Project Title	**Potrero Hydropower Plant, Peru**
ERM CVS Project Reference	2313.V1
Client Name	Empresa Electrica Agua Azul S.A.
Client Address	La Encalada 1257, of. 1105, Lima 33, Perú

CDM Validation Report

ERM Certification and Verification Services
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Version Control	Date
Version 1.0	26 June 2012 (draft validation report)
Version 2.0	28 November 2012 (final validation report)

Table of Contents

Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COP	Conference of the Parties
DNA	Designated National Authority
FAR	Forward Action Request
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
FSR	Feasibility Study Report
GHG	Greenhouse Gas
GSP	Global Stakeholder Process
GWP	Global Warming Potential
GWh	Giga Watt hour
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LoA	Letter of approval
MOP	Meeting of the Parties
MP	Monitoring Plan
MW/MWh	Mega Watt/Mega Watt hour
NCV	Net Calorific Value
NGO	Non-Governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PPA	Power Purchase Agreement
SCE	Standard coal equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added tax
VVS	CDM Validation and Verification Standard

Project/Party specific abbreviations

ANA	National Water Authority (Autoridad Nacional del Agua)
COES	Economic Operation Committee of the National Interconnected Electric Grid
MINEM	Ministry of Energy and Mines
SEIN	National Interconnected Electricity Grid
OSINERGMIN	Supervisory Agency for Investment in Energy and Mining
RER	Renewable Energy Sources.

1 Project Information

1.1 Key project information

Project Title	Potrero Hydropower Plant, Peru
Project Location(s)	The Project will be located in the north of Peru, in the district of Eduardo Villanueva, Province of San Marcos, Region of Cajamarca.
Host Party	Republic of Peru
Other Party(ies)	N/A
Project participants	Empresa Eléctrica Agua Azul S.A

Methodology(ies) used	ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 12.3.0 Methodology Valid from 17 September 10 to 10 May 12 (Requests for registration can be submitted until 11 January 2013)
Methodological tool(s) used	'Tool for the Demostration and Assessment of Additionality', version 06.1.0 'Tool to calculate the emission factor for an electricity system', version 2.2.1
Sectoral Scope(s) (as per http://cdm.unfccc.int/DOE/scopes.html)	Sectoral scope 1 (Energy industries renewable/non-renewable sources)

Project Design Document GSP Version	Date: 04 May 2012	**Project Design Document Final Version**	Date: 23 October 2012
	Version Number: 01		Version Number: 08

Starting date of the project activity	15 January 2013
Crediting Period start and end date	01 June 2016 to 31 May 2023 (Renewable)
Estimated annual average emission reductions	91,243tCO_{2e}

Dates of GSC	12 May 2012 to 10 June 2012
Date(s) of validation site visit	15, 16 and 17 May, 2012

1.2 Key technical information

Capacity of the project	19.9 MW
Lifetime of the project	50 years
Quantity of energy (electrical) delivered to the end user per year	140,440 MWh/year
Grid to which the project is connected to (if applicable)	National Interconnected Electricity Grid (SEIN),

1.3 Key financial information

IRR of the project without income of CERs	10.35%
IRR benchmark	12%

2 Summary and Validation Opinion

Project Title	Potrero Hydropower Plant, Peru
Name of Client	Empresa Electrica Agua Azul S.A.

Basis of validation	ERM CVS based its validation work on: • CDM approved monitoring methodology ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 12.3.0 and relevant CDM tools and guidelines. • CDM Validation and Verification Standard (version 02.0) • ERM CVS's internal CDM validation methodologies and protocols • CDM decisions and guidance issued by the CDM Executive Board • UNFCCC criteria for the Clean Development Mechanism • Host Country criteria for the Clean Development Mechanism
Responsibilities of ERM CVS	ERM CVS is responsible to provide a thorough independent third party assessment of the proposed CDM project activity to ensure that the proposed CDM project activity meets all the identified and applicable criteria for registration of projects under the CDM.
Responsibilities of Project participants	The Project Participants are responsible for preparing the PDD, supporting documentation and providing all necessary evidences to support the information included in the PDD.
Activities performed	ERM CVS conducted its activities in accordance with the CDM Validation and Verification Standard. The validation consisted of a review of project documentation, a site visit, interviews with relevant personnel, cross checking information through other reliable sources and reporting. Validation work was based on a validation protocol that sets out relevant CDM requirements. Where necessary, Clarification Requests and Corrective Action Requests were raised and closed out with the Project participants. The validation work was subject to detailed Technical Review and assessment prior to submission. No component of the project activity was excluded from the validation.
ERM CVS Conclusion	ERM Certification and Verification Services (ERM CVS) has performed the validation of the project activity against the criteria for the Clean Development Mechanism as set out by the Conference of the Parties and the UNFCCC CDM Executive Board, and host country criteria. The validation employed standard auditing techniques, and addressed the requirements of the CDM Validation and Verification Standard. The Party involved in the project fulfils the criteria for participation in the CDM, and has issued a letter of approval (LoA) for the project and authorised the Project participant. The LoA of the host Party confirms the contribution of the project towards sustainable development. The validation has provided sufficient evidence to demonstrate that the project activity is not the baseline scenario, and that emission reductions would be additional to what would have taken place in the absence of the CDM project activity. The project meets the applicability criteria and correctly applies methodology ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 12.3.0, and is therefore expected to result in real, measurable and long term reductions in greenhouse gas emissions. The monitoring plan provides for the collection and archiving of data sufficient to ensure that emission reductions can be verified. The DNA of the host Party has confirmed that the project assists in meeting sustainable development criteria. Nothing came to our attention to suggest that the project activity, if implemented as described, would not result in emission reductions of annual 91,243 tCO_2e per year on average over the first 7 years

	crediting period. In summary, it is the opinion of ERM CVS that the Project as described in the PDD Version 23 October 2012, meets all stated criteria of the CDM, correctly applies the methodology, and is expected to result in real, measurable and long term emission reductions. ERM CVS therefore requests the CDM Executive Board approves registration of the project activity.
Signed on behalf of ERM CVS	
Name:	Melanie Eddis
Date:	28 November 2012

3 Introduction

3.1 Validation Objectives

The purpose of validation is to ensure a thorough, independent assessment of proposed CDM project activities submitted for registration as a proposed CDM project activity against the applicable CDM requirements.

The DOE is responsible for reporting the results of its assessment in a validation report and submitting this validation report, along with the supporting documents to the CDM Executive Board as part of the request for registration of a project activity as a proposed CDM project activity.

The DOE also presents its opinion on the compliance of the proposed CDM project activity complies with the applicable CDM requirements, and only requests registration if this is a positive opinion.

In the course of validation, ERM CVS assesses the project's baseline, additionality demonstration, applicability to an approved CDM methodology, monitoring plan (MP), and compliance with relevant UNFCCC and host country criteria.

3.1.1.1 Validation Criteria

ERM CVS applies the following principles in performing its validation:

- Consistency
- Transparency
- Impartiality, independence and safeguarding against conflicts of interest
- Confidentiality

In all aspects of its work, ERM CVS ensures that the information and data reported are accurate, conservative, relevant, credible, reliable and complete.

3.2 Scope

The validation scope addresses the project activity as described in the Project design document (PDD) and associated documentation. The PDD and associated documentation are reviewed against the criteria and requirements stated in the CDM Validation and Verification Standard (VVS) and Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, as well as relevant decisions made by the CDM Executive Board.

The validation scope also included an assessment of completeness and accuracy of documentation, evaluation of evidences, information and assumptions made in the PDD and supporting documentation.

3.3 Contract Review

Prior to contracting with the client, a full review of the project and the validation requirements was made. This addressed both commercial risk and project risks associated with conducting the validation activities and confirmed the availability of an appropriately qualified team to conduct the validation.

3.4 Validation Personnel

Based on ERM CVS's review of the project, a validation team was established that takes into account the coverage of the technical area(s), sectoral scope(s) and relevant host country experience.

Personnel who were involved in the validation of this project activity were:

Validation Team

Name	Role	CDM Requirements	Technical area	Financial Expertise	Participated in site visit?
Miguel Cortes	Lead Validator	√	√		Yes
Daniel Galvan	Support Validator	√	√		Yes
Ignacio Barutta	Support Validator	√			No
Simon Cochrane	Financial Expert			√	No

DOE Head Office

Name	Role	CDM Requirements	Knowledge relevant to the technical area
Hamilton Ida	Technical Reviewer	√	√

3.5 Summary of CVs of the validation personnel

Miguel Cortes has 7 years of CDM experience, 5 of which was spent working as a project developer and 2 as a Technical Reviewer and Lead Assessor for ERM CVS. Miguel has undertaken 26 validations and 14 verifications in Renewable Energies (Scope 1), Manufacturing (Scope 4), Mineral Production (Scope 8) and Metal Production (Scope 9). Miguel has 9 years direct experience in the Cement industry, which included cement operations and mineral extraction/mining related activities. Miguel also has 5 years' experience as a consultant for GHG emission reduction projects in the sectoral scopes of manufacturing, Mining, and metal production, including WHR, Biofuels, Biomass Production and Hydro Power CDM projects. Miguel has completed the ERM CVS CDM training and Gold Standard training. Miguel holds a BSc and MSc in Civil Engineering

Daniel Galvan is a lead assessor with over 6 years' experience in CDM validation and verification as well as experience as a CDM consultant and UNFCCC external assessor. Before joining the CDM industry, Daniel worked for 4 years as factory inspector for product testing and certification. Since becoming a CDM auditor he has participated in more than 20 CDM validation and verification projects in Energy Industries, Waste Handling and Disposal, Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride, and Agriculture. He has completed the ERM CVS CDM training and has also completed lead auditor training in ISO 9001. Daniel also holds a BEng in Mechanical Engineering and Administration and a MSc in Quality Management Systems.

Ignacio Barutta has over 9 years of experience in the Environmental Engineering field and more than 7 years in the CDM and GHG emissions management arena. Ignacio is the author and developer of AM0063 and has participated in the development of many other UNFCCC approved methodologies and CDM projects. In addition to his work in CDM, Ignacio has worked on GHG emissions inventories, carbon footprint/carbon management, Life Cycle assessment (LCA), SH&E permitting and compliance, environmental due diligence, risk assessment, waste management, air emissions inventories/air quality control projects and site investigation/remediation (soil and groundwater).

Simon Cochrane is a CDM Financial Expert based in London, United Kingdom. Mr. Cochrane is an AAT and CIMA qualified accountant with almost 10 years' experience working in a variety of finance roles within the ERM Group, including project finance focused roles which involved liaising directly with project managers and project directors on a wide variety of environmental projects. Since November 2010, Mr. Cochrane has been working with ERM CVS specifically to audit investment analyses against the requirements of the CDM and has contributed to more than 150 validations.

Hamilton Ida has over seven years' experience in CDM, having spent 2.5 years managing the operation, maintenance and monitoring of over 30 CDM projects with methane capture and combustion from animal waste management systems (AWMS), and 3 years as a consultant developing CDM projects (AWMS, wastewater, biomass, renewable energy, and waste handling and disposal). Hamilton has been working with ERM CVS as a CDM Technical Reviewer since 2010. During this time, Hamilton has worked on a number of CDM validations and verifications in several different technical areas, including 1.1 (biomass and

biofuels), 1.2 (wind and hydro power) and 13.1 (landfill gas, waste incineration, waste gas recovery, composting and natural gas). He has also completed the ERM CVS CDM Validation and Verification Training, as well as the GHGMI Landfill Gas and Renewable Energy Sources Training. Hamilton has held lectures on CDM and carbon markets at many training courses promoted by the Brazilian National Industry Confederation. He holds a Bachelor degree in Veterinary Sciences and a Masters in Marketing.

4 Validation Approach

In carrying out its validation work, ERM CVS has:

(a) Determined whether the proposed project activity complies with the requirements of paragraph 37 of the CDM Modalities and Procedures (M&Ps), the applicability conditions of the selected methodology and guidance issued by the Board;

(b) Assessed the claims and assumptions made in the project design document (PDD). The evidence used in this assessment has not been limited to that provided by the project participants.

The validation was carried out in accordance with the most recent version of the VVS. The validation process employed standard auditing techniques and undertook necessary cross-checks and follow-up actions to ascertain the correctness of the information. The validation team included staff with experience in the relevant technical areas within the sectoral scope, and financial expertise where relevant. The validation report and associated documents have undergone a thorough technical review by ERM CVS before being submitted to the CDM Executive Board for registration. The validation consisted of the following key stages:

- Upload of the PDD for Global Stakeholder Process (GSP), receipt of any comments from stakeholders
- Review of documentation including PDD, methodology and key supporting documents and references
- A visit to the project site, including interviews with personnel responsible for developing the project
- Development of a draft validation report, identifying non-compliances including Corrective Action Requests (CARs) and Clarification Requests (CLs), taking into account findings of the GSP, desk review and site visit / interviews
- Resolution of outstanding issues (CARs and CLs) and development of a final validation report and validation opinion
- Independent technical review and report approval

4.1 Document Review

A detailed document review of the PDD, methodology and all other associated documentation and references took place prior to the site visit, and additional documents that were not available for the desk review were requested for review during the site visit. The document review includes:

- A review of data and information to verify the correctness, credibility and interpretation of presented information;
- Cross checks between information provided in the PDD and information from other sources, not limited to those provided by the PPs, applying ERM CVS's sectoral or local expertise and, if necessary, with independent background investigations
- Reference to available information relating to projects or technologies similar to the proposed project activity
- Review, based on the approved methodology being applied, of the appropriateness of formulae and accuracy of calculations

Where the review of the PDD at the document review stage raised issues, these were further reviewed and validated through supporting documentation and cross-checking from other sources and interviewing relevant personnel involved in the project activity during the site visit. During the document review the project team also compared the proposed project activity with available information relating to projects or technologies similar to the proposed CDM project activity under validation. Where appropriate, the validation team assessed the appropriateness of formulae and the correctness of calculations presented by the PPs. A list of all documents reviewed or referred to in the course of this validation is included in Appendix A.

4.2 Site visit and Interviews

The site visit took place on 15, 16 and 17 May, 2012 and included a tour of the physical project site which was still a greenfield site. The validation team visited the area of the upstream water and where the intake pipe will be located. The interview with the project owner, CDM consultant and document/evidence review took place in Cajamarca, Peru.

Site visits and interviews provided additional information and background to the project as well as cross checks with project documentation. Interviews were undertaken with relevant stakeholders in the host country, as well as personnel with knowledge of the project design and implementation. A list of interviewees, and the main topics discussed with each person can be found in appendix A.

The site visit was designed to enable the validation team to

- undertake a detailed review of additional project documentation and verify the supporting documentation;
- inspect the project site and confirm the validity of the project description in the PDD;
- assess the validity of the project boundary;
- cross-check the validity of the project information with other sources of information, including cross checks between information provided by interviewed personnel (i.e. by checking sources or other interviews) to ensure that no relevant information has been omitted; and
- interview relevant stakeholders in the host country, and personnel with knowledge of the project design and implementation.

4.3 Preparation of Draft Validation Report

Based on the findings of the desk review and site visit, ERM CVS prepared a draft validation report including a list of CARs and CLs, and provided this to the PPs. Where issues are identified that need to be further elaborated, researched or added to in order to confirm that the project activity meets the CDM requirements and can achieve credible emission reductions, ERM CVS identified these issues in the DVR so that they could be discussed with the PPs and concluded upon in the final validation report (FVR).

4.3.1 Remediation requests

Where issues were identified, ERM CVS raised one of the following remediation requests:

Clarification Request (CL): where information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Corrective Action Request (CAR): where:

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

Forward Action Requests (FAR): where it was necessary to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

CARs and CLs must be 'closed out' before the validation can be concluded. Close out is only possible where the PPs modify the project design, rectify the PDD or provide adequate additional explanation or evidence that satisfies ERM CVS's concerns. The validation process may be halted until the CARs and CLs are addressed to the validation team's satisfaction.

4.4 Final Validation Report and Validation Opinion

The final validation report (FVR) is completed when the CARs and CLs have been closed out to the satisfaction of ERM CVS. The FVR includes the validation opinion that sets out the validation conclusion regarding the compliance of the project with CDM requirements.

4.5 Internal Quality Control

The process of validation and decision of the validation team has been subject to an independent Technical Review. The scope of the Technical Review process is to independently assess that all procedures have been followed, necessary requirements have been met, and all conclusions are justified. The final validation decision is based on the findings and conclusions of the validation team, assessing the compliance of the project activity with the CDM requirements, and the technical evaluation of the independent technical reviewer. The final report is then reviewed and approved by the qualified signatory / final decision maker within ERM CVS.

5 Validation findings – Approval & Participation, Authorisation, Contribution to Sustainable Development, and Modalities of Communication

5.1 Approval & Participation

As per VVS section VII F, ERM CVS assessed whether the DNA of each Party indicated as being involved in the project activity has provided an appropriate letter of approval (LoA). This is a unilateral project.

	ERM CVS has confirmed that the LoA has been issued and provides confirmation of:			
Party	**Ratified Kyoto Protocol?**	**Voluntary Participation**	**Contribution to Sustainable Development**	**Exact project title**
Republic of Peru (Host Party)	Yes	Yes	Yes	Yes

ERM CVS received the LoA from PP and the authenticity has been confirmed by email with the DNA/27/.

	Question	**Validation findings (including justification and substantiation of information, data and evidence)**	**Draft OK/CAR/ CL**	**Final OK/ NOT OK**
5.1.1	Are LoAs in place for every PP that confirm ▪ Ratification of the Kyoto Protocol ▪ Voluntary Participation ▪ Reference to the precise project title in the PDD ▪ Contribution to sustainable development (host party only)	CAR01 has been raised to request the LoA and MoC document. The LoA /06/ from the host party DNA (MINAM-Peru) and MoC /08/ have been submitted to the DOE: ▪ Ratification of the Kyoto Protocol is confirmed ▪ Voluntary participation is confirmed ▪ Project title: "Potrero Hdropower Plant, Peru" in the PDD is confirmed ▪ Contribution to sustainable development is confirmed Authenticity was confirmed via e-mail sent by the local DNA (MINAM) /27/. CAR01 has been closed.	~~CAR01~~	OK
5.1.2	Is the information in the LoAs consistent with the other project documentation, including PP names, etc	The letter of approval makes reference to Empresa Electrica Agua Azul S.A., which is consistent with the PP stated in section A.4 of the PDD.	~~CAR01~~	OK

ERM CVS also reviewed whether the LoA contained any additional specifications:

	Question	**Validation findings (including justification and substantiation of information, data and evidence)**	**Draft OK/CAR/ CL**	**Final OK/ NOT OK**
5.1.3	Does any LoA contain additional specification or conditions of the project	ERM CVS can confirm that the LoA /06/ does not contain any additional conditions relevant to the validation requirements	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
	activity? If so, are these conditions fully complied with?			
5.1.4	If the LoA references a specific version of the Validation Report and this version cannot be submitted, then has either of the following been submitted? ▪ a statement indicating final LoA has not been received or ▪ an updated Validation Report	The host country LoA does not reference a specific version of the validation report.	OK	OK
5.1.5	If the project is a bundled activity (more than 1 project in the same PDD) does the LoA from the host party acknowledge the bundle activity?	Not applicable; the project is not a bundled activity.	N/A	N/A

Conclusion

ERM CVS confirmed that the LoA has been received from the only party involved in the project. Following VVS para 44, the validation report is going to be finalised pending confirmation of the LoA authenticity.

ERM CVS's validation of the approval status of the project activity confirmed that:

a) Each Party is a Party to the Kyoto Protocol

b) Participation is voluntary

c) In the case of the Host Party, the project activity contributes to the sustainable development of the country

d) The title of the project activity is identical in the LoA and the PDD.

ERM CVS therefore confirms that the LoA is in accordance with paragraphs 38-44 of the VVS.

5.2 Authorisation

As per VVS section G, ERM CVS evaluated whether all PPs are listed in a consistent manner in section A.4 of the PDD and have been appropriately authorised by a Party to the Kyoto Protocol. ERM CVS also checked the consistency of information between the PDD, Letter of Approval (LoA) and the Modalities of Communication (MoC).

PPs (list all)	Is the PP listed in Section A.4 of PDD?	Are contact details given in Annex 1 of PDD?	Does the LoA name the authorised PP?	Is information in the MoC consistent with PDD and LoA?
Empresa Eléctrica Agua Azul S.A.	Yes	Yes	Yes	Yes

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	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.2.1	Is the correct information provided on PPs, and consistently applied in A.4 and Appendix 1 of the PDD and other project documentation (Letters of Approval and Modalities of Communication)?	CAR01 has been raised to provide the LoA and MoC documents. PP has been provided the documents, therefore the CAR01 is closed. The information provided on PPs is correct and consistently applied in A.4 and Appendix 1 of the PDD, as well as with the LoA/06/ and MoC/08/.	~~CAR01~~	OK
	Can it be confirmed that there are no entities other than those approved as PPs included in section A.4 or Appendix 1 of the PDD.	ERMCVS has checked the LoA /06/ and MoC /08/ and can confirm that there are no entities other than those listed as PPs in section A.4 and Appendix 1 of the PDD.	OK	OK
	Does the host party wish to be considered a Project Participant? If so, is this correctly presented in the PDD?	The host party does not wish to be considered a project participant	OK	OK

Conclusion

All PPs to the project activity have been authorised by a party to the Kyoto Protocol, and ERM CVS has reviewed the Letter of Approval to confirm this. The PPs are listed in a consistent manner in the PDD and all related project documentation, including the LoA and Modalities of Communication. No entities other than those approved as PPs are included in section A.4 or Appendix 1 of the PDD.

