



VALIDATION REPORT

ZEUS HYDROELECTRIC POWER PLANT

BCR-CO-173-1-003

AENOR CONFIA, S.A.U.

VALIDATION REPORT BCR-CO-173-1-003	
Project Title	<i>Zeus Hydroelectric Power Plant</i>
Project ID	<i>BCR-CO-173-1-003</i>
Project holder	<i>Central Hidroeléctrica Zeus S.A.S. E.S.P.</i>
Project Type/Project activity	<i>Energy sector: Renewable energy- Hydraulic power</i>
Grouped project	<i>No</i>
Version number and date of the Project Document to which this report applies	<i>Version 6.0; 06/05/2025</i>
Applied methodology (ies)	<i>AMS-I.D.: Grid connected renewable electricity generation --- Version 18.0</i>
Project location	<i>Colombia</i> <i>Donmatías, Antioquía,</i>
Project starting date	<i>17/05/2022</i>
Quantification period of GHG emissions reductions/removals	<i>17/05/2022 to 16/05/2029</i>
Estimated total and average annual amount of GHG emission reductions/removals	<i>162,092 t CO₂e; 23,156 t CO₂e</i>


Contribution to Sustainable Development Goals	SDG 7, SDG 8 AND SDG 13
Special category, related to co-benefits	N/A
Version and date of issuing	Version 3; 08/05/2025
Work carried out by	Mr. Luis Javier ARRIBAS (Team Leader) Mr. Sergio RODRIGUEZ (Trainee Validator) Mr. Asis ARRANZ (Validator and Financial Expert).
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1 Executive summary

The Zeus Hydroelectric Plant project consists of a run-of-the-river power plant that uses the waters of the Rio Grande River, and have installed 2 Francis turbines, with a total installed capacity of 9.88 MW based on a feed flow of 7 m³/s and an expected generation of 59,200 MWh per year of renewable energy. Therefore, the project belongs to the energy sector.

This complies with the standard rule, which states that only small run-of-river hydropower plants between 500 and 20,000 kW of installed capacity are eligible.

The proposed project is in the municipality of Donmatias, which lies within the Antioquia department in Colombia.

The electricity is dispatched to the Colombian electricity grid. Prior to project implementation, no hydroelectric plant or other generation plants were installed at the site. In the baseline scenario, the energy delivered to the grid is generated by a mix of thermal and renewable power generation as reflected in the combined margin emissions factor (as per the tool applied). Hence, the project will reduce thermal power generation and GHG emissions from fossil fuel-based generation in the grid by increasing the share of renewable energy.

The scope of this validation process is to assess the estimated total GHG emission reductions of 162,092 t CO₂e for the first quantification period of GHG emissions reduction of the project from 17/05/2022 to 16/05/2029, and the purpose is to confirm the compliance of the project with the BCR standard (version 3.4) /16/, based on the initial version of the PD /1/, and the proper application of the monitoring methodology “AMS-I.D.: Grid connected renewable electricity generation, Version 18.0” /11/ and its related CDM tools and guidelines. During this validation process, 10 findings occurred to be classified as 7 corrective actions request, 2 clarifications actions request and 1 forward action request (FAR), which were treated by the project holder and clarified in a new version of the PD version 6.0 /2/, except to the FAR that should be clarified during the initial verification. Upon review of the documentation and explanations provided by the project holder, all findings were closed out in a clear and transparent manner. AENOR validated the project design and the implementation status through the documental review and onsite visit (it was conducted between 23/04/2024 to 24/04/2024), addressing conservatively the restrictions and uncertainties associated to this validation process. AENOR confirms that it achieved a reasonable level of assurance during validation. The validation team was able to conclude that as it was described in the version 6.0 of the project description (PD) /2/, it meets all relevant BCR requirements and correctly applies the baseline and monitoring methodology AMS-I.D.: Grid connected renewable electricity generation Version 18.0 /11/. Hence, AENOR requests the registration of the project.

2 Objective, scope and validation criteria

AENOR CONFIA, S.A.U. (AENOR hereafter) was appointed by “South Pole Carbon Asset Management S.A.S” to perform the validation of the “Zeus Hydroelectric Power Plant” in “Colombia” through the accepted offer, dated 21/06/2023. The objective of this validation activity is to have an independent third party for the assessment of the project design, and to ensure a thorough assessment of the proposed project activity against the applicable BCR. In particular:

The project's baseline and monitoring plan were assessed against “AMS-I.D.: Grid connected renewable electricity generation, Version 18.0” /11/.

The project's additionality justification was assessed against “Tool 21: Demonstration of additionality of small-scale project activities, version 13.1” /12/

The project's compliance with the requirements of BCR and other relevant rules, including the Host Country's legislation and sustainability criteria.

Validation is a requirement for all BCR projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

The scope of the validation is the independent and objective review of the Project Document Template (PD). The purpose of the validation is its usage during the registration process as part of the BCR project cycle. Therefore, AENOR cannot be held liable by any party for decisions made or not made based on the validation opinion that go beyond that purpose.

3 Validation process

3.1 Level of assurance and materiality

According to the requirements of the validation and verification manual, and provisions stated in clause 5.1.7 of ISO 14064-3, it was scheduled in the audit plan, the level of assurance and materiality considered during the validation has been:

- a) The level of assurance of 95%*
- b) The material discrepancy in the data supporting the GHG Project baseline and the estimate of GHG emission reductions of +/-5%.*

Therefore, AENOR hereby confirms that the reasonableness of assumptions of this validation report is reasonable, with respect to material errors, omissions, and misrepresentations. To guarantee this reasonableness of assumptions all data that is used

in the GHG emission reduction calculations have been reviewed without any sampling, and obtained from the original sources, as is detailed in the annex 3

3.2 Validation activities

3.2.1 Planning

The project validation / verification process was carried out in accordance with the requirements established in the ISO 14064-3:2019 “Greenhouse Gases. Part 3: Specification with guidance for validation and verification on gases and in the BCR Standard /16/.

As a step prior to the preparation of the validation Plan, the PD and other relevant documents that at the discretion of the audit team have been requested for a good organization of the audit were reviewed and was conducted a strategic and risk analysis, evaluating the issues indicated in the ISO 14064-3: 2019 standard by the audit team.

Based on the strategic and risk analysis and considering the requirements of the BCR Standard /16/, in the case of this project, a sampling was not carried out and 100% of data and information has been reviewed

3.2.2 Sampling plan

Based on the strategic and risk analysis carried out by the audit team that considered the requirements of the BCR Standard /16/ related to the level of assurance, the scope of validation, the validation criteria, the quality, and type of evidence (qualitative and quantitative) required to achieve the required level of assurance, the methodologies for determining representative samples, and the risks of potential errors, omissions, or misinterpretations, in the case of this project, a sampling was not carried out and 100% of data and information has been reviewed.

3.2.3 Execution

Preliminary assessment

As was indicated in section 1 of this report, the scope of this validation process was to assess the estimated total GHG emission reductions of 162,092 t CO₂e for the first quantification period of GHG emissions reduction of the project from 17/05/2022 to 16/05/2029, and the purpose is to confirm the compliance of the project with the BCR standard (version 3.4) /16/, based on the PD version 6.0 /2/, and the proper application of the monitoring methodology “AMS-I.D.: Grid connected renewable electricity generation, Version 18.0” /11/ and its related CDM tools and guidelines.

Therefore, as part of the preliminary assessment, the validation team requested the project holder for sufficient information to determine the purpose and scope of the validation considering the following:

if the project corresponds to a type of project eligible for BCR,

if the project applies a methodology eligible under the requirements of BCR,

if the monitoring plan complies with the methodology applied by the project,

if the determination of the baseline has been calculated in accordance with the requirements of BCR and existing sectoral and national regulations.

The validation scope is defined as an independent and objective review of the PD, the project's baseline study and monitoring plan, and other relevant documents. The information in these documents is reviewed against BCR rules and associated interpretations. AENOR has used a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of emission reductions.

The validation is not meant to provide any consultancy services to the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the PD.

The activities carried out during the validation were the following:

Tasks	Period
<i>Publishing the PD in the website of the program for public comments</i>	<i>01/03/2024 - 31/03/2024</i>
<i>Desk review of documents</i>	<i>01/04/2024 - 19/04/2024</i>
<i>Audit plan submission</i>	<i>04/04/2024</i>
<i>Follow-up actions (on-site inspection or remote; interviews; cross checks of information)</i>	<i>23/04/2024 - 24/04/2024</i>
<i>First submission of Findings, including CARs and CLs</i>	<i>29/04/2024 - 14/05/2024</i>
<i>Answer to findings</i>	<i>15/05/2024 - 01/07/2024</i>
<i>Second submission of Findings</i>	<i>02/07/2024 - 31/07/2024</i>
<i>Answer to findings</i>	<i>01/08/2024 - 03/09/2024</i>
<i>Third submission of Findings</i>	<i>04/09/2024 - 13/09/2024</i>

Answer to findings	14/09/2024 – 24/10/2024
Draft reports	06/08/2024
Validation/verification reports (after PP provides definitive documentation and the CARs and CLs are closed)	19/11/2024
Technical review	27/11/2024
Final validation report	28/11/2024
Final validation report (after BCR revision)	08/05/2025

The detail of the main validation activities is described below.

Document review

A detailed review of all project documentation was conducted to ensure consistency with, and identify any deviation from BCR program requirements, and the PD. Initial review was focused on the PD version 2.0 dated 23/02/2024 and provided on 26/02/2024, and included an examination of the project details, implementation status and internal reports, data and parameters, as well as BCR requirements compliance documented supporting evidences (see Annex 3). Documents reviewed included data from monitoring, management plans, maps, monitoring and responses to Corrective Action Requests and Clarifications (see Annex 2). The initial PD was revised several times due to the raised CARs and CLs, until the final version.

The desk review involved:

- Project document and emission reduction spreadsheet “Zeus Colombia Calculations”. /1/2/
- CDM baseline methodology AMS-I.D.: "Grid-connected renewable electricity generation" Version 18.0. /11/
- CDM "Demonstration of additionality of small-scale project activities" Version 13.1. /12/
- "Tool to calculate the emission factor for an electricity system" (Version 7.0). /13/
- BCR Standard Version 3.4. /16/
- Validation and Verification Manual Greenhouse Gas Projects version 2.4 /17/

A complete list of documents assessed for this validation is found in Annex 3.

3.2.3.1 Onsite inspection

As a part of the validation activities a physical site visit was executed to the project activity's location, details of which can be seen below.

The onsite visit was carried out by the lead auditor (Luis Javier Arribas) and the validator (Asis Arranz) during two days on 23-24/04/2024.

The following activities were conducted during the first day:

- The initial meeting in the headquarters of the PP.*
- The remote visit to the Riogrande electrical substation where is the delivery point of electrical energy generation by the project.*
- The remote interview with Camilo Correa, the Mayor from San Matias.*
- Review of the main requirements of BCR and the information included in the PD and complementary documentation provided by the PP initially (additionality, characteristics of the project, stakeholder consultation, baseline determination, etc).*

The following activities were conducted during the second day:

- The visit to the facilities of the Zeus Hydroelectric Power plant, reviewing the correct implementation of the project and including interviews with operational staff and project proponents to assess the information included in the project documentation.*
- Interview of Bernardo Gaviria and Ramiro Gaviria, residents of Vereda Pan de Azucar*
- Interview of Efren de Jesús Montoya, president, and merchant of Vereda San Isidro*

The purpose of this visit was to resolve questions and issues identified during the desk review of documents and to gain additional information regarding the compliance of the project with the relevant criteria applicable for BCR Standard /16/.

3.2.3.2 Interviews

During the validation period, follow-up interviews were performed by the validation team to further analyze the correctness and accurateness of the information provided.

The list of individuals who were interviewed during the validation on-site visit, executed on 23-24/04/2024 is given in Table below:

<i>Name</i>	<i>Role</i>
<i>Yeison Estiven Valencia</i>	<i>Machine House Operator</i>
<i>Gustavo Agudelo</i>	<i>Machine House Operator</i>
<i>Andres Fernando Pino Mesa</i>	<i>Capture Zone Operator</i>
<i>Duban Arley Restrepo Zapata</i>	<i>Capture Zone Operator</i>
<i>Juan Camilo Restrepo Restrepo</i>	<i>Capture Zone Operator</i>
<i>Yeison Stiven Restrepo zapata</i>	<i>Capture Zone Operator</i>
<i>Yhoiner Restrepo Herrera</i>	<i>Capture Zone Operator</i>
<i>Yorley Alcides Restrepo Zapata</i>	<i>Capture Zone Operator</i>
<i>Juan Camilo Usme Murillo</i>	<i>Capture Zone Operator</i>
<i>Carlos Holquin Martinez</i>	<i>Generation Director</i>
<i>Fernando Javier León Polit</i>	<i>Infrastructure Coordinator</i>
<i>Juan Esteban Ospina</i>	<i>Operation Supervisor</i>
<i>Janier Emitola Ruiz</i>	<i>Infrastructure Supervisor</i>
<i>Santiago Céspedes Montoya</i>	<i>Operation Coordinator</i>
<i>Adelaida Londoño</i>	<i>Environmental and Social Coordinator</i>
<i>Bernardo Gaviria</i>	<i>Resident of Vereda Pan de Azucar</i>

<i>Name</i>	<i>Role</i>
Ramiro Gaviria	Resident of Vereda Pan de Azucar
Efren de Jesús Montoya	President and merchant Vereda San Isidro
Camilo Correa	Mayor from Don Matías*
Santiago González Hernández	Regional Lead, Technical, Sustainable Technologies- South Pole (Consultant)

* Remote interview by WhatsApp videoconference

3.2.3.3 Findings

In line with BCR Standard version 3.4 /16/, the team reports the non-conformities in the forms of Corrective Action Requests (CARs), Clarification Requests (CLs) and Forward Action Requests (FARs). When and for which type of non-conformities CARs, CLs and FARs are issued are explained below.

The Validation team raises a CAR 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 BCR requirements have not been met.

There is a risk that emission reductions cannot be monitored or calculated.

The Validation team raises a CL if information is insufficient or not clear or not sufficiently transparent to determine whether the applicable CDM and/or BCR requirements have been met.

The Validation team raises a FAR during the validation to highlight issues related to project implementation that require a review during the first verification of the project activity.

Annex 2 of this report describes the results and responses given by the project holder to each of the requests for corrective actions, requests for clarification and requests for future actions, generated by the audit team during validation, as well as the conclusion responses provided by the project holder to these inquiries.

Those findings detected by AENOR (7 CAR and 2 CL) were treated by the project holder and clarified through communications or meetings between the two parties, and the information

resulting was included in the final version of the PD and the complementary documentation, identified in the annex 3. Additionally, a FAR was raised to be resolved during the first verification.

Clarification requests (CLs)

Annex 2 of this report describes with details the issues raised by the audit team as clarification request. The total number of findings that correspond to clarifications request were 2 and were closed correctly.

Corrective actions request (CARs)

Annex 2 of this report describes with details the issues raised by the audit team as corrective actions request. The total number of findings that correspond to corrective actions requests were 7 and were closed correctly.

Forward action request (FARs)

Annex 2 of this report describes with details the issue raised by the audit team as forward action request. The total number of findings that correspond to forward actions requests was 1 that was raised during the validation, for the subsequent project verifications.

3.3 Validation team

The appointment process of the validation team considers the technical area(s), sectoral scope(s), and relevant host country experience required amongst team members for the accurate and thorough assessment of the project design. The validation team and ITR were assigned to this validation activity on 22/05/2023, taking all the above factors into consideration and as a result of the contract review process, where is assessed the compliance of the validation team with the requirements of BCR Antibribery policy.

The validation team members and ITR are given in Table below:

Name	Role in the Team	Activities to be carried
Luis Javier Arribas Alonso	Lead auditor	Documentation review, on-site visit, report
Asis Arranz	Auditor and financial expert	Documentation review, on-site visit, report
Sergio Rodrigo Santano	Auditor (trainee)	Documentation review, report

<i>Name</i>	<i>Role in the Team</i>	<i>Activities to be carried</i>
<i>Richard Daniel Gonzales</i>	<i>Technical reviewer</i>	<i>Technical review</i>
<i>José Luis Fuentes</i>	<i>Approver</i>	<i>Approved this report</i>

In Annex 1, it is provided information to demonstrate how the team meets the compliance required for the validation, and list the documentation that supports the competencies of the validation team, required in the BCR Validation and Verification Manual.

4 Validation findings

The audit team summarizes the compliance, in accordance with applicable validation requirements in the BCR Standard /16/ and the VVM /17/, describing means of validation and a brief description of findings raised in each of the following sections.

As was explained in the previous section of this report, and in line with BCR Standard version 3.4 /16/, the team reports the non-conformities in the forms of Corrective Action Requests (CARs), Clarification Requests (CLs) and Forward Action Requests (FARs). When and for which type of non-conformities CARs, CLs and FARs are issued are summarized below and explained with detail in annex 2.

The findings detected by AENOR have been 7 CAR and 2 CL that shall be treated by the project holder and clarified through communications or meetings between the two parties, and the information resulting was included in the final version of the PD and the complementary documentation, identified in the annex 3. Additionally, a FAR has been raised to be resolved during the first verification.

4.1 Project description

The proposed project consists of implementing a hydroelectric plant located in the Rio Grande River basin in the municipality of Donmatías, which lies within the Antioquia department in Colombia at an approximate distance of 60 km from Medellín. Up to the site where the Zeus project is located, the Rio Grande River basin covers territories in the Donmatías and Santa Rosa de Osos municipalities. This information was checked during the onsite visit to the project area and previously, during the desk review, based on the information of different documents, such as the EIA /23/, construction agreement /28/ or the connection report provided to request the connection of the project to the SIN /22/, among others.

The construction contract was signed on September 30, 2020 /28/, although the Zeus hydroelectric power plant was declared commercially operational on May 19, 2022 /22/.

However, as part of a testing period, the plant began delivering energy to the grid on May 17, 2022 /29/. Therefore, the emission reductions started on May 17, 2022.

The project has installed 2 Francis turbines, provided by Wasserkraft Volk, with a total capacity of 9.88 MW based on a feed flow of 7 m³/s and an expected generation of 59,200 MWh per year of renewable energy. This information was checked during the onsite visit to the power plant and previously, during the desk review, based on the information of different documents, but mainly the “A.2. LT-1200 - Informe Potencia y energia” /21/.

The electricity is dispatched to the Colombian electricity grid, as could be checked during the remote visit to the Riogrande connection substation and during the desk review of the EIA /23/ and the connection report provided to request the connection of the project to the SIN /22/

Prior to project implementation, no hydroelectric plant or other generation plants were installed at the site, as the audit team could check during the onsite visit to the project area, and in the interviews with the stakeholders, and crosscheck it against the information provided by different documentation, such as the EIA /23/ and the environmental license /24/

In the baseline scenario, the energy delivered to the grid is generated by a mix of thermal and renewable power generation as reflected in the combined margin emissions factor (as per the tool applied). Hence, the project will reduce thermal power generation and GHG emissions from fossil fuel-based generation in the grid by increasing the share of renewable energy. This could be checked against the information provided from the electrical national regulator (XM) with information related to the different plants included in the SIN, their capacities, technologies used, generation and other technical information obtained directly from the website of XM, and provided in the PD.

The main characteristics of the turbines and generators are shown below and were reviewed during the onsite visit and found correct:

Main characteristics of the turbines /73/	
Number of units	2
Type	Francis Turbine
Maximum net head	160.14 m
Design flow per turbine	3500 l/s
Design capacity per unit	5.098 MW
Nominal speed	720 rpm

Main characteristics of the generators /73/	
Number of units	2
Capacity per unit	5600kVA
Voltage	6900 V
Frequency	60 Hz

The estimated emission reduction is 23,156 tCO₂ annually, and the total estimated emission reduction is 162,092 tCO₂ for the first crediting period.

4.2 Project type and eligibility

The information presented by the GHG project holder complies with the conditions established in the BCR Standard /16/ and Validation and Verification Manual /17/. The scope, the project type, the project activities and the project scale are correctly described in the PD version 6.0 /2/, in accordance with the BCR Standard /16/.

The following eligibility criteria are in the line with the project, as is detailed below and it was reviewed during the onsite visit.

