

CDM VALIDATION REPORT

Hidroeléctrica Choloma, S.A.

VALIDATION OF THE PROJECT ACTIVITY:

Choloma Hydroelectric Project

AENOR REFERENCE: 2011/078/CDM/10

VERSION: 02

VALIDATION REPORT

"Choloma Hydroelectric Project"

Validation Report:	AENOR Reference No.:		Version of this report:		Date:	
	2011/078/CDM/10		02		27/12/2012	
PDD:	Title:		GSC publication date:		Comments received:	
	Choloma Hidroelectric Project		21/05/2011		<input checked="" type="checkbox"/> Yes* <input type="checkbox"/> No	
Parties involved:	Host Party:		Other involved Parties:			
	Guatemala		---			
Project Participant(s):	In host Party:		In other involved Parties:			
	Hidroeléctrica Choloma, S.A.		---			
Size of the project activity:	<input checked="" type="checkbox"/> Small scale <input type="checkbox"/> Large scale					
Applied methodology/ies:	Title:		Code:		Version No.	
	Grid connected renewable electricity generation		AMS I.D		17	
Applied tools:	Title:		Version:			
	Tool to calculate the emission factor for an electricity system		02.2.1			
	Title:		Version:			
Emission reductions (ER):		GSC PDD:		Final PDD:		
<input checked="" type="checkbox"/> Annual average of the ER (tCO ₂ e)		21,760		18,926		
<input type="checkbox"/> Total ER (tCO ₂ e)						
Previous versions of this document:			Version:		Date:	
			1		18/12/2012	
			2			
			3			
			4			
Report prepared by:	Climate Change Unit. AENOR					

* The comments are detailed in Section 4 of this Validation Report

Abbreviations

AENOR	Spanish Association for Standardisation and Certification
ACM0002	Consolidated baseline methodology for grid-connected electricity generation from renewable sources
AMM	Administrador del Mercado Mayorista (Wholesale Market Administrator)
AMS I.D.	Grid connected renewable electricity generation
BM	Build margin
CAR	Corrective action request
CL	Clarification request
CDM	Clean development mechanism
CER	Certified emission reductions
CM	Combined margin
CNEE	Comisión Nacional De Energía Eléctrica (National Electric Energy Commission)
DECISION 4/CMP.1	Simplified Modalities and Procedures for Small-Scale CDM Project Activities Annex II
DNA	Designated national authority
EB	Executive Board of the CDM of the Kyoto Protocol
EIA	Environmental impact assessment
ER	Emission reductions
FAR	Forward action request
GHG	Greenhouse gasses
GSC	Global stakeholder consultation process
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of approval
MARN	Ministry of Environment and Natural Resources
MEM	Ministry of Energy and Mines
MP	Monitoring plan
MWh	Mega watt hour

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ODA	Official development aid
OM	Operating margin
PDD	Project design document
PP	Project participant
tC	Carbon tonne
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Clean Development Mechanism Validation and Verification Manual
SEIN	Guatemala's National Interconnected Electric System

Table 1: Abbreviations

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1 INTRODUCTION

This validation concerns a project implemented by the PP in Guatemala to reduce emissions of CO₂ by generating renewable energy from hydraulic resources. The objectives of the validation exercise are to confirm that the project meets the necessary CDM criteria, that the project follows the approved methodology, AMS I.D (Version 17), and that the proposals presented in the PDD will lead to a realistic determination of the emission reductions.

The scope of the validation covers the additionality assessment (investment barrier), environmental approval and the stakeholder consultation. In addition, it covers the application of the baseline methodology, the calculation of the emission factor and the monitoring methodology to quantify the emission reductions during the operational life of the project.

The project includes the installation of a 9.7 MW hydroelectric power plant in the Department (State) of Alta Verapaz, around 200 kilometers North-east of Guatemala City. This plant will generate electric energy that would otherwise continue to be generated with fossil fuel power plants.

1.1 Objective

Hidroeléctrica Choloma, S.A. has commissioned AENOR to validate "Choloma Hydroelectric Project". The purpose of a validation is to have an independent, third-party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria.