5.3 Contribution to Sustainable Development

As per VVS section H, ERM CVS evaluated whether the letter of approval by the DNA of the host Party confirms the contribution of the proposed CDM project activity to the sustainable development of the host Party.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
5.3.1 .1	Does the LOA from the Host Party confirm that the project activity contributes to the sustainable development of that country?	Yes the LoA provided by the DNA of the host party /06/ confirms that the project activity contributes to the sustainable development of the host party.	OK	OK

5.4 Modalities of Communication

As per VVS section I, ERM CVS validated that the MoC statement has been correctly completed and duly authorised. ERM CVS also validated the corporate identity of all project participants and focal points included in the Modalities of Communication (MoC) statement, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories (VVS para 53).

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.4.1	Are all corporate and personal details in the MoC, including specimen signatures, correct?	Pending to CAR01. LoA and MoC has been provided. CAR01 is closed. Yes. All corporate and personal details are correct into the MoC /08/ and consistent with LoA/06/. ERM CVS confirmed with the legal document of Empresa Electrica Agua Azul shareholders/42/, that Mr. Enrique Herrera and Mr. Pompeyo Aguirre are the legal representatives of the PP and the signatures actually match with the signatures of these people. Therefore it was confirmed that the option (a) of VVS paragraph 53 has been used, i.e. ERM CVS has directly checked evidence for corporate, personal identity and other relevant documentation.	~~CAR01~~	OK
	Has the MoC statement been correctly completed, including: • Using the latest form? • All information, including annex 1, has been correctly provided? • Listing all PPs?	MoC completed including: ▪ FCDM-MOC 02.1 ▪ Information provided is consistent with Appendix 1 of the PDD and Annex 1 of the MoC ▪ All PPs have been included (Empresa Eléctrica Agua Azul S.A.)	~~CAR01~~	OK
	Has the MoC been signed by the authorised signatories of the PP? Are the signatories consistent with the names given in Annex 1 of the MoC?	The MoC has been signed by the authorised signatories. The signatories are consistent with Annex 1 of the PDD.	OK	OK

Conclusion

ERM CVS has performed due diligence on the MoC statement in accordance with the requirements established in the VVS. ERM CVS can confirm that the MoC statement complies with all relevant forms and requirements.

6 Validation findings – GSP, PDD and Project Description

6.1 Main changes between the PDD version published for GSP and the final version submitted for registration:

- Changes related to the CARs and CLs, as identified in Appendix B
- The PP name has been changed from GSP-PDD. The validation team have confirmed, by consultation of legal and official documentation/02/42a/ that the name "Empresa Eléctrica Agua Azul" corresponds to the same legal entity name of "Empresa Eléctrica Agua Azul S.A."

6.2 Global Stakeholder Consultation

At the start of the validation, in accordance with the latest version of the Project Cycle Procedure, the unvalidated PDD supplied by the client was uploaded on the UNFCCC website for global stakeholder review for a period of 30 days. The global stakeholder process (GSP) period was from 12 May 12 to 10 June 12 .

/ http://cdm.unfccc.int/Projects/Validation/DB/LZOP7DKIRK6UFSF6D0IJJOEAA4FSPI/view.html /

No comments were received.

6.3 Project Design Document (PDD)

As per VVS section J, ERM CVS reviewed the PDD to determine whether it has been prepared in accordance with the latest PDD form (template) and guidance from the CDM Executive Board available on the UNFCCC website.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.5.2	Is the PDD prepared in accordance with the latest forms and guidance required by the CDM EB? http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html	The GSP-PDD was not prepared using the latest version of the latest version of the 'Project Design Document form for CDM project activities' (F-CDM-PDD). Please see CL01. ERM CVS confirms that the revised PDD was prepared using version 04.1 of the F-CDM-PDD, being in accordance with the 'Guidelines for completing the project design document form for CDM project activities' (Ver01.0, EB66 Annex08). CL01 is closed	~~CL01~~.	OK

Conclusion

ERM CVS has confirmed that the PDD has been prepared in accordance with the latest relevant forms and guidance.

6.4 Project Description

As per VVS section K, ERM CVS reviewed the description of the project in the PDD in order to evaluate whether it provides a clear and accurate description of the proposed CDM project activity. Validation of the project description was based on review of documentation, a physical site inspection and interviews.

6.4.1 Description of the project activity

The proposed CDM project 'Potrero Hydropower Plant, Peru' is a Greenfield and run-of-river hydropower generation plant. The project activity is located in Peru, San Marcos Province, Cajamarca Region, in the District of Eduardo Villanueva. The project will be constructed at the Crisnejas River and receives water from two main river basins (Cajamarca River basin and Condebamba River basin). The Project will have a design flow rate of 18 m^3/s, and net head of 126.288 m. It will comprise 2

Francis turbines with nominal capacity of 9.95 MW each, totalling 19.9 MW. The expected net electricity production is 140,440 MWh/year, which will be supplied to the Peruvian National Interconnected Electricity Grid (SEIN). The head race channel, tunnel, load chamber, all civil work, and electromechanical equipment will be located at the left margin of the river. No dam will be constructed and, consequently, no reservoir will be formed.

The Project is expected to avoid the emission of 91,243 tons of carbon dioxide equivalent (tCO_2e) per year, which will amount to 638,702 tCO_2e for the first crediting period of 7 years.

The findings of our validation of the project description in the PDD are set out below.

6.4.2 Project Location and Status

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.4.2.1	**(i) Description: project design** Does the project description in the PDD section A provide a clear, accurate and sufficiently detailed description of all relevant elements of the proposed project activity? Specifically, does the project description provide clear indication of: a) List of main technologies involved b) List of main equipment and installations c) The lifetime of the project equipment d) Monitoring equipment and its location e) Capacities and efficiencies f) Emissions sources and GHGs involved in the project activity g) Existing and forecast energy and mass flows and balances h) Interaction with processes/equipment outside the project boundary, if any, is stated. i) Description of technology transfer from Annex I countries (if applicable)	The CL01 has been raised to complete the description of the Section A according to the guidelines for completing CDM-PDD. The PDDv8 has been improved and supported with credible and relevant evidences.. Now the PDD description includes: a) List of main technologies involved: the key components of the project technology are described, and have been confirmed against the TSR /02/ and pre-studies/30/, including the description of components such as hydraulic intake and derivation of water, general dimensions and characteristic of hydraulic structures, etc. b) List of main equipment and installations described into the PDD are 2 Francis turbines with a nominal capacity of 9.95 MW each that totalizes a 19.90 MW. The head race channel, the tunnel, load chamber and all civil works and electromechanical equipment, will be located at the left margin of the river with an hydraulic water flow design of 18 m3/s. Components described in section A.3 of the PDD have been checked and found consistent with TSR/02/. c) The lifetime of the project equipment is stated in the PDD and evidenced with publicly available information/28/. The validation team confirms that the Horizontal Francis turbines could have more than 50 years of lifetime. d) Monitoring equipment and its location has been included into the PDD. The meter will be a bidirectional meter located at Aguas Calientes Substation, which is consistent with unifilar diagram into technical reports /02/30/. e) Capacities, efficiencies and load factor have been included and confirmed with technical studies report/02/30/. The total annual net power generation (140,440 MWh) is consistent with support evidence. f) Emissions sources and GHGs involved in the project activity have been listed in accordance with the applied methodology. g) Mass and energy flows /02/ have been added to section A.3 of the PDD to clearly explain the services and outputs expected from the project activity. . h) Interaction with processes/equipment outside the project boundary: not applicable, since the electricity grid is also included as part of the project boundary. i) Description of technology transfer from Annex I countries: the PDD clearly states that the most attractive proposal is from a manufacturer in India and technical knowledge comes from company and external companies and suppliers. No used equipment will be transferred from other countries. There is no evidence to suggest transfer of technology from Annex 1 countries. The CL01 is closed	~~CL01~~	OK
6.4.2.2	**Description: Project location** Is the location of the project	Yes, the location is correctly stated in the PDD and the correct geographical coordinates are given. This information was confirmed during the site visit and by	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	correctly stated in the PDD? Are geographical coordinates given (in decimal format)? How has the location been validated?	review of the TSR /02/		
6.4.2.3	**Description: Existing installations** a) If the proposed CDM project activity involves the alteration of an existing facility, installation or process, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation? b) How has the description of the existing facility, installation or process been validated? c) Is the description of the existing facility, installation or process consistent with information provided in other parts of the PDD such as common practice and baseline selection?	Not applicable. During the onsite visit, it was confirmed that the project is a greenfield and does not take place in an existing installation. No previous structures or preliminary constructions have been found.	OK	OK
6.4.2.4	**Description: Operational lifetime** a) Does the PDD state the operation start date of the project? How was this validated? If the project is being implemented in phases, is this clearly described in the PDD? b) What is the expected operational lifetime of the project activity? Is this lifetime considered reasonable for a project of this type in the host country?	CL01 was raised and closed out. Please see Appendix B. a) The project developer estimates to start project construction June 2013 and start commercial operation in June 2016. Validation team confirmed that the start date is after to the date of publication of the GSP-PDD (See 8.1 section below) and the probable starting date would be on the first trimester of 2013 depending of concession approval when a contract for civil works or equipment acquisition would be signed. Three years for construction is conservative assumption and credible according to sectoral knowledge b) The operational lifetime of the project activity is indicated to be 50 years in the PDD. Based on ERMCVS sectoral expertise, it is considered reasonable for a hydropower project activity and has been validated against publicly available references /28/.	~~CL01~~	OK
6.4.2.5	Is information on the plant load factor provided in the PDD? How has this been validated (please refer to the Guidelines for the reporting and validation of plant load factors, EB48_Annex 11.	CL01 was raised and closed out. Please see Appendix B. The load factor is stated and has been based on the hydrological study described in the Technical Study Report /02/. It has been defined ex-ante by a third party study in accordance with the 'Guidelines for the reporting and validation of plant load factors' (Version 01, EB 48 Annex 11).	~~CL01~~	OK

Conclusion

The process undertaken to validate the accuracy and completeness of the project description is set out in detail above. ERM CVS has confirmed that the project description in the PDD provides a clear, accurate and complete understanding of the nature of the proposed CDM project activity.

6.4.3 Description of baseline scenario

The project description was evaluated to confirm whether or not it provides a clear and accurate summary of the project and baseline scenario.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.4.3.1	Is there a clear description of the baseline scenario in the PDD? This should include: a) A list of the equipment(s) and systems that would have been in place in the absence of the project activity (if any) b) Information about the age and average lifetime of the baseline facility based on manufacturer's specifications and industry standards (if applicable) c) Installed capacities, load factors and efficiencies of the baseline facility (if applicable) d) An explanation of how the same types and levels of services provided by the project activity would have been provided in the baseline scenario.	The baseline is defined in the methodology ACM0002 as "Electricity delivered to the grid by the Project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources" as reflected in the combined margin ("CM") calculations according to the "Tool to calculate the emission factor for an electricity system". Details of the establishment and description of baseline scenario is provided in section B.4 of the PDD, and have been validated against the grid emission factor calculation /09/, the interconnection diagram figure 2 of Technical Study Report./02/ and the National Interconnected Electric Grid (SEIN) provided by COES /10/ a) Not applicable, the baseline scenario it to supply electricity from the grid. b) Not applicable, see above comment. c) Not applicable, see above comment. d) Same amount of electricity provided by the project activity would have been provided by the grid (SEIN) according to the PDD.	OK	OK
	If the scenario existing prior to the start of the implementation of the project activity is different from the selected baseline scenario, is there a clear description of the pre-existing scenario, with a list of the equipment(s) and systems in operation at that time?	Not applicable. The scenario existing prior to the start of the implementation of the project activity is the same as the selected baseline scenario	OK	OK

Conclusion

The project description in the PDD contains a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation. The description sufficiently covers all relevant elements, is accurate, and clearly states the differences resulting from the project activity compared to the pre-project situation.

7 Validation findings – Baseline and Monitoring Methodology

ERM CVS has evaluated the baseline and monitoring methodology selected by the PPs to confirm its applicability and whether or not it has been appropriately applied to the project activity.

7.1 Validity of selected methodology and methodological tools

As per VVS section L.1, ERM CVS validated that an approved and currently valid baseline and monitoring methodology (and associated methodological tools) has been applied for this proposed CDM project activity.

Baseline methodology(ies) applied	ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 12.3.0
Methodological tools applied as required by the methodology(ies)	'Tool for the Demostration and Assessment of Additionality', version 06.1.0 'Tool to calculate the emission factor for an electricity system', version 2.2.1

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.1.1	Are the number, title and version of the approved methodology clearly and correctly stated? Is the methodology within its period of validity?	ERM CVS has determined that the methodology is correctly quoted and applied by comparing it with version of the methodology available on the UNFCCC CDM website. The methodology is within its period of request for registration. .	OK	OK
	Are all the required tools applied and fully referenced in the PDD? Are the version numbers applicable at the time of validation?	ERM CVS has determined that the methodological tools are correctly quoted and applied by comparing with the actual text of the applicable version of the tools available on the UNFCCC CDM website. The tools are within their period of validity.	OK	OK
	If applicable, has any specific guidance provided by the CDM EB relevant to the project type or methodology been considered?	Yes. The following EB guidance have been considered: • Guidelines on the demonstration and assessment or prior consideration of the CDM, version 4 (EB 62, Annex 13); • Guideline for objective demonstration and assessment of barriers, version 1 (EB50, Annex 13); • 'Guidelines for completing the project design document form for CDM project activities' (Ver01.0, EB66 Annex08); • Guidance on the Assessment of Investment Analysis, version 5 (EB 62, Annex 5); • Guidance for the reporting and validation of plant load factors, version 01, (EB 48 Annex 11)	OK	OK

Conclusion

The applied methodology and associated methodological tools have been correctly described and are approved by the CDM Executive Board. All versions are currently valid.

7.2 Applicability of the selected methodology to the project activity

As per VVS section L.2, ERM CVS evaluated whether the selected baseline and monitoring methodology applied is applicable to the project activity. This evaluation was based on a review of the PDD and associated documentation and a visit to the project site. ERM CVS has validated that the applicability conditions of the methodology (and tools, where relevant) are met and that the project activity is not expected to result in emissions other than those allowed by the methodology.

ERM CVS has assured the compliance of the project activity with each of the applicability conditions of the selected methodology and tools:

	Applicability Conditions in methodology and/or tools	**Is this condition discussed in the PDD? (yes/no)**	**Does the project meet this condition?** (Yes/No, or state that this condition is not relevant for the project)	**Validation findings (including justification and substantiation of information, data and evidence).**	**Draft OK/ CAR/CL**	**Final OK/ Not OK**
7.2.1	This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	Yes	Yes	The proposed project activity complies with the applicability criteria a) because it is a new hydropower plant at a site where no renewable power plant was operated prior to the implementation of the project activity (green field plant. This has been confirmed during the site visit and against the Technical Study Report /2/.	OK	OK
	The methodology is applicable under the following conditions: • The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; • In the case of capacity additions, retrofits or replacements (except for capacity addition projects for which the electricity generation of the existing power plant(s) or unit(s) is not affected): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and	Yes	Yes	The applicability conditions are properly explained and clearly justified in the PDD; ERM CVS confirmed this against the Technical Study Report /02/31/, and during a site visit. The project activity fully met the criteria as described below: The project activity consists of a new run-of-river hydropower project with an installed capacity of 19.9MW which supplies electricity to and displaces electricity from the National Electric Interconnected Grid of Peru /10/ The project activity does not involve the addition of renewable energy generation at an existing facility, and does not seek to retrofit or modify an existing facility. No renewable power plant was operated at the site prior to the implementation of the project activity. This was confirmed during the site visit. The project activity is a Hydropower plant and only involves renewable units (no fuel-switch is involved). Thus, the validation team considers that the project participant has correctly applied the approved methodology for the proposed project activity.	OK	OK

	Applicability Conditions in methodology and/or tools	Is this condition discussed in the PDD? (yes/no)	Does the project meet this condition? (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
	no capacity addition or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;					
	In case of hydro power plants: • At least one of the following conditions must apply: o The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or o The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m2 after the implementation of the project activity; or o The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m2 after the implementation of the project activity. In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m2 after the implementation of the project activity all of the following conditions must apply: • The power density calculated for the entire project activity using equation 5 is greater	Yes	Yes	The project activity will not result in the implementation of a new reservoir or multiple reservoirs; this has been confirmed against the Technical Study Report/02/ and site inspections. The project activity includes construction of a water intake type grating inlet, which does not significantly affect the hydraulic behaviour at the point of water derivation.	OK	OK

	Applicability Conditions in methodology and/or tools	Is this condition discussed in the PDD? (yes/no)	Does the project meet this condition? (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
	than 4 W/m2; • All reservoirs and hydro power plants are located at the same river and were designed together to function as an integrated project1 that collectively constitutes the generation capacity of the combined power plant; • The water flow between the multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; • The total installed capacity of the power units, which are driven using water from the reservoirs with a power density lower than 4 W/m2, is lower than 15 MW; • The total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than 4 W/m2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.					
	The methodology is not applicable to the following: • Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; • Biomass fired power plants; • A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the reservoir is less than 4 W/m2. In the case of retrofits, replacements, or capacity	Yes	This condition is not relevant for the project activity.	The project activity comprises the implementation of a greenfield hydropower plant and does not involve heat recovery and co-fired fossil fuel. The project activity will not result in the implementation of a new reservoir or multiple reservoirs; this has been confirmed against the Technical Study Report/02/ and site inspections.	OK	OK

	Applicability Conditions in methodology and/or tools	Is this condition discussed in the PDD? (yes/no)	Does the project meet this condition? (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
	additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".					
	Applicability criteria from the "Tool to calculate the emission factor for an electricity system": The tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	N/A	N/A	The project electricity system is neither totally nor partially located in an Annex I country.	N/A	N/A

	Question	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
7.2.2	Has any source of GHG emission been identified within the project boundary that is expected to contribute more than 1% of the project activity's expected average annual emissions reductions, and which is not addressed by the applied methodology?	ERM CVS has determined that there will be no other GHG emissions within the project boundary expected to contribute more than 1% of the predicted emission reductions, which are not addressed by the applied methodology. This was confirmed by assessment of the project on site and by review of the detailed project design in the Technical Study Report /02/.	OK	OK

Conclusion

The applied methodology and associated tools are fully applicable to the project activity and is correctly applied in the PDD. There are no greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology, were identified.

7.3 Project Boundary

As per VVS section L.5, ERM CVS reviewed the description of the project boundary in the PDD, to determine whether all main GHG emission sources, the physical delineation of the proposed project activity and other relevant project and baseline emission sources covered in the methodology are included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM project activity.

According to the applied methodology, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the National Interconnected Electric Grid (SEIN).

7.3.1 Emission sources

The emissions sources included in or excluded from the project boundary, as set out in the applied methodology are as follows:

	Source	**Gas**	**Is this source included within the project boundary in the PDD?**	**Is inclusion / exclusion from the project boundary justified in the PDD?**	**How has this been validated?**
Baseline emissions	CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Yes	ERM CVS has validated against methodology ACM0002 and the application of the tool to calculate the emission factor for an electricity system
		CH_4	No	Yes	ERM CVS has validated against methodology ACM0002.
		N_2O	No	Yes	ERM CVS has validated against methodology ACM0002.
Project Activity	For geothermal power plants, fugitive emissions of CH4 and CO2 from non-condensable gases contained in geothermal steam	CO_2	N/A	N/A	The project activity is not a geothermal power plant
		CH_4	N/A	N/A	The project activity is not a geothermal power plant
		N_2O	N/A	N/A	The project activity is not a geothermal power plant
	CO2 emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO_2	N/A	N/A	The project activity is not a geothermal power plant and/or a solar thermal power plant.
		CH_4	N/A	N/A	The project activity is not a geothermal power plant and/or a solar thermal power plant.
		N_2O	N/A	N/A	The project activity is not a geothermal power plant and/or a solar thermal power plant.
	For hydro power plants, emissions of CH4 from the reservoir	CO_2	No	Yes	ERM CVS has validated the application of the methodology ACM0002
		CH_4	No	Yes	ERM CVS has validated the application of the methodology ACM0002 and the Technical Study Report (TSR) /02/. No CH4 emissions are expected to occur, since no reservoir will be implemented by the projects activity.
		N_2O	No	Yes	ERM CVS has validated the application of the methodology ACM0002 and the Technical Study Report (TSR) /02/

	Question	**Validation findings (including justification and substantiation of information, data and evidence)**	**Draft OK/ CAR/CL**	**Final OK/ Not OK**
7.3.1	Has the PDD justified the inclusion/exclusion of all potential sources of GHG emissions as set out in the	ERM CVS evaluated whether the sources of GHG emission set out in the applied methodology were included in the project boundary and, where the methodology allows PPs to choose whether a source or gas is to be included within the project boundary, this has been clearly justified in the PDD. The validation was based on	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	applied baseline methodology	TSR/02/ and confirmed during the site visit.		

Conclusion

The identified boundary and the selected sources and gases included in the final PDD are appropriately described and justified for the project activity, in accordance with the applied methodology. The information is correctly described in the section B.3 of the PDD.

7.3.2 Physical delineation of the project

ERM CVS evaluated whether the PDD correctly describes the physical delineation of the proposed CDM project activity, including which installations/processes are included within the geographical boundary of the project activity.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.2	Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM project activity included within the project boundary?	ERM CVS confirmed that the PDD correctly describes which installations/processes are included within the geographical boundary of the project activity. Based on the site visit, review of the figure 2 of the Technical Study Report /02/ and grid emission factor calculated which clearly describes National Electric Interconnected Grid of Peru/09/, ERM CVS confirmed that the PDD correctly describes which installations and processes are included within the geographical boundary of the project activity. The project boundary is correctly described in section B.3 of the PDD according to ACM0002 and the Tool to calculate the emission factor for an electricity system Figure 4 of the PDD contains a flow diagram of the project boundary which describes all the equipment, monitoring instrument location, systems and flows of mass and energy and the emissions sources and gases included in the project boundary and the monitoring variables. The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to. The Peru National Electric Interconnected Grid is clearly defined grid that runs throughout the country /10/	OK	OK
	Were any emission sources identified that will be affected by the project activity and are not addressed by the selected approved methodology? If so, was clarification of, revision to or deviation from the methodology approved in accordance with required procedures.	No emissions sources other than those addressed by the methodology were identified	OK	OK

Conclusion

The PDD correctly describes the project boundary, including the physical delineation of the proposed CDM project activity, in compliance with the requirements of the selected baseline methodology, and this is consistent with site observations and other documentation provided. All sources and GHGs required by the methodology have been included within the project boundary.