Table 1. Project type and eligibility

Eligibility criteria	Evaluation by validation body
Scope of the BCR Standard	<p>The project is eligible under the scope of the BCR Standard /16/ because it meets three of the conditions established:</p> <p>The following greenhouse gases, included in the Kyoto Protocol: Carbon Dioxide (CO₂), Methane (CH₄) and Nitrous Oxide (N₂O).</p> <p>According to the methodology applied, CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity are considered as main emission source.</p> <p>GHG projects using a methodology developed or approved by BioCarbon Registry, applicable to activities in the energy, transportation and waste sectors.</p> <p>The project applied the approved consolidated CDM baseline methodology AMS-I.D.: "Grid-connected renewable electricity generation" Version 18.0 /11/. The CDM methodologies are</p>

Eligibility criteria	Evaluation by validation body
	approved by BioCarbon as is indicated in section 9 of the BCR Standard. Quantifiable GHG emission reductions generated by the implementation of activities in the energy, transportation and waste sectors. The project has implemented activities in the energy sector to generate quantifiable GHG emission reductions because the Zeus Hydroelectric Plant project consists of a small run-of-the-river hydropower plant of 9.88 MW that is between 500 and 20,000 kW of installed capacity, as is required by the standard rule.
Project type	Activities in the energy sector. Renewable energy. According to the methodology applied, the project consists in the installation of a Greenfield small run-of-the-river hydropower plant to supply the electricity generated to the SIN (National Interconnected System).
Project activity(es)	Activity in the energy sector. Small run-of-the-river hydropower plant to supply electricity to the grid with an installed capacity between 500 and 20,000 kW
Project scale (if applicable)	Small scale based on CDM conditions given that it has an installed capacity less than 15 MW

4.3 Grouped project (if applicable)

The project activity is not a grouped project; thus, this section is not applicable.

4.4 Other GHG program

The project is not participating neither participated under other GHG program. The audit team has reviewed the registry of other GHG programs, such as CDM, VCS, GS4GG and Cercarbono, without existing a similar project registered, rejected or in process to be registered.

Therefore, the project does not participate under any emission trading program and other GHG Programs including renewable energy certificates (RECs) and this is also confirmed. It could be confirmed that no RECs and other VER carbon credits are being issued for the project at the time of this process.

4.5 Quantification of GHG emission reductions and removals

The audit team assesses that the emission reductions quantification was in accordance with the applicable requirements in the applied methodology and the VVM, examining, among other aspects, the following:

- *The project boundaries, including the risk of overlapping.*
- *The appropriate use of the adequate methodology*
- *The uncertainty and the conservative approach*
- *The baseline scenario*
- *The mitigation results of the project*

The design of a monitoring plan that includes everything related to the quantification and follow-up of GHG emission reductions, in accordance with the applied methodology.

For the assessment, the audit team has applied the means of validation specified in the VVM, including but not limited to:

- *Full review of the GHG project data and information.*
- *Cross-checking the information contained in the GHG project documents and other documentary sources used.*
- *Interviews with GHG project participants and those in charge of designing, implementing, and monitoring GHG activities.*
- *Cross-checking the information, ratified with the participants in the interviews, to ensure that relevant information was not omitted.*
- *Review of other sources of information related to the type of GHG project or sector in which it is located.*
- *Evaluation of the application of the methodology selected by the GHG project, including the identification of the baseline.*
- *Consideration of the appropriate and accurate use of models and parameters for the estimation of GHG reductions.*

A detailed description of the procedures carried out to assess the quantification of baseline emissions, project emissions, leakage and GHG emission reductions, including relevant data, parameters and equations, assumptions or additional considerations used in accordance with the provisions of the applied methodology and any referenced tools is provided in section 4.5.8 of this report.

4.5.1 Start date and quantification period

The Zeus hydroelectric power plant was declared commercially operational on May 19, 2022. However, as part of a testing period, the plant began delivering energy to the grid on May 17, 2022. Therefore, the emission reductions started on May 17, 2022.

However, according to the definition of start date provided by the BCR Standard /16/, it is when activities that result in actual reductions of GHG emissions begin. That is the activities that result in actual reductions/removals of GHG emissions begin. That is **when the implementation, construction, or real action of a GHG Project begins**.

Therefore, the project start date is May 17th/2022, as on that date the Zeus hydroelectric plant effectively began reducing GHG emissions due to the start of its implementation.

On the other hand, the definition of "Quantification Period" provided by the BCR Standard version 3.4., the start of the quantification period shall be a date later than or equal to when the project generates the first GHG emission reductions, therefore, the project holder has determined the start of the first quantification period when the plant began delivering energy to the grid on May 17, 2022 during the testing period.

Quantification period for the project activity is 7 years renewable twice. Therefore, first quantification period is 17/05/2022 - 16/05/2029 with both days inclusive, renewed two, for a maximum total length of 21 years, which does not exceed the project length period (the number of years from the project start date that project activity will be maintained with a maximum of seven years which may be renewed at most two times, provided that, for each renewal: 17/05/2022 -16/05/2043) and the operational time and lifespan of 50 years, and is in line with other BCR requirements.

4.5.2 Application of the selected methodology and tools

4.5.2.1 Title and Reference

The project activity is developed in accordance with the approved consolidated CDM baseline methodology AMS-I.D.: "Grid-connected renewable electricity generation" Version 18.0 /11/. Available at:
<https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTFQOQFQQH4SBK>

Additionality demonstration is assessed by applying the latest versions of the CDM "Demonstration of additionality of small-scale project activities" Version 13.1. /12/. Available at:
https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-21-v13.1.pdf/history_view

The emission factor of the relevant power system is determined based on the CDM procedure " Tool to calculate the emission factor for an electricity system" (Version 7.0) /13/. Available at:
https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf/history_view

The audit team has reviewed that the applied methodology and tools, and their specific versions are valid currently and are eligible under the BCR Standard /16/, as is explained in table 1 of section 4.2. of this report. The methodology has been applied in full, including the full application of any tools or parameters/data referred, as is explained in the following section of this report.

4.5.2.2 Applicability

The audit team has assessed the relevant information contained in the BCR-PD with on-site visit and evidence obtained against the application criteria listed in the methodology AMS-I.D version 18.0 /11/ and tools referred. The applicability conditions of the methodology and tools are justified as below:

For AMS-I.D, version 18.0 /11/:

Applicability conditions	Justification
<p>This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:</p> <p>(a) Supplying electricity to a national or a regional grid; or</p> <p>(b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.</p>	<p>This project activity consists in a greenfield Small run-of-the-river hydropower plant to supply renewable energy to the grid with an installed capacity between 500 and 20,000 kW. This information has been confirmed during the remote visit to the Riogrande connection substation and during the desk review of the EIA /23/, the environmental license /24/ and the connection report provided to request the connection of the project to the SIN /22/.</p>
<p>This methodology is applicable to project activities that:</p> <p>(a) Install a Greenfield plant;</p> <p>(b) Involve a capacity addition in (an) existing plant(s);</p> <p>(c) Involve a retrofit of (an) existing plant(s);</p> <p>(d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or</p> <p>(e) Involve a replacement of (an) existing plant(s).</p>	<p>This project activity consists in a greenfield Small run-of-the-river hydropower plant to supply renewable energy to the grid with an installed capacity between 500 and 20,000 kW. This information has been confirmed with the interviews conducted during the onsite visit and during the desk review of the EIA /23/, the environmental license /24/ and the connection report provided to request the connection of the project to the SIN /22/. There was no other</p>

<i>Applicability conditions</i>	<i>Justification</i>
	<i>power plant built before the project activity in the same area.</i>
<p><i>Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</i></p> <p><i>(a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir;</i></p> <p><i>(b) 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;</i></p> <p><i>(c) 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.</i></p>	<p><i>N/A. The project activity is a hydroelectric power plant without a reservoir. It consists in a greenfield Small run-of-the-river hydropower plant. This information was confirmed during the onsite visit to the power plant site, especially the water catchment area where the weir and the abduction channel, and during the desk review of the EIA /23/, the environmental license /24/ and the connection report provided to request the connection of the project to the SIN /22/.</i></p>
<i>If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.</i>	<i>The proposed project activity does not involve non-renewable components. Therefore, this condition is not applicable.</i>
<i>Combined heat and power (co-generation) systems are not eligible under this category.</i>	<i>The proposed project activity does not involve combined heat and power systems. Therefore, this condition is not applicable.</i>
<i>In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.</i>	<i>N/A. The project activity is a greenfield Small run-of-the-river hydropower plant.</i>

Applicability conditions	Justification
<i>In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.</i>	<i>N/A. The project activity is a greenfield Small run-of-the-river hydropower plant.</i>
<i>In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid, then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS-I.C.: Thermal energy production with or without electricity” shall be explored.</i>	<i>The project activity is not a landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions. It is a hydroelectric power plant; therefore, this criterion is not relevant.</i>
<i>In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply.</i>	<i>The project does not involve biomass. Therefore, this criterion is not relevant.</i>

In addition, the applicability conditions included in the " Tool to calculate the emission factor for an electricity system" (Version 7.0) are met:

Applicability Conditions	Justification
<i>This tool can be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a grid-substituting project activity that is where a project activity supplies electricity to a grid or a project activity that results in electricity savings that have been provided by the grid (e.g., demand-side energy efficiency projects).</i>	<i>The proposed project activity supplies electricity to the national grid, avoiding part of the electricity generated by grid-connected power plants. Therefore, this condition is met.</i>
<i>With this tool, the emission factor for the project's electricity system can be calculated only for grid power plants or, as an option, it can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in “Appendix 1: Procedures related to off-grid power generation” should be</i>	<i>In this case, the emission factor for the project power system is calculated only for grid-connected power plants. Therefore, this condition is met.</i>

Applicability Conditions	Justification
<i>met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.</i>	
<i>The tool is not applicable if the project's power system is located partially or wholly in an Annex I country.</i>	<i>In this case, the project's power system is located entirely in Colombia. Therefore, this condition is met.</i>

Therefore, all applicability conditions are met, and the Zeus project is eligible under this methodology.

Moreover, other applied tools have been assessed with on-site visit and evidence obtained against the application criteria listed in the referred tools which are:

- Tool 21 Demonstration of additionality of small-scale project activities (version 13.1) /12/: The project activity is a small-scale project activity (1.998 MWe < 15 MWe). Therefore, Tool 21 is applied to demonstrate additionality for the project activity that refers the following tools:

- Tool 01 Tool for the demonstration and assessment of additionality (version 07.0.0) /31/.

- Tool 27 Investment Analysis (version 13) /32/.

4.5.2.3 Methodology deviations (if applicable)

N/A. There is no methodology deviation.

4.5.3 Project boundary, sources and GHGs

In accordance with the AMS I.D. Version 18.0 methodology /11/, the spatial extent of the project boundary includes the project's power plant and all power plants physically connected to the electrical system to which the Zeus project is connected.

The metering equipment is located at the project's point of interconnection with the SIN, the Rio Grande substation. This information has been confirmed during the remote visit to the

Riogrande connection substation and during the desk review of the EIA /23/, the environmental license /24/ and the connection report provided to request the connection of the project to the SIN /22/.

The spatial extent of the project boundary is the National Interconnected System (SIN) of Colombia. This grid's power plants are connected and can be dispatched without significant transmission constraints. This information was checked against the SIN map /33/ provided by UPME (in Spanish, Unidad de Planeación Minero Energética) and information obtained from XM, who is the company responsible of operating and managing the SIN in Colombia, from the CREG (Commission for the Regulation of Energy and Gas) and other public entities involved.

The selected sources and gases identified in the PD are consistent with the requirements of the methodology applied and the information described by the Projects certification and registration guidelines in the "Energy sector Non-Conventional renewable energy sources" version 1.1 /34/ that indicates as main emission source the CO₂ due to the CO₂ emissions from electricity generation in fossil fuel fires power plants connected in the SIN that are displaced due to the project activity.

Therefore, the audit team considers that the project boundary, selected sources, and reservoirs are duly justified for the project holder.

4.5.3.1 Eligible areas in the GHG project boundaries (for AFOLU projects)

N/A. The project is not an AFOLU project.

4.5.4 Baseline or reference scenario

As stated in the approved methodology AMS-I.D. "Grid-connected renewable electricity generation," version 18.0: If the project activity is a greenfield power plant, the baseline scenario is as follows:

"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 into the grid."

Therefore, the baseline scenario identified for the project holder is consistent with the baseline scenario defined by the applied methodology.

Therefore, the emissions of the identified baseline scenario will be determined through the multiplication of generation of the project activity and the CO₂ emission factor for the displacement of electricity generated by power plants in the electricity system, by calculating the "combined margin" emission factor (CM) of the electricity system applying the methodological tool to calculate the emission factor for an electricity system version 07, as is explained with details in section 4.5.8.1 of this report, where are described:

- a) assumptions, methods, parameters, data sources, and factors are transparently applied, justified appropriately, and supported by adequate evidence;
- b) uncertainty is considered and there was used prudential assumptions;
- c) relevant national as also when applicable to sectoral policies and circumstances was considered and are listed in the project document;
- d) the procedures for identifying the baseline scenario maintain consistency with the emission factors, activity data, projection variables of GHG emissions, and the other relevant parameters;
- e) the implementation of procedures to ensure data quality under ISO 14064-2 and the requirements of the applied methodology.

The sources of information, about the baseline identification assessment and cross-check data used in the identified baseline scenario, was the website of the SIN operator (XM) that allowed the determination of the grid-connected power plants displaced by the generation of the project for the vintage required by the tool 07. Therefore, the audit team confirms that the documentary evidence used in determining the baseline scenario is relevant, and correctly justified.

4.5.5 Additionality

The additionality of the project has been demonstrated using the “Demonstration of additionality of small-scale project activities” (version 13.1).

In accordance with the tool, identification of alternatives, compliance with national regulations, investment analysis (with using CDM Tool 01 and CDM Tool 27) and barriers (i.e. investment barrier) have been checked by the validation team through document review, on-site visit and interviews. AENOR confirm that all data, rationales, assumptions and justifications presented in the PD and documentation provided by PP to support the demonstration of additionality are reliable and credible. Therefore, project activity is additional as per “Demonstration of additionality of small-scale project activities” (version 13.1).

To demonstrate the investment barrier, an investment analysis has been conducted, by using the CDM Tool 01 “Tool for the demonstration and assessment of additionality”, Version 07.0.0, and Project IRR is calculated for the financial analysis.

For the investment analysis, the Benchmark Analysis (Option III of Step 2 of Tool 1) is selected in the PD, since simple cost analysis (Option I) and investment comparison analysis (Option II) are not appropriate in line with the tool.

In line with the requirements of CDM Tool 27: Investment Analysis, version 13.0, the VVB has validated the following parameters to calculate the weighted average cost of capital (WACC) for the benchmark of the financial additionality assessment, following equation 1 of the tool:

- Cost of equity projects for Colombia is given as 8.69% in the Appendix of the tool.

- The cost of debt has been estimated as 7.3% through equation 2 of the tool, considering the average interest rate based on the 2018-2020 period of World Bank commercial lending interest rate in Colombia and the income tax rate by 35%.
- Applying the debt/equity finance structure of 50/50 as default values for equation 1.

WACC is 6.73% for the benchmark value and the audit team confirms the choice of benchmark as appropriate.

PP has calculated project IRR for a 22-year period, which is conservative. All the input parameters used in the financial analysis are taken from approved and trustworthy documents and all references are shown to the validation team. AENOR compared the input parameters for the financial analysis included in the PDD and IRR spreadsheet with the parameters stated in the reference documents listed in below table and was able to confirm that the values applied are consistent with the values stated in the references. IRR input documents were valid at the time of investment decision. The inputs considered for the IRR calculations have all been verified, as follows:

Project details	Unit	Data
Project size	MW	9.88
Location	-	Don Matías
Hydropower type	-	Run of river
Generation	MWh/y	59,200
Load factor	%	68.40%
Net Annual Generation	MWh	59,200
CAPEX		
Total CAPEX	MCOP	106,045
Property	MCOP	1,185
Civil Works	MCOP	62,247

Pipe Supply	MCOP	8,200
Electromechanical Equipment	MCOP	14,827
Transmission Line	MCOP	8,781
Designs	MCOP	2,972
Interventory	MCOP	3,250
Civil works interests	MCOP	4,583
O&M		
Total O&M (Including annual only costs)	MCOP/year	2,831
OPEX	MCOP/year	1,372
General	MCOP/year	34
Maintenance	MCOP/year	66
AOMR - Electric S/E	MCOP/year	456
Electromechanical Equipment Maintenance (Every 3 Years)	MCOP	67
Major and other maintenance (Every 5 Years)	MCOP	170
Civil Works Maintenance (Every 5 Years)	MCOP	692

Contributions	MCOP/year	10
Regulatory	MCOP/year	254
Insurance	MCOP/year	600
ICA	MCOP/year	5
Predial	MCOP/year	7
Financial Expenses	MCOP/year	26
Energy Tariff Details		
Energy Tariff	COP/MWh	305,000
Energy Tariff	COP/MWh	305,000
Taxes		
Corporate Tax Rate	%	38
IVA	%	19

Project IRR has been calculated as 5.44% in the absence of the carbon revenue. As the Benchmark is 6.73% and it does clearly exceed the resulting Project IRR, thus rendering the project activity economically unattractive. All income and expense lines represented by the project in the main financial model spreadsheet (Zeus Additionality Assessment v3 /8/) have been compared by the audit team through extensive supporting documentation provided by the PP. The calculations were validated and found to be correct by AENOR, as well as the assumptions and information of the sources of data provided by the PP. Detailed information on the resolution of findings can be seen in Annex 3 of this report /7/8/34/35/36/37/38/39/40/41/42/43/44/75/76/77/78/82/.

A sensitivity analysis has been carried out, complying with sub-step 2d of the tool, with variations of $\pm 5\%$ and $\pm 10\%$, for Investment Cost (CAPEX), Operation and Maintenance Costs (O&M), Energy Tariff, Tax and Energy Production. All the variables not included in sensitivity analysis, which constitute less than 20%, do not have material impact on the analysis. Reasonable variations of the above stated parameters were checked as in below.

The project proponent has chosen to make percentage variations on the concepts shown below, taking into account (1) estimates of energy generation from 2025, due to previous years already have generation data, having shown that it did not increase more than the expected 59,200 MWh, as well as (2) changes in the energy tariff from 2031, when PPA contract ends., /7/8/22/29/30/34/35/36/37/38/39/40/41/42/43/44/89/:

Parameter	-10%	-5%	0%	5%	10%
Energy generation	4.26%	4.86%	5.44%	5.99%	6.51%
Tax	6.12%	5.78%		5.08%	4.72%
O&M	5.67%	5.55%		5.32%	5.20%
Energy Tariff	4.80%	5.12%		5.73%	6.02%
CAPEX	6.67%	6.03%		4.88%	4.37%

The proposed project activity is unlikely to be the most financially/economically attractive as indicated in the 'Tool for Demonstration and Assessment of Additionality' (Version 07.0.0), as per Sub Step 2c paragraph 42b. The additionality of the project activity has been assessed in the above section through investment analysis and it is concluded that a financially more viable alternative to the project activity would have led to higher emissions.

It is seen that project is not the most attractive option. Therefore, the project is considered as additional to the baseline scenario.

In conclusion, AENOR confirms that this project activity is financially unattractive even after considering the possible fluctuation of the main parameters, and the above analysis is appropriate.

4.5.6 Conservative approach and uncertainty management

As is explained in section 4.6 of this report with more detail, in the baseline quantification and mitigation results are only used two parameters in accordance with the equation (1) of the methodology:

$$EG_{PJ,y} = \text{Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year } y \text{ (MWh)}$$

$EF_{grid,y}$ = 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” (t CO₂/MWh)

The first parameter is directly monitored by bi-directional meters (main and backup) installed at the interconnection point of the project with the SIN (Riogrande substation) and their information is read remotely by the grid operator (XM) and the Power plant. The information recorded by the meters will be verified through a cross-consultation of the values reported by the coordinator of the national electrical network in the SINERGOX virtual portal, and the lowest value will be chosen as a conservative measure. If a communication failure occurs during the reading process or there are difficulties in consulting the meter records it is applied a contingency plan and emission reductions cannot be claimed during that period until the meters are functioning correctly again and reliable data is available.

The energy measurement process is regulated under resolution CREG 038 of 2014, and according to the article 11, meters were calibrated prior to the operation start and will be calibrated after any repair or intervention. The calibration was and will be done by a laboratory accredited by the National Accreditation Body of Colombia (ONAC in Spanish) under the requirements of the NTC-ISO-IEC 17025 or the international equivalent. Article 28 defines that any plant whose generation is between 500 and 15,000 MWh/month or in the range of installed capacity between 1 and 30 MW must submit its measuring equipment to a maintenance process with a maximum periodicity of 4 years. The audit team could check that the main and back up meters are correctly calibrated /45/ prior to the operation start.

The second parameter is calculated in accordance with the requirements of the tool 07 version 07 with values of parameters obtained from recognized sources, mainly the grid operator (XM), UPME and default values from IPCC.

Personal responsible for monitoring are:

- The BCR Coordinators supervise the monitoring process, compile the monitoring data in an Excel spreadsheet, and calculate the emission reductions of the monitoring period. They also develop the monitoring report in accordance with the BCR rules.
- The Plant Manager is responsible for verifying energy measurements.
- The CGM (Measurement Management Center) is responsible for reading the electricity generated by the project and processing the energy produced by the meters installed at the substation.