Validation is a requirement for all CDM projects, and it is considered necessary in order to provide assurance of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

1.2 Scope

The scope of the validation is to assess all aspects of GHG reduction involved in the project, including the project design, the baseline, the determination of the grid's emission factor and the procedures proposed for monitoring emissions reductions in the future.

The following documents were reviewed as part of the scope of the activity:

- PDD [34], [35], including baseline study and monitoring plan.

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- Approved methodologies: AMS I.D version 16 and 17 /36/ /37/, ACM0002 13.0.0 /38/.
- Tool to calculate the emission factor for an electricity system", version 2.2.1 /39/
- Decision 4/CMP.1 and relevant decisions and guidelines from the EB.
- Clean Development Mechanism Validation and Verification Manual, version 01.2 /40/.
- Letter of Approval from the DNA of Guatemala /8/.
- Associated documentation (EF calculations, environmental requirements, investment analysis, etc.)

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. AENOR, based on the Instruction for Validation, Verification and Certification of Clean Development Mechanism (CDM) Project Activities (IE-DTC-039) /41/, and the Clean Development Mechanism Validation and Verification Manual, has used a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

2 METHODOLOGY

The project assessment aims to be a risk-based approach and is based on the methodology developed in the Clean Development Mechanism Validation and Verification Manual, an initiative of designated and applicant entities, which aims to harmonise the approach and quality of all such assessments.

The validation of the project began in May 2011 and has been concluded in December 2012. The validation was performed as an audit, in which a desk review of PDD version 1 was first undertaken against the approved methodology and CDM and other relevant criteria. The desk review was followed by a site visit to the project activity, local authorities and key stakeholders in Guatemala.

In order to ensure transparency, a validation protocol was customised for the project according to instruction IE-DCT-039. The completed validation protocol is enclosed in Annex 1 to this report.

The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, provides details and clarified the requirements a CDM project is expected to meet; and,
- It ensures a transparent validation process during which the validator documents how a particular requirement has been validated and the result of the validation.

The sequence of the validation is given in the table below:

Topic	Date
Submission of PDD for global stakeholder consultation process	21/05/2011
On-site visit	13, 21 and 24/06/2011
Validation Protocol - Version 01	30/08/2011
Final Validation Report	27/12/2012

Table 2: Sequence of the main validation activities

2.1 Appointment of team members and technical reviewers

The list of involved personnel and the qualification status are summarised in the table below:

Name	Qualification	
	Position in the team	Technical areas
		Energy generation from renewable energy sources
Luis Javier Arribas Alonso	Chief Validator	TA 1.2
Freddy Alejandro Garro Flores	Validator	TA 1.2
María Mercedes García Madero	Validator	TA 1.2
Marcelino Pellitero Martínez	Validator	TA 1.2
Alfonso Medrano Gutierrez	Technical review	TA 1.2
Elena Llorente Perez	Technical review	TA 1.2
José Antonio Gesto Vilacoba	Technical review	TA 1.2

Table 3: List of the personnel involved

Technical areas (TA) mentioned above correspond to the following:

TA code	Technical area
TA 1.1	Thermal energy generation from fossil fuels and biomass including thermal electricity from solar (COMPLEX)
TA 1.2	Energy generation from renewable energy sources
TA 2.1	Electricity distribution
TA 2.2	Heat distribution
TA 3.1	Energy demand
TA 4. 1	Cement sector (COMPLEX)
TA 4.2	Aluminium (COMPLEX)
TA 4.3	Iron and steel (COMPLEX)

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TA 4.4	Refinery (COMPLEX)
TA 5.1	Chemical process industries (COMPLEX)
TA 6.1	Construction
TA 7.1	Transport
TA 8.1	Mining and mineral processes, excluding those included in TA 8.2 below
TA 8.2	Oil and gas industry, coal mine methane recovery and use (COMPLEX)
TA 9.1	Metal production
TA 10.1	Mining and mineral processes, excluding those included in TA 10.2 below
TA 10.2	Oil and gas industry, coal mine methane recovery and use (COMPLEX)
TA 11.1	Chemical process industries (COMPLEX)
TA 11.2	GHG capture and destruction
TA 12.1	Chemical process industries (COMPLEX)
TA 13.1	Waste handling and disposal
TA 13.2	Animal waste management
TA 14.1	Forestry
TA 15.1	Agriculture
TA 15.2	Animal waste management