Where the methodology allows PPs to choose whether a source or gas is to be included within the project boundary, the PPs have sufficiently justified that choice. The justifications provided are reasonable, based on assessment of supporting documented evidence /02//09//10/ and site observations. The project boundary is justified for the project activity, based on ERM CVS's local and sectoral knowledge.

7.4 Baseline identification

As per VVS section L.6, ERM CVS reviewed the PDD to assess whether it correctly identifies the baseline for the proposed CDM project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity.

As per VVS paragraph 115, no alternative analysis is required if the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario.

The baseline identification has been validated as follows:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.4.1	Does the PDD identify the baseline, a scenario that represents the anthropogenic emissions by sources of GHG that would occur in the absence of the proposed CDM project activity?	Yes. The baseline is specified by the methodology.	OK	OK
	Have the procedures/ steps to identify the most reasonable baseline scenario, as required by the methodology and applicable tools, been documented clearly in the PDD?	Yes. The PDD clearly identifies the baseline scenario, electricity delivered to the grid by the project activity that would have otherwise been generated by the existing grid-connected power plant and the addition of new power sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system", which is specified by the methodology.	OK	OK
	Are all feasible and credible alternatives identified including but not limited to all the potential scenarios listed in the methodology? Does the list of alternatives include the project activity undertaken without being registered as a CDM project?	The baseline is specified by the methodology and no further procedures / steps to identify the most reasonable baseline scenario are required. The PDD identifies two alternative scenarios: (1) the proposed project being implemented without seeking CDM status, and (2) the continuation of the baseline scenario, i.e. electricity being provided by the SEIN grid.	OK	OK
	Are realistic different configurations or combinations of alternatives that may be able to provide similar outputs and services considered?	Not applicable. No configuration or combination is required to determine alternative scenarios	N/A	N/A
	Are all considered alternatives assessed for consistency with (enforced) mandatory laws and regulations?	Yes. The PDD clearly states that the 2 identified realistic and credible alternative scenarios to the project activity are in compliance with mandatory legislation and regulations taking into account the enforcement in the region or country and EB decisions on national and/or sectoral policies and regulations, which was confirmed by the validation team, based on the provided evidences /29/.	OK	OK
	(a) Have all applicable CDM requirements been taken into	(a) All applicable CDM requirements have been taken into account in the identification of the baseline scenario, which has been carried out in accordance	~~CAR02~~	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	account in the identification of the baseline scenario? (b) Have all relevant national and/or sectoral policies and circumstances been taken into account, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector? Are the relevant national and/or sectoral policies and circumstances identified and correctly considered in the PDD?	with the methodology ACM0002. (b) The relevance to the project activity of the national/sectoral policy stated in the PDD was not clearly explained in the GSP-PDD. See CAR02. The revised PDD included the explanation on how the national/sectoral policy stated in the PDD is relevant to the project activity in section B.5 of the PDD, and found to be consistent with evidences provided/29/. CAR02 has been closed.		

Conclusion

Based on the site visit and documentary evidence to cross check the information contained in the PDD as referenced above, ERM CVS confirms that:

a) All the assumptions and data used by the PPs in establishing the baseline scenario are listed in the PDD, including their references and sources;

b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;

c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;

d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;

e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

7.5 Algorithms and/or formulae used to determine emission reductions

As per VVS section L.7, ERM CVS has evaluated whether the steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring methodology.

ERM CVS conducted validation activities to determine whether the equations and parameters in the PDD have been correctly applied by comparing them to those in the selected approved methodology. Where the methodology provides for selection between different options for equations or parameters, ERM CVS confirmed that adequate justification has been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided) and that the correct equations and parameters have been used, in accordance with the methodology selected.

ERM CVS verified the justification given in the PDD for the choice of data and parameters used in the equations. Where data and parameters will not be monitored throughout the crediting period of the proposed CDM project activity but have already been determined and will remain fixed throughout the crediting period (ex-ante parameters), ERM CVS assessed that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions. Where data and parameters will be monitored on implementation

and hence become available only after validation of the project activity, ERM CVS confirmed that the estimates provided in the PDD for these data and parameters are reasonable (please see section 8 for details of the validation of the monitored parameters).

7.5.1 Ex Ante Data and Parameters

The Project activity does not include ex-ante parameters.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.5.1	Have the parameters required by the methodology / tools been correctly described in the PDD? Where the methodology provides for selection between different options for data and parameters; is the choice of data and parameters justified?	CL02 has been raised to clarify in the PDD the justification of the project emissions calculation and the employed methodological procedure for calculating the grid emission factors. The parameters required by the methodology and tool have been correctly updated and justified. The revised PDD was updated and the ex-ante parameters eliminated from the PDD, which is consistent with the methodology and the tool to calculate the emission factor for an electricity system. In addition, the dispatch data analysis was correctly chosen based on the grid electricity matrix, data availability and traceability, and the provisions of the methodology and tools. CL02 is now closed.	~~CL02~~	OK

7.5.2 Equations and calculations used to calculate emission reductions

The following steps are applied in the PDD to determine emission reductions, in accordance with the methodology and tools applied:

Baseline emissions

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

Where:

BE_y = Baseline emissions in year *y* (tCO_2/yr)

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

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2/MWh)

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for: (a) greenfield plants, (b) retrofits and replacements; and (c) capacity additions. These cases are described next.

(a) Greenfield renewable energy power plants

If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

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

Where:

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

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

Calculation of the emission factor (EF) of the national electricity grid

According to the requirement of ACM0002, the proposed project applied the steps of the Tool to calculate the emission factor for an electricity system to calculate the grid emission factor. The grid emission factor is calculated as a combined margin (CM) which is made up of the combination of operating margin (OM) and build margin (BM).

Step 1: Identify the relevant electric power system

The relevant electricity power system applicable to project activity is the Peruvian Interconnected Electricity System (SEIN)

Step 2: Choose whether to include off-grid power plants in the project electricity system

Option I : Only grid power plants are included in the calculation.

Step 3: Select a method to determine the operating margin (OM)

Dispatch Data Analysis OM (OM -DD) was selected due to the relevant dispatch hourly data to calculate, the COES is available to provide /10/

Step 4: Calculate the operating margin (OM) emission factor according to the selected method

(c) Dispatch data analysis OM

$$EF_{Grid,OM-DD,y} = \frac{\sum_h EG_{PJ,h} \cdot EF_{EL,DD,h}}{EG_{PJ,y}}$$

Where:

$EF_{Grid, OM-DD, y}$ = Dispatch data analysis operating margin CO_2 emission factor in year *y* (tCO_2e/yr)
$EG_{PJ, h}$ = Electricity displaced by the project activity in hour *h* of year *y* (MWh)
$EF_{EL, DD, h}$ = CO_2 emission factor for grid power units in the top of the dispatch order in hour *h* in year *y* (tCO_2/MWh)
h = Hours in year $_y$ in which the project activity is displacing grid electricity
y = Year in which the project activity is displacing grid electricity

$$EF_{EL,DD,h} = \frac{\sum_n EG_{n,h} \cdot EF_{EL,n,y}}{\sum_n EG_{n,h}}$$

$EF_{EL,DD,h}$ = CO2 emission factor for grid power units in the top of the dispatch order in hour *h* in year *y* (tCO2/MWh)
$EG_{n,h}$ = Net quantity of electricity generated and delivered to the grid by grid power unit *n* in hour *h* (MWh)
$EF_{EL,n,y}$ = CO2 emission factor of grid power unit *n* in year *y* (tCO2/MWh)
n = Grid power units in the top of the dispatch (as defined below)
h = Hours in year *y* in which the project activity is displacing grid electricity

Determine the set of grid power units *n* that are in the top of the dispatch, obtain from a national dispatch centre:

At each hour *h*, stack each grid power units electricity generation using the merit order. The group of grid power units *n* in the dispatch margin includes the units in the top x% of total electricity dispatched in the hour *h*, where x% is equal to the greater of either:

(a) 10%; or
(b) The quantity of electricity displaced by the project activity during hour *h* divided by the total electricity generation by grid power plants during that hour *h*.

$$EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} \times 3.6}{\eta_{m,y}}$$

Where:

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

$EF_{CO2,m,i,y}$ = Average CO2 emission factor of fuel type *i* used in power unit *m* in year *y* (tCO2/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 = Relevant year as per the data vintage

Build margin calculation for the set of units selected:

$$EF_{Grid,BM,y} = \frac{\sum_m EG_{m,y} \cdot EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

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 electricity generation data is available

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:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y*(tCO_2e/MWh)
$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year *y*(tCO_2e/MWh)
W_{BM} = Weighting of build margin emission factor (%)
W_{OM} = Weighting of operating margin emission factor (%)

Project emissions

The project activity will not result in the construction of a new reservoir or multiple reservoirs; this has been confirmed by the validation team against the Technical Study Report/02/ and site inspections. As such, CH_4 emissions from the reservoir have not been considered by the PP, which was considered appropriate by the validation team.

Therefore, $PE_{HPy} = 0$, and consequently, $PE_y = 0$.

Leakage

Following the ACM0002 version 12.3.0 methodology no leakage emissions are considered.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.5.2	Has the PP correctly applied all relevant calculations as required by the methodology and associated tools? Is it fully explained how the procedures provided in the Methodology and applicable Tools are applied by the proposed project activity? *(i.e. Are the required steps clearly*	The GSP-PDD /01/ and Emission Reduction Calculations spread sheet/05/ do not have clear description of sources and references. Traceability of data calculation cannot be done. Serious inconsistencies have been found. CAR03 has been raised. ERM CVS confirmed that the calculations, assumptions and values have been completed and corrected by the PP. They included all the required steps from the tool to calculate the emission factor for an electricity system. The equations and methodological options for Dispatched analysis have been applied correctly and explained into the procedures. The input values and assumptions have been clearly referenced and the data into the PDD, ER spreadsheet and 2011 data	~~CAR03~~	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	followed?)	records from COES/10/ are fully consistent and traceable. CAR03 is closed.		
	Where the methodology provides for selection between different options for equations; is every choice of options for calculating project emissions, baseline emissions and leakage offered by the methodology correctly justified in the context of the project activity and baseline scenario?	The PDD does not explain clearly the methodological option for Dispatch analysis calculation. All assumptions for OM calculation according to the Tool to calculate the emission factor for an electricity system needs to be clarified. The CL02 has been raised. ERM CVS confirms that the PP has correctly chosen and justified methodological choices for Dispatch analysis consistent with the electricity data records of 2011 year/10/ CL02 is closed.	~~CL02~~	OK
	Are the formulae required for the determination of project emissions, baseline emissions and leakage correctly presented in a complete and transparent manner, enabling a complete identification of parameters to be used and / or monitored?	Yes, the description of the selection of a method for calculating the operating margin grid emission factor and GHG emissions to be accounted are consistent with the project description provided in the PDD, the applicable methodology and the Tool to calculate the emission factor for an electricity system.	~~CL02~~	OK
	Are detailed calculations provided in a traceable spreadsheet showing relevant information? Are the tables of emission reductions in the PDD (section B.6.4) consistent with the calculations?	A cross-check between the evidence sources for input values /10/ and the spreadsheet /05/ has been carried out Data was traceable and consistent with the calculations required by the methodology and tools. CAR03 is closed.	~~CAR03~~	OK
	Can the calculation of emission reductions be replicated using the data and parameters supplied in the PDD?	Yes. ERM CVS confirmed that the emission reduction calculations can be replicated by using the data available and parameters supplied in the PDD.	OK	OK

Conclusion

ERM CVS confirms that:

As per the VVS paragraph 99, based on the information reviewed and calculations reproduced by the validation team, ERM CVS confirms the following:

(a) All assumptions and data used by the PPs are listed in the PDD, including their references and sources;

(b) All documentation used by PPs as the basis for assumptions and the sources of data are correctly quoted and interpreted in the PDD;

(c) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;

(d) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;

(e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD

8 Validation findings – Additionality

As per the VVS sections L.8 to L.13, ERM CVS assessed the PDD to determine whether it clearly describes how the proposed CDM project activity is additional, as supported by sufficient and appropriate evidence. In accordance with decision 3/CMP.1, annex, paragraph 43, a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity. ERM CVS assessed and verified the reliability and credibility of all data, rationales, assumptions, justifications and documentation provided by PPs to support the demonstration of additionality in order to critically assess the presented evidence, using local knowledge and sectoral and financial expertise. In undertaking this aspect of the validation, ERM CVS considered tools and documents provided by the CDM Executive Board to demonstrate the additionality of the proposed CDM project activity, as well as specific complementary or alternative requirements included in the approved CDM methodology. In the sections below, ERM CVS describes all steps taken, and sources of information used, to cross-check the information contained in the PDD on additionality. Where appropriate, we describe how the validation team determined that the documentation assessed is authentic.

8.1 Starting date and prior consideration of the CDM

As per VVS section L.9, if the project activity start date is prior to the date of publication of the PDD for stakeholder comments, it shall be demonstrated that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity. ERM CVS therefore evaluated the start date of the project activity

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.1.1	What is the start date of the project activity? Is this before the publication of the PDD for public comments?	The project activity start date is given in the PDD as 01 June 2013 which is after the PDD publication for GSP. CL03 has been raised to request clarification according to the plan for project activity implementation. ERM CVS confirmed that the first real action for project activity development will be the signing of the contract to access route construction. According to the PP this contract is expected to be signed on 15 January 2013. The validation team confirmed that the date is consistent with technical studies for this purpose/46a/ and the actual legal status of the project (i.e. submission of documents for approval of final concession to power generation/02/). During the site visit ERM CVS verified that no real action or implementation of the project had yet taken place. CL03 is closed.	~~CL03~~	OK
	Is the start date clearly defined in the PDD in accordance with the “Glossary of CDM terms”? Does the PDD contain a description of how this start date has been determined, and a description of the evidence available to support this start date?	Please see CL03. Yes, the start date has been clearly defined in accordance with the glossary of CDM terms. The PDD provides a substantiation of the selection of the starting date consistent with the evidences submitted by the PP /02/30/46a/. CL03 is closed	~~CL03~~	OK
	If the start date is prior to the publication of the PDD for stakeholder comments, does the PDD provide an implementation timeline of the proposed CDM project activity, in line with the PDD guidelines?	In accordance with the Guideline for completing CDM-PDD, the timeline table is required in cases when the starting date of the project activity is before the validation. In the case of the proposed project activity, the starting date is after the global stakeholder consultation (12 May 12 to 10 June 12); nevertheless, the PDD contains a table “Actions towards CDM status of the project”, which is discussed below.	OK	OK

The timeline of the project is set out in the table below, showing the evidence used to support each step. CL04 was raised to request PP provide evidences of action towards CDM in Table 4 of the PDD. All evidences have been supplied by the PP and reviewed by ERM CVS. CL04 is closed.

	Activity	Date	How has ERM CVS validated this information	Draft OK/ CAR/CL	Final OK/ Not OK
8.1.2	Hydrological study approval	29/12/2011	ERM CVS confirmed the validity of this date against the evidence of the approval of hydrological study in to Crisnejas River by ANA/31/.	OK	OK
	Prior Consideration of the CDM. DNA	03/02/2012	ERM CVS confirmed the validity of this date against the evidence provided for DNA submission /33/ and checked against information on the UNFCCC website	~~CL04~~	OK
	Prior Consideration of the CDM. - UNFCCC	18/02/2012	Prior consideration of the CDM form submitted to the UNFCCC has been provided /32/ and checked to be informed in the UNFCCC website.	~~CL04~~	OK
	Local Stakeholder Consultation.	14/03/2012	Validated against the minutes and report of the stakeholder consultation /26/ and confirmed during the interview with the mayor of Eduardo Villanueva Municipality / IV2/,	~~CL04~~	OK
	Contract with EcoResources	14/02/2012	Contract between Project Participant and Ecoresources (prior to project construction) has been provided /34/.	~~CL04~~	OK
	Request for Definitive Concession Submitted to Minister of Energy and Mines	04/05/2012	ERM CVS confirmed the validity of this date against the format of formal submission of documents to request the Definitive Concession approval to Minister of Energy and Mines has /35/.	~~CL04~~	OK
	Documents submitted for the National Approval Process at the Peruvian DNA.	05/06/2012	Evidence of the Documents submitted for the National Approval Process at the Peruvian DNA has been provided /36/.	~~CL04~~	OK
	Signature of access route contract.	15/01/2013	Starting date. The signing of the contract to access route to project site. The validation team confirmed that this will be the first real action for project activity development and the date is consistent with technical studies for this purposes/46a/ and the actual legal status of the project (i.e. submission of documents for approval of final concession to power generation/02/)	~~CL03~~	OK
	Start of Construction	01/06/2013	Expected date of the project civil works construction contract	OK	OK
	Start of power plant operation	01/06/2016	Expected date of the start of power plant operation	OK	OK

ERM CVS reviewed the evidence provided for the timeline, and can confirm that the timeline is credible and supported by reliable evidence.

Conclusion

Based on the evidence provided, ERM CVS confirms that the start date for this project is 15th January 2013. This is after the publication of the PDD for stakeholder comments**.** The starting date of the project activity is after 02 August 2008. ERM CVS has validated the compliance of the project with the Guidelines on the demonstration and assessment of prior consideration of the CDM provided by the CDM Executive Board (EB 62 Annex 13) as follows.

8.2 Identification of alternatives

As per VVS section 115, ERM CVS evaluated whether the PDD clearly describes credible alternatives to the project activity in order to determine the most realistic baseline scenario, the project applies methodology ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 12.3.0 which defines the baseline as Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system". The identification of alternatives is validated in detail in section 7.4 above.

Conclusion

ERM CVS confirms that the baseline is correctly defined in the PDD in line with the methodology.

On the basis of local and sectoral knowledge and the evidence provided, ERM CVS confirms that the baseline is correctly identified, following the procedures in the applied methodology and tools, and that the selected baseline complies with all relevant policies and regulations.

8.3 Investment analysis

As per VVS section L.11, ERM CVS evaluated the investment analysis presented in the PDD to demonstrate the additionality of the proposed CDM project activity. ERM CVS evaluated whether there is sufficient and reliable evidence to validate that the proposed CDM project activity would not be either:

- the most economically or financially attractive alternative; or
- economically or financially feasible without the revenue from the sale of CERs.

Additionality of the project is demonstrated using the 'Tool for the demonstration and assessment of additionality' version 06.1.0. An investment analysis is used to demonstrate that the project activity is not financially or economically feasible without CER revenues, or is not the most financially or economically attractive option.

The financial analysis was assessed by the validation team, including assessment of the spreadsheet and evidences relating to the input values to the financial analysis. The analysis was also assessed by referring to the latest version of the 'Guidelines on the assessment of investment analysis' ('I.A. Guidelines') by a financial expert assigned by ERM CVS, who has specific expertise in the assessment of financial analysis for CDM projects. The validation of the investment analysis is set out below and in the resolution of CARs and CLs relating to the investment analysis.

8.3.1 Evaluation of Analysis Option

PPs can choose one of the following approaches:

- **Option I (Simple Cost Analysis):** Used when the proposed CDM project activity and the identified alternatives would produce no financial or economic benefits other than CDM-related income. It involves documentation of the costs associated with the proposed CDM project activity and the alternatives identified and demonstration that there is at least one alternative which is less costly than the proposed CDM project activity;
- **Option II (Investment Comparison Analysis):** Used to compare the rate of return of the project activity (without CDM) and the alternative(s), to demonstrate whether the proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative;
- **Option III (benchmark analysis)**: Used to demonstrate that the financial returns of the proposed CDM project activity would be insufficient to justify the required investment, when compared to a benchmark.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.3.1	Has the appropriate option been chosen? (as per the *Guidance on the Assessment*	The GSP-PDD does not provide a clear description for benchmark selection. CL05 was raised. Sub-step 2a has been updated. CL05 is closed.	~~CL05~~	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	of Investment Analysis)	The PP has chosen the benchmark analysis, which is appropriate given that the project generates revenues from electricity sales (hence option I, simple cost analysis, is not applicable) and the alternative (continuation of electricity supply by the grid) is not a comparable investment alternative (hence option II, investment comparison analysis, is not applicable). The selection by the PP is in line with the 'Tool for the demonstration and assessment of additionality' and the 'Guidance on the assessment of investment analysis' CL05 is closed.		

Option III evaluation

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.3.2	Is benchmark analysis appropriate? (*If the PP has to make an investment, to supply the same outputs and services, and there is at least one other alternative option than building the project activity without CDM, benchmark analysis is not appropriate and investment comparison analysis should be used*).	Yes, the project developer has the alternative of making no investment (continuation of the supply of electricity from the existing generation mix operating in the grid). The project developer is not obliged to make an investment to supply the same outputs and services the benchmarking analysis is appropriate.	OK	OK
	Is the most suitable financial indicator for the project type and decision-making context clearly identified, such as IRR?	Yes. Project IRR (post tax) is used; this is consistent with the selected benchmark. A 12% benchmark is established by the government in the Electric Concessions Law (article 79) /11/ as the reference rate to evaluate investments in the power sector. The Internal Rate of Return (IRR) is one of the most widely accepted financial indicators for project evaluation. Project IRR demonstrates that the proposed project activity cannot be considered a financially attractive option without the additional revenue provided by the Clean Development Mechanism	OK	OK

Conclusion

ERM CVS confirms that the choice of option used for evaluation of the investment analysis is appropriate for this project activity.

8.3.2 Evaluation of Benchmark/Discount rate

The assessment used an external source of Benchmark. To confirm the suitability of the benchmark applied in the investment analysis, ERM CVS has

a) Determined whether the type of benchmark applied is suitable for the type of financial indicator presented;

b) Ensured that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity;

c) Determined whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the PPs involved and determining whether the same benchmark has been applied or if there are verifiable circumstances that have led to a change in the benchmark.