Therefore, the project adequately demonstrates and justifies that the use of data and parameters to estimate the reduction or removal of GHG emissions are consistent with the emission factors, activity data, projection of GHG emissions, and the other parameters, then it is unnecessary to apply a discount factor for managing uncertainty.

4.5.7 Leakage and non- permanence

According to the methodology applied, shall be only considered leakage in biomass project activity, due to the use of biomass residues. Therefore, it is not applicable to this project, and leakage has not been considered. Therefore, there is no risk of leakage.

$$LE_y = 0$$

Section 4.10 of this report provides details of the steps taken to assess the non-permanence risk.

The project holder ensures the permanence of the project activity establishing mitigation measures to reduce the risk level of the risks identified, in accordance with the BCR's Permanence and Risk Management Tool v1.1. This was checked by the audit team during the desk review of the PD, ad complementary evidence, such as the recovery plan /46/, emergency firefighting plan /47/, management plan for hazardous waste /48/, training /49/, etc. The main mitigation measures are training and the development of different contingency plans to be implemented when necessary to ensure the project benefits are maintained over time, such as recovery plan /46/, emergency firefighting plan /47/, management plan for hazardous waste /48/.

4.5.8 Mitigation results

The projected mitigation results have been determined through the quantification of the emission reductions of the project activity, calculated as per the AMS-I.D version 18 /11/ and the tool 7 version 07.

Therefore, the emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

$$ER_y = \text{Emission reductions in year } y \text{ (t CO}_2\text{)}$$

$$BE_y = \text{Baseline Emissions in year } y \text{ (t CO}_2\text{)}$$

$$PE_y = \text{Project emissions in year } y \text{ (t CO}_2\text{)}$$

$$LE_y = \text{Leakage emissions in year } y \text{ (t CO}_2\text{)}$$

However, due to $PE_y = 0$ and $LE_y = 0$. Then, the emission reductions are:

$$ER_y = BE_y$$

As is explained bellow, the audit team has reviewed that the PD has applied the parameters, equations assumptions and additional considerations in accordance with the applied methodology and tool. Moreover, the audit team has reviewed that the correct values from the proper sources have been used in the equations applicable, reproducing the calculations to ensure that the quantification of the emission is correct.

4.5.8.1 GHG baseline emissions

The baseline emissions are calculated as follows:

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

Where:

BE_y = Baseline emissions in year y (t CO₂)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh)

$EF_{grid,y}$ = 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” (t CO₂/MWh)

The emission factor is calculated in a transparent and conservative manner as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the “Tool to calculate the emission factor for an electricity system”.

Calculations are based on data from an official source (UPME) and made publicly available.

As the project activity is the installation of a greenfield power plant, then:

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

Where:

$EG_{PJ,facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

Therefore, the parameters for monitoring during the crediting period are:

- $EG_{PJ, facility, y}$ that is monitored directly with electricity meters, and the estimated value for the validation is 59,200 MWh, value obtained from the document "A.2. LT-1200 - Informe Potencia y energia" developed during the design stage of the project.
- $EF_{grid, y}$ that is using the latest version of the "Tool to calculate the emission factor for an electricity system". The estimated value for the validation is 0.3912 tCO₂/MWh, although it should be updated annually during monitoring.

Combined margin (CM) consists of the combination of operating margin (OM) and build margin (BM) as per the applied tool. The relevant formula is as follows:

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

$EF_{grid, BM, y}$ Build margin CO₂ emission factor in year y (t CO₂/MWh)

$EF_{grid, OM, y}$ Operating margin CO₂ emission factor in year y (t CO₂/MWh)

w_{OM} Weighting of operating margin emissions factor (per cent)

w_{BM} Weighting of build margin emissions factor (per cent)

As per Tool 07, 6 steps are followed to calculate the emission factor of the project activity. The steps are specified in the BCR-PD and each of them is applied sequentially:

Step 1: Project electricity system is the national grid system which is called National Interconnected System (SIN). There is only one power grid system in Colombia and all connected power plants are included in the project boundary.

There is a connected electricity system, corresponding to Ecuador. There are electricity imports from Ecuador to Colombia.

For the purpose of determining the build margin emission factor, the spatial extent is limited to the project electricity system.

For the purpose of determining the operating margin emission factor, the CO₂ emission factor for net electricity imports from a connected electricity system is considered 0 t CO₂/MWh.

Electricity exports are not subtracted from electricity generation data used for calculating and monitoring the electricity emission factors.

Step 2: Option 1 is chosen, and only grid-connected power plants are included in the calculation.

Step 3: The simple adjusted OM is applied, using the ex-post data vintage that shall be the year in which the project activity displaces grid electricity, requiring the emission factor to

be updated annually during monitoring. For the ex ante estimation is considered the values of year 2022, when the project began delivering energy to the grid.

STEP 4. The simple adjusted operating margin emission factor $EF_{grid,OM-adj,y}$ (tCO₂e/MWh) is a variation of the simple operating margin emission factor, where the power sources (including imports) are separated in low-cost/must-run power sources (k) and other power sources (m), as follows:

$$EF_{grid,OM-adj,y} = (1 - \lambda_y) \times \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} + \lambda_y \times \frac{\sum_k EG_{k,y} \times EF_{EL,k,y}}{\sum_k EG_{k,y}}$$

Where,

$EF_{grid,OM-adj,y}$ = Simple adjusted operating margin CO₂ emission factor in year y (tCO₂/MWh)

λ_y = Factor expressing the percentage of time when low-cost/must-run power units are on the margin in year y

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)

$EG_{k,y}$ = Net quantity of electricity generated and delivered to the grid by power unit k in year y (MWh)

$EF_{EL,m,y}$ = CO₂ emission factor of power unit m in year y (tCO₂/MWh)

$EF_{EL,k,y}$ = CO₂ emission factor of power unit k in year y (tCO₂/MWh)

m = All grid power units serving the grid in year y except low-cost/must-run power units

k = All low-cost/must run grid power units serving the grid in year y

y = The relevant year as per the data vintage chosen

The lambda factor (λ_y) is determined as:

$$\lambda_y(\text{per cent}) = \frac{\text{Number of hours low} - \frac{\text{cost}}{\text{must}} - \text{run are on the margin in year } y}{8760 \text{ hours per year}}$$

The project applied the approach 2 to calculate the lambda factor.

The selected option for calculating the emission factor of each plant is based on the available fuel consumption and electricity generation information (option A1, Tool 07 CDM) of the different plants of the Colombian Interconnected System, with the following expression:

$$EF_{EL,m,y} = \frac{FC_{i,m,y} \times NCV_{i,y} \times EF_{CO_2,i,y}}{EG_{m,y}}$$

Where,

$EF_{EL,m,y}$ = CO₂ emission factor of power unit m in year y (t CO₂/MWh)

$FC_{i,m,y}$ = Amount of fuel type i consumed by power unit m in year y (Mass or volume unit)

$NCV_{i,y}$ = Net calorific value (energy content) of fuel type i in year y (GJ/mass or volume unit)

$EF_{CO_2,i,y}$ = CO₂ emission factor of fuel type i in year y (t CO₂/GJ)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)

m = All power units serving the grid in year y except low-cost/must-run power units

i = All fuel types combusted in power unit m in year y

y = The relevant year as per the data vintage chosen

However, for the calculation of the emission factor of each power unit m , the following options should be considered as well according to the availability of information:

Option A2. If for a power unit m only data on electricity generation and the fuel types used is available, the emission factor should be determined based on the CO₂ emission factor of the fuel type used and the efficiency of the power unit, as follows:

$$EF_{EL,m,y} = \frac{EF_{CO_2,m,i,y} \times 3.6}{\eta_{m,y}}$$

Where,

$EF_{EL,m,y}$ = CO₂ emission factor of power unit m in year y (t CO₂/MWh)

$EF_{CO_2,m,i,y}$ = Average CO₂ emission factor of fuel type i used in power unit m in year y (t CO₂/GJ)

$\eta_{m,y}$ = Average net energy conversion efficiency of power unit m in year y (ratio)

m = All power units serving the grid in year y except low-cost/must-run power units

y = The relevant year as per the data vintage chosen

3.6 = Conversion factor (GJ/MWh)

If for a power unit m only data on electricity generation is available, Option A₃ has been used as a simple and conservative approach with an emission factor of zero tCO₂/MWh.

The validation team has reviewed the calculations and the relevant values (e.g. $FC_{i,m,y}$, $NCV_{i,y}$ and so on) for the OM calculation. The calculations and the values of the relevant parameters (as per the provided references) are done correctly. The validation team reproduced the calculations which are in the ER Calculation Excel sheet. As a result, $EF_{grid,OM-adj,y}$ value is calculated as “0.5454 tCO₂/MWh”.

STEP 5. In terms of the vintage of data, option 1 of the tool is chosen, i.e. the ex-ante approach. Therefore, for the first crediting period, the build margin emission factor is calculated ex-ante based on the most recent information available on units already built for sample group m at the time of PDD submission for validation (2023).

Capacity additions from retrofits of power plants are not included in the calculation of the build margin emission factor.

The sample group of power units m used to calculate the build margin is determined as per the step c) and from $SET_{5-units}$ and $SET_{\geq 20\%}$, the second set of power units is selected that comprises the larger annual electricity generation (SET_{sample}).

The build margin emissions factor is the generation-weighted average emission factor (tCO₂/MWh) of all power units *m* during the most recent year *y* for which power generation data is available, i.e. in this case the year 2023 (data provided by XM and consulted through its virtual SINERGOX portal). The calculation is made as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where,

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year *y* (tCO₂/MWh)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)

$EF_{EL,m,y}$ = CO₂ emission factor of power unit *m* in year *y* (tCO₂/MWh)

m = Power units included in the build margin

y = Most recent historical year for which power generation data is available

The emission factor of each power unit *m* in the build margin is determined analogously as for the operating margin.

As in the case of the OM calculation, the validation team has reviewed the calculations and the relevant values (e.g. $FC_{i,m,y}$, $NCV_{i,y}$ and so on) for the BM calculation. The calculations and the values of the relevant parameters (as per the provided references) are done correctly. The validation team reproduced the calculations which are in the sheet “Build Margin (BM)” of the ER Calculation Excel file “Zeus Colombia Calculations.xlsx”.

The resulting BM emission factor set for the first credit period is:

$EF_{BM,2023}$	0.2369 tCO ₂ /MWh
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STEP 6. The combined margin emission factor is calculated as follows:

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

Where,

$EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh)

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh)

w_{OM} = Weighting of operating margin emissions factor (%)

w_{BM} = Weighting of build margin emissions factor (%)

For hydroelectric projects the weighting of operating and build margin is done as indicated in the tool for the first crediting period, i.e. $w_{OM}=0.5$ and $w_{BM}=0.5$.

Once calculated the CO₂ OM and BM emission factor, the combined margin emission factor is:

$$EF_{grid,CM,y} = 0.5454 \times 0.5 + 0.2369 \times 0.5 = 0.3912 \text{ tCO}_2/\text{MWh}$$

Actual and ex-ante baseline emissions in t CO₂ are calculated using the equation indicated previously in this section of this document and tabulated below:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$
$$BE_y = 59,200 \times 0.3912 = 23,156 \text{ tCO}_2$$

Therefore, the audit team considers that the quantification of GHG reduction of GHG emissions, including relevant data, parameters and equations, assumptions and additional considerations have been used in accordance with the provisions of the applied methodology.

4.5.8.2 GHG project emissions

According to the applied methodology, only hydro power plants with reservoir shall determine the GHG emissions reduction in the project scenario.

Since the project activity has no reservoir, the project emissions are zero:

$$PE_y = 0 \text{ tCO}_2.$$

4.5.8.3 GHG leakage

According to the methodology, there is no risk of leakage.

4.6 Monitoring plan

4.6.1 Description of the monitoring plan

According to the applied methodology, only two parameters shall be monitoring during the crediting period:

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh)

$EF_{grid,y}$ = 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” (t CO₂/MWh)

However, for the calculation of the $EF_{grid,y}$ and according to “Tool to calculate the emission factor for an electricity system”, the following parameter shall be also monitored during the crediting period:

$FC_{i,m,y}$, $FC_{i,k,y}$ = Amount of fuel type i consumed by power plant/unit m or k (or in the project electricity system in case of $FC_{i,y}$) in year y

$NCV_{i,y}$ = Net calorific value (energy content) of fuel type i in year y

$EF_{CO_2,i,y}$ and $EF_{CO_2,m,i,y}$ = Amount of fuel type i consumed by power plant/unit m or k (or in the project electricity system in case of $FC_{i,y}$) in year y

$EG_{m,y}$, $EG_{k,y}$ = Net electricity generated by power plant/unit m or k (or in the project electricity system in case of EG_y) in year y or hour h

4.6.2 Data and parameters determined at registration and not monitored during the quatification period, including default values and factors.

In accordance with the applied methodology, applicable tools, BCR Standard, BCR tool for Monitoring, Reporting and Verification (MRV); and BCR Validation and Verification

Manual, the only parameter determined at registration and not monitored during the quantification period is the $EF_{grid,BM,y}$

The values used to calculate the parameter $EF_{grid,BM,y}$ are obtained from recognized sources, mainly the grid operator (XM), UPME and default values from IPCC.

According to the applied methodology and tool, the audit team has checked Data Unit, Description, Source of Data, Value calculated and are correct,

4.6.3 Data and parameters monitored.

The parameter $EG_{PJ,y}$ is directly monitored by bi-directional meters (main and backup) installed at the interconnection point of the project with the SIN (Riogrande substation) and their information is read remotely by the grid operator (XM) and the Power plant. The information recorded by the meters will be verified through a cross-consultation of the values reported by the coordinator of the national electrical network in the SINERGOX virtual portal, and the lowest value will be chosen as a conservative measure. If a communication failure occurs during the reading process or there are difficulties in consulting the meter records it is applied a contingency plan and emission reductions cannot be claimed during that period until the meters are functioning correctly again and reliable data is available.

The energy measurement process is regulated under resolution CREG 038 of 2014, and according to the article 11, meters were calibrated prior to the operation start and will be calibrated after any repair or intervention. The calibration was and will be done by a laboratory accredited by the National Accreditation Body of Colombia (ONAC in Spanish) under the requirements of the NTC-ISO-IEC 17025 or the international equivalent. Article 28 defines that any plant whose generation is between 500 and 15,000 MWh/month or in the range of installed capacity between 1 and 30 MW must submit its measuring equipment to a maintenance process with a maximum periodicity of 4 years. The audit team could check that the main and back up meters are correctly calibrated /45/ prior to the operation start.

Meter	Serial	Model	Brand	Calibration date	Accuracy
Main	51386024	ZMD402CT44.0459 S3	LANDIS & GYR	16/11/2021	0.2 S
Reserve	51386022	ZMD402CT44.0459 S3	LANDIS & GYR	16/11/2021	0.2 S

The values of the parameters monitored and used to calculate the parameter $EF_{grid,y}$ are obtained from recognized sources, mainly the grid operator (XM), UPME and default values from IPCC.

According to the applied methodology and tool refer to these monitoring parameters, the audit team has checked Data Unit, Description, Source of Data, Description of the Measurement Method, Frequency of Monitoring, Value Applied, Monitoring Equipment, QA/QC Procedures, and Calculation Method and all information has been found correctly indicated in the BCR-PDD, and that the list of parameters to be monitored is complete and consistent with AMS-I.D (v18.0), and that the monitoring plan adheres to the monitoring methodology used.

The contribution of the project to SDG 7 is covered by the electricity metering. Further, for monitoring of contribution under SDG 8 the employment generation parameter is included too.

Parameter monitored	Demographic data of permanent jobs created by the project.
Unit	Number of jobs per year by sex, age and disabilities
Source of data	HR hiring data.
Monitoring frequency	Annually.

Personal responsible for monitoring are:

The BCR Coordinators supervise the monitoring process, compile the monitoring data in an Excel spreadsheet, and calculate the emission reductions of the monitoring period. They also develop the monitoring report in accordance with the BCR rules.

The Plant Manager is responsible for verifying energy measurements.

The CGM (Measurement Management Center) is responsible for reading the electricity generated by the project and processing the energy produced by the meters installed at the substation.

Therefore, the project adequately demonstrates and justifies that the use of data and parameters to estimate the reduction or removal of GHG emissions are consistent with the emission factors, activity data, projection of GHG emissions, and the other parameters, then it is unnecessary to apply a discount factor for managing uncertainty.

The validation team confirms that the monitoring plan can be properly implemented, that all monitoring arrangements are feasible within the project design as per the inspections of the on-site visit, and that the means of implementation of the monitoring plan, including data management and QA/QC procedures, are sufficient to ensure that the emission reductions to be achieved by the project activity can be properly reported and verified through document review and interview with the project owner.

4.7 Double counting avoidance

The project is not participating neither participated under other GHG program. The audit team has reviewed the registry of other GHG programs, such as CDM, VCS, GS4GG and Cercarbono, without existing a similar project registered, rejected or in process to be registered.

Therefore, the project does not participate under any emission trading program and other GHG Programs including renewable energy certificates (RECs) and this is also confirmed. It could be confirmed that no RECs and other VER carbon credits are being issued for the project at the time of this process.

The PP has applied the BCR Tool “Avoiding Counting (ADC)” to avoid double counting of emission reductions.

As per the requirements of the tool, a letter needs to be provided to ensure that the country where the project is being conducted acknowledges that the project is reducing emissions. Additionally, the focal point should state that the project is appropriately registered in the country's public registry system.

In Colombia, the National Registry for the Reduction of Greenhouse Gas Emissions (RENARE) was established through Resolution 1447 of 2018. It is responsible for managing initiatives aimed at mitigating GHG emissions at the national level.

The letter will be sent as the registration process goes in parallel to the RENARE registration. Due to it, a FAR was raised for the audit team, requesting to provide the letter sent to the RENARE during the following verification.

4.8 Compliance with Laws, Statutes and Other Regulatory Frameworks

The project was implemented in accordance with the Colombian national laws and regulations. Project received all necessary permissions from the related governmental organizations.

Applicable laws and regulations to the project activity:

1) Laws 142 (Public Services Law) /50/ and 143 (Electricity Law) of 1994 /51/, which represent the last major reform of the power sector and establish the current regulatory framework.

2) Law 99 of 1993 establishes the general requirements for the issuance of environmental licenses and permits and defines the role of the Ministry of the Environment and the Regional Autonomous Corporations (CAR) in the licensing process /52/.

3) Law no. 50 of 1990, by which reforms were introduced to the Substantive Labor Code and other provision are issued /53/.

4) Law 2277 of 2022. Art. 240 Parr. 4. General tax rate for legal persons /54/.

5) Resolucion_creg_0038_2014 /55/.

6) CNO Agreement 981 Annex 1: "Identification of interventions that require meter calibration tests or routine tests of TTs or TCs and the development of procedures for performing routine tests for TTs and TCs" /56/.

7) CNO (National Operation Council) agreement 1043 of 2018 /57/

8) Resolution No. 1811-6435 of November 2018 /58/.

Based on these laws, project received the following permissions and licenses to establish and operate the project:

1) For generating the electricity: Project was approved for commercial operation /22/.

2) Environmental License /24/, and likewise, the concession of water, discharge permit, among other authorizations and responsibilities included therein.

During the desk review, all documentation related to the compliance with all relevant local, regional and national laws, statutes and other regulatory frameworks was requested and reviewed and was found complete and correct. Therefore, the audit team confirmed that the project complies with the relevant regulations.

The PP has not provide evidence of the implementation of a documented procedure (Document Management System) in which to identify and have access, on an ongoing basis, to relevant legislation and regulations, demonstrating that have a procedure in place to periodically review compliance with them, although the PP is working in the same sector during long time and during the onsite visit demonstrated to the audit team a deep knowledge of the energy sector and applicable legislation.

4.9 Carbon ownership and rights

The audit team reviewed the following documentation to ensure that the carbon ownership and rights were to Central Hidroeléctrica Zeus S.A.S. E.S.P.:

- The registration and registrations made in the commercial registry of the Chamber of Commerce of Medellín for Antioquia on October 19, 2022 where Central

Hidroeléctrica Zeus S.A.S. E.S.P. is constituted and certified by the existence and legal representation /59/.

- *Civil works contract signed by Central Hidroeléctrica Zeus S.A.S. E.S.P. /28/*
- *Declaration of commercial operation of the Zeus hydroelectric power plant of “Central Hidroeléctrica Zeus S.A.S. E.S.P.” /22/*
- *Carbon Credits Purchase Agreement Zeus_South Pole where “Central Hidroeléctrica Zeus S.A.S. E.S.P.” sold the emission reductions to “South Pole Carbon Asset Management SAS” for the period from 2022 to 2031. /60/*
- *Easement agreements with the owners of areas where the electrical line or the buried pipes cross /35/.*

Therefore, after the evaluation of the agreements and documents, the audit team ensures that the requirement is met and the carbon ownership of the project activity is belonged to the project owner, which is Central Hidroeléctrica Zeus S.A.S. E.S.P., and it has been adequately justified.

