program 16 (PA-16): Restoration of Permanent Preservation Areas outside the Reservoir

2.1.17. Program 17 (PA-17): Support to Fishermen

2.1.18. Program 18 (PA-18): Surveillance of the Reservoir and its surroundings

2.1.19. Program 19 (PA-19): Management of Solid Waste

2.1.20. Program 20 (PA-20): Management of Liquid Effluents

2.1.21. Program 21 (PA-21): Monitoring and Control of the Golden Mussel Population

2.1.22. Program 22 (PA-22): Environmental Management

Therefore, the potential negative environmental and socio-economic impacts identified by the project proponent during the project implementation are regulated and monitored by the environmental agency in order to mitigate them.

Verra Response:

The VVB has revised the Verification Report v2.0, dated 12 January 2022, with the information on the potential impacts and the mitigation measures as per the host country laws. The finding is closed, and no further action is required.

Finding 09

In line with Section 4.1.14 of the VCS Program Standard v4.1: The validation/verification body shall use the VCS Verification Report Template or an approved combined verification report template available on the Verra website, and adhere to all instructional text within the template.

Summarize any stakeholder input received during ongoing communication with local stakeholders. Assess whether the project proponent has taken due account of all and any input, and provide an overall conclusion regarding local stakeholder input.

Include the project proponent's response to all input, describe any resultant changes to the project design and provide an explanation of how the project proponent's responses are appropriate.

Section 4.2.2 of the VVB Verification Report v1.1, dated 29 September 2021 does not include all the required information as required by the template

The VVB shall include the omitted information accordingly

VVB Response:

MR and verification report were revised to include more information regarding the ongoing communication with local stakeholders.

Verra Response:

The Verification Report has been revised to include the mechanism for ongoing communication with stakeholders. However, the VVB does not include any information on comments received and how due

account was taken by the project proponent in the course of this monitoring period.

The VVB is requested to explain how it verified the same

VVB Response:

RINA: As part of the programs monitored by the Environmental agency (IBAMA) twice a year, there is the Program 12 (PA-12): Social Communication (listed in the finding 08 above). For example, free translation of the of the Annuar Report 2 (July 2020 to June 2021):

The Social Communication Program aims to maintain open and permanent communication channels between the community and Foz do Chapecó Energia, passing on information relevant to the enterprise and of public interest, in addition to meeting the demands of the population living in the vicinity.

The report describes all the actions done, with pictures and evidences (such as signed docs, reports, radio vouchers, etc), confirming the ongoing communication with local stakeholders.

The verification report was revised to include additional information.

Verra Response:

The verification report has been revised sufficiently to include the requested information. The finding is now closed.

Finding 10

In line with Section 4.1.14 of the VCS Program Standard v4.1: The validation/verification body shall use the VCS Verification Report Template or an approved combined verification report template available on the Verra website, and adhere to all instructional text within the template.

Identify the data and parameters used to calculate the GHG emission reductions and removals, and describe the steps taken to assess the following for each of them:

- *The accuracy of GHG emission reductions and removals, including accuracy of spreadsheet formulae, conversions and aggregations, and consistent use of the data and parameters.*
- *Whether the methods and formulae set out in the project description for calculating baseline emissions, project emissions and leakage have been followed.*
- *The appropriateness of any default values used in the monitoring report.*

Describe the steps taken to assess whether manual transposition errors between data sets have occurred.

Provide an overall conclusion regarding whether GHG emission reductions and removals have been quantified correctly in accordance with the project description and applied methodology.

Section 4.4 of the VVB Verification Report v1.1, dated 29 September 2021 does not include all the required information as required by the template

The VVB shall include the omitted information and provide sufficient assessments as required

VVB Response:

Verification report was revised to include the missing information.

RINA verified that the VCUs spreadsheet /03/ reports all the monitored data in accordance with the evidences provided and no error is found in the final version. Methods and Formulaes are correctly presented in accordance with the methodology and registered PD as detailed above. Data used the VCUs calculation are from official sources and manually transferred to the VCUs spreadsheet. No transposition error was found.

It is RINA's opinion that the GHG emission reductions /03/ have been quantified correctly in accordance with the project description /02/and applied methodology /06/ with reasonable level of assurance.

Verra Response:

The VVB has revised Section 4.4 of the Verification report and included assessment criteria and an overall conclusion on the accuracy and correctness of the GHG emission reductions. This finding is closed, and no further action is required.