Details of the validation of the benchmark are provided in the following table:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
If a Government/officially approved benchmark has been used				
8.3.2 .1 (a)	Is the use of a government/official benchmark appropriate (*i.e. are such benchmarks used for investment decisions for this type of project in the host country*)?	The chosen benchmark is a project IRR benchmark established as a suitable rate for this kind of project by the Government of Peru. According to the official documented source this benchmark should be applied for projects of this type in the host country /11/. The rate is widely used in the country and accepted for electric power projects. Based on local and sectoral knowledge the validation team confirms that the benchmark is verifiable and appropriate.	OK	OK
	Is an appropriate benchmark or discount rate value chosen that is relevant for the project activity (i.e. for this investor, country, risk of project, time of investment decision)? Is the benchmark applicable to the project activity and the type of IRR calculation presented (*project or equity IRR; before or after tax*)?	The benchmark provided by the host country government in the document 'Electric Concessions Law' (article 79) /11/ is specific for electric power projects and is widely applied in the host country. The benchmark is specifically applicable to the electric power industry in Peru, and therefore is suitable for the proposed project. This has been confirmed with public and reliable information/24/37/.The reference for the benchmark /11/ was issued in 1992 and there is no more recent guidance to replace it. A project IRR indicator, post tax, is used. However, the PDD did not include clear justification whether the benchmark is pre-tax or post-tax and whether it is project IRR or equity IRR. Furthermore, it is stated that the benchmark is intended for real cash flow analyses while the analysis is based on nominal cash flows. CAR04 has been raised. The PP provided relevant justification to explain that Project IRR post-tax can be used. Although there is currently no debt funding arrangements in place for the project activity, the investment analysis has incorporated interest payable into the analysis using the same loan terms conditions from another similar hydropower project, the Pizarras project, developed by Empresa Eléctrica Agua Azul S.A. (also the main shareholder of the proposed project activity). The comparison with the Pizarras project is valid because both projects have similar capacity, located in the same region (Cajamarca) and have the same shareholders. This has been confirmed with information of Empresa Eléctrica Agua Azul S.A./42/. ERM CVS confirmed in the IRR calculation that actual interest payable is taken into account in the calculation of income tax assuming debt conditions, which is applicable to project conditions and consistent with the guidelines for investment analysis. CAR04 is closed.	~~CAR04~~	OK
	Is the benchmark or discount rate based on verifiable publicly available data sources?	Yes. The benchmark is based on a publicly available source 'Electric Concessions Law' (article 79), issued on November, 1992 by the Government of Peru /11/.	OK	OK
	Is the chosen benchmark appropriate and in line with other benchmarks or discount rates used in current or previous projects by the same or similar investors? (*including the Benchmark or discount rate used in Feasibility Studies or other financial analyses of the project activity*)	The chosen benchmark has been established as a suitable rate for this kind of project by the Government of Peru. The rate is widely used in the country and is widely accepted as a reference for projects of this type. Based on local and sectoral knowledge, the chosen benchmark is widely applied in investment decisions for similar projects and by similar investors.	OK	OK
If an external benchmark or discount rate has been used:				
8.3.2 .2 (b)	Is the use of an external benchmark appropriate?	Not applicable	N/A	N/A

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	Is the benchmark or discount rate based on publicly available data sources?	Not applicable	N/A	N/A
	Is the benchmark based on parameters that are standard in the market? (I.A Guideline 13)	Not applicable	N/A	N/A
	Are the assumptions underlying the referenced benchmark or discount rate relevant to the sector?	Not applicable	N/A	N/A
	Is an appropriate benchmark or discount rate value chosen that is relevant for the project activity (*i.e. for this investor, country, risk of project, time of investment decision*)?	Not applicable	N/A	N/A
	Is the chosen benchmark conservative and in line with other benchmarks or discount rates used in current or previous projects by the same investor? *(including the benchmark or discount rate used in Feasibility Studies or other financial analyses of the project activity)*	Not applicable	N/A	N/A
	Does the benchmark meet the requirements of the investment analysis guidelines paragraph 15, *i.e. if the cost of equity is used in the determination of the benchmark, is the cost of equity determined either by: (a) selecting the values provided in Appendix A of the investment analysis guidelines; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated*? Are all underlying factors sufficiently justified?	Not applicable	N/A	N/A
	If the cost of debt is used in the determination of the benchmark, is it calculated as the cost of financing in the capital markets (e.*g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on documented evidence from financial institutions with regard to the cost of debt financing of comparable*	Not applicable	N/A	N/A

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	projects? In cases where this data is not available, has the commercial lending rate in the host country been used to calculate the cost of debt? (I.A. Guideline 16)			
	Is the debt:equity ratio used to determine the benchmark based on the typical debt/equity finance structure observed in the sector of the country? *If such information is not readily available, 50% debt and 50% equity financing may be assumed as a default.* (I.A. Guideline 18)	Not applicable	N/A	N/A
If an internal company benchmark or discount rate has been used:				
8.3.2 .3 (c)	Can the project only be implemented by the PP? (*Only in the particular case where the project activity can only be implemented by the PP, can the specific financial/economic situation of the company undertaking the project activity can be considered in the financial analysis*) Therefore is the use of an internal benchmark or discount rate appropriate in this case?	Not applicable	N/A	N/A
	Is it sufficiently demonstrated that project activities under similar conditions developed by the same company used the same benchmark or discount rate? Has ERM CVS undertaken a thorough assessment of the financial statements of the PP to assess the past financial behaviour of the entity during at least the last 3 years in relation to similar projects? (I.A. Guideline 14) If the company is brand new, has it been demonstrated that the same benchmark would have been used for similar projects in the same sector in the country/region?	Not applicable	N/A	N/A
	Is the cost of debt determined in accordance with the guidelines on the assessment of investment analysis, guideline 16?	Not applicable,	N/A	N/A

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	Is the cost of equity determined either by: (a) selecting the values provided in Appendix A of the investment analysis guidelines; or by (b) calculating the cost of equity using best financial practices, based on data sources which can be clearly validated? Are all underlying factors sufficiently justified? (I.A. Guideline 15)	Not applicable,	N/A	N/A
	Is the debt:equity ratio in line with Guideline 17 of the Guidelines on the assessment of investment analysis?	Not applicable.	N/A	N/A
Risk Premiums				
8.3.2 .4	Are risk premiums applied in the development of the benchmark or discount rate? If so, are they reasonable and justified? How has this been validated?	A government benchmark is used and no additional risk premiums are applied.	N/A	N/A

8.3.3 Investment analysis assumptions and Input Values

ERM CVS evaluated the assumptions and input values used in the investment analysis

Assumptions based on Feasibility Study Reports (FSR)

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.3.3 .1	Has the FSR been the basis of the decision to proceed with the investment in the project? How has this been verified?	No FSR has been used in the investment decision for this project.	N/A	N/A
	Are the values used in the PDD and associated annexes valid and consistent with the FSR?			
	At the time of the investment decision, are the input values from the FSR valid and applicable (*based on specific local and sectoral expertise and knowledge*)?			

Input values used in the investment analysis

As per VVS paragraph 120 (a to c) ERM CVS has conducted a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determined the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices. ERM CVS has cross-checked the parameters against third-party or publicly available sources, such as invoices or price indices where available, and has reviewed feasibility reports, public announcements and annual financial reports, where available, related to the proposed CDM project activity and the PPs. Details of the validation activities and cross checks carried out are set below.

Some input parameters are based on the actual values from another similar hydropower project, the Pizarras project, recently developed by the same developer, Empresa Eléctrica Agua Azul S.A. (main shareholder). The Pizarras project is currently under construction and is very similar to the proposed project activity (run-of-river, 18 MW, no reservoir, similar design), as confirmed by the validation team through the review of the official technical report of the other similar project submitted for the concession approval /40/ and publicly available information about the project on the CDM website /44/(note: CDM documentation such as the PDD or validation report for the Pizarras project were not used as the sources for any values. The values come from the actual values in contracts and official documents of the compared Pizarras project). The Debt contract from the Pizarras project is also used. However due to confidentiality conditions in the debt contract, the name of the financial institution providing the loan is not referred to by name here.

ERM CVS has validated that sufficient information is provided in the PDD and spreadsheet to replicate the investment analysis, in line with paragraphs 12 and 13 of the PDD guidelines.

<table>
<tr><th></th><th>Input parameter</th><th>Validation
(source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)</th><th>Cross check
(cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)</th><th>Draft OK/ CAR/CL</th><th>Final OK/ Not OK</th></tr>
<tr><td colspan="6">Technical assumptions</td></tr>
<tr><td>8.3.3.2</td><td>Electricity generation per year (load factor) – 140,440 MWh based on a load factor of 81%</td><td>The annual electricity generation is sourced from the TSR /02/.

CL01 has been raised to request relevant evidence to further justify the load factor definition.

PP clarified that the load factor was defined based on the Hydrological Study for Crisnejas River into the Potrero project localization/30/31/. The load factor has been included into the Technical Study Report /02/, which is the base to formal request of project activity implementation approval/35/. Therefore, the load factor has been defined ex-ante by a third party study and provide to the government in accordance with the ‘Guidelines for the reporting and validation of plant load factors’ (Version 01, EB 48 Annex 11).

CL01 is closed</td><td>The validation team cross-checked the assumed load factor of the project activity against the PLF of small hydro projects in Peru, identified by World Bank into the sectoral economic assessment/24/.

<table><tr><td>Peruvian Hydro Project</td><td>Capacity
MW</td><td>Load Factor
%</td></tr><tr><td>Poechos, Puira</td><td>15,4</td><td>44%</td></tr><tr><td>Moche I&II, La Libertad</td><td>20,6</td><td>56%</td></tr><tr><td>El Sauce San Martin</td><td>9,5</td><td>48%</td></tr><tr><td>Cerro Mulato Lambayeque</td><td>8</td><td>81%</td></tr><tr><td>Culqui</td><td>20</td><td>76%</td></tr><tr><td>Aricota III</td><td>19</td><td>40%</td></tr></table>The average load factor is 58%, therefore the proposed project activity load factor is considered conservative.</td><td>~~CL01~~</td><td>OK</td></tr>
<tr><td></td><td>Project operational lifetime (Assessment period) – 50 years</td><td>An operational lifetime of 50 years has been referenced in the PDD which is consistent with the 50 year period considered in the investment</td><td>The validation team crosschecked information and confirmed the 50 year project lifetime is consistent with the lifespan of Francis turbines and</td><td>~~CL06~~</td><td>OK</td></tr>
</table>

<table>
<tr><th></th><th>Input parameter</th><th>Validation
(source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)</th><th>Cross check
(cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)</th><th>Draft OK/ CAR/CL</th><th>Final OK/ Not OK</th></tr>
<tr><td></td><td></td><td>analysis.

CL06 was raised to support clearly the assumption of 50 years.

According to the evidence provided/37/38/, the validation team confirmed that 20 year timeline is considered a reasonable investment horizon according to the authorities and guidelines for a hydro project in Peru. Therefore increasing the lifespan of the project for the IRR calculation and demonstration of additionality constitutes a conservative approach, which is consistent with ERM CVS's financial and sectoral knowledge.

CL06 is closed.</td><td>generators. This was validated using technical public information /28/.</td><td></td><td></td></tr>
<tr><td colspan="6">Costs (US$)</td></tr>
<tr><td>8.3.3.2</td><td>Investment costs - $35,860,860

Split $7,172,172 in year 0-0, $17,930,430 in year 0-1 and $10,758,258 in year 0-2</td><td>CL07 was raised to request the PP to clarify and support all data and values included in the investment analysis.

The breakdown of the estimated total investment cost includes:

• Civil works - $20,561,893 (direct cost) are, based on technical study for access route to project site/46a/ and signed contracts of superficial and underground works /46b/46c/ of Pizarras project developed by the same developer. The validation team verified that civil works quantities and types of construction; such as intake, tunnels, channels, pipes, power house and others quantities are equivalent and consistent with Potrero Project as stated in the 3rd party technical assessment /46k/.

• Machinery and equipment - $11,223,892 split as $9,936,689 (turbine and generators), $940,873 (substation) and $346,330 (transmission line) are based on a formal proposal to supply the Francis Turbines (i.e, two turbines of 9.95 MW each /46d/ to Potrero project and signed contracts for equipment supply and installation /46e/46f/46g/ with transmission line construction /46h/ of the Pizarras project. The validation team verified that the technical specifications and scope of work are equivalent and consistent with</td><td>The investment costs have been cross checked against the information on World Bank assessment for small hydro projects in the host country/24/.

<table><tr><td></td><td>Capacity</td><td colspan="2">Capital Cost</td></tr><tr><td>Project</td><td>MW</td><td>US$M</td><td>$M/MW</td></tr><tr><td>Poechos, Puira</td><td>15.4</td><td>16.9</td><td>1.32</td></tr><tr><td>Moche I&II, La Libertad</td><td>20.6</td><td>16.7</td><td>0.97</td></tr><tr><td>El Sauce San Martin</td><td>9.5</td><td>11.7</td><td>1.48</td></tr><tr><td>Cerro Mulato Lambayeque</td><td>8</td><td>8.7</td><td>1.31</td></tr><tr><td>Culqui</td><td>20</td><td>54.0</td><td>3.24</td></tr><tr><td>Aricota III</td><td>19</td><td>21.0</td><td>1.33</td></tr></table>The total investment cost is between 0.97 to 3.24 US$M/MW. The project costs of approximately 1.8 US$M/MW lie in the middle of the range, and are therefore considered reasonable and appropriate.

The validation team also cross checked the assumed unit cost of the project activity per MW installed against the unit costs of similar registered CDM projects (run-of-river hydropower projects implemented in South America in the range -50% to +50% of installed capacity of the project activity – 9.95 to 29.85 (9 projects, as shown in the table</td><td>~~CL07~~</td><td>OK</td></tr>
</table>

	Input parameter	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		Potrero Project description/02/ and consistent with the description in the 3rd party assessment/46k/. Construction services - $2,655,000, split as $1,262,600 (assistance) and $1,392,400 (supervision) according to a signed contract for the Pizarras project/46i/. Both projects have the same scope of work and similar conditions during the construction stage, as it could be confirmed with the 3rd party assessment/46k/. • Social responsibility – $148,643 based on a document signed by the Legal representative of Empresa Electrica Agua Azul S.A with Eduardo Villanueva Municipality/46j/, where the Potrero Project will be located. • Contingencies – $1,271,431, calculated as a 4% of the sum of "civil works" and "machinery and equipment", based on sectoral experience and confirmed with public information provided in the comparative analysis developed by the PP/47/ As described above, the key values are taken from a similar project developed by the same developer in the same region, the Pizarras project, which is currently under construction. These values are considered reliable and conservative by the validation team since the Pizarras project is a slightly smaller project than Potrero HPP (meaning that the investment costs are likely to be conservative), has the same shareholders as the Potrero Project and is located in the same geographical region, as confirmed by the validation team through the review of the 3rd party technical assessment/46k/ and checking the project description in the official technical report of the Pizarras project /40/ and the design of the Potrero project /02/ . Furthermore, ERM CVS confirmed that total investment value used in the investment analysis in the PDD is lower than the estimated investment costs stated in the legal documentation provided on the final concession approval document for the proposed project /02/ which are $37,760,000 (including taxes), and therefore the investment costs used	below). The investment costs range between USD 1.17 and 2.38 Million/MW, according to the available information in the UNEP Risoe Center CDM Pipeline, from July 2012/52/. Projects in South America were chosen to provide an additional comparison to inform the validation opinion, and are presented here merely for the purpose of transparency. The unit cost of the project plant (USD 1.8 Million/MW) is within the range of the assessed hydro projects in South America.		

	Input parameter	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		in the investment analysis are considered to be conservative. In summary, the input values applied for total investment have been validated based on evidences submitted /46/47/02/. CL07 is closed.			
	Operation and maintenance - $436,881/year	CL07 was raised to request to PP, clarify and support every data and values included into the investment analysis. O&M cost has been assumed equivalent of signed operation and maintenance contracts from the Pizarras project/49/ .This assumption is considered reasonable and credible because Pizarras and Potrero project have the same scope and type of activities during the operation; both project are run-of-river with similar capacities (18 MW vs 19.9 MW), the same type of Francis Turbine, similar hydro structures and similar electro equipment and system, which is confirmed with the technical 3rd party assessment/46k/ and official project information of both projects /02//40/ The contributions and legal obligations are fixed by regulations/15/16/20/ and the percentage of insurance has been checked with the public information provided into the comparative analysis developed by PP/47/	Taking into consideration that there is not enough host country specific information to form a reliable comparison of O&M costs, the validation team have cross checked the O&M costs against information of the International Energy Agency "Hydropower Essentials 2010" /51/ which states that the O&M costs for a run-of-river Hydropower plants in OECD countries and with an installed capacity between 10 to 100MW are normally approximately 5 to 20 USD per MWh. Thus the O&M cost of the proposed project activity (12.3 USD per MWh) is considered reasonable. Nevertheless, ERM CVS has not relied on this cross check alone to validate the O&M costs. As discussed on the left, ERM CVS has reviewed the technical report of Pizarras submitted for the concession approval /40/ and the comparative technical 3rd party assessment of Potrero and Pizarras /46k/. Therefore the O&M cost is conformed to be realistic and credible CL07 is closed	~~CL07~~	OK
	Insurance - $127,143 /year	Calculated as 0.4% of civil works plus machinery and equipment costs CL07 has been raised to clarify the rationale of the calculation. Relevant explanation has been provided. CL07 is closed.	The insurance value has been assumed from the comparison analysis of other Peruvian project which seems reasonable /47/. 0.4% of total initial investment is consistent with the average rate of Peruvian projects.	~~CL07~~	OK
	Construction Technical and Direction Services.- 2,655.000.	Based on Technical assistance contract during the construction and installation of equipment on Pizarras project/46i/. The contract is divided into items. Construction Direction and Management of project – 1,262,600 Technical supervising during	The input values applied have been validated based on evidences submitted /46i/46k/ and there is consistent with the sectoral knowledge and the characteristics of project activity.	OK	OK

	Input parameter	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		construction – 1,392,400			
	Contribution to OSINERG - $65,518/year Calculated as 1% of total revenues	Referenced to 'Decree No. 136-2002-PCM' /39/ and found to be consistent.	The applied percentage has been validated according to publicly available reference decree /39/ and is therefore considered reasonable based on ERM CVS's local and sectoral knowledge.	OK	OK
	Water Tariff - $50,236/year Calculated as 1% of energy sales	Referenced on the Law 25844 – Art 214 /11/. Values applied in the spreadsheet were found to be consistent.	It was not clear the source for this tariff. See CL07. PP clarified the sources of the applied percentage, which has been validated according to publicly available reference decree /11/ and is therefore considered reasonable based on ERM CVS's local and sectoral knowledge. CL07 is closed.	~~CL07~~	OK
	COES Tariff - $49,889/year Calculated as 0.75% of total revenues	Referenced to 'COES Administrative Procedure 8A' /16/ and found to be consistent.	This percentage of contribution to COES was validated according to the publicly available evidence /16/ and is therefore considered reasonable based on ERM CVS's local and sectoral knowledge.	OK	OK
Revenues					
8.3.3.3	Are all potential sources of revenue accounted for in the analysis?	Yes. All sources of revenues have been included in the analysis and are listed below.	See below the analysis for each input.	OK	OK
	Income for guaranteed power – USD 532.936 /year Calculated as 6.04 USD/kW of net capacity (7.35 MW) per month	The Guaranteed Power Capacity Tariff (PPM) is referenced into 'OSINERGMIN Resolution Nº 067-2011-OS/CD' /17/ and the Guaranteed Power amount comes from the TSR/02/ The 2.691 PEN/ USD exchange rate is referenced also to 'OSINERGMIN Resolution Nº 037-2012-OS/CD /17/,	The PPM tariff is fixed by OSINERGMIN and consistent to the publicly available evidence /17/ The Guaranteed Power per month is consistent with technical report/02/ and the exchange tariff also defined by the government/17/. The income from guaranteed power is therefore considered reasonable based on ERM CVS's local and sectoral knowledge.	~~CL07~~	OK
	Electricity tariff – USD 0.0466 /kWh during peak hours and USD 0.042772/kWh during off-peak hours Number peak hours 5 per day Off peak hours 19 per day	The validation team confirms that the off peak tariff (PEMF), peak tariff (PEMP) for Cajamarca Line, and the relevant exchange rate (2.691 PEN / USD) were sourced from the 'OSINERGMIN Resolution Nº 037-2012-OS/CD /17/, published by the Peruvian Supervisor Organism of Investment in Energy and Mining (OSINERGMIN), which establishes the electricity tariff for generation units in Peru, at national level,	In CAR04, the PP has been asked to justify the source and the rationale to have a fixed value for the electricity tariff. ERM CVS confirms that the electricity tariff is defined by the government /17/, which leaves no room for considering different values. Furthermore and taking into account	~~CAR04~~	OK