There are no ethnic groups and/or local traditional communities as project participants in the project area, as is demonstrated with the certification from the Home Ministry /62/. Additionally, the PP demonstrate with the certification from the Incoder (Instituto Colombiano de Desarrollo rural), that the project does not cross or occupy territory legally owned by indigenous communities /61/.

4.10 Risk management

The project has conducted risk assessments and management to identify the environmental, financial, and social risks associated with the implementation of the project activity in accordance with the BCR’s Permanence and Risk Management Tool v1.1. This was done to justify the risk-management measures to ensure that greenhouse gas (GHG) emission reductions are maintained throughout the project quantification period.

Therefore, the project holder has identified the different risks for the three dimensions (environmental, financial, and social) and identifying the potential natural and anthropogenic risks. The main mitigation measures established due to the identified risks are training and the development of different contingency plans to be implemented when necessary to ensure the project benefits are maintained over time, such as recovery plan /46/, emergency firefighting plan /47/, management plan for hazardous waste /48/, as is detailed below:

<i>Risk type</i>	<i>Risk</i>	<i>Risk level</i>	<i>Mitigation measure</i>
<i>Environmental</i>			

<i>Risk type</i>	<i>Risk</i>	<i>Risk level</i>	<i>Mitigation measure</i>
<i>Natural</i>	<i>Earthquakes</i>	<i>Critical</i>	<i>Early alarms, adequate training and recovery plan.</i>
<i>Natural</i>	<i>Mass movements</i>	<i>Critical</i>	<i>Landslides prevention and recovery plans.</i>
<i>Technological</i>	<i>Equipment failure</i>	<i>Critical</i>	<i>Preventive maintenance of equipment.</i>
<i>Anthropic</i>	<i>Fires, explosions</i>	<i>Critical</i>	<i>Management of equipment and combustible materials. Emergency firefighting plan.</i>
<i>Social</i>			
<i>Anthropic</i>	<i>Malicious acts</i>	<i>Tolerable</i>	<i>Contract with a security company.</i>
<i>Anthropic</i>	<i>Non-compliance by suppliers</i>	<i>Tolerable</i>	<i>Supplier control</i>
<i>Anthropic</i>	<i>Work accidents</i>	<i>Critical</i>	<i>Adequate training. Attention to work emergencies.</i>
<i>Anthropic</i>	<i>Inadequate management of equipment and hazardous materials</i>	<i>Critical</i>	<i>Adequate training. Attention to work emergencies. Management Plan for hazardous waste.</i>
<i>Anthropic</i>	<i>Politics intervention</i>	<i>Tolerable</i>	<i>Continuous communication plan.</i>
<i>Financial</i>			
<i>Anthropic</i>	<i>Investor insolvency and changes in</i>	<i>Acceptable</i>	<i>Energy purchase and sale contract with indexed prices.</i>

<i>Risk type</i>	<i>Risk</i>	<i>Risk level</i>	<i>Mitigation measure</i>
	macroeconomic variables		

On the other hand, the project has available a contingency plan to mitigate and reverse risks. The plan aims to protect the environment, people, and material resources before, during, and after such an event, to ensure the project maintenance over time.

The project holder ensures the permanence of the project activity establishing mitigation measures to reduce the risk level of the risks identified, in accordance with the BCR's Permanence and Risk Management Tool v1.1. This was checked by the audit team during the desk review of the PD, ad complementary evidence, such as the recovery plan /46/, emergency firefighting plan /47/, management plan for hazardous waste /48/, training /49/, etc., considering that the identification of risks is consistent with the requirements of the "Risk and permanence" tool and the mitigation measures established are adequate to ensure the permanence of the project activity.

4.11 Sustainable development safeguards (SDSs)

The project holder has carried out an environmental and social assessment, analyzing the probable effects on biodiversity, ecosystems, and communities within the limits of the project and the audit team considers that the analysis is supported with reliable and recent references, in general considered in the EIA /23/, construction contract /28/, environmental license /24/ and internal documents develop by the project holder, Employee Hiring Contract /63/, Internal Labor Regulations and the position profile /64/, easement agreements with the owners of areas where the electrical line or the buried pipes cross /35/, certification from the Home Ministry /62/, certification from the Incoder /61/.

The project holder has analyzed the potential negative effects on biodiversity and ecosystems, as well as the significant socioeconomic adverse impacts of their activities in accordance with the "Sustainable Development Safeguards, SDSs" tool /9/10/.

Therefore, the project holder has carried out a risk assessment under the Environment aspect, divided on Land use: Resource Efficiency and Pollution Prevention and Management, Water, Biodiversity and Ecosystems and Climate Change; and defining the several mitigation or preventive actions, as is required by the tool. Related to Climate Change, the project did not identify any potential risk.

Related to the social aspect, the risk assessment carried out by the project holder is divided on:

(a) Human Rights

Labor and Working Conditions. The project complies with Colombia's labor and human rights laws and practices'. It has an Internal Labor Regulation /64/ that ensures compliance with relevant laws prohibiting forced labor, human trafficking, and child labor practices. By signing the Employee Hiring Contract /63/, the worker declares to know and is bound to comply with the obligations of the Internal Labor Regulations and the position profile.

Gender equality and Women empowerment. The Internal Labor Regulation includes a mechanism for preventing workplace harassment behavior aimed at generating a collective coexistence conscience. This promotes work with decent and fair conditions, harmony between those who share work life, and a good environment and protects the privacy, honor, mental health, and freedom of people at work.

Land Acquisition, Restrictions on Land Use, Displacement, and Involuntary Resettlement. Zeus legally owns the land where the hydroelectric power plant is located. Only in the areas where the electrical line or the buried pipes cross, the project holder is not the owner of lands, but easement agreements /35/ had been signed with the owners to ensure their conformity and economical compensation for it. No local people were forcibly displaced by the project activity.

Indigenous Peoples and Cultural Heritage. There are no ethnic groups and/or local traditional communities as project participants in the project area, as is demonstrated with the certification from the Home Ministry /62/. Additionally, the PP demonstrate with the certification from the Incoder (Instituto Colombiano de Desarrollo rural, in Spanish), that the project does not cross or occupy territory legally owned by indigenous communities /61/. Therefore, the project did not damage cultural heritage or harm indigenous people.

Community Health and safety. The project ensures that hazardous and domestic wastes are disposed of properly according to Colombia's regulations and the PMA_MF_o4 Waste Management Plan /65/. Moreover, as part of the environmental management plan, the project develops periodical activities to the maintenance of the roads affected by the project, and other community infrastructures.

(b) Corruption.

The project holder establishes in the PD that There is no misuse of funds, bribery to secure contracts or permits, nepotism or favoritism in the selection of contractors, fraudulent reporting, conflicts of interest, lack of transparency, weak regulatory oversight, lack of

¹ Law no. 50 of 1990, by which reforms were introduced to the Substantive Labor Code and other provision are issued.
<https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=281>

accountability mechanisms, environmental permitting corruption, and subcontractor corruption in project activities.

(c) Economic impact

The main economic impact identified by the project holder during the construction and operational phase is the creation of employment opportunities for the local community, circumstance that could be check during the on site visit with the interviews with the different staff works in the project, checking that several of them are from the local communities.

Therefore, after review all evidence provided by the project holder and the documentation provided in the PD, the audit team considers that the “Sustainable Development Safeguards, SDSs ” tool has been used by the project holder properly.

4.12 Stakeholder engagement and consultation

In accordance with the regulations outlined by the Ministry of Environment and Sustainable Development, any hydroelectric project is required to conduct a consultation inviting local stakeholders to participate in a meeting where project information, such as a project description document, is provided and their feedback is obtained. Therefore, all process of this stakeholder consultation is supervised by the government as part of the Environmental Impact Assessment (EIA) /23/ and the approval of the environmental license /24/, including the appropriate sending of invitations to relevant stakeholders /67/, information related to the project /68/69/ and its potential risks /70/ and recollection of the stakeholder satisfaction with the consultation process /71/ and register of comments and doubts and their response /72/. Different meetings (in each village of the ADI and in each municipality of the AII) were conducted before the beginning of the construction of the project /28/ (January and June 2015, February and March 2016) and once finished the construction and before the operation starting (April 2022).

Based on the previous information, the audit team considers that the consultation has been conducted through a comprehensive assessment and understand the various individuals, groups, and organizations that will be impacted by the project activities. This issue could be checked through the interview with several stakeholders that confirmed that all the process was clear and participative.

The different meetings (in each village of the ADI and in each municipality of the AII) were conducted before the beginning of the construction of the project /28/ (January and June 2015, February and March 2016) allowed for the collection of information used to characterize and assess the Project baseline and the identification of potential impacts and management measures, considering the scope and areas of influence of the project. Additionally, this information could be checked and updated with the information obtained from the meetings conducted once finished the construction and before the operation starting (April 2022).

Any mitigation measures put in place due to the information recollected during the stakeholder consultation was included in the Environmental Management Plan (EMP) /66/. And the community and local authorities were informed about the progress of the construction phase, the execution of the EMPs and the results of environmental and social management.

Finally, after review all information shared by the PP and the recollected by the audit team from the interviews during the onsite visit, it is considered that the stakeholder consultation has been carried out in accordance with the national laws and the BCR requirements, and that the information included in the PD is completed and adequate, including the complete list of comments received, including contact information for the stakeholder who made the comment, and the response and actions carried out due to them.

4.13 Public consultation

During the public comments period of the project, from 01/03/2024 to 31/03/2024 no comments have been received and uploaded in the “Project Documents” of the website of BioCarbon.

4.14 Socioeconomic aspects

The audit team could verify in the interviews with some local stakeholders during the onsite visit, that the community supports the initiative in terms of its socioeconomic effects. The project was seen by the local population as having a favorable environmental and social impact. Several local individuals are employed by the project, supporting the local economy.

When it comes to the distance between the project site and nearby facilities that could be impacted by operation of the project, there are none, except to the properties where the electrical line or the buried pipes pass, that receive an economical compensation although the owner is not affected and can develop a normal activity in them. Therefore, the project's activities have no detrimental effects on the lives of the locals.

In addition, the PP works with interested parties to get their perspectives on the project during all the process of the project, before the construction, during and after the operation starting, to recollect any surgency, comment or grievance.

As it is explained with detail in section 5.11 of this report, the project holder has carried out an environmental and social assessment, analyzing the probable effects on biodiversity, ecosystems, and communities within the limits of the project and the audit team considers that the analysis is supported with reliable and recent references, in general considered in the EIA /23/, construction contract /28/, environmental license /24/ and internal documents develop by the project holder, Employee Hiring Contract /63/, Internal Labor Regulations and the position profile /64/, easement agreements with the owners of areas where the electrical line or the buried pipes cross /35/, certification from the Home Ministry /62/, certification from the Incoder /61/.

The project holder has analyzed the potential negative effects on biodiversity and ecosystems, as well as the significant socioeconomic adverse impacts of their activities in accordance with the “Sustainable Development Safeguards, SDSs” tool.

Therefore, the project holder has carried out a risk assessment under the Environment aspect, divided on Land use: Resource Efficiency and Pollution Prevention and Management, Water, Biodiversity and Ecosystems and Climate Change; and defining the several mitigation or preventive actions, as is required by the tool. Related to Climate Change, the project did not identify any potential risk.

4.15 Sustainable Development Goals (SDG)

Regarding the United Nations Sustainable Development Goals (SDGs), the project achieves the following SDGs:

SDG 7 Affordable and Clean Energy / SDG 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix / SDG 7.2.1 Renewable energy share in the total final energy consumption.

The audit team checked and confirmed that project activity generates renewable energy, about 59.2 GWh per year and supplies it to the Colombian national grid (SIN). Through this way, project contributes to the SDG 7.2. target, and the relevant indicator is SDG 7.2.1.

SDG Goal 8 Decent Work and Economic Growth / SDG 8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value / 8.5.2 Unemployment rate, by sex, age, and persons with disabilities.

The audit team checked during the onsite visit and confirmed that project estimates the creation 235 job opportunities during construction phase and 13 during the operation phase, however, the value of the indicator will be monitored annually through the HR hiring data. Through this way, project contributes to the SDG 8.5. target, and the relevant indicator is SDG 8.5.2.

SDG Goal 13 Climate Action / SDG 13.2 Integrate climate change measures into national policies, strategies and planning / SDG 13.2.2 Total greenhouse gas emissions per year.

The audit team checked and confirmed that project will naturally play an important role in global climate change mitigation activities through preventing emissions of CO₂ that would otherwise be released to the atmosphere in the baseline conditions. Project annually achieves 23,156 tCO₂ emission reduction. Through this way, it contributes to SDG 13 goals of the UN.

The audit team checked and confirmed that the latest version of the tool “SDG Tool” /9/10/ has been used to determine the different SDGs properly.

4.16 REDD+ safeguards (if applicable)

The project activity is not a REDD+ project; thus, this section is not applicable.

4.17 Climate change adaptation

Many environmental benefits result from the implementation of the project “Zeus Hydroelectric Plant” that collaborate in the climate change adaptation of the national policies indicated in the “PNACC (National Plan for Adaptation to Climate Change of 2016):

- 1. Increased availability of electricity generated from clean and renewable sources: Hydroelectric power is an energy source that relies on water flow to generate electricity. This means it does not deplete the water resource, making it a renewable energy source. Zeus Hydroelectric Plant reduces the reliance on fossil fuels, significantly contributing to greenhouse gas emissions. Hydroelectric plants provide a clean and sustainable energy source, essential in mitigating climate change impacts.*
- 2. Reduced Reliance on Fossil Fuels replacing fossil fuels: Zeus helps reduce the reliance on fossil fuels for electricity generation. Hydroelectricity can provide a stable and sustainable energy supply as Colombia transitions from fossil fuel-based power generation to cleaner alternatives. This transition helps decrease the overall carbon footprint of the energy sector.*
- 3. Stabilizing Energy Supply with a diversification in the energy production: Hydroelectricity can provide a stable and sustainable energy supply and broadens the range of technologies used to produce energy.*

4.18 Special categories related to co-benefits.

The project does not intend to achieve one of the special categories: “co-benefits can be divided into three additional benefits: biodiversity conservation, community benefits, and gender equity”; therefore, this section is not applicable.

5 Internal quality control

Following the completion of the assessment process by the validation team, the final documentation including the validation report and annexes must undergo an internal quality control by an independent Technical Reviewer, who is another Team Leader of AENOR that is not involved in the validation activities of this specific project activity.

Further CLs and CARs may be raised by the Independent Technical Reviewer during this review, in order to cover all the points that may need further clarification.

After all CLs and CARs are closed, the validation report is again reviewed and finally approved by the Team Leader, ITR and the Climate Change Unit Manager, and the request for registration is submitted to the Project Developer along with the relevant documents.

6 Validation opinion

AENOR performed the validation of the “Zeus Hydroelectric Power Plant” in Colombia, conducting a onsite visit between 23/04/2024 and 24/04/2024. The GHG Statement is the responsibility of the “Central Hidroeléctrica Zeus S.A.S. E.S.P”. The validation was performed based on Validation criteria for projects set out in BCR Standard Version 3.4 and Host Party criteria, as well as per criteria given to provide for consistent project operations, monitoring and reporting.

The validation was performed by a validation team consisting of Luis Javier Arribas as the Team Leader, Sergio Rodríguez as the Trainee Validator, Asis Arranz as the Financial Expert and Richard Daniel Gonzales as the ITR” and the project activity was checked against the applicable rules and regulations of BCR Standard Version 3.4 /16/.

AENOR hereby confirms that the proposed project activity “Zeus Hydroelectric Power Plant” in Colombia, applied all relevant EB-guidance as the selected baseline and monitoring methodologies and the associated methodological tools have been applied correctly. Validation of the GHG statement was conducted in accordance with ISO 14064-3; 2019. The total emission reductions from the project are estimated to be on the average 23,156 tCO₂e per year over the selected 7-year quantification period.

As a result, the validation team assigned by AENOR. concludes that the proposed Project Activity “Zeus Hydroelectric Power Plant” in Colombia, as described in the BCR-PD (version 6 dated 06/05/2025):

- *Meet with all relevant Host Country criteria;*
- *Meet with all relevant requirements of the BCR project activities [including BCR Standard version 3.4];*
- *Applies correctly the baseline and monitoring methodology “AMS-I.D.: Grid connected renewable electricity generation, Version 18.0” /11/;*
- *Its additionality is sufficiently justified in the PD;*
- *Is likely to achieve estimated emission reductions;*

The validated GHG emission reductions over the entire quantification period of the proposed project:

<i>Year</i>	<i>GHG emission reductions in the baseline scenario (tCO_{2e})</i>	<i>GHG emission reductions in the project scenario (tCO_{2e})</i>	<i>GHG emissions attributable to leakages (tCO_{2e})</i>	<i>Estimated Net GHG Reduction (tCO_{2e})</i>
19-05-2022—31-12-22	14,528	0	0	14,528
2023	23,156	0	0	23,156
2024	23,156	0	0	23,156
2025	23,156	0	0	23,156
2026	23,156	0	0	23,156
2027	23,156	0	0	23,156
2028	23,156	0	0	23,156
1-1-29—18-05-2029	8,628	0	0	8,628
Total	162,092	0	0	162,092
Annual average	23,156	0	0	23,156

Therefore, AENOR requests the registration of the proposed project activity as a BCR project activity.

7 Validation statement

Once completed the validation, AENOR confirm that:

- Carbon ownership of the project activity is belonged to the project owner, which is the Central Hidroeléctrica Zeus S.A.S. E.S.P, the company has transferred its carbon

credit related rights to South Pole Carbon Asset Management S.A.S. by the agreement dated as 12/09/2022 /60/.

- b) The level of assurance of the validation is reasonable.
- c) The scope of this validation process is to assess the estimated total GHG emission reductions of 162,092 t CO₂e for the first quantification period of GHG emissions reduction of the project from 17/05/2022 to 16/05/2029, and the purpose is to confirm the compliance of the project with the BCR standard (version 3.4) /16/, based on the PD version 6.0 of 06/05/2025 /2/, and the proper application of the monitoring methodology “AMS-I.D.: Grid connected renewable electricity generation, Version 18.0” /11/ and its related CDM tools and guidelines.
- d) The data and information supporting the GHG declaration are hypothetical based on studies developed previously to the construction of the project, and historical data to determine the emission factor of the grid.
- e) This assessment is accompanied by the GHG declaration made by the responsible party,
- f) Validation Team confirms that the proposed project activity “Zeus Hydroelectric Power Plant” in Colombia, applied all relevant EB-guidance as the selected baseline and monitoring methodology and the associated methodological tools have been applied correctly. Validation of the GHG statement was conducted in accordance with ISO 14064-3; 2019. The total emission reductions from the project are estimated to be on the average 23,156 tCO₂e per year over the selected 7-year quantification period.

AENOR confirms that the project is implemented as described in the project document and the identification of the baseline, the use of data and parameters for the estimation of the mitigation results, the GHG emission reductions and the monitoring plan were determined applying the selected methodology. Based on the information we have assessed; we confirm that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

The project’s contribution to sustainable development objectives is:

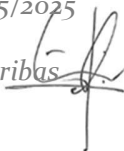
- SDG 7 Affordable and Clean Energy,
- SDG Goal 8 Decent Work and Economic Growth,
- SDG Goal 13 Climate Action.

- g) Validation Teams’s conclusion on criteria and indicators related to co-benefits: Not Applicable
- h) AENOR confirm information which are given above.

Madrid, 08/05/2025

Luis Javier Arribas

Team leader



José Luis Fuentes

Climate Change Unit Manager

8 Facts discovered after validation

This is the first validation of the project. Therefore, no new information has been arised after the issuance of the validation report and statement.

Annex 1. Competence of team members and technical reviewers

Luis Javier Arribas is an industrial engineer and holds a master's degree in industrial metrology and calibration, concerted quality systems and quality assurance. Senior auditor in validations and verifications of carbon projects at AENOR. He is qualified as a validator, verifier, and team leader of CDM/JI, and voluntary carbon market projects, such as VCS, SDVISTa or Gold Standard, in AENOR's Climate Change Unit. He has a solid experience of more than 20 years in environmental and energy assessment and is an expert in quality control testing and quality assurance of systems. Since he joined AENOR, more than ten years ago, in 2008, he has actively participated in the audit of international projects in the following areas: energy distribution; energy demand; transport; waste management and disposal with a special focus on Latin America and the MENA region, but also in other countries such as Ruanda, Uganda, Kenya, South Africa, Malawi, etc . In addition, he was a lead auditor in Energy Efficiency Management Systems with ISO 50000 and other ISOs such as ISO 9001, ISO 14001. Due to his many years of experience, Javier knows the rules of BCR perfectly, and knows how to focus on what is relevant. He has an exceptional knowledge of carbon standards and their methodologies, variables and approaches, tools, templates, guidelines, etc., as well as regulatory bodies. She has good communication and networking skills, strong writing and reporting skills. Luis Javier Arribas has worked on a variety of projects related to the present project activity, which stands out due to his extensive experience in the renewable energies, specially run of river hydropower in Colombia. These include projects of VCS, CERCARBONO or GS, among others. Likewise, Luis Javier Arribas has worked in several projects of the aforementioned standards, which have involved all types of social relations with the stakeholders related to the project. In addition, a whole series of documentation related to the project is available which facilitates the understanding and adjustment to the social needs of the project activity.