Finding 11

In line with Section 4.1.14 of the VCS Program Standard v4.1: The validation/verification body shall use the VCS Verification Report Template or an approved combined verification report template available on the Verra website, and adhere to all instructional text within the template.

Identify the evidence used to determine the GHG emission reductions and removals and describe the steps taken to assess the sufficiency of quantity, and appropriateness of quality, of the evidence. Include details of any cross-checks performed on the reported data and how the following were assessed:

- *The reliability of the evidence, and the source and nature of the evidence (external or internal, oral or documented) for the determination of GHG emission reductions or removals.*
- *The information flow from data generation and aggregation, to recording, calculation and final transposition into the monitoring report.*
- *Where the project description does not specify calibration frequency of monitoring equipment, the appropriateness of implemented calibration frequency.*

Provide an overall concluding statement with respect to the sufficiency of quantity, and appropriateness of quality, of the evidence used to determine the GHG reductions and removals.

Section 4.5 of the VVB Verification Report v1.1, dated 29 September 2021 does not include all the

required information as required by the template

The VVB shall include the omitted information and provide sufficient assessments as required

VVB Response:

Verification report was revised to include the missing information.

All monitored data was cross checked against official sources Data used the VCUs calculation are from external/official sources /13/ /55/ /08/ /56/ /11/ /57/ and manually transferred to the VCUs spreadsheet. No transposition error was found.

The calibration periodicity was correctly followed in accordance with the ONS requirements at the time of PD registration: calibration should be conducted each 2 years. (Note: according to updated ONS procedures valid on 01/01/2017 onwards, energy meter calibration shall be conducted in a 5-year period).

It is RINA's opinion that the GHG emission reductions /03/ have been quantified correctly in accordance with the project description /02/and applied methodology /06/ with reasonable level of assurance.

Verra Response:

The VVB has provided appropriate referencing and an overall conclusion regarding the quality of evidence for the verification audit used to arrive at a reasonable level of assurance. The finding is closed, and no further action is required.

2. MINOR FINDINGS

Finding 1

1. Please submit the ER calculations spreadsheet. PP
Verra: OK
2. Verification Report Section Summary: Pls include what the VVB exception is about **RINA:** verification report revised (The exemption requested by the Project Proponent is to allow eight years and three months of the project to be verified by one VVB)
Verra: OK
3. Verification Report Section 1.4: Unclear if the nominal capacity of 217.14 MW is for **each** or overall. Furthermore, a calculation of the total nominal capacity (217.14x4) leads to 868.56MW . The source of this nominal capacity of 217.14MW shall also be included as it is not in the MR.
RINA: verification report revised (Total installed capacity of the Project will be 855 MW (based on generator's plate capacity, confirmed during the videoconference remote audit), consisting of four sets of hydroelectric Francis type turbines with nominal capacity 217.14 MW each and the electricity generator nominal power is 213.75 each, with a predicted electricity supply to the grid of 3,784,320 MWh per annum.). The PD contains this information but could be incorrect, so PP to clarify correctness.
Verra: Already adjusted in the Section 1.1 of the monitoring report v3.2.
4. Verification Report Section 2.1/2.2: Version of the VCS Program Standard should be updated to v4.1. **RINA:** verification report revised
Verra: OK
5. Verification Report Section 4.1: Date of remote audit is not consistent with date indicated in

section 2.3. **RINA:** verification report revised (31/08/2021)

Verra: OK

6. Verification Report Section 4.4: The VVB shall consider review comments related to PD data and calculation above. **RINA:** verification report revised

Verra: OK

7. VVB to provide email address in the title page. **RINA:** Section contact of verification report revised (GHG_Services ghg.services@rina.org)

Verra: OK

3. ASSESSMENT CONCLUSION

On 20 December 2021, Verra completed the review of the VCS verification approval request for Project 896, *Foz do Chapecó*, the results of which can be found above. The project review report was sent to *RINA Services S.p.A. (RINA) and the PP*. with 11 assessment findings and 07 minor finding(s).

On 16 January 2022, Verra reviewed the responses to all the review findings except Findings 6 & 9 and minor finding 3. The updated project review report was sent to *RINA Services S.p.A. (RINA) and the PP* for further response.

On 21 January 2022, Verra closed all findings.