	Input parameter	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		between 01 May 2012 and 30 April 2013. Based on the review of the provided reference and its local and sectoral knowledge, the validation team confirms that the referred resolution /17/ is imposed on the proposed project by the government and, therefore, that the electricity tariff considered in the investment analysis is reasonable.	the purposes of the investment analysis, the tariff has been fixed during the entire assessment period and this approach is considered conservative, since the tariff is fixed periodically by the government and the forecasted tariff to 2027 would not be higher than 0.030 USD/KWh, as observed in official reports /29/. CAR 04 is closed.		
Taxes and subsidies (if applicable)					
8.3.3.4	Are there any policies, subsidies, incentives, grants, tax breaks etc that apply to any of the alternatives? Are these incorporated in the analysis?	CL08 was raised to request clarification regarding the existence of any incentive for the renewable energy sector in Peru. The revised PDD includes an explanation regarding Decree 1002 'Law of Promotion of Renewable Energy Resources (RER)' /14/, a public subsidy to promote the diffusion of renewable energy, which grants higher tariffs to awarded renewable energy projects, i.e., it is a national/sectoral policy that gives comparative advantage to less emissions-intensive technologies over more emissions-intensive technologies. Although the project may be eligible to receive a higher electricity tariff, based on the 'Law of Promotion of Renewable Energy Resources (RER)', this preferential value has not been taken into account in the investment analysis, since this regulation was published on 01 May 2008 and was considered an E-policy. It has been confirmed by ERM CVS that this law was adopted after 11 November 2001 and, as such, does not need to be taken into account in developing a baseline scenario (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place), in accordance with the CDM Project Standard. CL08 was closed	The applicability of the subsidy for renewable energy resources from by the Peruvian government was confirmed by the validation team through the review of the 'Law of Promotion of Renewable Energy Resources (RER)' /14/	~~CL08~~	OK

	Input parameter	Validation (source of the value used in the PDD financial analysis, including justification and substantiation of information, data and evidence)	Cross check (cross check of parameter against other sources or sectoral/financial knowledge, including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	Income tax rate	30% is referenced to Decree 179-2004-EF /19/ However, the rationale of income tax on EBIT was not clear in the 1st version of the cash flow. CL 09 was raised. The investment analysis has been adjusted for income tax after distribution of income to workers. CL09 is closed	Income tax has been cross checked against the relevant regulation/19/ and its calculation was corrected and calculated after distribution of income to workers (EBIT minus income to workers) consistent with the regulations/20/, providing a conservative approach.	~~CL09~~	OK
	Distribution of income to workers	5% of EBIT, referenced to Decree 892 /20/ and found to be consistent.	The application of this tax to the spreadsheet was found to be consistent with Article 2, Decree Nº 892/20/	OK	OK

8.3.4 Investment analysis calculations

As per VVS paragraph 120(d) ERM CVS has assessed the correctness of computations carried out and documented by the PPs as follows:

Spreadsheet evaluation

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.3.4.1	Has the PP supplied unprotected and traceable spreadsheet versions of all investment analysis? Have the listed input values been consistently applied in all calculations? Are the computations/ formulae correct? (this includes the computations implicit in input values, such as technical calculations of the amount of energy demanded or sold etc) From the investment analysis provided, is it possible to reproduce the results?	CL10 has been raised to review the traceability with the data into the different sections of the IRR calculation and PDD. The PP reviewed and corrected all links and references and the traceability now is possible and transparently. The PP has supplied unprotected and traceable spreadsheet versions of the investment analysis /04/, and links to evidences found to be consistent with the calculations. The results can be reproduced. The CL10 has been closed.	~~CL10~~	OK

Depreciation and residual value

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.3.4.2	Is any residual value of the project activity assets included in the analysis? Are residual value assumptions reasonable and justified and consistent with local accounting rules/international best practice/industry experience?	No residual value was included in the cash flow. However, no explanation was provided to support this approach. CL11 has been raised. ERM CVS confirms that the assumption of zero residual value is consistent with Peruvian legislation as evidenced in the document 'Ley de Concesiones Eléctricas', Decree Law 25844, article 70/11/, subsection c). CL11 is closed.	~~CL11~~	OK
	Is the depreciation consistent with the assessment period and the residual value? Are depreciation costs/ periods consistent with local accounting regulations?	CL12 has been raised to request the rationale of the depreciation rate and amend the investment analysis as applicable. PP provided relevant evidence that the depreciation rate is consistent with the actual accounting rules of the host country for machinery and equipment /21/, which was confirmed by the validation team. The depreciation rate for civil works costs are depreciated over 20 years. Machinery & equipment costs are depreciated over 10 years. This is consistent with the depreciation rates applied and the assessment period. CL12 is closed Pre-investment costs as included in the GSP-PDD are not depreciated and CAR05 has been raised. The pre-investment item has been eliminated from the investment analysis as these are sunk costs, which is consistent with the investment guidelines. Therefore, ERM CVS found this modification to be reasonable and conservative. CAR05 is closed.	~~CAR05~~ ~~CL12~~	OK
	Is depreciation correctly accounted for? (*Depreciation costs (and other non-cash items) related to the project activity should be excluded (not deducted) from net Cash Flow used for calculating the financial indicator (e.g. IRR, NPV). Depreciation is relevant only for the calculation of income tax.*)	Depreciation costs are excluded from the cash flow and are only included for the purposes of determining income tax.	OK	OK

Taxation and interest

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK

8.3.4.3	Is the treatment of taxation consistent with the chosen benchmark or discount rate? *(i.e. taxation should only be treated as an expense in the IRR/NPV calculation if the chosen benchmark or discount rate is intended for post-tax calculations?)*	CAR04 has been raised to justify the post-tax benchmark selection. Arguments to substantiate the utilization of the post-tax benchmark had been added and validation team confirmed that the discount rate of 12% is widely used in electricity sector in Peru. This has been confirmed with regulation/11/, Peruvian CDM Hydro Projects/25/ and relevant governmental public information/24/37/, where the 12% is the minimum expected return for investment in electricity sector in Peru. The reference for the benchmark /11/ was issued in 1992 and there is no more recent guidance to replace it. CAR04 is closed. The treatment of taxation is consistent with the chosen benchmark. Both the investment analysis and the benchmark are post-tax.	~~CAR04~~	OK
	For post-tax benchmarks or discount rates : a) Are interest costs included in the calculation of net taxable income and thus tax? b) Are interest costs calculated in accordance with the *Guidance on the Assessment of Investment Analysis?*	Pending the resolution of CAR04. PP has provided clarification on the selection of post-tax benchmark selection. See previous. A Project IRR post-tax benchmark is applied. a) Yes the interest payable has been taken into account in the calculations of income tax. b) Yes. Although it is clear that the Project Activity does not have debt funding arrangement, in order to comply with investment analysis guidelines the PP has incorporated assumption of interest into the analysis using loan terms agreed for the Pizarras project developed by the same developer with a similar installed capacity (18MW). This comparison with the Pizarras project is considered valid because both projects have similar capacity, are located in the same Peruvian Region (Cajamarca) and have the same shareholders. This has been confirmed with public information of the other project /42/. The Debt contract from this other project is used, however due to confidentiality conditions in the debt contract, the name of the financial institution providing the loan cannot be mentioned. Nevertheless ERM CVS has validated that sufficient information is provided in the PDD and spreadsheet to replicate the investment analysis for the proposed project activity, in line with paragraphs 12 and 13 of the PDD guidelines.	~~CAR04~~	OK
	*If a **Project IRR** has been used:* Are the costs of financing expenditures excluded from the calculation of Project IRR? *(financing costs should not be deducted from Net Cash Flow)* *If an **Equity IRR** has been used:* Is the debt portion of the investment cost excluded as a cash outflow and the interest costs and principal repayments included as costs?	A project IRR has been used. The costs of financing expenditures are not deducted from the net cash flow /04/. CAR 04 is closed.	OK	OK

Recommenced projects (Project activities where an investment decision was taken but implementation subsequently ceased)

The project is not a recommenced project (i.e. an investment decision was taken but the implementation of the project subsequently ceased, and then re-started due to consideration of the CDM benefits).

Sensitivity analysis

A sensitivity analysis has been carried out to demonstrate the impact on the IRR of variations in the key input values to the financial analysis in accordance with the *Guidelines on the assessment of investment analysis (EB62 Annex 5)*. All costs and revenues greater than or equal to 20% of total costs / revenues have been included in the analysis. The variation in each parameter needed in order for the IRR to reach the benchmark, and the likelihood of such variations taking place, are explained in the PDD. As per VVS paragraph 120(e) ERM CVS has assessed the sensitivity analysis by the PPs to determine under what conditions variations in the result would occur, and the likelihood of these conditions. ERM CVS has reviewed the calculations for the sensitivity analysis which are presented in the IRR Spreadsheet /04/ and checked whether the computations are reproduced as correct and consistent with the information presented in the PDD.

The findings of the validation of sensitivity analysis are set out below.

	Parameters >/= 20% of costs or revenues (list all)	**Is the parameter included in the PDD sensitivity analysis?**	**Is the sensitivity analysis correctly calculated and traceable?**	**Is the degree of variation reasonable ?**	**Validation of why such variation is considered unlikely, based on evidence**	**Draft conclusion** [OK/ CAR / CL]	**Final conclusion** [OK/Not OK]
8.3.4.4	Investment costs	Yes	The tax charges are not correct. – CAR06 has been raised. PP demonstrate that depreciation and taxes shall be changes according to investment. CAR 06 is closed	Yes	The variation of ±10%, applied by the PP to analyse the sensitivity of this parameter, did not make the IRR of the project achieve the benchmark The total Investment Cost to reach the benchmark needs to be reduced by 13.7%. PP provided relevant evidence, which demonstrates the prices index in Peru into the last decade have increased by 35%/43/ and one of the main implementation barrier for small hydro project is the increment of civil works expenses beyond than inflation/38/. Therefore, the validation team confirms that it is unlikely that the total investment cost could decrease by 13.7%.	~~CAR06~~	OK
	O&M costs	Yes	Yes The input values have been revised. See CAR06	Yes	The variation of ±10%, applied by the PP to analyse the sensitivity of this parameter, did not make the IRR of the project achieve the benchmark O&M costs would need to be reduced by 157% for the IRR to achieve the benchmark, which is not possible.	~~CAR06~~	OK
	Electricity tariff	Yes	Yes	Yes	The variation of ±10%, applied by the PP to analyse the sensitivity of this parameter, did not make the IRR of the project achieve the benchmark The electricity tariff would have to be increased by 17% (to 54.16 USD/MWh) during the entire assessment period for the IRR to achieve the benchmark. According to Referential Plan of Electricity 2008 – 2017 /29/, projections made by the MINEM (Ministry of Energy and Mining of Peru) indicate a reduction in the tariff in the future, with an electricity tariff around 30 USD/MWh in 2027. Besides, the electricity tariff is regulated and	OK	OK

	Parameters >/= 20% of costs or revenues (list all)	Is the parameter included in the PDD sensitivity analysis?	Is the sensitivity analysis correctly calculated and traceable?	Is the degree of variation reasonable ?	Validation of why such variation is considered unlikely, based on evidence	Draft conclusion [OK/ CAR / CL]	Final conclusion [OK/Not OK]
					fixed by the government (OSINERGMIN) /17/. As such, ERM CVS considers that it is unlikely that the electricity tariff may be increased in a way to allow the IRR to achieve the benchmark.		
	Annual electricity generation (load factor)	Yes	Yes	Yes	The electricity generation would have to be increased by 17% in average during the whole assessment period for the IRR to achieve the benchmark. Since the estimated PLF is 81%, as above validated in section 8.3.6, such increase in the electricity generation is considered not realistic.	~~CAR06~~	OK

Investment analysis conclusion

On the basis of its specific local and sectoral expertise, ERM CVS has confirmed that the input values to the investment analysis are valid and applicable at the time of the investment decision.

The PDD presents the key input parameters and results of the IRR of the project, and ERM CVS assessed the correctness of computations carried out by the PPs by reproducing the results using the IRR calculation spreadsheet /04/.

The validation team confirms that the calculations are correct, traceable, and consistent with the provided supporting documentation.

All input values used in the spreadsheet are consistent with the PDD and the supporting documentation. The calculation is in line with the *Guidelines on the Assessment of Investment Analysis*, and is considered reasonable on the basis of ERM CVS's local and sectoral expertise and financial knowledge.

The project IRR calculated in the PDD and the spreadsheet are consistent. The IRR of the project without CDM income is well below the benchmark of 12%, and hence it can be concluded that the project is not financially or economically attractive.

8.4 Common practice analysis

The proposed project activity is a large-scale project and therefore common practice analysis has been carried out as a credibility check of the other available evidence used by the PPs to demonstrate additionality. This is a test to complement the investment analysis (Step 2 of the additionality tool) to confirm that the project activity is not widely observed and commonly carried out in the region.

The project applies the additionality tool version 06.1.0. For measures covered in paragraph 6 of the tool, common practice analysis should be carried out in accordance with the requirements of paragraph 47 of the tool. The project falls under the measures listed in paragraph 6 of the tool since it involves 'Switch of technology with or without change of energy source (including energy efficiency improvement as well as use of renewable energies)';. ERM CVS used its local and sectoral expertise to assess compliance with the common practice requirements of the tool for the demonstration and assessment of additionality, paragraph 47. The tool requires the following:

Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number Nall. Registered CDM project activities and projects activities undergoing validation shall not be included in this step;

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number Ndiff.

Step 4: Calculate factor F=1-Ndiff/Nall representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.

The proposed project activity is a "common practice" within a sector in the applicable geographical area if both the following conditions are fulfilled:

(a) the factor F is greater than 0.2, and

(b) Nall-Ndiff is greater than 3.

8.4.1 Consideration of whether the project activity is 'first-of-its-kind'

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.4.1	Is the proposed project activity described a 'first of its kind'? If so, does the project comply with the 'Guidelines on additionality of first-of-its-kind project activities'?	No, the proposed project activity is not described as a first of its kind.	OK	OK

8.4.2 Geographical scope of the common practice analysis

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.4.2	Is the applicable geographical area of the common practice analysis appropriate for the assessment related to the project activity's technology or industry type? If a region other than the host country is chosen, is this appropriate?	The geographical scope is the host country "Peru". This is considered appropriate for the project type and industry. This is considered appropriate since regulatory and investment conditions vary considerably from country to country.	OK	OK

8.4.3 Comparison with similar and operational projects

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.4.3.1	In the applicable geographical area, has the PP identified all plants that deliver the same output or capacity, within the applicable output range, that	Yes, the PDD includes all the identified power plants that deliver the same output that started commercial operation before the starting date of the proposed project activity, the range include projects within 9.95-29.85 MW of installed capacity(+/-	~~CL14~~	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	started commercial operation before the starting date of the project? How have we validated the data sources, including that the list includes all relevant plants?	50%) and CDM Projects have been excluded. N_{all} = 9. However, the relevant source of the provided information was not referenced in the GSC-PDD nor provided to the validation team. CL14 was raised. In response to CL14, the PP included the references in the revised PDD and provided relevant evidence and documents to demonstrate the plant names and install capacity, which were confirmed by the validation team through the review of the provided evidence /10/. CL14 is closed. The power plants listed in the revised PDD were validated according to provided evidence /10/ and the CDM pipeline projects /25/.		
	Has the PP correctly identified those plants that apply technologies different than the technology applied in the proposed project activity?	Pending on CL14. After the closure of CL14, ERM CVS confirms that the PP correctly identified all plants that apply technologies different than the technology applied in the proposed project activity. N_{diff} = 8. CL14 is closed	~~CL14~~	OK
	Has the PP correctly calculated the factor F, in accordance with the requirements of the tool? Is the project activity common practice (The proposed project activity is a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled: (a) the factor F is greater than 0.2, and (b) Nall-Ndiff is greater than 3)?	Pending on CL14. After the closure of CL14, ERM CVS confirms that the PP calculated correctly factor F (= 0.11) in accordance with the requirements of the tool. Since F is not greater than 0.2 and $N_{all} - N_{diff}$ = 1, which is lesser than 3, the proposed project activity is not considered common practice in the applicable geographical area. CL14 is closed	~~CL14~~	OK
	Has the PP provided documented evidence and, where relevant, quantitative information to support the analysis?	Pending on CL14. After the closure of CL14, ERM CVS confirms that the PP provided documented evidence /10/ and quantitative information to support the analysis. CL14 is closed.	~~CL14~~	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.4.3 .2	Overall, has it been demonstrated that the proposed CDM project activity is not common practice?	Pending on CL14. After the closure of CL 14, yes, Based on the steps followed in order to comply with the common practice analysis according to the type of measure under paragraph 6 of the Tool for the Demonstration and Assessment of additionality. CL14 is closed	~~CL14~~	OK

Common Practice Conclusion

The proposed project is not claimed to be the first-of-its kind, therefore common practice analysis has been carried out as a credibility check to compliment the demonstration of additionality to confirm that the project activity is not widely observed and commonly carried out in the region. ERM CVS has validated that:

a) The geographical scope of the common practice analysis is justified;

b) An assessment of the existence of similar projects has been undertaken by the PPs and validated by ERM CVS

c) The project complies with the requirements of the Tool for the demonstration and assessment of additionality

d) The proposed project activity is not common practice

9 Validation Findings - Monitoring Plan and Other issues

ERM CVS evaluated the monitoring plan for the proposed project to ensure that it is based on the approved monitoring methodology that has been applied. As per the VVS section L.14, ERM CVS applied a two-step process, based on review of the documented procedures, interviews with relevant personnel, project plans and any physical inspection, to assess:

a) *Compliance of the monitoring plan with the approved methodology*::

(i) By means of document review, identify the list of parameters required by the selected approved methodology;

(ii) Confirm that the monitoring plan contains all necessary parameters, that they are clearly described and that the means of monitoring described in the plan complies with the requirements of the methodology.

b) *The Implementation of the monitoring plan*, taking into account:

(i) Whether the monitoring arrangements described in the monitoring plan are feasible within the project design;

(ii) Whether the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.

9.1 Compliance of the monitoring plan with the approved methodology

The monitoring plan in the PDD includes all parameters necessary for monitoring of this type of project in accordance with the approved methodology that has been applied for this project. The parameters are clearly described and the means of monitoring described in the plan complies with the requirements of the methodology.

9.1.1 Completeness of monitoring parameters

The monitoring parameters required by the methodology and applicable tools for this type of project are:

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)
$EG_{facility,y}$	Quantity of net electricity generation supplied by the project plant to the grid in year y	Yes, the parameter is appropriately included in the monitoring plan, as required by the applied methodology.
$EF_{grid,CM,y}$	Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"	Yes, the parameter is appropriately included in the monitoring plan, as required by the applied methodology. The parameter will be monitored ex-post yearly, according to the choices made by the PP explained in section B.6.1 of the PDD.
$EG_{PJ,h}$	Electricity displaced by the project activity in hour h of year y.	Yes, the parameter is appropriately included in the monitoring plan, as required by the 'Tool to calculate the emission factor for an electricity system', version 2.2.1 for the calculation of $EF_{grid,OM-DD,y}$.
$EG_{n,h}$	Electricity generated and delivered to the grid by power units *n* in hour *h*.	Yes, the parameter is appropriately included in the monitoring plan, as required by the 'Tool to calculate the emission factor for an electricity system', version 2.2.1 for the calculation of $EF_{grid,OM-DD,y}$.
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year y	Yes, the parameter is appropriately included in the monitoring plan, as required by the 'Tool to calculate the emission factor for an electricity system', version 2.2.1 for the calculation of $EF_{grid.BM,y}$.
$\eta_{m,y}$	Average net energy conversion efficiency of power unit m in	Yes, the parameter is appropriately included in the monitoring plan, as required by the 'Tool to calculate the emission factor for an electricity system',

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)
	year y (ratio)	version 2.2.1 for the calculation of $EF_{grid,OM-DD,y}$.
$EF_{CO2,m,i,y}$	Average CO2 emission factor of fuel type i used in power unit m in year y.	Yes, the parameter is appropriately included in the monitoring plan, as required by the 'Tool to calculate the emission factor for an electricity system', version 2.2.1 for the calculation of $EF_{grid,OM-DD,y}$.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.1.1	Are all required parameters (according to the methodology and tools) included in the monitoring plan?	There are parameters that were not clearly referenced in section B.7.1. Parameters that are not supposed to be monitored, according to the 'Tool to calculate the emission factor for an electricity system', version 2.2.1, were erroneously included. See CAR07 In response to CAR08, the PDD was revised according to the requirements of the applied methodology and the 'Tool to calculate the emission factor for an electricity system', version 2.2.1. ERM CVS confirms that all required parameters (according to the methodology and tools) were included in the monitoring plan. CAR07 is closed	~~CAR07~~	OK

Conclusion

The parameters included in the monitoring plan are appropriate for this project activity. In ERM CVS's opinion, the PPs are able to implement the monitoring plan.

9.1.2 Compliance of monitoring

For each parameter, ERM CVS has validated whether it has been addressed in accordance with the baseline and monitoring methodology.

Monitored Parameters	Parameter Names			
	$EG_{facility,y}$	$EF_{grid,CM,y}$	$EG_{PJ,h}$	$EG_{n,h}$
Parameter Description correct?	Yes	Yes	Yes	Yes
Description in line with methodology?	Yes	Yes	Yes	Yes
Data unit correctly expressed?	Yes	Yes	Yes	Yes

Monitored Parameters	Parameter Names			
	$EG_{facility,y}$	$EF_{grid,CM,y}$	$EG_{PJ,h}$	$EG_{n,h}$
Source clearly referenced?	Yes	Yes	Yes	Yes
Correct value provided for ex ante estimation?	Yes	Yes	Yes	Yes
How has this value been verified?	Yes /02/	Yes /05/10/	Yes /02/	Yes /10/
Measurement method correctly described?	Yes	Yes	Yes	NA
Measurement and recording frequency correctly described?	Yes	Yes	Yes	Yes
Correct reference to standards?	Yes	Yes	Yes	NA
Indication of accuracy provided?	Yes	Yes	Yes	NA
QA/QC procedures described?	Yes	Yes	Yes	Yes
QA/QC procedures appropriate?	Yes	Yes	Yes	Yes

Monitored Parameters	Parameter Names			
	$EG_{m,y}$	$\eta_{m,y}$	$EF_{CO2,m,i,y}$	
Parameter Description correct?	Yes	Yes	Yes	
Description in line with methodology?	Yes	Yes	Yes	
Data unit correctly expressed?	Yes	Yes	Yes	
Source clearly referenced?	Yes	Yes	Yes	
Correct value provided for ex ante estimation?	Yes	Yes	Yes	
How has this value been verified?	Yes /09/10/	/09/	IPCC	
Measurement method correctly described?	NA	NA	NA	
Measurement and recording frequency correctly described?	Yes	Yes	Yes	
Correct reference to standards?	NA	NA	NA	
Indication of accuracy provided?	NA	NA	Yes	
QA/QC procedures described?	Yes	Yes	Yes	
QA/QC procedures appropriate?	Yes	Yes	Yes	

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.1.2	Are all required parameters appropriately monitored in accordance with the methodology/tools?	PP was requested to revise and complete the monitoring plan description into section B.7, of the PDD which is not consistent with Appendix 5 in the PDD. See CAR08. Furthermore, CL15 has been raised to clarify the rationality of selection of fossil fuel emission factors. The Section B.7 has been clarified and corrected according to Appendix 5 of the PDD. Further background information on monitoring plan of the PDD and the IPCC emission factors have been supported. ERM CVS has validated the consistency of parameters included in the monitoring plan with the applied methodology and related tools provisions. CAR08 and CL15 are closed.	~~CAR08~~ ~~CL15~~	OK

Conclusion

The means of monitoring all relevant monitored parameters complies with the requirements of the methodology and applicable tools.