Richard Gonzáles has been an Industrial Engineer, auditor and team leader in emission reduction projects since 2011, mainly CDM, Gold Standard and VCS-CCB projects. He is qualified as a validator, verifier, and team leader of CDM/JI, and voluntary carbon market projects in the Climate Change Unit of AENOR. He is also qualified as an Auditor in Carbon Footprint of Organization and Products and auditor in Environmental Management Systems under the ISO 14001 standard and Energy Efficiency Management under ISO 50001. Richard is also a qualified auditor to audit with the Mexican System for Reducing Emissions, RENE. It is approved by RENE as a leading verifier for audits in the energy sector. It is approved by Semarnat to act under RENE as the main verifier in the energy sector. He is an expert in GHG inventories, management and mitigation strategies working for several Peruvian consultancies and the National Environment Fund (Peru). Richard is in charge of most of the validation and verification activities in Peru in the energy and forestry sectors, but he is also involved in projects in countries in the region and in other technical areas. All these years of work as an auditor have allowed him to develop skills to audit projects in the energy sector, knowing how to focus on what is relevant both in the visit to the plants and in the documentary review of the monitoring reports. Richard has an exceptional knowledge of the different carbon standards and their methodologies, variables and approaches, tools,

templates, guidance, etc., as well as regulatory bodies. Likewise, Richard Gonzáles has worked in several projects of the aforementioned standards, which have involved all types of social relations with the stakeholders related to the project. In addition, a whole series of documentation related to the project is available which facilitates the understanding and adjustment to the social needs of the project activity.

Asis has a degree in Economics and a master's degree in Climate Change (Impacts and Mitigation). He has a solid background in finance and specialization in the energy and environmental sector. He has experience in budget management and in strategies and action plans for mitigation and adaptation to climate change at the national and international level, and in the development of inventories, methodologies for calculating and monitoring GHG emissions. His educational and professional career has been developed in Spain, Slovakia, Australia and the United Kingdom, where he has gained experience in dealing with international clients, research work, climate change adaptation and mitigation projects, carbon footprints, energy commercial management, finance and business assistance.

Sergio Rodrigo is an Environmental Technologies Engineer. He is actually becoming a validator/verifier under the ISO-14000 family requirements. Currently, Sergio is working in AENOR as a trainee auditor; not only studying VERRA Requirements, but also Clean Development Mechanism, Gold Standard, BioCarbon Registry, and other standards or procedures. He is mainly focusing his career in becoming a useful participant in all the audit processes. In addition, he is also becoming an ISO-9000 family auditor as well. He is also a fluent English speaker and writer.

Annex 2. Clarification requests, corrective action requests and forward action requests

<i>Finding ID</i>	<i>Type finding</i>	<i>of</i>	<i>Corrective action</i>	<i>Date 13/05/2024</i>
<i>Section No.</i>				
4.2.				
<i>Description of finding</i>				
<p>The Project Document has not been completed in the current version of the BCR template, version 2.3.</p> <p>In addition, points 7.1.1 and 8 of the new template must be completed.</p>				
<i>Project holder response (28/06/2024)</i>				
<p>The Project document was updated with the latest version of the BCR template, version 2.3.</p> <p>Sections 7.1.1 and 8 are completed.</p>				
<i>Documentation provided by the project holder</i>				
BCR_2.1_Zeus Hydroelectric_V2.0				
<i>CAB assessment (30/07/2024)</i>				
<p>The updated Project Document has been completed in the current version of the BCR template, version 2.3., and points 7.1.1 and 8 of the template have been completed.</p> <p>Therefore, the CAR 01 is closed.</p>				

Finding ID	Type of finding	Corrective action	Date 13/05/2024
Section No.			
4.2.			
Description of finding			
<p>The following items have not been completed in accordance with the instructions included in the 'BioCarbon_Template-GHG-Projects_V2.3':</p> <ol style="list-style-type: none"> 1. Project holder's contact information box in the cover page is not correctly fulfilled; Physical address is missing. 2. Section 2.3 does not include a brief description of the criteria by which the project demonstrates compliance with the special category(ies) to which the project is proposed to apply according to section 8 of the BCR Guidelines for Energy Sector NCRE sources (PCH, Run-of-river, Guarantee a permanent environmental flow of the natural riverbed) 3. Section 3.2.3 does not define the type of quantification period (fixed or renewable) and the number of renewal periods for the total length of project lifespan 4. Section 3.2.3.1 does not identify according to section 10.4 of BCR Standard, the project start date between the different dates indicated, such as construction contract sign, generation start date, commercially operational date. 5. Section 3.2.3.2 does not indicate the number of renewal periods and the total length of project lifespan 6. Section 3.6 does not demonstrate that take actions to ensure the project benefits are maintained over time; applying the BCR Tool "Permanence and Risk Management. 7. Section 4 of the PD, does not describe the manner in the project activity met the legal compliance including, among others, the laws related to the protection of human and indigenous peoples' rights, in accordance with international regulations, such as the United Nations Declaration on the Rights of Indigenous Peoples and ILO Convention 169 on Indigenous Peoples. 8. Financial and social risks are associated with the implementation of the project activities are missing in section 7. 			

9. Section 7.1 indicates that the contingency plan is applied in case of a disaster, but the measures taken to ensure that the project is maintained over time, as reflected in agreements or contracts, have not been explained and justified, using the “Risk and permanence” tool
10. Section 10 of the PD does not provide detailed information about the “information that was made available to stakeholders during the consultation process”.
11. Table 16 of section 10.1 does not include contact information of the stakeholder who made the comment

Project holder response (28/06/2024)

1. The project holder’s address is included: Carrera 43B No. 16-95 Oficina 1312
2. The discharge channel is a high concrete channel built to return the captured flow to the main channel of the Rio Grande River, thus ensuring that the flow is adequately returned to the river. This will guarantee a permanent environmental flow of the natural riverbed.
3. The project timeframe corresponds to a renewable 7-year period for quantifying GHG emission reductions, which can be renewed for a maximum of five times.
4. According to BCR Standard section 10.4, the start date of GHG projects is the date on which the project begins the activities that will result in effective GHG emissions reductions. Therefore, the real action of the project is the date the plant began delivering energy to the grid, May 17, 2022.
5. The project crediting period can be renewed a maximum of five times, for a maximum total duration of 42 years.
6. Section 3.6 was completed to demonstrate the permanence and risk management.
7. The project does not intersect or overlap with territory legally titled as Indigenous Reservations, nor with collective titles belonging to black or Afro-descendant or ethnic communities.
8. Financial risks were included in Section 7.
9. The section was updated accordingly to the measures taken to ensure the project maintenance over time.
10. The reference of the information provided to the stakeholders was added.

11. Contact information was added. The names are not included to safeguard the privacy of the stakeholders.

Documentation provided by the project holder

- 6. Inf-0120-GP-C9-Plan de Riesgos.pdf
- 7. Certificación Incoder.pdf and Certificación Min Interior.pdf
- 8. Licencia Ambiental.pdf
- 10. ANX-1.5-Presentación_Proyecto Zeus.pptx and ANX-1.5-Presentación_Resultados Proyecto Zeus_.pptx
- 11. ^aICA-1a- PMA_MS_01_01.pdf

CAB assessment (30/07/2024)

1. The physical address included in the Project holder's contact information box in the cover page is not complete as is indicated in section 5.1.
2. Section 2.3 of the updated PD includes information that demonstrates the specific conditions described in section 8 of the BCR Guidelines for Energy Sector NCRE sources (PCH, Run-of-river, Guarantee a permanent environmental flow of the natural riverbed):
 - a. The project consists of a run-of-the-river power plant that harnesses the waters of the Rio Grande River
 - b. An installed capacity of 9.88 MW, therefore, less than 20 MW.
 - c. The discharge channel returns the captured flow to the main channel of the Rio Grande River. Additionally, the spillway has an orifice through which the environmental flow is reintegrated into the original course of the Rio Grande River. This way, a permanent environmental flow of the natural riverbed is guaranteed.

Therefore, this issue is closed.
3. Section 3.2.3 of the updated PD defines the type of quantification period (renewable) and the number of renewal periods for the total length of project lifespan (maximum of five times), in accordance with section 10.5 of the BCR Standard. Therefore, this issue is closed.

4.	Section 3.2.3.1 of the updated PD does not identify the construction date as the project start date according to section 10.4 of BCR Standard, that is when the activities that result in actual reduction of GHG emissions begin.
5.	Section 3.2.3.2 of the updated PD indicates the number of renewal periods and the total length of project lifespan, maximum of five times and 42 years, but evidence of the lifespan shall be provided.
6.	The project holder has demonstrate that take actions to ensure the project benefits are maintained over time with the provided evidence “Inf-0120-GP-C9-Plan de Riesgos.pdf” that is a contingency plan where different risks are identified and actions to reduce their impact in the project are defined. Therefore, this issue is closed.
7.	Section 4 of the PD has been updated with information clarifying that the project activity met the legal compliance including, among others, the laws related to the protection of human and indigenous peoples’ rights, in accordance with international regulations, such as the United Nations Declaration on the Rights of Indigenous Peoples and ILO Convention 169 on Indigenous Peoples. The information included in the PD has been crosschecked against the evidence provided “Certificación Incoder.pdf” and “Certificación Min Interior.pdf” and are found correct. Therefore, this issue is closed.
8.	Section 7 of the updated PD has included the Financial and social risks, in accordance with the evidence provided “Inf-0120-GP-C9-Plan de Riesgos” and “Licencia Ambiental”. Therefore, this issue is closed.
9.	Section 7 has been updated with the measures taken to ensure that the project is maintained over time, in accordance with the “Risk and permanence” tool and is determined in the contingency plan. Therefore, this issue is closed.
10.	Section 9 of the updated PD provides detailed information about the “information that was made available to stakeholders during the consultation process” and that has been provided to the audit team as evidence to close this issue. Therefore, this issue is closed.
11.	Table 14 of section 9.1 of updated PD includes contact information of the stakeholder who made the comment. Therefore, this issue is closed.
Project holder response (03/09/2024)	
1.	The address in the cover page was updated to be the same as in Section 5.1.
2.	Section 3.2.3.1 of the updated PD identifies the construction date as the project start date according to section 11.4 of BCR Standard version 3.4.

3.	Section 3.2.3.2 of the updated PD was updated with version 3.3, to a maximum renewal period of 42 years.
4.	NA
5.	In equipments' catalogues and warranties it is not possible to show the lifespan of the equipment. The warranty only shows the maximum time in which the supplier is responsible for any imperfection in the manufacture of the equipment, but this does not determine the life of the project. In practice, there are projects in operation that are more than 50 years old, which shows that a project, and especially its equipment and infrastructure, with an adequate maintenance plan, can have a long useful life. The equipment for the Zeus Hydroelectric project is European, and the main equipment, such as the turbine and the generator, is manufactured in Germany. The supplier guarantees the equipment for five years and establishes a useful life of no less than 30 years and up to 80 years or more with an adequate maintenance plan. The average lifetime for other hydroelectric plants is around 40 and 80 years for the main electrical equipment.
Documentation provided by the project holder	
5.	https://www.wkv-ag.com/en/investor-relations/ and https://www.enelgreenpower.com/es/learning-hub/energias-renovables/energia-hidroelectrica/faq
CAB assessment (13/09/2024)	
1.	The physical address included in the Project holder's contact information box in the cover page is consistent with the information indicated in section 5.1. Therefore, this issue is closed.
4.	Section 3.2.3.1 of the PD version 3 identifies the construction date as the project start date according to the BCR Standard, that is when the activities that result in actual reduction of GHG emissions begin. Therefore, this issue is closed.
5.	The information and evidence provided by the Project holder justifies properly the lifetime of 50 years indicated in the response to a comment received during the meeting conducted in Santa Ana Community in April 2022 as part of the stakeholder consultation, and it is consistent with the lifespan of the project activity defined by the project holder. However, the first quantification period of GHG emission reductions indicated in section 3.2.3.2 of the PD version 3 is not consistent in all sections of the document (page 2, table 9, table of section 3.7.4. and section 5.3), and the number of renewal periods and the total

length of project lifespan is not in accordance with the requirements of section 11.5 of the BCR Standard version 3.4.
Project holder response (24/10/2024)
5. The quantification period of GHG emission reductions is updated in all sections to be consistent with 30/09/2020-29/09/2027.
Documentation provided by the project holder
BCR_2.1_Zeus Hydroelectric_V.4.pdf Zeus Colombia Calculations_V4.xlsx 13-Biocarbon Zeus SDG-Tool-2023_V.2
CAB assessment (11/11/2024)
The final version of the documentation shared has been already completed in accordance with the instructions included in the 'BioCarbon_Template-GHG-Projects_V2.3', including the quantification periods of GHG emission reductions, the renewal periods and the total length of project lifespan indicated in all sections of the document. Therefore, the CAR 02 is closed.

Finding ID	3	Type of finding	Corrective action	Date 13/05/2024
Section No.				
5.5.2.				
Description of finding				
The following items are against the criterion of 'AMS-I.D Small-scale Methodology: Grid connected renewable electricity generation Version 18.0':				

1. *The justification of the first applicability conditions does not justify if the project supplies electricity to a national or a regional grid. The second applicability condition has not been justified. Last condition of the methodology is missing: "In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply*
2. *Equation 2 of the methodology is not shown correctly in section 3.7.3. and the description of each parameter identified in the equation is not included.*
3. *There is a missing description of the parameter y in Step 4 of section 3.7.7.*
4. *Density Assumption in Section 3.7.4 is not correct, due to the lack of reservoirs.*
5. *Parameter EFgrid,BM,y is not considered by the methodology as a fixed parameter. Description included in its table is not correct*
6. *Parameter EFgrid,OM,y is not considered by the methodology as a monitored parameter.*
7. *In the parameter EGZeus,y has not been considered the electricity delivered to the project plant from the grid in the captation area.*
8. *Description of the parameter EFgrid,CM is not consistent with the tool.*
9. *Tables of the parameters to monitor project's contribution to the Sustainable Development Goals (SDGs do not include all required information of the parameters, such as source of data (with corresponding references), monitoring frequency, value(s), purpose of data*

Project holder response (28/06/2024)

1. *The project activity consists of the installation of a new hydroelectric power plant to supply electricity to the national grid. The second applicability condition is justified: The project activity consists of a) installation of a greenfield hydroelectric power plant. The last applicability criterion was completed.*
2. *The Equation 2 of AMS I.D. was included as PD Equation 4, with the parameter's description.*
3. *The description of parameter "y" was included for PD Equation 5.*
4. *The correction was made accordingly.*

5. The $EG_{grid,BM,y}$ is calculated ex-ante. The parameter is not showed as a fixed parameter but as a “data available at validation”.
6. Parameter $EF_{grid,OM,y}$ is showed as a “data available at validation”.
7. The $EG_{Zeus,y}$ parameter will be considered as Net electricity supplied to the grid by the project plant in the year y = Electricity injected to the grid (MWh)-Electricity consumed from the grid (MWh)
8. The description of the parameter $EF_{grid,CM}$ was updated to be consistent with the tool.
9. Tables of the parameters to monitor project’s contribution to the Sustainable Development Goals were completed.

Documentation provided by the project holder

BCR_2.1_Zeus Hydroelectric_V2.0

CAB assessment (30/07/2024)

The justification of all applicability conditions has been included in the updated PD in accordance with the methodology and tools applied, and the audit team could verify them during the onsite visit. **Therefore, this issue is closed.**

Equation 2 of the methodology is shown correctly in section 3.7.3 of the updated PD and the description of each parameter identified in the equation have been included. **Therefore, this issue is closed.**

The description of the parameter y has been included in Step 4 of section 3.7.7 of the updated PD. **Therefore, this issue is closed.**

Information of section 3.7.4 is consistent with the requirements of the methodology applied. **Therefore, this issue is closed.**

The $EF_{grid,BM,y}$ is not considered as parameter by the methodology or the tool, however, the audit team accepts that it is included as a “data available at validation”. Description included in its table is now correct. **Therefore, this issue is closed.**

The methodology and tool only identify as parameters the $EF_{grid,y}$ and the parameters necessary to calculate it and identify in paragraph 106 of the tool. Therefore, the $EF_{grid,OM,y}$ is not considered by the methodology or the tool as a parameter.

<p>In the parameter $EG_{Zeus,y}$ has been considered the electricity delivered to the project plant from the grid in the captation area. Therefore, this issue is closed.</p> <p>Although the parameter $EF_{grid,CM}$ is calculated ex post, it has not been considered as to be monitored.</p> <p>Tables of the parameters to monitor project's contribution to the Sustainable Development Goals (SDGs) include all required information of the parameters, such as source of data (with corresponding references), monitoring frequency, value(s), purpose of data Therefore, this issue is closed.</p>
<p>Project holder response (03/09/2024)</p>
<p>6. The $EF_{grid,OM,y}$ was delated from the monitoring parameters.</p> <p>8. The parameter $EF_{grid,CM}$ was added to the monitoring parameters</p>
<p>Documentation provided by the project holder</p>
<p>BCR_2.1_Zeus Hydroelectric_V.2 Section 16 Monitoring Plan</p>
<p>CAB assessment (13/09/2024)</p>
<p>Section 16 Monitoring plan of the BCR PD version 3 included the parameters required by the applied methodology and tool, without including the $EF_{grid,OM,y}$ and including the parameter $Ef_{grid,CM}$ calculated ex post, and all parameters necessary to calculate it and identify in paragraph 106 of the tool.</p> <p>Therefore, the issues 6 and 8 are closed.</p> <p>Therefore, the CAR 03 is closed.</p>

Finding ID	4	Type finding	of	Corrective action	Date 13/05/2024
Section No.					
5.5.2.					

Description of finding

The following items are against the criterion of 'Tool 07: Tool to calculate the emission factor for an electrical system. Version 7.0':

1. *Second applicability condition is not consistent with the tool: "two sub-options under the step 2 of the tool are available to the project participants.*
2. *Selected Option regarding the Tool 07 in Step 1 is missing.*
3. *The project electricity system and connected electricity systems are not clearly identified in step 1 of section 3.7.3.*
4. *Ex-ante option and ex-post option to calculate the operating margin emission factor, build margin emission factor and combined margin emission factor are indicated in different sections of the project document*
5. *The data vintage chosen to calculate the operating margin emission factor, build margin emission factor and combined margin emission factor are not documented in the project document*
6. *It is not identified the approach selected to calculate the lambda factor according section 6.4.2 of the tool.*
7. *It is not Include equation (5) of tool, identifying the parameters used*
8. *Step 5 in section 3.7.3. indicates that the sample group of power units m used to calculate the build margin is the resulting set (SET sample-CDM>10yrs), but it is not consistent with data shown in the spreadsheet "Zeus Colombia Calculations" for year 2023.*

Project holder response (28/06/2024)

1. *The second applicability condition was updated to be consistent with the tool.*
2. *Option A for Step one description was added.*
3. *The project electricity system is defined by the spatial extent of the power plants physically connected through transmission and distribution lines to the project activity (i.e., Zeus Hydroelectric Project), and that can be dispatched without significant transmission constraints. In this case, the project electricity system is given as the National Interconnected System (SIN) of Colombia.*

4. The Build margin CO₂ emission factor ($E_{fgrid,BM}$) was set ex-ante for the first crediting period; the $E_{fgrid,CM}$ will depend only on the variations expressed by the operating margin CO₂ emission factor ($E_{fgrid,OM}$) that the ex-post option was chosen. All the parameters were updated to be consistent through all the document.
5. The data vintage chosen to calculate the $E_{fgrid,OM}$ was chosen to the three most recent years from the operation start date (2020, 2021, 2022). For the BM is 2022.
6. The approach selected to calculate the lambda factor was added to the PD.
7. Equation 5 of the Tool 07 was added as PD Equation 8 with the parameters description.
- 8.