Table 4: List of technical areas

2.2 Document review

The project design document submitted by the PP was reviewed against the approved methodology and against CDM and other relevant criteria. Additional background documents related to the project design and baseline were also made available before and during the on-site visit in Guatemala. These additional background documents were also reviewed.

To address the corrective actions and clarification requests that arose from the desk review and on-site visit, the PP revised the project design document several times before developing and submitting the final version, 3.4, dated 05/12/2012.

The final validation findings are presented in this report on the project, as described in final version of the project design document.

The reviewed documents used during the validation process are detailed in the chapter 7 of this report.

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2.3 Follow-up actions

The AENOR validation team composed of Luis Javier Arribas Alonso and Freddy Garro Flores conducted interviews with project developers and main stakeholders in Guatemala to confirm selected information and to resolve issues identified in the document review.

On 13, 21 and 24/06/2011, AENOR's validation team carried out the visit to the project site. During the visit, representatives from PP were interviewed, in addition relevant local stakeholders such as local authorities and local inhabitants of towns affected by the project activity, to confirm relevant information and to resolve issues identified in the document review.

Interviewed organisation Person/Position	Interview topics
HIDROELECTRICA CHOLOMA, S.A. Rodrigo J. Tormo, general manager Miguel Luciano Chó, plant manager Laura Ruiz, project assistant Ana Maldonado, assistant manager Juan Luis Ramacinni, quality consultant Mario Gutierrez, plant operation manager Pablo Orozco, Plant operator ENERGÍA Y MEDIO AMBIENTE Alaide González Leche, consultant	✓ Project design ✓ Additionality assessment ✓ Baseline determination: OM & BM (power plants, electricity production, start of operation, fuels, efficiencies, most recent data...) ✓ Monitoring plan ✓ EIA approval and related conditions ✓ Project location
DNA-MARN <u>DNA</u> Raul Castañeda, Coordinator <u>MARN</u> Roxanna Martínez, environmental technician Luisa Fernández, environmental technician	✓ Comments and opinion about the project ✓ Letter of approval ✓ Legislation applicable to the project ✓ Benefits for the local community ✓ Environmental regulations: Authorizations

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Interviewed organisation Person/Position	Interview topics
AMM Luis Eduardo Sandoval Figueroa, Economic transactions	<ul style="list-style-type: none"> ✓ Compliance with law applicable to electrical generation ✓ Operation of the electricity dispatch model ✓ Baseline determination: OM & BM (power plants, electricity production, start of operation, fuels, efficiencies, most recent data...)
LOCAL STAKEHOLDERS SENALÚ HEALTH CENTRE Juan José Medina, Director EDUCATIONAL SUPERVISION Natalia Vaides A., secretary Oscar García Moya, technician COMMUNITY OF SANTA LUCIA SECACAO Santiago Quim Ba, auxiliary Mayor Juan Cucul Tox, secretary Julian Alberto López, deputy Mayor COMMUNITY OF LA MONTAÑESA Juan Sub, coordinator Antonio Cucul, auxiliary Mayor COMMUNITY OF NUEVO SAN CARLOS Alfonso Cholón, Mayor Mario Choc Coc, health representative COCODE Mateo Pérez, coordinator	<ul style="list-style-type: none"> ✓ Opinion about the project ✓ Knowledge of the environmental impact ✓ Benefits for the local communities ✓ Land owners' current socioeconomic situation ✓ Stakeholder consultation

Table 5: Interview topics

2.4 Findings

As an outcome of the validation process, the team can raise different types of findings according to the Clean Development Mechanism Validation and Verification Manual.

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

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When a non-conformance arises, the validation team shall raise a Corrective Action Request (CAR). A CAR is issued, when:

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

Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

A Forward Action Request (FAR) is raised during validation 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.