9.2 Implementation of the monitoring plan

ERM CVS evaluated the feasibility and sufficiency of the monitoring plan. The key components of the monitoring plan are as follows.

Operational and management structure:

The PDD contains a diagram illustrating the organisational monitoring structure to be implemented in order to monitor the project activity. Additionally a general manager in charge of operation and CDM requirements, and will be in overall charge of the monitoring system and there will be separate roles for data recording/archiving and checking meters, in order to carry out the monitoring plan.

Equipment:

Metering the net electricity supplied by the project activity to the grid will be carried out by a meter with accuracy 0.2S.

Quality Assurance and Quality Control (QA/QC) of equipment and data:

The monitoring plan described in section B.7 of the PDD states that the project owner and the grid company will record the readings of the meters monthly and all monitoring data and records will be archived in electronic format, and the meter readings may be cross-checked with available internal and/or external information, such as electricity invoices or official reports. Data will be archived and be kept for 2 years after the end of the last crediting period or the last issuance of CERs, whichever occurs later.

The PDD describes trouble-shooting procedures in the monitoring plan. In case of failure of the principal recording equipment, the secondary measuring equipment in the power plant and in the substation will continue the monitoring of the project parameters. The PDD contains sufficient description on how quality will be controlled and assured in the monitoring of emission reductions.

Feasibility of the monitoring plan:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.2.1	Are the arrangements described in the plan feasible and practical within the project design? Please consider: (a) operational and management structure, including responsibilities (b) Plans for maintenance and calibration of equipment (c) Plans for QA/QC of equipment and data (d) Installation of monitoring equipment (whether in place, or planned)	PP was request to revise and complete the monitoring plan description. Please see CAR08. The operational and organisational structure has been updated and now is considered sufficient to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified. The data management procedures are considered appropriate to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified. The revised PDD include and correct the amount, type and location of electricity meters. All parameters are consistent in the different sections, also describing QA/QC, frequency and calibration related aspects. Section B.7.3 Other Elements of the Monitoring Plan is described in accordance with the guideline for completing the project design document and complemented with the Appendix 5 of the PDD. CAR08 is closed	~~CAR08~~	OK

Conclusion

Based on the validation activities performed, ERM CVS concludes that:

(a) The monitoring plan is fully in compliance with the requirements of the methodology;

(b) The monitoring arrangements described in the monitoring plan are feasible within the project design;

(c) The means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.

The assessment conducted by ERM CVS is by means of review of the documented procedures, interviews with relevant personnel, project plans and physical inspections of the proposed CDM project activity site.

10 Validation Findings –Local Stakeholder Consultation and Environmental Impact

10.1 Environmental Impacts

As per VVS section M, ERM CVS evaluated whether an analysis of the environmental impacts of the project activity had been conducted in accordance with paragraph 37(c) of the CDM modalities and procedures.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
10.1.1	Confirm whether an analysis of the environmental impacts of the project activity has been conducted, including transboundary impacts, and if those impacts are considered significant by the PPs or Host Party?	Not applicable. The Crisnejas River does not cross any international boundaries and hence the project has no trans-boundary impacts. Nevertheless, the project owner is developing an environmental impact declaration for the proper management of any environmental impact that has been submitted to the DOE /03/.	NA	N/A
	Has the PP conducted an environmental impact assessment if required to do so by the host Party, in accordance with the Party's procedures?	CL16 was raised for the PP provided an explanation and evidences that let ERMCVS confirm that the environmental impact assessment is not required by the host country. Electric Concessions Law/11/ Article 38, states that environmental impact assessment is not required for renewable energy projects with less than 20 MW of installed capacity. Section D of the PDD includes the potential environmental impacts identified by the project participants which are not considered to be significant /03/ CL16 is closed. Nevertheless the PP made an environmental impact study, " environmental impact declaration", in order to analyze the potential impacts of the project and manage them appropriately /03/.	~~CL16~~	OK

Conclusion

It was confirmed that no environmental impact assessment is required by the host Party. However, an environmental impact declaration assessment /03/ has been prepared in order to obtain the definitive concession. From the reference evidence it is concluded that environmental impacts are not considered to be significant and that an environmental management measures been included in the assessment in order to minimize the potential impacts.

10.2 Local Stakeholder Consultation

As per VVS section N, ERM CVS evaluated whether the project participants have completed a local stakeholder consultation process and that due steps were taken to engage stakeholders and solicit comments for the proposed project activity.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
10.2.1	Have comments from relevant local stakeholders been invited prior to the publication of the PDD on the UNFCCC website?	During the site visit and interviews with the representatives of the communities /IV1//IV2/ ERMCVS has confirmed that the local stakeholder consultation was held in the main church of Eduardo Villanueva Municipality, on Wednesday 14th, 2012, a summary of the comments including pictures of the event checked /22/.	OK	OK
	Is the summary of comments received as provided in the	As a result of CAR09, the PP provided a clear description in the PDD as well as evidences /22/ regarding how the stakeholder consultation process was carried	~~CAR09~~	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	PDD complete?	out and the resulting comments. According to the onsite interviews/IV1//IV2/, the attendants understood the basics of the project and its environmental impacts and could clarify their concerns. These were mainly about the support that is going to be provided to the communities (infrastructure, jobs) and some concerns such as impacts on the water. Some others were interested in the scope of the proposed project in order to confirm that this is not another goldmine projects. Goldmine projects are not well accepted by the communities. The public comments received during the public meeting and knowledge of project activity development could be confirmed on site visit with a valid representative of the Eduardo Villanueva community /IV1/IV2/. CAR09 is closed.		
	Has due account been taken of any stakeholder comments received and is this adequately and clearly described in the PDD?	After CAR09, ERM CVS confirmed that evidences have been provided in order to substantiate the stakeholder process /22/ CAR09 is closed.	~~CAR09~~	OK

Conclusion

Based on the document reviews undertaken and interviews with local stakeholders, ERM CVS concludes that relevant local stakeholders were invited to comment on the project prior to publication of the PDD on the UNFCCC website, and that the consultation undertaken is adequate in the context of the project. The stakeholders did not identify any serious concerns or significant negative impacts from the construction of the project. ERM CVS has therefore validated that the local stakeholder consultation is adequate.

10.3 Public funding

ERM CVS evaluated whether the information relating to public funding in the PDD Annex 2 has been correctly presented.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
10.3.1	If the project involves public funding from an Annex 1 country, have the annex 1 parties involved provided an affirmation that such funding does not result in a diversion of official development assistance?	CL17 has been raised to request to PP to provide evidence to prove that the project does not involve any Annex1 public funding. PP provided evidence /45/ in order to confirm that the project does involve public funding from an Annex 1 country. No annex 1 parties are involved in the proposed project activity. CL17 is closed	~~CL17~~	OK
	Is the information provided on public funding (PDD, Annex 2) provided in compliance with the actual situation or planning as available by the PPs?	After CL17, the validation team confirmed that Annex 2 is in line with the submitted evidence /45/. CL17 is closed	~~CL17~~	OK

Conclusion

ERM CVS has confirmed that there is no public funding from Annex 1 countries, applied to the proposed project activity.

Appendix A: Documents and Interviewees

A.1 DOCUMENT LIST

Reference number	Date	Document Title and version number (if applicable)
01	04 May 2012 18 July 2012 16 August 2012 22 August 2012 21 September 2012 11 October 2012 17 October 2012 23 October 2012	**Project Design Document** for the proposed project Version 01 (for GSP) Version 02 Version 03 Version 04 Version 05 Version 06 Version 07 Version 08
02	04 May 2012	**Technical Study Report (TSR)**, Empresa Electrica Agua Azul S.A. – Legal document to request the final concession to power generation of Potrero Hydro Project. Evidence of submission by PP to authorities in 04/05/2012 (See /35/)
03	April 2012	**Environmental Impact Declaration** Environmental Impact Declaration for the Potrero Hydropower Plant. May 2012, developed by O. Y. Ingeniería E.I.R.Ltda,
04	23 October 2012	**IRR calculation spreadsheet** (Version 09) 23-10-12
05	27 August 2012 22 October 2012	**EF and ER calculation spreadsheets** Version 3 EFgrid-DD-CM August 2012 Version 3 ER Potrero V 3 22-10-12
06	09 July 2012	**Host Country Letter of approval** for the proposed project issued by MINAM, Peru - LoA - for Potrero From Peruvian DNA_ MINAM
08	17 July 2012	**Modalities of Communication**. MoC Potrero Hydroelectric Plant, Peru
	Evidences and Support documents to cross check	
09	2012	2011 Annual Report of Operative Statistics of National Interconnected Electricity Grid
10	2012	Centre of Information of National Interconnected Electric Grid (SEIN) provided by COES (Comité de Operación Económica del SEIN) http://www.coes.org.pe/wcoes/coes/infoperativa/mapasein.aspx (Map)

Reference number	Date	Document Title and version number (if applicable)
		http://www.coes.org.pe/wcoes/coes/estadistica/EstadisticaMensual.aspx (Monthly Statistics) http://www.coes.org.pe/wcoes/coes/salaprensa/estadistica_anual.aspx (Annual Statistics)
11	May 2010	Law 25844 Electric Concessions Law – Peru http://www.minem.gob.pe/minem/archivos/file/Electricidad/normatividad/dl25844.pdf
12	November 2010	Ministry of Energy and Mines – Republic of Peru- Terms of Reference developed by for Rural Electrification Projects http://dger.minem.gob.pe/ArchivosNormasTecnicas/TR-Perfil_Integrado.pdf
13	June 2012	Central Bank of Peru (Banco Central de la Reserva del Perú) Inflation Report 2012 - 2014
14	01 May 2008	Decree No. 1002 for promotion of power generation base on renewable sources in Peru. (Decreto Legislativo No. 1002)
15	24 December 2002	Decree No. 136-2002-PCM, for contribution of project activity of 1% of revenues to OSINERG http://www.osinerg.gob.pe/newweb/uploads/JARU/CD/008fiscalizacion/ds136-2002-pcm.pdf
16	22 October 2008	COES (Committee of Economic Operation of the System) Administrative Procedure 8A of COES tariff – 0.75% of revenues. http://www.coes.org.pe/dataweb2/2008/DO/PROCEDIMIENTOS/Proced_admin_8a.pdf
17	01 April 2011	OSINERGMIN Resolution Nº 037-2012-OS/CD. Fixed prices applicable for the period between 01/05/2012 and 30/04/2013. http://www2.osinerg.gob.pe/Resoluciones/pdf/2012/OSINERGMIN%20No.037-2012-OS-CD.
18	14 October 1997	OSINERG Resolution of the Comission on Electrical Tariffs No. 024-97 P/CTE http://www2.osinerg.gob.pe/Resoluciones/1997/24-1997.html
19	08 December 2004	Decree No. 179-2004-EF – Law of Income Tax – Cap VII Article 55 http://www.sunat.gob.pe/legislacion/renta/ley/capvii.htm
20	01 January 1997	Decree No. 892 (Decreto Legislativo) Distribution of incomes for workers. (5%) http://www.mintra.gob.pe/contenidos/archivos/prodlab/D.%20Leg.%20892%2011-11-96.pdf
21	09 July 2011	Decree No. 136-2011-EF Article 5 – Depreciation rules. http://www.sunat.gob.pe/legislacion/renta/regla/cap6.htm
22	 28 February 2012 02 March 2012 14 March 2012	Local Stakeholder consultation a. Invitation to Stakeholder presentation b. Newspaper announcement c. Stakeholders presentation (1 and 2) *Project Description CHP PAguirre PPT*

Reference number	Date	Document Title and version number (if applicable)
		LSC- Climate change and CDM PPT *LSC - Record of the workshop*
23	April 2011	Public announces to formal initiation process of Water Concession into the Crisnejas River. Municipality of Crisnejas and ANA
24	May 2011	World Bank Group, Energy Sector Management Assistance Program (ESMAP), Peru Opportunities and Challenges of Small Hydropower Development
25	01 August 2012	UNEP Riso Centre, Jorgen Fenhann, CDM Pipeline
26	14 March 2012	LSC meeting reports a. Minute of LSC Meeting b. Ecoresources Report.
27	06 September 2012	MINAM confirmation of LoA authenticity - RE Confirmación LoA Potrero Hydropower Plant Perú (outlook e-mail file)
28	Website information	Lifetime of Francis Turbine and generator: http://sclida.en.alibaba.com/featureproductlist.html http://es.tradekey.com/product_listall/uid/5737627.htm http://sclida.en.alibaba.com/product/504927309-209843737/Turbine_with_synchronous_generator.html.
29	2009	MINEM – Referential Plan of Electricity Sector to 2008 – 2017 years. Perspectives for Electricity market into the future.
30	March 2012	Kiev Asociados SAC. Pre-Operative Studio Volume I and Volume II
31	29 December 2011	ANA´s Approval of Hydrological Study for Empresa Eléctrica Agua Azul S.A
32	17 February 2012	Prior consideration UNFCCC
33	17 February 2012	Prior consideration to Peruvian DNA
34	14 February 2011	Contract services between EcoRessources and Agua Azul contract for Potrero Project.
35	04 May 2012	Evidence of the formal submission to the Ministry of Energy and Mines (MINEM) for the definitive concession approval
36	24 May 2012	Letter for submission of the LoA file to the Peruvian DNA (MINAM)
37	June 2011	Investment guidelines for investment in rural electrification projects in Peru -MINEM
38	March 2011	Energy Sector Management Assistance Program ESMAP- Peru Opportunities and Challenges of Small Hydropower Development
39	26 December 2002	Decree No. 009-93-EM' article 214. http://www.osinerg.gob.pe/newweb/uploads/JARU/CD/008fiscalizacion/ds136-2002-pcm.pdf
40	December 2010	Pre Operation Study Las Pizarras 2010- Official Document to approval of connextion to the SEIN grid.

Reference number	Date	Document Title and version number (if applicable)
41	22 October 2008	ttp://www.coes.org.pe/dataweb2/2008/DO/PROCEDIMIENTOS/Proced_admin_8a.pdf
42	28 May 2012	Empresa Eléctrica Agua Azul S.A. project information. Details of Shareholders of Empresa Electrica Agua Azul S.A. http://www.aluzcleanenergy.com/en/
43	Website information	National Institute of Statistics and Informatics (Instituto Nacional de Estadística e Informática – INEI) http://www.inei.gob.pe/web/aplicaciones/siemweb/index.asp?id=003
44	Website information	CDM Porject Las Pizarras Project – Validation http://cdm.unfccc.int/Projects/Validation/DB/LVI6PGAV0UZ6YW2VLH7Z8XTBIWN1YK/view.html
45		Confirmation that the party involved will not apply public funding to the proposed project activity - Annex I funding
46	 February 2012 07 July 2011 02 May 2011 18 April 2012 28 December 2011 29 February 2012 28 December 2011 03 February 2012 20 June 2011 26 January 2012 November 2012	Investment costs a. Definitive study access and campsite Vera y Moreno S.A. b. Contrat OC 0002 Superficial civil works with ERD S.A. c. Contrat OC 0001 Underground civil works with ERD S.A. d. Francis Turbine supplier e. Contract EM 0002-2011 overhead travelling crane - ERD S.A f. Contract CON PER CH PIZ EQP 001 0-ERD S.A - electrical panels g. Contract EM0003 butterfly valve - ERD S.A. h. Contract OC 0003 - ERD S.A - Transmission line construction i. Technical assistance contract on the similar project developed by the same developer j. Project Activity Social Investment Plan signed by Legal Representative with Eduardo Villanueva Municipality k. O.Y. Ingenieria E.I.R Ltda “Comparative assessment between Potrero and Pizarras projects and technical assessment of the input values in the investment analysis of Potrero project.
47	August 2012	Technical Analysis to define rates and tariff selected for Insurance and Contingencies Items according Peruvian CDM Project.
48	2011	a) Contract of long term loan conditions between a International Financial Institution with project developer where Empresa Electrica Agua Azul S.A. is the main shareholder, for a similar hydropower project recently developed with a similar installed capacity (18MW) to the proposed project activity. b) The 6 last months Libor value (2012) http://indicadoreseconomicos.bccr.fi.cr/indicadoreseconomicos/Cuadros/frmVerCatCuadro.aspx?id

Reference number	Date	Document Title and version number (if applicable)
		ioma=1&CodCuadro=%20342
49	10 May 2012	O&M Cost : Preventive Operation and maintenance contract with Duke Energy Egenor S en C por A.
50	23 August 2011	Second Public Tender to Supply Electricity with Renewable Energy Project in Peru. http://www2.osinerg.gob.pe/EnergiasRenovables/EnergiasRenovables.html
51	Webpage information	International Energy Agency "Renewable Energy Essentials 2010: Hydropower"
52	July 2012	UNEP Risoe Center CDM Pipeline, CDM Hydro comparable projects, South America.
53	27 July 2011	Law text IGV and ISC 16%- Supreme Decree N° 055-99-EF Article 17
54	11 November 2004	Municipal Tax Law - Supreme Decree N° 156-2004-EF Article 76

A.2 INTERVIEWS

Reference	Name	Title & Organisation	Main topics discussed
IV1	Fanuel Urbano Vargas	President of the Comunnity / Community of Chirimoyo	• Stakeholder consultation • Perception of environmental impacts • Social conflicts • Public audience and local inhabitant's concerns
IV2	Victor Eduardo Alamo Iparraseno	Major / Eduardo Villanueva Municipality	• Stakeholder consultation • Perception of environmental impacts • Social conflicts • Public audience and local inhabitant's concerns
IV3	Nelsi Isabel Malaga Cueva	CDM Consultant / Ecoresources Carbono	Project design, technology, timelines, monitoring. PDD, additionality demonstration, emissions reductions and EF calculations, monitoring plan. Environmental permits and regulations
IV4	Pompeyo Aguirre	Project Owner / Empresa Electrica Agua Azul S.A.	Project design, technology, timelines, financing, monitoring. Environmental permits and regulations

Appendix B: Remediation Form

Corrective Action Requests (CARs), Clarification Requests (CLs) and Forward Action Requests (FARs)

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
CAR01 The Modalities of Communication and Host Party LoA have not yet been provided.	5.1.1. 5.1.2. 5.1.3 5.1.4 5.2.1 5.3.1 5.4.1	The Modalities of Communication and Host Party LoA has been submitted. The MoC has been signed by the project participant. *Ref Doc 61. MoC Potrero* The LoA was approved on July 19th, 2012. *Ref Doc 60. LoA - for Potrero From Peruvian DNA_ MINAM*	The MoC as per the "F-CDM-MOC" format was submitted to the validation team in a scanned version, signed and dated 17/07/2012./08/ Consistently with the statement provided in Section G of the PDD, a scanned version of the LoA issued by the MINAM and dated 09/07/2012 was submitted to the validation team. /06/ The authenticity has been confirmed by Validation team through DNA communication/27/ CAR01 - Closed
CAR02 There is no clear description into the PDD of the relevant national regulation or sectoral policies related applicable to the project activity development.	7.4.1	The main national and sectoral regulation is the Electric Concessions Law as listed and detailed in Sub-step 1b section "B.5. Demonstration of additionality". The Peruvian electric market is ruled by the Energy Concession Law 25844 since 1992. In addition it has been added the Regulation for Environmental Protection in Energy Activities N°29-94-EM that regulates the environmental conditions in the electric market and the Legislative decree 1002 from 2008 that sets conditions to potentially introduce non-conventional renewable energy sources in the grid. *Ref Doc 62. SD 29-94 EM - Environmental Protection in Energy Activities*	The relevant national regulation and sectoral policies are discussed properly in the revised PDD. The validation team confirmed with official sources that the law for promotion of power generation based on renewable sources in Peru /14/, entered into force on 01 May 2008.