Documentation provided by the project holder

BCR_2.1_Zeus Hydroelectric_V2.0

<https://paratec.xm.com.co/paratec/SitePages/generacion.aspx?q=capacidad>

CAB assessment (30/07/2024)

1. Second applicability condition is now consistent with the tool: “two sub-options under the step 2 of the tool are available to the project participants. **Therefore, this issue is closed.**”
2. Selected Option regarding the Tool 07 in Step 1 has been identified in the updated PD. Evidence published by the Colombian DNA shall be provided where the delineation of the project electricity system and connected electricity systems could be checked.
3. The evidence provided to identify the project electricity system does not consider the wind plants that are identify in the spreadsheet “Zeus Colombia Calculations.xlsx”, therefore the project electricity system identified in the updated PD is not consistent with the plants connected to the electricity system considered in the calculation of the estimated emission reductions. On the other side, the updated PD does not describe the connected electricity systems considered in the spreadsheet from Ecuador.
4. Ex-ante option is indicated in section 16 of the monitoring plan, when is described the information of the operating margin emission factor.
5. The data vintage identified in section 3.7 of the PD to calculate the operating margin emission factor (2020, 2021, 2022) is not consistent with the ex post option chosen to calculate it and the data vintage used to calculate it in the spreadsheet (2022).

According to the tool, if the ex post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity.

6. It is now identified the approach selected to calculate the lambda factor according section 6.4.2 of the tool. **Therefore, this issue is closed.**

7. It is now included equation (5) of tool, identifying the parameters used. **Therefore, this issue is closed**

8. Step 5 in section 3.7.3. indicates that the sample group of power units m used to calculate the build margin is the resulting set ($SET_{sample-CDM>10yrs}$), and it is not consistent with data shown in the spreadsheet “Zeus Colombia Calculations_V2” for year 2023 corresponding to option “d” ($AEGSET_{sample-CDM}$: Included all plants registered as CDM project activity, starting with power units that started to supply electricity to the grid most recently; Tasajero 2 with date of Entry on 30/11/2015, less than 10 years old, is the latest plant included).

Project holder response (03/09/2024)

1. NA.

2. We added the list of generation resources in Colombia shared by the XM, which centralizes public information on the Wholesale Energy Market (MEM) and the operation of the National Interconnected System (SIN).

3. There are three wind power plants in Colombia. The reason that they are not listed in the web page of PARATEC is because JEPİRACHI 1 – 15 was retired from the SIN from May 26th, 2024; but it was part of the project electricity system when it started supplied energy to the grid. Guajira I and WESP 01 are not registered yet in the SIN, but they started test phase on July 5th, 2022 and November 28th, 2022 respectively, so they have supplied energy to the grid that must be considered. All this is listed in the webpage of the Evidence provided of XM Paratec, section of [News: https://paratec.xm.com.co/paratec/SitePages/default.aspx](https://paratec.xm.com.co/paratec/SitePages/default.aspx)

The imports from Ecuador were included in the PDD.

4. The section was updated to be consistent.

5. The section was updated to be consistent to the Tool 07. According to ex-post option, the calculation of OM is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

6. NA

7.	NA
8.	<i>This was updated according to finding 7.8. The CDM plants were updated to include all the projects registered in any Carbon Standard. Therefore, the AEGSET>20% is larger than 10 years, so Step 5 (d) was necessary.</i>
Documentation provided by the project holder	
1.	NA.
2.	<i>Sinergox. Tools: “Listado de Recursos de Generación”. Available at: https://sinergox.xm.com.co/ layouts/15/WopiFrame.aspx?sourcedoc={CA2AAC95-83D2-4573-AEB9-42CoCC10780C}&file=Listado Recursos Generacion.xlsx&action=default</i>
3.	<i>https://paratec.xm.com.co/paratec/SitePages/default.aspx</i>
<i>Screenshots: “Parque Eólico WESP01.jpg”, “Inicio de pruebas Guajira I.jpg”, and “Retiro JEPİRACHI.jpg”.</i>	
CAB assessment (13/09/2024)	
2.	<i>According the UNFCCC website (https://cdm.unfccc.int/DNA/index.html). The Ministry of Environment and Sustainable Development is the Colombian DNA, and the entity indicated by the PD (XM) is not recognized as part of the DNA (https://www.minambiente.gov.co/organigrama-minambiente/) neither as an associated entity (https://www.minambiente.gov.co/entidades-adscritas-al-ministerio/). Therefore, the PD shall clarify the reason because the selected Option regarding the Tool 07 in Step 1 has been identified in the updated PD. Evidence published by the Colombian DNA shall be provided where the delineation of the project electricity system and connected electricity systems could be checked.</i>
3.	<i>The evidence and information provided to identify the project electricity system is considered adequate and the project electricity system identified in the updated PD is consistent with the plants connected to the electricity system considered in the calculation of the estimated emission reductions. On the other side, the updated PD describes the connected electricity systems considered in the spreadsheet from Ecuador. Therefore, this issue is closed.</i>
4.	<i>Ex-ante option is indicated in section 16 of the monitoring plan, when is described the information of the operating margin emission factor. It has been deleted to the option ex-ante and it is indicated that the parameter is calculate for each year. Therefore, this issue is closed.</i>

5. The data vintage identified in section 3.7 of the PD to calculate the operating margin emission factor (2020, 2021, 2022) is not consistent with the ex post option chosen to calculate it and the data vintage used to calculate it in the spreadsheet (2022). According to the tool, if the ex post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity. The data vintage identified in section 3.7 is correct but section 16 still indicates that the parameter is calculated as average of the last three most recent years.

8. According to the spreadsheet "Zeus Colombia Calculation_V3", the oldest plant included in the 20% of AEGtotal is Cogenerador Proenca 1 with "date of entry" of 29/04/2014, less than 10 years old, considering the year 2023 for the calculation of the EFBM, and the value of AEGtotal is obtained excluding the plants registered in Carbon Standards. Therefore, step 5 (d) is not necessary, and the information indicated in the step 5 in section 3.7.3. is not consistent with data shown in the spreadsheet "Zeus Colombia Calculations_V3" for year 2023.

Project holder response (24/10/2024)

2. We corrected the Option selected to be consistent with the source of data, as the corresponding DNA of Colombia does not have information regarding the energy generation. Option 2 was selected "A delineation of the project electricity system defined by the dispatch area of the dispatch centre responsible for scheduling and dispatching electricity generated by the project activity. Where the dispatch area is controlled by more than one dispatch centre, i.e. layered dispatch area, the higher-level area shall be used as a delineation of the project electricity system (e.g. where regional dispatch centres are required to comply with dispatch orders of the national dispatch centre then area controlled by the national dispatch centre shall be used)."

5. The data vintage identified in section 3.7 of the PD to calculate the operating margin was updated to be consistent in Section 16.

8. The BM calculation was corrected considering the missing plants registered in Cercarbono. We deleted the unnecessary steps of calculation in the PDD for Step 5.

Documentation provided by the project holder

BCR_2.1. Zeus Hydroelectric_v.4

CAB assessment (11/11/2024)

The requested items have been updated in accordance with the requirements of 'Tool 07: Tool to calculate the emission factor for an electrical system. Version 7.0' and the final version of the documentation shared are correct, including the identification of:

- The correct option in the step 1
- The correct data vintage chosen to calculate the operating margin emission factor, build margin emission factor and combined margin emission factor
- The approach selected to calculate the lambda factor according section 6.4.2 of the tool
- The equation (5) of the tool with the parameters used.

Moreover, Step 5 of the determination of the build margin emission factor has been calculated in the spreadsheet and described in section 3.7.3. of the PD correctly and consistently, excluding the plants registered in Carbon Standards and more than 10 years old.

Therefore, the CAR 04 is closed.

Finding ID	5	Type of finding	Corrective action	Date 13/05/2024
Section No.				
4.2 and 5.5.5.				
Description of finding				
<p>The following items are not correct or complete:</p> <ol style="list-style-type: none"> 1. Section 1.3 shall indicate the CDM document, including version, that defines the size of small-scale projects. 2. Some footnotes or references should be added to some text extracts of the PDD (e.g., Pt 1.3 System scale definitions; Pt 2. Tool applied for the Combined Margin Emission Factors; Pt 3.7. AMS-I.D Meth. And BioCarbon Standard requirements) 				

3. Table of section 3.2.3.3 does not detail the verification of the period 01/01-2026 – 16/05/2026 and 01/01-2029 – 16/05/2029.
4. Section 3.4 does not provide the link and version of the “Non-binding practice examples to demonstrate additionality for SSC project activities” and “CDM Investment analysis tool”.
5. The default value for the expected return on equity provide in section 3.4 does not correspond to the value provided in the latest version of the CDM Tool 27, version 13. References to different version of this tool have been found in different section of the project document.
6. Section 3.4 does not provide the source of the income tax rate of 35%.
7. Section 3.4 does not provide enough detailed information regarding the benchmark result of 7.06% related to how calculated through the “Zeus Additionality Assessment” and the formula shown in the tool 27.
8. Some data presented in the table of section 3.4 are not consistent with the evidence provided.
9. Tables of the parameters monitored include the “Value monitored” instead of the “Value applied” to calculate the estimation of the emission reductions.

Project holder response (28/06/2024)

1. CDM project standard for project activities: Project type and eligibility. Version 3.0. (Paragraph 119.a.)
2. References were added as per the suggestions from the auditor.
3. The table of section 3.2.3.3 was corrected with the biannual verification period.
4. The link was added in a footnote. https://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid15_v01.pdf
5. The default value for the expected return on equity provide in section 3.4 was updated with the value from the Tool 27 version 13 of 8.69%. The Zeus additionality Assessment.xlsx file was updated too. All the references were updated accordingly to the latest version of the Tool 27.
6. Source added: Law 2277 of 2022. Art. 240 Parr. 4. General tax rate for legal persons. <https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=199883>

7. The benchmark calculation method was described according to the Tool 27 with the description of the parameters.
8. The data presented in the Table 6 were updated with the correct values. See comments.
9. The tables were updated with "Value applied".

Documentation provided by the project holder

Zeus additionality Assessment.xlsx

Folder: 1. DCTOS SOPORTE PREDIOS

Folder: 2. Tarifas de energía

Folder: 3. Contribuciones

4. ELECTROMECHANICAL EQUIPMENT ASSEMBLY CONTRACT.pdf

Folder: 5. DCTOS SOPORTE LINEA TRANSMISION + HIDROMECAICOS + OTROS

CAB assessment (30/07/2024)

1. Section 1.3 of the updated PD indicates the CDM document, including version, that defines the size of small-scale projects: CDM project standard for project activities, version 3.0. (Paragraph 119.a.). **Therefore, this issue is closed.**
2. References were added to provide evidence of the information included in the updated PD. **Therefore, this issue is closed.**
3. The table of section 3.2.3.3 was corrected with the detail of all monitoring period during this crediting period. **Therefore, this issue is closed**
4. Section updated with the corresponding references. The VVB has reviewed the sources of data represented and deems them correct. **Therefore, this issue is closed.**
5. All references for CDM Tool27 along the PDD have now a uniform version, the latest one 13, with the correct cost of equity from the Appendix of the tool. **Therefore, this issue is closed.**
6. The source of data of the tax rate displayed has been represented in the PDD, and the audit teams confirms its veracity. **Therefore, this issue is closed.**

7. The corresponding WACC equation from the CDM Tool27, v13, has been correctly represented with its parameters, and now it is possible to track the final result of the benchmark analysis done by the PP. However, some more detailed information, such as the weighting of debt and equity applied by the project (50% each), is missing.
8. Some values are still not consistent with the supporting documents provided by the PP:
- Total CAPEX by 101,136 MCOP with “RESUMEN CAPEX” file.
 - Predios has been modified to 1,185 MCOP being consistent with “RESUMEN CAPEX” file, but not with the new evidence provided “1. RESUMEN PREDIOS ZEUS” file.
 - Electromechanical equipment by 14,827 MCOP with “RESUMEN CAPEX” file.
 - Transmission line has been modified by a lower value 8,455 MCOP, which is not consistent now with “RESUMEN CAPEX” file. In addition, according to the evidence provided by the PP for cement and steel, the total sum of the invoices results are not consistent with the ones reflected in “RESUMEN CAPEX” (the total result for the transmission line with the correct result of the invoices, would be higher rather than lower).
9. Tables of the parameters monitored include the “Value monitored” instead of the “Value applied” to calculate the estimation of the emission reductions. **Therefore, this issue is closed.**

Project holder response (03/09/2024)

7. Paragraph modified to be more detailed: “The benchmark is based on parameters that are standard in the market, then the typical debt/equity finance structure observed in the sector of the country should be used. Nevertheless, no information about the debt/equity finance structure of these projects comparable to the project activity, was found. Thus, when the information is not readily available, 50 per cent debt and 50 per cent equity financing has been assumed as a default, according to the Tool 27.”
8. The documents were updated accordingly.
- The value in Zeus additionality.xlsx “Total CAPEX” was updated according to the total on RESUMEN CAPEX_V2 to be consistent.
 - For the Property Item, Servidumbre-TERESITA BUILES contract is provided to the auditor. For the electromechanical equipment item, the value was updated in RESUMEN CAPEX_V2, the contract value is stated in page 4, sixth clause.

- Electromechanical equipment value was updated according to the total on RESUMEN CAPEX_V2 to be consistent.
- Transmission line was reviewed each line and updated “Acero” and “Cemento” according to the evidence provided. See “Resumen_Soportes_LT_Updated.xlsx”

Documentation provided by the project holder

8. – RESUMEN CAPEX_V2.xlsx
- Folder 1: 1. RESUMEN PREDIOS ZEUS Updated.xlsx; Escritura Teresita Builes.pdf
 - RESUMEN CAPEX_V2.xlsx; Zeus Additionality Assessment_2.xlsx; 4. Contrato montaje equipos electrosanicos.pdf
 - Resumen_Soportes_LT_Updated.xlsx

CAB assessment (13/09/2024)

7. Detailed information about the weighting of debt and equity applied by the project have been added correctly in Section 3.4 of the PDD updated.
8. The following issues have been modified by the PP:
- Supporting documentation for CAPEX, which is now consistent with the PDD.
 - The figure of predios in “Zeus Additionality Assessment 2” is now consistent between all the updated supporting documents provided to the audit team.
 - Although the value of CAPEX is still not consistent with the total invoices sum received by the VVB, the difference is minimum and do not exceed the 5% of margin error of the project. The rest of the values of Transmission Line have been reviewed and are now consistent.

Therefore, CAR 05 is closed.

Finding ID	6	Type of finding	Corrective action	Date 13/05/2024
Section No.				
5.5.5.				
Description of finding				
Section 3.4 does not provide information related to the “Sensitivity analysis”, as is required by the BCR additionality and CDM Tool 01 version 7.0. for the demonstration and assessment of additionality when the investment analysis concludes that the project is not financially attractive without the financial benefits derived from Verified Carbon Credits sale, and the “Common practice analysis”, if apply.				
Project holder response (28/06/2024)				
The Zeus additionality sheet has an error on the energy tariff. The error was corrected, and the IRR now is positive, then the sensibility analysis is no longer required.				
Documentation provided by the project holder				
Zeus additionality.xlsx Precios PPA.pdf				
CAB assessment (30/07/2024)				
According to the BCR Additionality, Option III (benchmark analysis): “if the project activity has a less favorable indicator, for example, a lower IRR than the reference, then the Project cannot be considered financially attractive. If the investment analysis concludes that the Project is not financially attractive, without the financial benefits derived from Verified Carbon Credits’ sale, proceed to sub-step 3d (Sensitivity Analysis)”. The IRR of the project without carbon revenues, is indeed positive, but below the 7.06% benchmark for it to be economically viable, as mentioned at the end of section 3.4 of the PDD.				

Therefore, as the project is additional, the analysis of the 3d sub-step (Sensitivity Analysis) of the CDM Tool01, version 7 must be carried out.

Project holder response (03/09/2024)

The Sensitivity Analysis was included in the Additionality Assessment calculation by applying variation in the main parameters such as annual electricity generation and costs such as CAPEX, operation and maintenance, taxes, and energy tariff were considered for reasonable variations (+/-10%).

The analysis demonstrates that the project activity is unlikely to reach the benchmark without the carbon revenues.

Documentation provided by the project holder

Zeus Additionality Assessment_2.xlsx

CAB assessment (13/09/2024)

The sensitivity analysis calculation has been added in the financial model spreadsheet with clear traceability of the estimates and in the additionality assessment of the PDD. The VVB deems the assessment correct and the figures consistent with the supporting documentation.

Therefore, CAR 06 is closed.

Finding ID	7	Type of finding	Corrective action	Date 13/05/2024
Section No.				
5.5.8.				
Description of finding				
Related to the spreadsheet "Zeus Colombia Calculations", have been found the following issues:				

1.	<i>The BE and ER values have not been rounded conservatively.</i>
2.	<i>The value of the generation considered for the estimation of the BE is not the same for all years, 59,200 MWh, regardless of what the plant has generated during monitoring.</i>
3.	<i>Provide evidence of the source of the 59,200 MWh data. The document “A.1. Inf-0116-GP-Zeus Feasibility Study” indicates in table 4.2. an average annual generation of 47,510 MWh, while document “A.1. LT-1200 – Executive Summary_Feasibility Study” reflects an average annual generation of 56,240 MWh.</i>
4.	<i>The project has calculated the Bey with the average OM of the ex-ante option for the years 2024-2028, while for the years 2023 and 2024 it has applied the value calculated with the ex-post option but considering a different year (2022 and 2023), and for the year 2029 the ex-post option but considering the data for the year 2022.</i>
5.	<i>On the other hand, the calculation of the BM indicates that the ex-ante option has been used, so they should use the most recent data available at the time of delivering the PDD to the DOE for validation, that is, 2023, however, the Bey has been determined considering BM calculated with values from different years, and for the year 2022 and 2029 they use data from 2022, and for the rest of the years, from 2023-2028, they use the data from 2023.</i>
6.	<i>The total SIN generation considered for 2023 in the BM (80,495,021 MWh) is different from that considered in the OM (81,025,101.26 MWh).</i>
7.	<i>Egtotal 2023 (cell I2 of the Build Margin (BM) sheet) corresponds to Egtotal 2022.</i>
8.	<i>The generation of the “AUTOG CANTAYUS” and “CANTAYUS” Plants is discounted in cell J3 of the Build Margin (BM) sheet, as if they were CDM, although they are not identified as such in the AQ column.</i>
9.	<i>20% of the generation does not take into account that “if 20 per cent falls on part of the generation of a unit, the generation of that unit is fully included in the calculation”, and for 2023 instead of the correct value of 11,649,395.02 MWh determine the value of 11,635,037 MWh, including up to the AUTOG ARGOS YUMBO plant (included) with an operational date of 20/03/2016, less than 10 years old. On the other hand, the value indicated in cell J7 of the Build Margin (BM) sheet as AEGSET\geq20 per cent is not correct and considers more plants than those corresponding to 20%.</i>
10.	<i>The technology of the plants is not identified in the Build Margin (BM) sheet so it is not possible to easily know which ones consume fossil fuel or are renewable, but for example, TERMOBOLIVAR 1, which is a Natural Gas thermal power plant, no value has been identified for the EF of the plant (column AH). The same thing happens for the Termocapachos plant</i>

11. The hourly load only has 8736 hours instead of the 8760 that 2023 has, that is, 24 hours less, and only 8184 for 2022, that is, only 341 days.
12. For the calculation of lambda, the fixed value of 8760 indicated in the tool is not used in the denominator.
13. Tabs G2023 of Excel "Zeus Calculations EF Support" miss information from 31/12/2023
14. Table 2 of LCMR generation included in the "LCMR-Non_LCMR" tab considers plants with "Gas", "Thermal" and "Carbon" technology.

Project holder response (28/06/2024)

1. The ER estimation is updated with a "rounddown" formula.
2. The value of 59,200 MWh is used for the entire monitoring period.
3. According to the latest document "A.2. LT-1200 – Informe Potencia y energía" (2020)
4. The Bey estimation is done for all the crediting period with the calculated EFOM using the most recent data available for the year in which the project activity displaces grid electricity, in this case, when the project begins energy generation in 2022.
5. Bey estimation uses EFBM calculated for 2023 for all the crediting period.
6. The Build margin total generation is not considering the electricity imports.
7. The formula was updated.
8. AUTOG Cantayus Plant is the same as Cantayus. This plant is registered in CDM. The corresponding cells "AQ/142 and 143" were updated.
9. With the data missing from 2023, the calculations were adjusted accordingly to the comments. The AEGSET_{≥20} comprises the plants corresponding to the 20% generation.
10. A column was added to identify the plants' technology. Those power plants did not record fuel consumption. See "Zeus Calculations EF Support" Tabs "F2016, F2017, F2018, F2019, F2020, F2021, F2022, F2023".
11. We completed the data for the hours missing in G2022 and G2023 and updated in all the document (Hourly_load, Lambda 2022, Lambda 2023, LCMR-Non_LCMR, etc.)

12. The denominator was corrected to the value 8760 for tabs Lambda 2022 and Lambda 2023.
13. We completed the data for the day missing in G2023.
14. Those plants are not centralized and does not report fuel consumption. See “Fuel Summary”.

Documentation provided by the project holder

11. Generación_(kWh)_2022 and Generación_(kWh)_2023, Zeus Calculations EF Support_V.2.xlsx, Zeus Colombia Calculations_V2.xlsx

CAB assessment (30/07/2024)

1. The BE and ER values have been rounded conservatively. **Therefore, this issue is closed.**
2. The value of the generation considered for the estimation of the BE is the same for all years, 59,200 MWh, that is the value considered in the design of the project (document “A.2. LT-1200 – Informe Potencia y energía”). However, the calculation of the BE for the latest period of 2029 should be better the result of 21,141-14,528 **Therefore, this issue is closed.**
3. The value of 59,200 MWh data is obtained from the document “A.2. LT-1200 – Informe Potencia y energía” dated March 2020, more recent than the document “A.1. Inf-0116-GP-Zeus Feasibility Study” dated November 2015. **Therefore, this issue is closed.**
4. The project has calculated the Bey for all years with the OM of the ex-post option determined for the year 2022, in which the project activity started to displace grid electricity. **Therefore, this issue is closed.**
5. The calculation of the BM has been carried out in accordance with the ex-ante option, using 2023 data, which is the most recent data available at the time of delivering the PDD to the DOE for validation, in 2024. **Therefore, this issue is closed.**
6. The total SIN generation considered for 2023 in the BM (80,495,021 MWh) is in accordance with paragraph 22 of the tool 07 version 07.0. Therefore, this issue is closed.
7. Egtotal 2023 is calculated correctly with the generation data of 2023. **Therefore, this issue is closed.**
8. There are different plants identified as CDM projects, such as AUTOG PTAR BELLO, CELSIA SOLAR ESPINAL, ESCUELA DE MINAS, AURES BAJO, TEQUENDAMA

1 that are not found in the UNFCCC website, and CDM projects registered in the UNFCCC website do not identify in the spreadsheet, such as “El Popal 20 MW hydroelectric project”, “Santiago 2.8 MW Hydroelectric Project”, “Rio Amoya Run-of-River Hydro Project”, “Dona Juana landfill gas-to-energy project”, “Incauca S. A. Fuel Switch from Coal to Green Harvest Residues CDM Project.” (Incauca 1?).

9. 20% of the generation for 2023 has not been calculated correctly, and it is considered the set of plants with less than 10 years and including the CDM project activities to obtain the AEGSET-sample-CDM of 14,363,578 MWh, although the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEGtotal) with a value of 13,566,832.08 MWh (including up to the CARLOS LLERAS plant (included) with an operational date of 22/11/2015, less than 10 years old) is higher than the 20% of the total generation.

10. The technology of the plants is identified in the Build Margin (BM) sheet. **Therefore, this issue is closed.**

11. The hourly load of 8760 has been considered for 2023. **Therefore, this issue is closed**

12. For the calculation of lambda, the fixed value of 8760 indicated in the tool is not used in the denominator. **Therefore, this issue is closed**

13. Information from 31/12/2023 has been included in Tab G2023 of Excel “Zeus Calculations EF Support_V2”. **Therefore, this issue is closed**

14. The approach conservative considering some thermal plants as LCMR generation because they do not report fuel consumption shall be explain clearly in the PD to apply it in the calculation of the OM ex post in the future in the same way. In any case, clarify then, the reason why the following plants are considered No LCMR plants although there are no fuel consumption data for them in the column T of the sheet Simple Adjusted OM: PROELECTRICA 2, PROENCA II, TERMOBOLIVAR 1, TERMOCAPACHOS, TERMOCENTRO CC, TERMOMECHERO 4, TERMOMECHERO 5, TERMOMECHERO 6, TERMOPIEDRAS and TERMOPROYECTOS

15. Additionally, clarify the calculation of the emission factor carried out in the sheet “Simple Adjusted OM” of the spreadsheet “Zeus Colombia Calculations_V2” for the plants Barranquilla 3 and 4, Flores 4 CC, Flores I CC, Termocandelaria 1 and 2, and Termocandelaria CC with emission factor o consuming GAS and producing electricity for year 2023. The same case is for the following plants consuming ACPM: Termodorada 1, Termoemcali CC, termonorte, termosierra CC and Termovalle CC.

Project holder response (03/09/2024)

8. The project considers all the plants registered in Carbon Standards; we added the registry link in "Zeus Colombia Calculations_V3.xlsx".

9. The calculation of 20% generation was updated accordingly to the last finding.

14. The conservative approach was updated to be applied to all the thermal plants without fuel consumption. In the Zeus Colombia Calculations_V3.xlsx, the plants modified were marked with yellow to facilitate review. "Simple Adjusted OM" and "LCMR-Non_LCMR" sheet. The approach was described in the PDD for further calculations.

15. The document has an error as the EF table, cells K403 and K406, had an additional comment that caused the formula to not recognize the names. The error was corrected and marked with yellow. See "Simple Adjusted OM" sheet.

Documentation provided by the project holder

Zeus Colombia Calculations_V3.xlsx".

CAB assessment (13/09/2024)

8. Different plants are not identified as plants registered in Carbon Standards, such as El Paso (project 151 of Cercarbono), parque eólico WESP01 (project 115 of Cercarbono), or Dario Valencia Samper (number 39 of Cercarbono), etc.

9. Although the 20% of the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEGtotal) is 14,141,934 MWh, it is considered the set of plants with less than 10 years without including the CDM project activities to obtain the AEGSET>20 per cent of 14,327,277 MWh, however, the value obtained without considering the latest plants (La Naveta, La Rebusca, cogenerador Proenca and cogenerador Proenca 1) will be 14,188,448.87 MWh higher than the 20% generation of 14,141,934 MWh.

14. The approach conservative considering some thermal plants as LCMR generation because they do not report fuel consumption has been explain clearly in the PD to apply it in the calculation of the OM ex post in the future in the same way.

All plants without fuel consumption data has been considered LCMR. **Therefore, this issue is closed.**

15. The calculation of the emission factor has been carried out correctly in the sheet "Simple Adjusted OM" of the spreadsheet "Zeus Colombia Calculations_V3" for the plants that consume GAS and ACPM. **Therefore, this issue is closed.**

Project holder response (24/10/2024)

8. The plants registered in the Standard Cercarbono were added: El Paso, WESP01, Dario Valencia Samper, Guayepo, La Loma, Guavio Menor, Cucuana, La Naveta, Salto II, Porce III, Caruquia, and Agua Fresca.

9. The calculations were updated including the plants registered in the Standard Cercarbono; therefore, the values of AEGtotal and AEGSET>20 per cent are different. With the update, the new value of the 20% of AEGtotal is 13,148,128 MWh, and the AEGSET>20 per cent is 13,162,145 MWh. None of the power units in SETsample started to supply electricity to the grid more than 10 years ago, then we use this value to calculate the build margin. The BM value and the ER were updated in all the sections accordingly.

Documentation provided by the project holder

Zeus Colombia Calculations_V4.xlsx

CAB assessment (11/11/2024)

Related to the spreadsheet “Zeus Colombia Calculations”, have been found the following issues:

1. All plants registered in Carbon Standards have been identified correctly and excluded from the calculation, and all other plants considered correctly in the calculation.
2. The group of plants selected because they suppose the 20% of the annual electricity generation of the project electricity system has been correct, taking into account that “if 20 per cent falls on part of the generation of a unit, the generation of that unit is fully included in the calculation”, and the value of AEGSET \geq 20 per cent does not consider more plants than those corresponding to 20%.
3. The conservative approach to be applied to all the thermal plants without fuel consumption information has been included in the PD, considering that are LCMR with emission factor null, in accordance with the option A.3 of the tool.
4. The emission factor of all thermal plants has been calculated correctly, applying the correct values.

Therefore, CAR 07 is closed.

Finding ID	1	Type finding	of	Clarification action	Date 13/05/2024
Section No.					
5.6.					
Description of finding					
Clarify what fuel "GAS NI" and "ACPM" are in order to verify the values of their emission factors.					
Project holder response (28/06/2024)					
GAS NI: "Gas Natural Genérico"					
ACPM: "Diesel B2"					
a.html					
CAB assessment (30/07/2024)					
The information requested has been clarified and the values of the emission factors verified properly against the data source provided in the PD, although it is different to the provided in the response to this finding.					
Therefore, the CL 01 has been closed.					

Finding ID	2	Type finding	of	Clarification action	Date 13/05/2024
Section No.					
5.1., 5.5.1., 5.5.5., 5.6., 5.7., 5.8., 5.9., 5.10., 5.14., 5.15.					
Description of finding					

The following items must be duly evidenced and provided as additional information for the audit team:

- 1. The gross head of 169.9 m*
- 2. The installed capacity of 9.88 MW, if the capacity of turbines is 5098 kW each one*
- 3. Expected annual generation of 59,200 MWh per year.*
- 4. Dimensions of the d channel (3.0 m wide, 40 m long, and 0.6 m high)*
- 5. Construction contract signed.*
- 6. Source of equation to calculate the post-tax cost of debt.*
- 7. Evidence of the following data provided in the table of section 2.4 and shown in “OPEX PCH ZEUS” Excel file provided by the PP:*
 - a. electromechanical Equipment Maintenance cost*
 - b. Contributions*
 - c. Energy tariff details*
- 8. Provide evidence of the “Document Management System” applied to identify and access relevant laws and regulations on an ongoing basis and demonstrate the periodically review compliance with it*
- 9. Decree 2041*
- 10. Resolution No. 1811-6435 of 2018*
- 11. Connection study report submitted to include the plant in the SIN.*
- 12. Staff flow-chart to evidence to show the qualification needs for the role of monitoring, etc.*
- 13. Commercial registry of the Chamber of Commerce of Medellín for Antioquia.*
- 14. Agreement between Central Hidroeléctrica Zeus S.A.S. E.S.P. and South Pole Carbon Asset Management S.A.S.*
- 15. Systematic process implemented to evaluate the risks associated with the project applying the BCR Tool “Permanence and Risk Management”*

16.	<i>Reversal Risks Plan.</i>
17.	<i>An evidence to ensure the training given to involved staff related to Risk Assessment and Management.</i>
18.	<i>Landslide Recovery Plan.</i>
19.	<i>Emergency firefighting plan</i>
20.	<i>Recovery plan against malicious acts.</i>
21.	<i>certificate of the Ministry of the Interior 952 of May 27, 2014</i>
22.	<i>Invitation letters sent to the different stakeholders.</i>
23.	<i>Evidence that the information requested by Santa Rosa and Don Matias Communities was sent by May 12, 2022.</i>
24.	<i>Satisfaction surveys conducted to evaluate the perception and satisfaction of social organizations, communities and municipal officials (section 10.2).</i>
25.	<i>Tool for Determining the Contributions of GHG Projects to Achieving the Sustainable Development Goals (SDGs) used to demonstrate compliance with the SDGs</i>
26.	<i>Host Country Attestation (HCA) according to the Annex A of “Avoiding double counting (ADC) tool” version 2 and required by BioCarbon to the project holders.</i>
27.	<i>Resolution 1447 of 2018</i>
28.	<i>Resolution CREG 038 CREG resolution 038 of 2014 and CNO agreement 1043 of 2018</i>
29.	<i>Evidence of the maximum periodicity of 4 years in the calibration of the meters.</i>
30.	<i>agreement CNO 981</i>
31.	<i>Circular 098 of 2014, Annex 2.</i>
Project holder response (28/06/2024)	
1.	<i>Value updated to 163.9 according to the evidence.</i>
2.	<i>See dococument “A.2. LT-1200 – Informe Potencia y energia” Although the two turbines have a total capacity of 10,196 MW, the real installed capacity of the power plant</i>

was calculated based on the maximum turbine flow, which results in a capacity of 9,887 MW.

3. According to the latest document "A.2. LT-1200 – Informe Potencia y energía" (2020)

4. Updated to 2.5 m wide, 40 m long, and 0.6 m high.

5. See folder: 3 – Contrato de construccion firmado

6. <https://www.investopedia.com/terms/p/pretax-rate-of-return.asp>

7. The evidence is presented in the folder: C. Análisis Financiero for b) and c). The data for the electromechanical Equipment maintenance was based on other similar projects from the same project holder.

8. Please clarify why this document/evidence is necessary.

9. https://archivo.minambiente.gov.co/images/normativa/app/decretos/7b-decreto_2041_oct_2014.pdf

10. In the Environmental License Resolution.

11. See folder: 4- Estudio de conexión enviado para incorporación al SIN

12. Missing document from PP.

21. Please clarify why this document/evidence is necessary.

23. Missing document from PP. The information provided to the stakeholders regarding the project is presented in "Administracion.pdf"

24. Folder: 6- Encuestas de satisfacción

25. 13-Biocarbon Zeus SDG-Tool-2023.xlsx

26. There is a doubt if it is correct that the Project Holder signs the letter.

27. <https://www.minambiente.gov.co/wp-content/uploads/2022/01/15.-Resolucion-1447-de-2018.pdf>

28. https://gestornormativo.creg.gov.co/gestor/entorno/docs/resolucion_creg_0038_2014.htm and <https://www.cno.org.co/content/acuerdo-1043-por-el-cual-se-aprueba-la-modificacion-del-documento-de-condiciones-minimas-de>

29. CREG Resolution 038 of 2014. Art 6. Types of measurement points; Art 28. Maintenance of the measurement system.
30. <https://www.cno.org.co/content/acuerdo-981-por-el-cual-se-aprueba-la-modificacion-del-documento-de-identificacion-de-las>
31. 14-Circularo98-2014 Anexo2.xlsx

Documentation provided by the project holder

1. 1- Evidencia sobre la distancia del salto bruto: PL-180-LT1320_TUB-01-Ro
- 2.-A.2. LT-1200 – Informe Potencia y energía
- 3.-A.2. LT-1200 – Informe Potencia y energía
4. Dimensiones canal de descarga.PNG
5. 2. CONTRATO OBRA CIVIL.pdf
6. <https://www.investopedia.com/terms/p/pretax-rate-of-return.asp>
7. b) Precios PPA.pdf; c) Contribucion año 2023. Superservicios CHZ.pdf
10. A.6. LICENCIA AMBIENTAL 21-11-2018.pdf
11. Folder: conexiónio de contribución enviado para la contribución al SIN.
12. Missing document from PP.
13. 11-Certificado EyR_CHZ.pdf
14. 12-Carbon Credits Purchase Agreement Zeus_South Pole.pdf
15. Inf-0120-GP-C9-Plan de Riesgos.pdf
16. Inf-0120-GP-C9-Plan de Riesgos.pdf
17. Capacitación medidas de intervención al riesgo.pdf and Capacitación riesgos y peligros.pdf
18. PM-10 PLAN GESTION DE RIESGOS CHZ.pdf
19. PM-10 PLAN GESTION DE RIESGOS CHZ.pdf

20. PM-10 PLAN GESTION DE RIESGOS CHZ.pdf
22. Folder: 4- Invitaciones enviadas a consulta de partes interesadas
23. Missing document from PP. The information shared is presented in "Administracion.pdf".

CAB assessment (30/07/2024)

1. The evidence provided is now in accordance with the value provided in the PD, but it is not consistent with the information provided in the document "A.2. LT-1200 – Informe Potencia y energia". Evidence provided describes the height level of the pipeline without considering the height level of water in the loading tank (figure 2.1 of document "A.2. LT-1200 – Informe Potencia y energia") and the water level in the discharge after the turbine (figure 2.2). This way the total gross head would be 169.98 m
2. The response is considered correct but it is not clarified in the PD does not clarify if the capacity value is the nameplate capacity, the rated capacity or maximum operative capacity considering the maximum flow of 7m³/s (see table 4.2 of the document "A.2. LT-1200 – Informe Potencia y energia").
3. Expected annual generation of 59,200 MWh per year has been justified properly. **Therefore, this issue is closed.**
4. Wide dimension of the discharge channel has been provided (2.5 m wide), but not the length of 40 m (44.18 m or 48.97 m in accordance with the evidence received), neither the height of 0.6 m high
5. Construction contract signed has been provided. **Therefore, this issue is closed.**
6. Source of equation to calculate the post-tax cost of debt has been provided. **Therefore, this issue is closed.**
7. Related to the evidence provided to justify the following data provided in the table of section 2.4 and shown in "OPEX PCH ZEUS" Excel file provided by the PP:
 - a. Electromechanical Equipment Maintenance cost. The value reported in the PD and the "OPEX PCH ZEUS" spreadsheet by 68 MCOP/year, is not consistent with the evidence provided by the PP: "4. CONTRATO MONTAJE EQUIPOS ELECTROMECHANICOS".
 - b. Contributions: Value reported in the PD and the "OPEX PCH ZEUS" spreadsheet by 11 MCOP/year is not consistent with the value of the evidence provided "Contribucion año 2023. Superservicios CHZ" shows a value of 605,000\$.

- c. Energy tariff details. Evidence provided is adequate. **Therefore, this issue is closed.**
8. Provide evidence of the “Document Management System” applied to identify and access relevant laws and regulations on an ongoing basis and demonstrate the periodically review compliance with it, as is required by the section 10.7 of the BCR standard and instruction for completing the section 4 of the template.
9. Decree 2041 has been provided. **Therefore, this issue is closed.**
10. Resolution No. 1811-6435 of 2018 has been provided. **Therefore, this issue is closed.**
11. Connection study report submitted to include the plant in the SIN has been provided. **Therefore, this issue is closed.**
12. “Organigrama” file was provided as Staff flow-chart to identify the role of monitoring, etc. **Therefore, this issue is closed.**
13. Commercial registry of the Chamber of Commerce of Medellín for Antioquia has been provided to justify the information provided by the PD in section 5.3 related to the constitution of Central Hidroeléctrica Zeus S.A.S. E.S.P. **Therefore, this issue is closed.**
14. Agreement between Central Hidroeléctrica Zeus S.A.S. E.S.P. and South Pole Carbon Asset Management S.A.S. has been provided to justify that all carbon rights will remain within Central Hidroeléctrica Zeus S.A.S. E.S.P for the crediting period. **Therefore, this issue is closed.**
15. Evidence provided to justify the systematic process implemented to evaluate the risks associated with the project applying the BCR Tool “Permanence and Risk Management” seems correct and in accordance with the tool. **Therefore, this issue is closed.**
16. Reversal Risks Plan has been provided. **Therefore, this issue is closed.**
17. Evidence provided are considered adequate to ensure the training given to involved staff related to Risk Assessment and Management. **Therefore, this issue is closed.**
18. Landslide Recovery Plan is included in the risk plan provided. **Therefore, this issue is closed.**
19. Emergency firefighting plan is included in the risk plan provided. **Therefore, this issue is closed.**

20. Recovery plan against malicious acts is included in the risk plan provided. **Therefore, this issue is closed.**
21. Certificate of the Ministry of the Interior 952 of May 27, 2014 and INCODER certificate have been provided to justify that there are no collective territories assigned by INCODER, nor are there ethnic communities within the project area, as is indicated in section 4 of the PD. **Therefore, this issue is closed.**
22. Invitation letters sent to the different stakeholders during the construction stage has been provided for the different communities affected by the project, but not prior construction stage.
23. Evidence with the information requested has been provided. **Therefore, this issue is closed.**
24. Satisfaction surveys conducted to evaluate the perception and satisfaction of social organizations, communities and municipal officials (section 10.2) have been provided. **Therefore, this issue is closed.**
25. Tool for Determining the Contributions of GHG Projects to Achieving the Sustainable Development Goals (SDGs) used to demonstrate compliance with the SDGs has been provided, and the audit team has found that the proofs indicated in the column “verification” for the SDG 8 and 13 do not allow to demonstrate the implementation of the mentioned activity, and in the column “contribution” for all SDGs is not provided specific benefits linked to the context of the project.
26. Host Country Attestation (HCA) according to the Annex A of “Avoiding double counting (ADC) tool” version 2 and required by BioCarbon to the project holders has not been provided. However, it seems that the document shall be uploaded in the registry system before authorizing VCC retirements for CORSIA, if the project is eligible for CORSIA. **Therefore, this issue is closed and a FAR is opened.**
27. Resolution 1447 of 2018 has been provided. **Therefore, this issue is closed.**
28. Resolution CREG 038 CREG resolution 038 of 2014 and CNO agreement 1043 of 2018 have been provided. **Therefore, this issue is closed.**
29. The maximum periodicity of 4 years in the calibration of the meters Has been justified properly. **Therefore, this issue is closed.**
30. Agreement CNO 981 approved in 12/06/2017 has been provided. **Therefore, this issue is closed.**
31. Circular 098 of 2014, Annex 2 has been provided. **Therefore, this issue is closed.**

Project holder response (03/09/2024)

1. The PD was updated with the value of 169.98m considering the evidence “Informe Potencia y energia”.
2. The real installed capacity was explained in the PD as: “Although the two turbines have a total capacity of 10,196 MW, the real installed capacity of the power plant is 9.887 MW, calculated based on the maximum turbine flow of 7 m3/s.”
4. The PDD was updated with the dimensions of the evidence provided.
7.
 - a. The contract only includes the installation of the electromechanical equipment. The value presented was estimated by comparing the costs on other hydroelectric projects from the PP. As support, we add the invoice of the first maintenance, this needs to be done every year but the Zeus Additionality_V2.xlsx document is registered every three years.
 - b. The value projected in OPEX is based on payments made for other projects for different periods or fiscal years; however, the actual value paid is the one effectively settled for the corresponding fiscal year by the competent authority, in this case, the Superintendency of Public Services. This value depends on variables beyond our control, such as the value of costs and expenses that the Superintendency determines it must settle and collect pro rata from all public service providers through the contribution to supply its operation. For the Zeus additionality calculation, we used an average from past years of other hydroelectric plant, from 2020 to 2022, and the Zeus 2023 contributions.
8. Zeus Hydroelectric SAS ESP does not have an internal “Document Management System”; nevertheless, the company is affiliated to the Center for Renewable Energy and Water Studies – CEERA, which is an association that reunites the companies related to the Small Hydroelectric Plants (PCH) and the Plants at Water’s Edge (RoR), considered as Non-conventional Sources of Renewable Energy (FNCER). The company’s legal and technical departments are active members of CEERA’s management, technical, environmental and regulatory committees. With this mechanism, we are able to identify and stay up to date on everything related to the sector and ensure that projects comply with current rules and regulations.
22. The invitation to stakeholders for consultation prior to the project was made through verbal invitation through community leaders and municipal administrations, so this evidence is not available; however, the meeting minutes and attendance lists are available, complying with the requirements of the environmental authority, the entity responsible for issuing the Environmental License for the project, a requirement without which the construction of this type of project would not be possible.