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		---------- The new version of the CDM – PDD has consider the regulations mentioned in section "Description of baseline scenario" into the Sub-step 1b of Additionality section.	 CAR02 is closed.
CAR03 The calculation of emission factor for relevant electricity system is not clear and the data cannot be traceable. Serious inconsistencies on data have been found during the validation and there are no clear references. Please revise, complete and correct. .	7.5.2 9.1.2	The grid emission factor spread sheet references has been updated with the recently uploaded Statistical Report of 2011 by COES. The spread sheet has been revised and all the references of 2010 have been changed. These were editorial mistakes in the model since the 2010 version was updated with 2011 information from COES. All the input values are from the SEIN operation of 2011 as can be contrasted with the raw data submitted to the validation team. **Build Margin Calculation – Worksheet "EF_Grid_BM"** • The links have been updated. • The reference related to "COES Annual Statistics Reports (2006-2010) were updated in order to reference the respective charts of COES – Annual Statistics 2011. • Inconsistencies related to the COES entering date and installed capacity of the power plants have been modified according to the evidence provided (COES – Annual Statistics 2011). • Formulas in the mentioned cells where corrected. **Worksheet SEIN Power Plants EF** • Formulas in cells E89:E137 where corrected, in order to be consistent with results for Residual 500. • Considering that the power plant referred for the EF in cell D63 is a hydroelectric	ERM CVS confirmed that all and data referenced in the PDD and ER spreadsheet to calculate the emission factor for electricity system in Peru in 2011 comes from official reports of the Centre of Information of National Interconnected Electric Grid (SEIN) provided by COES (Comité de Operación Económica del SEIN)/10/. The spreadsheet and model of emission reduction /05/ has been corrected and completed. ERM CVS cross-checked with the public information of Peruvian electricity market/10/ and CDM Pipeline/25/ CAR03 – Can be closed

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		power plant, its EF is 0. • Cell D136, Tumbes Diesel efficiency data is correct, according to the COES Annual Statistic 2011. Chart N°6.8. The technology is diesel and uses Residual 6. Cross check this information with COES – Annual Statistics 2011, Chart N° 3.1. **Worksheet JAN (January)** • Dispatch data in both cells J752 and S752, corresponding to Bella Vista Alco and Bella Vista Man power plants, respectively, does not appear in the mentioned evidence because both power plants did not operate in year 2012 (January to December). This can be contrasted with the following evidence: COES – Annual Statistics 2011, Chart N° 5.7B. In addition, all the dispatch data for every month was contrasted with: *COES – Annual Statistics 2011, Chart N° 5.7B* and *folder 1) Despacho horario de plantas*; being consistent. • The data in Cell BK752 January, appears in evidence "Despacho horario de plantas", contained in folder 1), being the sum of Cells ES2986 and EU2986. It is important to consider that the Arcata power plant integrates the following power plants: Huayllacho, Misapuquio, San Antonio, and San Ignacio. This can be seen in COES – Annual Statistics 2011, Chart N° 5.19, Note 1, http://www.snpower.com.pe/images/Arcata_factsheet_tcm121-18510.pdf, and http://www.snpower.com.pe/operaciones/centrales-de-produccion/arcata/. Therefore, in order to obtain the dispatch data of the Arcata power plant, the dispatch data of the mentioned power plants (obtained from sheet GENERACION SICN of the Excel files contained in folder 1) Despacho horario de plantas) must be added together.	
CAR04 The investment analysis and the benchmark selection in the GSP PDD are not consistent.	8.3.3	A Project IRR post-tax is used, based on: Article 79 of the Law Decree 25844 for electricity concessions establishes a rate of return on investments of no less than 12%. If we consider an investment with 100% equity, the rate of return would be equal to the return on equity, and the return on	Arguments and evidences to substantiate the utilization of the selected benchmark had been added to the PDD, "Sub-step 2.b: Option III. The validation team confirmed that the discount rate of 12% is

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Please correct		equity is, by definition, the amount of net income returned (and net income is obtained only after tax deduction). *Ref Doc 14. Law 25844 – Electric Concessions Law* Deducting the yearly income tax payment reflects a real cash outflow that should be considered in the analysis as it represents a yearly expense that must be paid by the project if it is to operate in the country. This expense could make the difference of whether to invest or not in such project in the country. Considering 12% as a benchmark IRR before tax deduction would mean that the benchmark IRR after taxes would be around 8.4% which is a low benchmark for an investor to use, and therefore not a reasonable assumption. A reasonable assumption is that an investor is risk adverse by nature and will demand a higher rate of return for an investment. The common practice of other hydroelectric power plants in Peru, including the ones that have been registered under the CDM, is to consider the tax expense and apply the benchmark IRR after the deduction. All the registered projects' validation reports analyze and support the use of this benchmark applied post-tax. The nominal cash flow was converted into a real cash flow in order to use the real IRR benchmark selected. The inflation rate used was the one provided by the Peruvian Central Reserve Bank, according to *Ref Doc 59. Inflation Report - June 2012 page 2*. The only individual cash flow that could be inflated according to the general inflation rate is Operation and Maintenance – preventive. The other individual cash flow data could not be inflated due to the following reasons: • Energy Sales: A forecast of the Marginal Costs in the energy system developed by the Ministry of Energy and Mines (MINEM), was intended to be used in order to determine the electricity price in the project evaluation (according to subsection d) Article 47 of the Concession Law, the basic price of the energy will be determined by horary blocks for the studied period, like a weighted average of the marginal costs calculated before and the demand, properly updated for the corresponding year; Evidence can be found at page 27 of "Ref Doc 14. Law 25844 – Electric Concessions Law" and page 167 of "Ref Doc 52. MINEM - Reference Electricity Plan	widely used in power generation and grid dispatch projects in Perú, registered as CDM at UNFCCC, stated at Article 79, Law 25844/11/. Furthermore, there are solid public information, such as terms or references for rural electric project and energy project, where the 12% discount rate reflects a reasonable post-tax benchmark for the local context and sector. Furthermore, the PP justified that the assumption of post-tax Project IRR assumption are equivalent and consistent with the guidelines of investment analysis based on the assumption that the project activity would have the same conditions of financing as the Pizarras project, also developed by Empresa Eléctrica Agua Azul S.A. (the main shareholder in the proposed project activity). ERM CVS confirmed that the comparison with Pizarras project is valid based on the fact that both projects have similar capacity, are located in the same region (Cajamarca) and have the same shareholders. This has been confirmed with official technical reports/40/ and cross-checked with public information about the Pizarras project /42/ The investment analysis calculation spreadsheet has been updated considering inflation in order to carry out the assessment considering a real cash flow. The inflation of 2%. ERM CVS

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		2008-2017"). Since the forecast tariff is expected to be lower than USD 30 per MWh (USD 0.03 per kWh), the existing tariffs of USD 0.0466 per kWh for peak hours and USD 0.042772 per kWh for off-peak hours where used as a conservative approach, because these are higher than the forecasted by the MINEM. Both tariffs were fixed prices determined by OSINERGMIN, applicable for the period between 01/05/2012 and 30/04/2013, in the respective generation bar, or connection point, to the grid (in Cajamarca). Evidence can be seen at http://www2.osinerg.gob.pe/Resoluciones/pdf/2012/OSINERGMIN%20No.037-2012-OS-CD.pdf Likewise, the tender tariff was revised at the sensibility analysis in the PDD, in order to demonstrate that, even if the project developer could access to a Renewable Energy Resources (RER) auction and win it (despite the reasons given in the PDD of why it is highly possible that the project developer could not win), that tender tariff that he could access at, would not be enough to reach the Project IRR benchmark. A calculation of an interquartile range of the bidding prices of the second RER auction was made in the PDD, to determine the potential tariff for the Project. These prices were obtained from OSINERGMIN (entity responsible of the RER auctions) and can be seen at http://www2.osinerg.gob.pe/EnergiasRenovables/EnergiasRenovables.html Income from guaranteed power: It is revenue obtained from the guaranteed power multiplied with the Guaranteed Power Capacity Tariff. The plant guaranteed power it is a fixed energy supply, calculated following the Regulation of the Electric Concession Law, and approved by the Ministry of Energy and Mines. Likewise, the Guaranteed Power Capacity Tariff is a fixed tariff determined by OSINERGMIN. Evidence can be seen in: Ref Doc 02. File submitted to the Ministry of Energy and Mines (MINEM) for the concession approval; and http://www2.osinerg.gob.pe/Resoluciones/pdf/2012/OSINERGMIN%20No.037-2012-OS-CD.pdf • Insurance: It is a percentage of the initial investment (1%). Based on project developer experience and electric market information. Ref Doc 69. Insurance and	consider valid, reasonable and conservative according to the public inflation rate perspectives in Peru/13/. Furthermore, the PP has provided a clear description with supporting evidence to demonstrate why is not possible to inflate each individual cash flow, as follows: The assumption of fixed value for electricity, ERM CVS was able to confirm that the electricity tariff is conservative due to the fact that 46,6 USD/MWh is higher than the forecasted tariff by the government (30 USD/MWh). This has been checked with official reports of MINEN/29/. The possibilities of preferential tariff based on the Law for promotion of Renewable Energy Resources (RER) /14/ has not been taken into account due to the fact that this regulation belongs to E-policies type, therefore it may not be taken into account, consistent with the information note on the implementation for E+/E- in the context of projects (EB53 Annex32) Furthermore, canons, contributions and legal obligations are fixed by regulations. This has been confirmed with the regulations/15/16/20/ and the percentage of insurance has been checked with the public information provided into the comparative analysis developed by

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		Contingency Benchmarks • Contribution to OSINERG: It is a percentage of the revenues (1%). Supreme Decree No. 136-2002-PCM, dated 24/12/2002. Can be found on http://www.osinerg.gob.pe/newweb/uploads/JARU/CD/008fiscalizacion/ds136-2002-pcm.pdf • Water Canon: It is a percentage of the energy sales (1%). Evidence can be found in Rulebook of the Law 25844 – Electric Concession Law "Ley de Concesiones Eléctricas", Article 214. http://www2.osinerg.gob.pe/MarcoLegal/pdf/REGLACE.pdf • COES tariff: It is a percentage of the revenues (0.75%). Evidence can be found on COES (Committee of Economic Operation of the System) Administrative Procedure 8A. http://www.coes.org.pe/dataweb2/2008/DO/PROCEDIMIENTOS/Proced_admin_8a.pdf • Distribution of income to workers: It is a percentage of the income before taxes (5%). Law 892 (http://www.mintra.gob.pe/contenidos/archivos/prodlab/D.%20Leg.%20892%2011-11-96.pdf), Artículo 2 Therefore, only the individual cash flow related to *Operation and Maintenance – preventive* was inflated according to the general inflation rate, because there is no evidence of a specific inflation rate for it.	PP/47/, which is consistent with the sectoral knowledge. CAR 4 can be closed.
CAR05 Pre-investment costs are not depreciated and carry a residual value of zero. Furthermore the interest cost has not been included into the calculation of net taxable	8.3.11	According to the "Guideline on the assessment of investment analysis", paragraph 6: Any expenditures occurred prior to the decision to proceed with the investment in the project (pre-investment costs) will not impact the final investment decision as such expenses sunk costs which remain unaffected by the decision to proceed or not with a project activity. Therefore, pre-investment costs are not considered in the investment analysis as a conservative assumption for this project activity. According to the investment conditions, in *Sub-step 2d: Sensitivity analysis* of the PDD, this specific kind of project has limited access to the national financial market, as there	The exclusion of pre-investment costs is both in line with paragraph 6 of the Guidelines on the assessment of investment analysis and conservative. ERM CVS confirms that the assumption of zero residual value is consistent with Peruvian legislation as evidenced in the document Law 25844/11/, article 70,

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
income. Please amend the analysis as appropriate		are limited interest of commercial banks in financing small-scale projects due to extremely strict risk assessments and high transaction costs, based on the "ESMAP (2011) *Peru Opportunities and Challenges for Small Hydropower Development (Ref Doc. 33)*. Therefore, there is a possibility that PP does not access to financial debt. Furthermore, PP do not know if it will request to access financial debt and the conditions of any potential future financial offer. --- As mentioned before, the project faces a limited access to the national financial market, because it is considered to be a high risk project. This is supported by Ref Doc 33 .ESMAP 2011. Furthermore, PP does not have any debt contract subscribed with any financial entity nor has formally request loans to any national or international entity therefore there is no formal evidence at this moment. The project developer does not know if the project will have access to any financial support. As a conclusion, there cannot be any evidence to support if the project will include any debt for funding, having no clear parameters to take into account for any debt scenario. This is why the PP is taking a conservative posture and considering a scenario where it will be funded with 100% private capital, eliminating any arbitrary debt parameter. As mentioned, there is no evidence that support either the assumption that the project will be funded with 100% equity or it will have a portion financed by debt. However the other project in development by Empresa Eléctrica Agua Azul S.A. already has a loan approved for another similar hydropower project, the Pizarras project, with a similar installed capacity in the same region with an international entity, and if a loan is approved for the proposed project activity it will be most likely with the same financial institution and with similar conditions. The parameters in Pizarras loan contract were used in the project evaluation, in order to comply with the CAR request and consider the discount interest payable in the calculation of income tax. These parameters introduced in the evaluation are: - Debt percentage on investment. - Interest rates.	subsection c). Evidence has been provided to support the assumption that the project will not be funded 100% by equity. The PP has stated that there is currently no debt funding arrangements in place for the project activity/38/. However, in order to comply with CDM requirements the PP has incorporated interest into the analysis using loan terms agreed for the 18 MW Pizarras hydropower project in the host country, which is comparable project due to its size, location and shareholders. ERM CVS has validated the input values relating to loan interest using the evidences provided/48/. It has been confirmed that the input values used in the analysis are reasonable, appropriate and conservative based on the evidences provided and ERM CVS' understanding and expertise. CAR05 is closed

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		- Debt terms. - Debt proportion over total debt (total debt is 60% of the investment, and it was financed in two parts). All the parameters where introduced in the "Inputs" sheet of the Cash flow of PP and can be observed in the following document "Ref Doc 70. 6 month Libor" These parameters where used because of the similarities that both projects have and more important, because both projects have the same shareholders. Therefore, the decisions made regarding financing and access to service debt will be very similar. See "Aluz Co and Empresa Electrica Agua Azul" to confirm the participation of Aluz in the project. This familiarity is the reason why we have access to all Las Pizarras information. Even when the project has no formal debt approved, Las Pizarras reference information is a formal, real, and appropriate reference data applicable to the project activity. In this scenario the project is still additional. The Pizarras project is now around a MM USD 50 total budget, but Potrero project activity is considering conservative assumptions and optimistic scenario alternatives in order to be conservative in the IRR spreadsheet.	
CAR06 The depreciation assumptions are not correct and sensitivity analysis is not consistent with the standard degree on investment analysis. Please review and adjust. The O&M cost calculation is not correct.	8.3.13	In the IRR Excel file a change was made in the initial investment sensitivity analysis, taking in consideration that a percentage change in the initial investment will affect the depreciation amounts. Therefore, a percentage ratio was used to reflect this change in the respective depreciations. A formula in the cells E123 and E124 in the SA sheet was created. This formula multiplies the respective ratio by the initial investment changed and the appropriate depreciation factor. This change is also reflected in the PDD. The O&M costs have been updated according to new information of the project. This can be seen in the Excel file "*Ref doc 17. Project Budget Potrero*", where the following documents can be found: *Ref Doc a. "Definitive study access and campsite Vera y Moreno S.A.", Ref Doc b. "Contrat OC 0002 Superficial civil works with ERD S.A., Red Doc c. "Contrat OC 0001 Underground civil works with ERD S.A.", Ref Doc d. "bfl*	The sensitivity analysis presented considering variations of Initial Investment Costs, Running Costs, Electricity Tariff and Annual Electricity Generation (variations to the load factor). The values resulting from the spreadsheet SA workbook calculations are consistently reflected in the PDD. As reflected in the PDD, the degree of variation applied in the SA worksheet to the parameters subjected to change, is always over +/-

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		proposal annexure -I", Ref Doc e. "Contract EM 0002-2011 overhead travelling crane - ERD S.A", Ref Doc f. "Contract CON PER CH PIZ EQP 001 0-ERD S.A - electrical panels", Ref Doc g. "Contract EM0003 butterfly valve - ERD S.A.", Ref Doc h. "Contract OC 0003 - ERD S.A - Transmission line construction, Ref Doc i. "Pizarras Technical assistance contract", Ref Doc j. "Contract O & M", Ref Doc k - Operation and Maintenance Costs Budget", and Ref Doc l. " Social Investment Plan". --- The spreadsheet have been updated in order to be consistent with the 0.0% simulation and, therefore, with the initial cash flow. Due to the prior changes in the first and second cash flows, the numbers referenced to the cells where incorrect. The mentioned changes in the initial investment sensitivity analysis can be seen in the rows named "Civil Works" and "Machinery", related to the Depreciation. This can be identified in the cash flow named "Change in initial investment" (Lines 110 to 144), that is in the SA sheet of the IRR Excel file. In regard of the O&M costs: - The value S/. 1'510,384.23 it is not included in the value referred as Total Project Cost of S/. 10'740,080.36. The first value refers to the cost of implementing a direct road from the existing asphalt road to the shore of the Crisnejas River as can be seen in Ref Doc m. Direct road cost. Ref Doc m considers two alternatives and the cheapest one was selected for the project evaluation. As for the value S/. 10'740,080.36, it refers to the access road from the Shore of Crisnejas River to the intake, tunnel, load chamber and power house, as can be seen in Ref Doc n. Access road cost - project facilities. - Ref Doc 70. Comparative table Pizarras - Potrero facilities shows a detailed list of similarities between Pizarras project and Potrero project, justifying the values used. The Pizarras tunnel length is taken into account in the cost of the Potrero tunnel by the follow: the length of Potrero tunnel is 1/3 of the length of the tunnel of Pizarras,	10% in order to reach the benchmark. Regarding the Initial Investment cost variations, it was confirmed that carrying out a variation to the initial investments, both depreciation and tax shall be changed too. Furthermore, content inconsistencies into the IRR spreadsheet were corrected. All O&M costs have been clarified and updated in the IRR calculation model. It has been confirmed that the input values used in the analysis are reasonable, appropriate and conservative based on the evidences provided. See the section 8.3.3 for validation details CAR06 – Can be closed

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		therefore, it is considered the same fraction of the cost of Pizarras tunnel, to estimate the cost of Potrero tunnel (taking into account that all other characteristics all similar). As for the 0.7 factor, it was corrected in order to be 1/3 (0.33) of the cost of Pizarras tunnel. - The Ref Doc j. Contract O&M was replaced for the complete version of itself, in order to clarify the scope and obligations. - In order to be conservative and justify the use of the O&M amounts in the budget, all parameters referred in Ref Doc k. Operation and Maintenance Costs Budget, were omitted, because these have no further reference and cannot be supported. Contingencies: A benchmark analysis was performed with all CDM hydroelectric projects registered in Peru, in order to support the 4% contingency value used in the project evaluation. The normal standard deviation with a confidence level of 95% was determined and the project parameter is in the range below de median. Therefore the data used is proven to be in accordance with the market conditions and is considering a low and conservative value (below the median). The assessment can be seen in Ref Doc 69. Insurance and Contingency Benchmarks	
CAR07: Please review and correct the Section B.7.1 due to the following a. Some monitored parameters have not been included properly. b. There are other parameters that are not monitored parameters	9.1.1 9.1.2	To consider the 3 sections of this CAR: - The parameters W_{BM} and W_{OM} where moved from section B.7.1 to section B.6.2, due to the fact that are fixed parameters during the first crediting period. - Also, a revision of section B.7.1 was made and all other parameters required are specified with clarity. It is important to mention that the $EF_{CO2,m,i,y}$ parameter was obtained from the IPCC default values at the lower limit of the uncertainty at a 95% confidence as provided in table 1.4 of Chapter 1 of Vol.2 of the "2006 IPCC Guidelines on National GHG Inventories", because no available national data can be obtained (this clarification has been included in the PDD). - Finally, the procedure for baseline and emissions reduction has been revised and	The corrections done to the corresponding section regarding fixed and monitored parameters is consistent with ACM0002_ver12.3 and the Tool to calculate the emission factor for an electricity system. Parameters that are not supposed to be monitored, were corrected. Please see section 9 for further details of the validation of the monitoring plan.

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
according to the methodology or the tool to calculate the emission factor for an electricity system c. Others parameters could be fixed during all monitoring period, which need properly identification in to the monitoring plan		validated according to the ACM0002 and the "Tool to calculate the emission factor for an electricity system". All the used monitoring parameters are listed in the PDD. --- The parameters $\mathbf{EF}_{grid,BM,y}$; $EG_{PJ,h}$ and $EG_{n,h}$ and $\mathbf{EF}_{EL,DD,,h}$: have been updated in section B.7.1 in order to update the monitoring frequency and properly consider the fuel consumption data available.	CAR07 – Can be closed
CAR08: Please revise the monitoring plan, section B.7 of the PDD: The number and type of electricity meters in section B.7 is not consistent with the number of electricity meters in Appendix 5. The Calibration frequency is not consistent and calibration standard is not described. The electricity meters location is not consistent with location provided in figure 4 of the PDD. Please revise equipment	9.2	The number of meters reported in Appendix 5 is now in accordance with the description of B.7. It is important to mention that there will be one main meter for the project activity assessment, but the project developer can implement additional meters if considered needed in the substation of the power plant. The calibration frequency and references are listed in section B.7. of the new version of the PDD. The meter location is in the project substation Aguas Calientes that is part of the SEIN, therefore figure 4 is considered correct. Section B.7.3 has been updated to extend the description of the monitoring plan (MP). Since many details are listed for the MP, these are described in Appendix 5 of the PDD. --- The project meters used for CDM monitoring purposes will be located in the substation. In case of failure of the main meter a secondary meter will be installed in the	The operational and management structure to monitor the emission reduction now is clear and complete in the PDD. Please see section 9 for further details of the validation of the monitoring plan. CAR08 – Can be closed

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
setup – Please revise section B.7.3 Other Elements of the monitoring Plan in accordance with the guidelines for completing PDD.		substation. This information is in Appendix 5 of the CDM-PDD.	
CAR09: The comments provided in section E.2 of the GSP-PDD in order to reflect the comments provided local stakeholder consultation to the audit team are not clear. Furthermore, provide the evidence of the public announcement was and documents listed as footnotes in this section (E.2) were provided to the validation team.	10.2	The local stakeholders commented the importance of the mining conflict in Cajamarca in the dynamic of the local stakeholder consultation process. Therefore, this mining conflict is now more detailed in section E.2 of the new version of the PDD. The documents are submitted to support section E of the PDD. --- Section E.1 shall describe the process by which comments from local stakeholders have been invited for the project activity. The PDD has described the local stakeholder consultation developed in February 14th, 2012, including the invitation process (newspaper, formal letters, radio and posters), the scope of the information exposed in the workshop and the social context in Cajamarca (mining conflict with Newmont project: Conga). Some clarifications have been added in this section to improve the information in this section. In addition the evidences of the payments for the radio announcements are submitted. *Ref Doc 46 a. LSC - radio announcement payments* Section E.1 shall identify stakeholders that have made comments and provide a summary of these comments. Since a formal list of all the stakeholders was not made since there was fear to be formally identified in the permanent conflict context, there are no names related to all the comments, but a summary of the comments is listed in the CDM-PDD. The new version of the PDD has a more detailed description of the comments and answers. Section E.3 shall provide information demonstrating that all comments received have	Section E of the PDD provides a clear description of how the stakeholder process was carried out. Evidences had been provided in order to confirm how and that many interested parties had been invited to the consultation as well as that the event took place. /22a/22b/22c/26/27/ The public comments received during the public meeting and knowledge of project activity development could be confirmed on site visit with a valid representative of the Eduardo Villanueva community /IV1/IV2/. CAR09 – Can be closed

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		been considered. The new version of the CDM –PDD considers a more detailed explanation of the project commitments and formal information in development. All the previously submitted evidences support the information in the PDD. Please see Ref Doc 50. LSC - EcoRessources Report (page 6 for the comments), Ref Doc 49 .LSC - Record of the workshop and Ref Doc 02. File submitted to the Ministry of Energy and Mines (MINEM) for the concession approval (page 104 -107) that contains the consultation process description. See Ref Doc l. Social Investment Plan for the latest version of the social investment plant for this project.	