25. The sections were updated accordingly:

SDG 8 Contribution: The project will generate jobs for all women and men in the construction, operation, and maintenance of the Zeus Hydroelectric plant for the local people in its area of direct influence, contributing to the region's economic growth.

SDG 8 Evidence: Contracts, payroll, workforce data, and employment records from contractors, subcontractors, and other businesses involved in the project.

SDG 13 Contribution: The Zeus Hydroelectric Plant will supply 59,200 MW per year of renewable energy to the Colombia national grid, reducing 22,586 tCO₂ per year by displacing other fossil-fuel-based power plants.

SDG 13 Evidence: Emission reductions calculation spreadsheet. Colombia XM network coordinator official data.

Documentation provided by the project holder

4. Folder 5: Altura de canal de descarga.pdf

7. a. Zeus Addtionality_V2; Factura mantenimiento 2023

b. Contribucion superservicios_CH Concordia_2020; Contribucion superservicios_CH Concordia_2021; Contribucion superservicios_CH Concordia_2022; Contribucion superservicios_CH Concordia_2023

8. Folder 4: CERTIFICACIÓN GRUPO COLVIVA CHZ - CHC;
<https://ceera.co/afiliados>

22. Folder 3: Actas de socialización.

25. 13-Biocarbon Zeus SDG-Tool-2023_V2.xlsx

CAB assessment (13/09/2024)

1. The PD still indicates a total gross of 163.9 instead of 169.98 m, in accordance with the value provided in the document "A.2. LT-1200 – Informe Potencia y energia".

2. The PD explains clearly the total capacity of turbines and the real installed capacity of the power plant base on the maximum turbine flow. Therefore, this issue is closed.

4. The dimension of the discharge channel has been indicated in the PD in accordance with the evidence received. Therefore, this issue is closed.
7. Related to the evidence provided to justify the following data provided in the table of section 3.4 and shown in "OPEX PCH ZEUS" Excel file provided by the PP:
- a. Clarified by the PP.
- b. Although the PP has clarified the information requested, nevertheless, contributions reflected in the financial model by 8,381,000, 19,027,000, 13,357,000 and 599,000 are not traceable and their sources of data/evidence are missing. The source of data of this item is pending to be addressed.
8. The response is considered adequate, and the audit team could check in the website of CEERA (<https://ceera.co/afiliados>) that the PD is a member of this association and that a service of the affiliation is the reception of information related to any updated law. Therefore, this issue is closed.
22. Although there is no evidence of the invitation letters sent to the different stakeholders prior construction stage, the audit team could review the meeting minutes and attendance lists, and verify that the participation of the stakeholders was appropriate and conform with the requirements of the environmental authority. Therefore, this issue is closed.
25. For the SDG 8 is not provided specific benefits linked to the context of the project in the column "contribution", indicated the estimation of the contribution.

Project holder response (24/10/2024)

1. The PD was updated with the value of 169.98m considering the evidence "Informe Potencia y energia".
7. To trace the contributions, we are annexing an example of the documents from the Superintendency of Public Services (SSPD by the Spanish acronym) for the fiscal year of 2023:
- "Resolucion-20231000433895-Contribucion-Especial-2023": It is the document under which the SSPD establishes the methodology of the rate that each service provider must pay and defines the taxable base and sets the rate to be paid.
 - "Liquidacion contribucion superservicios CHZ_2023": contains the calculation of the contribution payment made by the SSPD according to the Certified financial statements values in Unique System of Information (SUI by the Spanish acronym) 2022 and the Resolution 20231000433895.

- “Documento Soporte CREG 905 006 de 2023”: In which the amount to be paid by each service provider is established based on the previous resolution of the SSPD. For Zeus: from page 62, Table 21. “Consolidated regulated energy service providers contributing to the special contribution 2023”, line 27.
- “20230524 ESTADOS FINANCIEROS 2022 CHZ”: This is the information that the PP uploads to the SUI webpage, from which the SSPD will follow the procedure described in the Resolution.
- “REPORTE CHZ AÑO 2023”: Is the quick calculation the PP does to check the value sent by the SSPD.

25. The document was updated to include the specific benefits of the project: “The project will generate jobs for all women and men in the construction (235), operation, and maintenance (13) of the Zeus Hydroelectric plant for the local people in its area of direct influence, contributing to the region’s economic growth.”

Documentation provided by the project holder

1. BCR_2.1_Zeus Hydroelectric; liquidacion contribución superservicios CHZ_2023.pdf; Documento Soporte CREG 905 006 de 2023.pdf; Resolucion-20231000433895-Contribucion-Especial-2023.pdf; 20230524 ESTADOS FINANCIEROS 2022 CHZ.pdf; REPORTE CHZ AÑO 2023.xlsx
25. 13-Biocarbon Zeus SDG-Tool-2023_V.2.xlsx

CAB assessment (11/11/2024)

1. Value has been updated correctly in the new version of the PD.
7. In addition to having held a meeting by Microsoft Teams between the VVB and the PP, the issue has been clarified and sufficient evidenced.
25. The corresponding document has been updated with the information requested. The VVB has assessed it and deems it correct.

Therefore, CL 02 can be closed.

Finding ID	¹	Type of finding	Forward action	Date 13/05/2024
Section No.				
5.7.				
Description of finding				
<p>The project holder shall provide the Host Country Attestation (HCA) from the designated national authority or designated focal point of the host country of the project activity and be publicly available on the registry platform on the project page, at least, before authorizing VCC retirements for CORSIA, in case of CORSIA Eligible units, according to the Annex A of “Avoiding double counting (ADC) tool” version 2.</p>				
Project holder response (03/09/2024)				
<p>The project will provide the HCA from the RENARE in case CORSIA Eligible units are claimed.</p>				
Documentation provided by the project holder				
CAB assessment (dd/mm/yyyy)				

Annex 3. Documentation review

Document Title / Version	Author	Organization	Document provider (if applicable)
/1/ BCR_2.1_Zeus Hydroelectric version 2	South Pole Carbon Asset Management S.A.S.	CHZ	South Pole
/2/ BCR_2.1_Zeus Hydroelectric version 6	South Pole Carbon Asset Management S.A.S.	CHZ	South Pole
/3/ Zeus Colombia Calculations version 1	South Pole	CHZ	South Pole
/4/ Zeus Colombia Calculations_V5	South Pole	CHZ	South Pole
/5/ Zeus Calculations EF Support version 1	South Pole	CHZ	South Pole
/6/ Zeus Calculations EF Support version 3	South Pole	CHZ	South Pole
/7/ Zeus Additionality	South Pole	CHZ	South Pole

Document Title / Version	Author	Organization	Document provider (if applicable)
Assessment version 1			
/8/ Zeus Additionality Assessment_3	South Pole	CHZ	South Pole
/9/ Biocarbon Zeus SDG-Tool-2023 version 1	South Pole	CHZ	South Pole
/10/ Biocarbon Zeus SDG-Tool- 2023_V.2	South Pole	CHZ	South Pole
/11/ CDM baseline “Methodology AMS-I.D.: “Grid- connected renewable electricity generation” Version 18.0.	---	UNFCCC	UNFCCC
/12/ CDM “Demonstration of additionality of small-scale project activities” Version 13.1.	---	UNFCCC	UNFCCC
/13/ Tool to calculate the emission factor for an electricity system (Version 7.0).	---	UNFCCC	UNFCCC

Document Title / Version	Author	Organization	Document provider (if applicable)
/14/ Glossary: CDM terms version 11.0	---	UNFCCC	UNFCCC
/15/ CDM Project Standard for Project Activities version 3.0/15/ Generación_(kWh)_2021	---XM	UNFCCC CXM	UNFCCC https://sinergox.xm.com.co/
/16/ BCR Standard Version 3.4.	---	BCR	BCR
/17/ Validation and Verification Manual Greenhouse Gas Projects version 2.4	---	BCR	BCR
/18/ PL-180-LT1320_TUB-01-Ro / March 2020	I-Consult	CHZ	South Pole
/19/ A.1. Inf-0116-GP-Estudio Factibilidad Zeus/November 2015	I-Consult	I-Consult	South Pole
/20/ A.1. LT-1200 – Resumen Ejecutivo_Estudio Factibilidad/March 2020	I-Consult	CHZ	South Pole

Document Title / Version	Author	Organization	Document provider (if applicable)
/21/ A.2. LT-1200 – Informe Potencia y energía /March 2020	I-Consult	CHZ	South Pole
/22/ A.5. CERTIFICADO XM_DECLARACION EN OPERACION_19 052022	Director Planeación Operación	XM Compañía de Expertos en Mercados S.A. E.S.P	South Pole
/23/ A.6. EIA/March 2016	I-Consult	I-Consult	South Pole
/24/ A.6. LICENCIA AMBIENTAL 21-11-2018	Office Manager	Tahamies Territorial Office	South Pole
/25/ A.7. Certificado EyR_CHZ/19/10/2022	director of public records	Cámara de Comercio de Medellín para Antioquia	South Pole
/26/ A.8. RUT CHZ 20-10-2021	DIAN	DIAN	South Pole

Document Title / Version	Author	Organization	Document provider (if applicable)
/27/ E. Diagrama Unifilar/ 28/01/2021	---	Wasser kraft Volk AG (WKV)	South Pole
/28/ CONTRATO OBRA CIVIL.pdf /30/09/2020	CHZ	CHZ / Constru ctora Moricha l	South Pole
/29/ Generación_(k Wh)_2022	XM	XM	https://sinergox.xm.com.co/
/30/ Generación_(k Wh)_2023	XM	XM	https://sinergox.xm.com.co/
/31/ Tool 01 Tool for the demonstration and assessment of additionality (version 07.0.0)	---	UNFCC C	UNFCCC
/32/ Tool 27 Investment Analysis (version 13)	---	UNFCC C	UNFCCC
/33/ SIN Map	UPME	CELSIA	CELSIA
/34/ Projects certification and registration guidelines in the "Energy sector	---	BCR	BCR

Document Title / Version	Author	Organization	Document provider (if applicable)
Non- Conventional renewable energy sources” version 1.1			
/35/ DCTOS SOPORTE PREDIOS / 2020	CHZ and owners	CHZ	South Pole
/36/ Tarifas de energía / 19/12/2019	Dicel and CHZ	CHZ	South Pole
/37/ Contribuciones /2020-2023	Superint endenci a de Servicio s Públicos Domicil iarios	CHZ	South Pole
/38/ ELECTROMECHANICAL EQUIPMENT ASSEMBLY CONTRACT.pdf / 7/04/2021	Hidroturbinas Delta S.A.S.	CHZ	South Pole
/39/ DCTOS SOPORTE LINEA TRANSMISION + HIDROMECAICOS + OTROS	IDEA	CHZ	South Pole

Document Title / Version	Author	Organization	Document provider (if applicable)
<i>July 2021 – May 2022</i>			
<i>/40/ RESUMEN CAPEX_V2.xlsx</i>	---	CHZ	<i>South Pole</i>
<i>/41/ RESUMEN PREDIOS ZEUS Updated.xlsx;</i>	---	CHZ	<i>South Pole</i>
<i>/42/ Escritura Teresita Builes.pdf /11/03/2022</i>	<i>Teresita del niño Jesús Builes Cadavid</i>	CHZ	<i>South Pole</i>
<i>/43/Resumen_Soportes_LT_Update d.xlsx</i>	---	CHZ	<i>South Pole</i>
<i>/44/ Precios PPA.pdf /25/07/2021</i>	DICEL	CHZ	<i>South Pole</i>
<i>/45/ Calibration certificates</i>	EPM	EPM	<i>South Pole</i>
<i>/46/ Recovery plan / February 2023</i>	---	CHZ	<i>South Pole</i>
<i>/47/ Emergency firefighting plan February 2023</i>	---	CHZ	<i>South Pole</i>
<i>/48/ Management plan for hazardous waste</i>	---	CHZ	<i>South Pole</i>

Document Title / Version	Author	Organization	Document provider (if applicable)
/49/Training / February 2022	---	CHZ	South Pole
/50/ Laws 142 (Public Services Law) / 1994	---	---	https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=2752
/51/ Law 143 (Electricity Law) of 1994	---	---	https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=4631
/52/ Law 99 of 1993	---	---	https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=297
/53/ Law no. 50 of 1990	---	---	https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=281
/54/ Law 2277 of 2022	---	---	https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=199883
/55/ Resolucion_creg_0038_2014	---	---	https://gestornormativo.creg.gov.co/gestor/entorno/docs/resolucion_creg_0038_2014.htm
/56/ CNO Agreement 981 Annex 1 / 2017	---	---	https://www.cno.org.co/content/acuerdo-981-por-el-cual-se-aprueba-la-modificacion-del-documento-de-identificacion-de-las
/57/ CNO (National Operation Council) agreement 1043 of 2018	---	---	https://www.cno.org.co/content/acuerdo-1043-por-el-cual-se-aprueba-la-modificacion-del-documento-de-condiciones-minimas-de
/58/ RESOLUCION No. SSPD-	Superintendente	Superintendencia de	South Pole

Document Title / Version	Author	Organization	Document provider (if applicable)
20231000433895 DEL 03/08/2023		Servicios Públicos Domiciliarios	
/59/ commercial registry of the Chamber of Commerce of Medellín for Antioquia on October 19, 2022	Public registry Manager	Chamber of Commerce	South Pole
/60/ Carbon Credits Purchase Agreement / 12/09/2022	South Pole and CHZ	CHZ	South Pole
/61/ Certificación Incoder.pdf /30/10/2010	Incoder	Incoder	South Pole
/62/ Certificación Min Interior.pdf /27/05/2014	Home Ministry	Home Ministry	South Pole
/63/ Employee Hiring Contract	CHZ	CHZ	South Pole
/64/ Internal Labor Regulations and the position profile / April 2022	CHZ	CHZ	South Pole
/65/ Waste Management	---	CHZ	South Pole

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<i>Plan / February 2023</i>			
<i>/66/ Environmental Management Plan / February 2023</i>	---	CHZ	South Pole
<i>/67/ Invitations to relevant stakeholders</i>	CHZ	CHZ	South Pole
<i>/68/ ANX-1.5- Presentación_Proyecto Zeus.pptx / January 2015</i>	I-Consult	CHZ	South Pole
<i>/69/ ANX-1.5- Presentación_Resultados Proyecto Zeus_.pptx / March 2016</i>	I-Consult	CHZ	South Pole
<i>/70/ Inf-0120-GP-C9-Plan de Riesgos.pdf / March 2016</i>	CHZ	CHZ	South Pole
<i>/71/ Stakeholder satisfaction with the consultation process / 2022</i>	Ingeobosque	CHZ	South Pole
<i>/72/ Register of comments and doubts from the stakeholders and</i>	I-Consult	CHZ	South Pole

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<i>their response / 2016</i>			
<i>/73/ Main equipment pictures</i>	---	---	<i>South Pole</i>
<i>/74/ Project general diagrams/March 2020</i>	<i>I-Consult</i>	<i>I-Consult</i>	<i>South Pole</i>
<i>/75/ 20230524 ESTADOS FINANCIEROS 2022 CHZ.pdf</i>	---	CHZ	<i>South Pole</i>
<i>/76/ Documento Soporte CREG 905 006 de 7/12/2023.pdf</i>	---	CREG	<i>South Pole</i>
<i>/77/ LIQUIDACION CONTRIBUCION SUPERSERVICIOS CHZ_2023.pdf</i>	<i>Superintendente</i>	<i>Superintendencia de Servicios Públicos Domiciliarios</i>	<i>South Pole</i>
<i>/78/ REPORTE CHZ AÑO 2023.xlsx</i>	---	CHZ	<i>South Pole</i>
<i>/79/ ICA-1a-PMA_MS_01_01.pdf</i>			

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/80/ Dimensiones canal de descarga.PNG			
/81/ Altura de canal de descarga.pdf			
/82/ Contribucion año 2023. Superservicios CHZ.pdf			
/83/ Folder: 4- Estudio de conexion enviado para incorporacion al SIN			
/84/ Capacitación medidas de intervención al riesg.pdf and Capacitación riesgos y peligros.pdf / February 2022	---	CHZ	South Pole
/85/ PM-10 PLAN GESTION DE RIESGOS CHZ.pdf / February 2023	---	CHZ	South Pole
/86/ Factura mantenimiento 2023	Transequipos	CHZ	South Pole

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/87/ CERTIFICACIÓN GRUPO COLVIVA_CHZ - CHC /27/10/2022	CEERA	CEERA	South Pole
/88/ Actas de socialización / 2015	I-Consult	CHZ	South Pole

Annex 4. Abbreviations

<i>Abbreviations</i>	<i>Full texts</i>
<i>BCR</i>	<i>BioCarbon Registry</i>
<i>BM</i>	<i>Build Margin</i>
<i>CAR</i>	<i>Corrective Action Request</i>
<i>CDM</i>	<i>Clean Development Mechanism</i>
<i>CER(s)</i>	<i>Certified Emission Reduction(s)</i>
<i>CL</i>	<i>Clarification request</i>
<i>CM</i>	<i>Combined Margin</i>
<i>CO₂</i>	<i>Carbon dioxide</i>
<i>CO_{2e}</i>	<i>Carbon dioxide equivalent</i>
<i>DNA</i>	<i>Designated National Authority</i>
<i>DOE</i>	<i>Designated Operational Entity</i>
<i>DR</i>	<i>Document Review</i>
<i>EF</i>	<i>Emission Factor</i>
<i>EIA</i>	<i>Environmental Impact Assessment</i>
<i>ER</i>	<i>Emission Reductions</i>
<i>ERPA</i>	<i>Emission Reduction Purchase Agreement</i>

<i>Abbreviations</i>	<i>Full texts</i>
<i>FAR</i>	<i>Forward Action Request</i>
<i>FSR</i>	<i>Feasibility Study Report</i>
<i>GHG</i>	<i>Greenhouse gas(es)</i>
<i>GWP</i>	<i>Global Warming Potential</i>
<i>IPCC</i>	<i>Intergovernmental Panel on Climate Change</i>
<i>IRR</i>	<i>Internal Rate of Return</i>
<i>kWh</i>	<i>Kilo Watt Hour</i>
<i>MW</i>	<i>Mega Watt</i>
<i>MWh</i>	<i>Mega Watt Hour</i>
<i>NCV</i>	<i>Net Calorific Value</i>
<i>OM</i>	<i>Operating Margin</i>
<i>PD</i>	<i>Project Developer(s)</i>
<i>SDG's</i>	<i>Sustainable Development Goals</i>
<i>tCO_{2e}</i>	<i>Tonnes of CO₂ equivalents</i>
<i>UNFCCC</i>	<i>United Nations Framework Convention on Climate Change</i>
<i>VCC</i>	<i>Verified Carbon Credits</i>
<i>VVM</i>	<i>Validation and Verification Manual</i>

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NOTE: This format shall be completed following the instructions included. However, it is important to highlight that these instructions are complementary to the BCR STANDARD, and the BioCarbon Validation & Verification Manual, in which more information on each section can be found.