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
CL01: The PDD is not consistent with the latest forms required by CDM EB. The content of section A of the PDD is not consistent with the 'Guidelines for completing the CDM-PDD', please	5.5.2 6.4.1 6.4.4 6.4.5	The PDD was updated to the latest forms required by CDM EB. • Section A.3 has been updated with the latest project information. The information is set in the documentation submitted to the Ministry of Energy and Mines to request for the definitive concession. This file is based on external technical data like the pre-operative studies and the environmental impact assess.	The latest version of the PDD has been developed under form FCDM-PDD ver04.1. Section A.3 has been updated including description of project components and expected power generation and has been confirmed to be consistent with the submitted evidences /02/. Project lifespan has been included and well evidenced /28/. The PDD also clearly states that

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
take into account: • There is no complete scenarios description. There is not mass or energy flow description. • The capacities, efficiencies and load factor are not in line with the Guidelines for the reporting and validation of plant load factors. • Some data not consistent with TSP/02/ and document seems not a valid third party evidence. Please review There is no technology transfer from Annex 1 countries (i) justification.	8.3.6	• A diagram of the project flow was made and inserted in the section A.3 of the PDD. • A more detailed description of the water flow from the intake to the power house was made in the section A.3 of the PDD with its respective references. • Francis turbines have a lifespan of 30-50 years as known in the energy sector. Some evidences are listed below: http://factory.dhgate.com/alternative-energy-generators/horizontal-shaft-francis-turbine/water-turbine/hydro-turbine-p42804620.html / http://sclida.en.alibaba.com/featureproductlist.html / http://es.tradekey.com/product_listall/uid/5737627.htm / http://sclida.en.alibaba.com/product/504927309-209843737/Turbine_with_synchronous_generator.html. In Peru turbines can easily be operative for more than 50 years, with proper periodic and major maintenance. The project developer considers this equipment characteristics and do not add cost for equipment replacement in the IRR excel file Likewise, the generator, for being part of the Francis turbine, has the same lifespan. • The monitoring equipment is detailed in the PDD. The main meter will be in the substation of the grid connection. The activity would not have project emission because it would not implement neither it is associated to a water reservoir. The final energy production yearly is 140,440 MWh based in historical water flow information as set in the project hydrological study. • All the equipment will be bought new. Therefore, there would not be a technology transfer from other countries (including Annex 1 countries).	know-how and technology will be transferred to the host country and that the proposed project will involve the purchase of new equipment, preventing the transfer of used equipment from other countries. Section B.3, describes and list the GHG emission sources in accordance with the applicable methodology. Figure 5 of the PDD describes the monitoring equipment location. . The plant load factor has been defined ex-ante using a third party study as per reference /02/, in accordance with the Guidelines for the reporting and validation of plant load factors. CL01 – Can be closed

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		• According to the Guidelines For Completing The Project Design Document Form, if the baseline scenario is a continuation of current practice, thus identical to the scenario existing prior to the implementation of the project activity, there is no need to repeat the description of the scenarios, only state that both are the same. Since this condition is met by the project activity, the PDD has stated that both scenarios are the same. • According to the guidelines The plant load factor shall be defined ex-ante in the CDM-PDD according to one of the following three options: (a) The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval; (b) The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company). The project load factor is set in the concession file submitted to the Ministry of Energy and Mines (MINEM) for the concession approval, therefore the option (a) is used. This file is based on external technical reports like the Pre-Operative Studios from the company Kiev Asociados SAC and information used in the Environmental Impact Declaration developed by the company O. Y. Ingeniería E. I. R. Ltda.. in addition the file submitted to the MINEM is based on a hydrological study using historical data . --- The new version of the PDD uses the full template Version 04.1 of F-CDM-PDD. According to the Guidelines for completing the PDD, comments a) and c) where revised and introduced into section "A.3. Technologies and measures" of the project PDD, completing the missing information. The supporting evidences of the technical data introduced in this section are also listed for the IRR calculation section since where already	

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		mentioned in the PDD but in other section. At the end of the section it is stated that the baseline scenario is the continuation of current practice according to the methodology, therefore identical to the scenario existing prior to the implementation of the project activity. A more suitable description for the technology transfer conditions is included in the PDD.	
CL02: There is no clear description into the PDD to demonstrate that Project Emissions can be neglected. The description and justification for selection of different methodological choices for Dispatch Analysis calculation into the PDD is not clearly explained.	7.5.1 7.5.2	As per the new descriptions of the water intake and distribution through the power plant facilities, it can be demonstrated that the project is a run of river power plant, therefore will not increase an existing reservoir, nor create a new one. As per the applicable methodology, only hydro power plants with reservoirs shall account for project emission. The description of the methodology of the calculation of the emission factor describes every step according to the "Tool to calculate the emission factor for an electricity system.	According to the project description and characteristics provided in the PDD, the exclusion of project emissions is in line with the applied methodology. The description of the selection of a method for calculating the operating margin grid emission factor by dispatch data analysis and built margin option 2 are consistent with the guidelines provided in the Tool to calculate the emission factor for an electricity system. CL02 - Closed
CL03: The starting date justification is not consistent with with the CDM glossary. Please review.	8.1.1	As per the CDM glossary, the starting date the earliest date at which either the implementation or construction or real action of a CDM project begins. Since the implementation of access roads is set as a first milestone in the project implementation, due to difficulty in the access, and since the investment is high (4.5 MM) to be contracted in October 2012, this is considered to be the starting date of the CDM project (in compliance with the CDM glossary).	Based on the explanation and evidences provided, the starting date definition in the PDD is confirmed to be consistent with the CDM glossary. ERM CVS confirmed that the starting date will depend on the signed construction contracts that could be the contract to civil works for access road on January 2013 according to the preliminary

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
			design of 3rd party /46a/. In any case, ERM CVS confirmed during the site visit that there is no physical evidence that real actions for project implementation has been developed, which is consistent with the fact that Empresa Electrica Agua Azul submitted the formal request for final approval of concession on May 2012 /02/ The Section C.1.1 is now consistent with other sections.. CL03 – Closed
CL04: PP do not provide the following documents listed in the project timeline (Table 4 of the GSP-PDD): • Prior consideration of the CDM form submitted to the DNA. • Contract between Project Participant and Ecoresources Prior . • Request for Definitive Concession Submitted to Minister of Energy and Mines Documents submitted for the National	8.1.2	The documents listed in table are: - *Ref Doc 26. Prior consideration UNFCCC.* - *Ref Doc 63. EcoRessources - Agua Azul contract.* - *Ref Doc 64. Evidence of the file submission to the Ministry of Energy and Mines (MINEM) for the concession approval* - *Ref Doc 01. Pre-Operative Studio Volume I.* - *Ref Doc 04. Pre-Operative Studio Volume II.* - *Ref Doc 50. LSC - EcoRessources Report.*	The PP has provided the hydrological study/31/, prior consideration evidence /33/, CDM consultant contract/34/, concession approval with Energy Minister/35/ and document for LoA approval/32/, which were reviewed and checked by the Validation team and found to be consistent and relevant. Please see section 8.1.2 for further details of the validation of the starting date and prior consideration. CL04 - Closed

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
Approval Process at the Peruvian DNA		- *Ref Doc 03. Hydrological study approval / Ref Doc 25. Prior consideration MINAM* - *For the File submitted fo the LoA process see the LoA procedure, the letter of submission of the file and the social investment plan: Ref Doc 65. Letter for submission of the LoA file to the Peruvian DNA (MINAM), Ref Doc 66. MINAM procedure for LoA approval and Ref Doc l. Social Investment Plan. The LoA was approved on July 2012 therefore all the requirements were fulfilled.*	
CL05: PP does not provide clear justification for benchmark selection into the Section B.5 of PDD. Please review.	8.3.1 8.3.2	A clearer explanation was given in the PDD, Sub-step 2a: Determine appropriate analysis method (section B.5).	Arguments and evidences to substantiate the utilization of the selected benchmark had been added to the PDD, Sub-step 2.b: Option III. The validation team confirmed that many other power generation and grid dispatch projects in Perú, registered as CDM at UNFCCC, had applied for comparison purposes, the 12% discount rate stated at Article 79, Law 25844/11/, which is consistent with public sectoral studies for hydro projects in Peru/24/ and official guidelines for investment in the rural electrification sector in Peru/37/. Therefore the discount rate selected in the investment analysis is a reasonable benchmark for the local context and sector. CL05 - Closed
CL06 The operational lifetime used into the investment analysis has not been clearly supported.	8.3.6	According to "*Ref Doc 33 .ESMAP 2011*", the lifetime used for the calculation of the IRR is 20 years, based on the fact that risk adverse investors are not attracted on long investment horizons, because they are looking a short payback period. This fact is supported by "Ref Doc 20. Investment guidelines for investment in electrification projects – MINEM", where the national authority for projects evaluation take an investment horizon of 20 years, and is also supported by the "Guidelines on the assessment of investment analysis" where it is	The PP provides relevant discussion and public sectoral studies/24/ and official regulations/37/ that establish that 20 years is an appropriate and typical period of assessment. Taking into consideration that the investment horizon applied in investment analysis is 50 years,

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		established a maximum of 20 years for an appropriate period of assessment. Taking in consideration that all registered hydroelectric projects took an investment horizon of 40 years, PP decided to take this conservative approach and make an investment analysis with a 40 years investment horizon. Despite these facts, PP is going to be even more conservative and will take an investment horizon of 50 years, which is the project's potential operative lifetime.	increasing the lifespan of the project for the IRR calculation and demonstration of additionality would constitute a conservative assumption, according to the Financial Expert opinion into the validation team. CL06 - Closed
CL07 The evidences that support every data and values included into the investment analysis are no clear. Please review. Furthermore, the multiplier of 1.18 assumption applied into the investment cost is not clear and there is no support of exchange rate for PEN/USD	8.3.7	The evidence for the investment costs is related to the following files: *R ef Doc a. Definitive study access and campsite Vera y Moreno S.A. / Ref Doc b. Contrat OC 0002 Superficial civil works with ERD S.A. / Ref Doc c. Contrat OC 0001 Underground civil works with ERD S.A. / Ref Doc d. bfl proposal annexure –I / Ref Doc e. Contract EM 0002-2011 overhead travelling crane - ERD S.A / Ref Doc f. Contract CON PER CH PIZ EQP 001 0-ERD S.A - electrical panels / Ref Doc g. Contract EM0003 butterfly valve - ERD S.A. / Ref Doc h. Contract OC 0003 - ERD S.A - Transmission line construction / Ref Doc i. Pizarras Technical assistance contract / Ref Doc l. Social Investment Plan / Ref Doc 02. File submitted to the Ministry of Energy and Mines (MINEM) for the concession approval / Ref doc 17. Project Budget Potrero.* The 1.18 multiplier applied into the investment cost is because all the investment costs do not include the appropriate taxes, that are: 16% for general sales tax (according to the Supreme Decree N° 055-99-EF, article 17) and 2% for the municipal promotion tax (according to the Supreme Decree N° 156-2004-EF, article 76). The evidence can be found in *Ref Doc 56. Law text IGV and ISC - Supreme Decree N° 055-99-EF (page 9)* and *Ref Doc 57. Municipal Tax Law - Supreme Decree N° 156-2004-EF* (page 21). The evidence related to O&M and administrative expenses can be found in the following files: *Ref Doc j. Contract O & M / Ref Doc k -*	The PP provided a relevant 3rd party technical assessment /46k/ in order to demonstrate and explain the rationale of every input value in the investment analysis. In summary, the source of values for Potrero investment analysis come from specific quotations, formal contracts with the Municipality of Eduardo Villanueva or reference values of the Pizarras project which is a similar project developed by the same project developer, with a similar size (18 MW vs 19.9MW of Potrero), similar civil and electric works and located in the same region of Catamarca. This was confirmed by the Validation team with legal documentation of the Pizarras project/40/ and public information of Empresa Eléctrica Agua Azul S.A/42/. According to the breakdown of the total cost of investment, ERM CVS verified the following: • Civil works have been determined with the technical study for access route for construction purposes for the project site/46a/, signed contracts of superficial civil works /46b/ and underground works /46c/ of the similar Pizarras

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
		Operation and Maintenance Costs Budget. A formal quotation of the insurance cost could not be acquired because the project is in a development stage. Although, a benchmark ratio was used, based that all the CDM registered projects used the same percentage. The water canon tariff can be found in *Ref Doc 09. Law 25844 – Rulebook for the Electric Concessions Law, article 214.* The supervision of the project can be found in the cash flow as "construction services" and the evidence is in the file "Ref Doc i. Pizarras Technical assistance contract". Finally, the support for the exchange rate PEN/USD can be found in the file "*Ref Doc 06. OSINERG Resolution 037." Page 17.* --- CAR 06 has been properly answered.	project developed by the same developer. • The cost of turbines and generators are based on the formal quotation of the equipment supplier/46d/ for Potrero project and contracts for electro-mechanical installations/46e/ and electricity and valve supply contracts of Pizarras, a similar project developed by the same developer /46f/46g/. • The cost of the substation and transmission lines were defined according to the equivalent values of the Pizarras project through signed construction contracts/46h/ • Construction services has been assumed from the signed contract for the Pizarras project /46i/, which will have the same scope of work as the Potrero Project. • Social responsibility are values according to the formal commitment of Project developers with the Eduardo Villanueva Municipality through legal contract/46j/ • Contingencies, calculated as a 4% of civil works and machinery and equipment, were confirmed with the public information provided in the comparative analysis developed by the PP/47/ The validation team validated with the engineering studies/46k/ that the quantities of civil works, type of hydraulic structures, technical specification and scope of work are equivalent and consistent with the Potrero project. Furthermore, the validation

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
			team confirmed that the total value of investment is more conservative than the value supplied in the legal documentation to request the final concession/02/ Furthermore, ERM CVS cross-checked the level investment value of project activity (i.e. 1.8MUSD/MW) with a relevant sectoral study in Peru/24/ and found that the values for the sector lies in the range of 0.97 to 3.24 MUSD/MW, therefore the input values are consistent and credible. In terms of O&M values, the PP assumed the same values as the signed O&M contract for Pizarras project/49/ since both projects are similar with the with same scope and type of activities during operation, which was confirmed with the 3rd party technical assessment/46k/. In the same way, the cost of Construction Technical and Direction Services has been assumed from the signed contract of Pizarras project/46i/, which has a similar scope of work and assistance during construction, which is confirmed by the 3rd party technical assessment of both projects/46k/. The 1.18 multiplier applied to the input values, reflecting taxes on purchases of 16% and municipal tax of 2%, which had been cross-checked with the submitted evidences /53/54/ and found to be consistent. According to above description, all input values have been cross-checked with submitted evidences

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
			and found to be consistent. CL07 – Can be closed
CL08 Please clarify if Peru have any subsidies or economic incentives for renewables energy sector	8.3.9	There are no subsidies for renewable energy sources in Peru. As per Legislative decree 1002 (described in section B,4 - REf Doc 67. DL. 1002) OSINERG (The Supervisor Organism of the Investment in Energy and Mines), that acts as the regulatory entity of the electric system. Osinerg determines and controls the official tariffs in Peru) has there have been two renewable energy tenders. These tenders are developed for hydro power plants up to 20 MW and all the other renewable energy sources with no installed capacity limit; only the projects fulfilling the tender conditions can win and have access to the benefits. The main conditions are to guarantee and amount of annual electricity delivered to the grid and request a fixed tariff (only for electricity since firm power will not be paid) that is under a not disclosed tariff determined by OSINERG for every source type. It can be concluded that there are no economic incentives for renewable energy sources in general and the existing benefits have a great amount of uncertainty (from the date or even existence of a next tender and the lack no knowledge of a not disclose tariff limit). The project is developed considering CDM as important project income source.	The applicability of the subsidy for renewable energy resources from the Peruvian government was confirmed by the validation team through the review of the 'Law of Promotion of Renewable Energy Resources (RER)' /14/. The Decree 1002 is a E- policy as previously has been discussed CL08 - Closed
CL09 The rationality of the calculation of income tax on EBIT before distribution of income to workers is not clear into the investment analysis. Please	8.3.9	The following correction was made: distribution of income to workers is calculated based on EBIT, and income tax is calculated after distribution of income to workers. *Ref Doc 58. Income distribution to workers - Law Decree N°892*, page	The correction done to the spreadsheet was found to be consistent with Article 2, Decree Nº 892./20/ CL09 - Closed

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
review.		1	
CL10 The traceability into the investment analysis spread sheet (IRR spreadsheet) is not clear and transparently. Please review.	8.3.10	The links have been revised and corrected.	The links have been checked and found consistent with the applied values. CL10 - Closed
CL11 Please justify the assumption and rationale of residual value into the investment analysis.	8.3.11	According to the Electric Concession Law "Ley de Concesiones Eléctricas", Decree Law 25844, article 70, subsection c): The residual value of the installations of each company is considered cero (0) in addition the equipment operational lifetime is no longer than the project evaluation horizon.	ERM CVS confirms that the assumption of zero residual value is consistent with Peruvian legislation as evidenced in the document 'Ley de Concesiones Eléctricas', Decree Law 25844, article 70/11/, subsection c). CL11 is closed
CL12 The depreciation rate is not consistent with the evidence provided. Please clarify and adjust the investment analysis consistently	8.3.11	According to "*Ref Doc 11. Income Tax Law – Rulebook",* article 22, the depreciation rates are correct.	The PP provided relevant evidence that the depreciation rate is consistent with the actual accounting rules of the host country for machinery and equipment /21/, which was confirmed by the validation team. The depreciation rate for civil works costs are depreciated over 20 years. Machinery & equipment costs are depreciated over 10 years. This is consistent with the depreciation rates applied and the assessment period, which was confirmed with ERM CVS's Financial Expert. . CL12 - Closed
CL13 PP needs to review and improve the	8.4.1	The main additionality step is the investment analysis. The barriers have been modified in order to become part of the explanation of the	The barrier analysis was removed from the PDD. The additionality assessment relies on the

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
barriers analysis according to the CDM guidance and demonstrate that the barriers do not have direct impacts on the financial returns. . Furthermore, PDD needs to show clearly how CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by any of barriers.	8.4.2 8.4.3	investment analysis results.	investment analysis. CL13 - Closed
CL14: There is not clear the reference and sources of the operative power plant listed in the PDD as part of the common practice analysis. Please provide evidences.	8.5.3	The information is based in Table 3.1 of the 2011 Statistic Report (COES - Annual statistics 2011 in file FE SEIN or available at www.coes.org.pe - http://www.coes.org.pe/wcoes/coes/salaprensa/estadistica_anual.aspx). The PDD has been updated.	The PP included the references in the revised PDD and provided relevant evidence and documents to demonstrate the plant names and installed capacity, which were confirmed by the validation team through the review with the Centre of Information of National Interconnected Electric Grid (SEIN) provided by COES /10/. CL14 - Closed
CL15: There is not clear justification to use of IPCC values for fossil fuel emission factors.	9.1.1	The justification is set in section B.7.1 of the PDD, for the parameter $EF_{CO2,m,i,y.}$	The value applied is consistent with the provisions of the Tool to calculate the emission factor for an electricity system. CL15 - Closed
CL16: PP does not provide evidence of the EIA.	10.1	The Environmental impact Declaration (DIA) of the project is the Ref Doc 51. Environmental Impact Declaration for the Potrero Hydropower Plant	The Environmental Impact Declaration (EID or DIA in Spanish) has been submitted to the validation team and checked to be consistent with the local regulation requirements and statements in the PDD/03/.

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
			CL16 - Closed
CL17: Please provide evidence to confirm that the project does involve public funding from an Annex 1 country	10.3	A formal format was signed by the project developer to evidence this condition. *Ref Doc 68. Annex I funding.*	The PP submitted evidences supporting that the proposed project activity will not receive public funding, as stated in Appendix 2 of the PDD. CL017 - Closed

Forward Action Requests	Ref. to Section Number	Summary of PP's response	Final conclusion
No FAR is raised			

In addition some editorial and minor changes to the PDD were made by the PP that had no relevance on compliance with CDM requirements.

Document template history

Date	Version Number	Change
09 February 2009	Version 1	Initial Adoption
06 December 2010	Version 2	Revision of sections relating to stakeholder comments, common practice analysis, project boundaries, elimination of baseline alternatives, financial analysis and technical aspects relating to projects at existing facilities
28 March 2011	Version 3	Revisions to include more detailed requirements to check consistency of equations, units and project specific information, and guidance on the level of detail required in project description
28 May 2011	Version 4	Revision of validation protocol to include further detail relating to paragraph 92 of the VVM
22 October 2011	Version 5	Content and structural updates including removal of the separate validation protocol and incorporations of relevant questions into the report, revision of question wording to improve clarity and to ensure question wording is in line with the VVM, reduction of repetition in the report
01 May 2012	Version 6	Revision of template to comply with the VVS, which replaces the VVM