The project participants were requested to address all validation findings and finally provided the validation team with sufficient evidence to determine that the applicable CDM requirements have been met. The project participant modified the initial PDD to resolve the validation team concerns and resubmitted a final version of the PDD. AENOR has prepared this report based on the final PDD.

All of the validation findings are summarised in Section 3 below and are documented in more detail in Section 6 and in the validation protocol included in Annex 1.

2.5 Internal Quality Control

Following the completion of the assessment process by the validation team, all documentation undergoes an internal quality control through a technical review before submission to the CDM-EB. The Technical reviewer is a qualified member of AENOR, independent of the team that carried out the validation of the project activity. The technical reviewer or the team appointed for the technical review are qualified in the technical area and sectoral scope of the project activity.

3 VALIDATION FINDINGS

3.1 Approval

There is only one project participant (Hidroeléctrica Choloma, S.A.) and one Party (Host, Guatemala) involved in the Project Activity.

Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements from 21/05/2011 to 19/06/2011. The PDD and comments have been made publicly available. Please refer to Section 4 for details.

The project participant provided the validation team with the Letter of Approval Letter from Guatemala. The LoA was issued on 23/03/2011 (Letter No. 022) by the Ministry of the Environment and Natural Resources.

AENOR confirms that the LoA states the following:

- Guatemala is a party of the Kyoto Protocol (Date of ratification: 05/10/1999).
- Guatemala confirms its voluntary participation in the CDM
- The project's contribution to sustainable development.
- The precise proposed CDM project activity title in the PDD being submitted for registration.
- LoA does not contain additional specification neither conditions of the project activity.
- The LoA does not refer to a specific version of the PDD or validation report.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Guatemala.

AENOR ensures that the LoA has been issued by the respective Party' designated national authority and does not doubt the authenticity of the letter of approval received from the PP. During the on site visit to the project activity, the DOE team met the DNA and they officially confirmed that the LoA provided by the project participant was authentic. Hence, AENOR confirms that the LoA is in compliance with paragraphs 45-48 of the VVM v.1.2.

3.2 Participation

As stated above, Hidroeléctrica Choloma, S.A., from the host country Guatemala, is the only project participant involved in the project activity, and has been listed in tabular form in section A.3 of the PDD. This information is consistent with the contact details provided in Annex 1 of the PDD.

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AENOR ensures that the participation of Hidroeléctrica Choloma, S.A. has been approved by a Party involved to the Kyoto Protocol by means of the letter of approval issued on 23/03/2011 from the DNA of Guatemala.

No other entities have been included in these sections of the PDD. In addition, the approval of participation has been issued by the relevant DNA.

Therefore, AENOR's validation team states that the project participant of the project activity meets all relevant participation requirements.

3.3 Project Design Document

The PDD of the "Choloma Hydroelectric Project" has been prepared in accordance with the applicable template (version 03) of the CDM-PDD and guidance from the CDM Executive Board under Clean Development Mechanism Validation and Verification Manual.

The initial version of the PDD was submitted for GSC on 21/05/2011. Due to the clarifications and corrective actions requested during the validation process, the project participant made the final version of the PDD dated 05/12/2012, which includes all issues raised to the PP either corrected or clarified.

The latest version of the PDD is in compliance with relevant applicable forms and guidance stated by the CDM documentation.

The relevant changes in the final PDD respect to the PDD for GSC are the following:

Issue	Information in PDD for GSC	Information in final PDD
Description of the project	<p>An average of 34 GWh of electricity per year.</p> <p>900 hectares of natural rain forests.</p> <p>A water storage tank of 23,000 m³.</p> <p>A generator of 10 MW.</p> <p>A main step-up Transformer of 12 MVA.</p> <p>A single Pelton turbine, twin jets, horizontal shaft</p>	<p>An average of 36.538 GWh of electricity per year.</p> <p>800 hectares of natural rain forests.</p> <p>A water storage tank of 20,000 m³.</p> <p>A generator of 9.7 MW.</p> <p>A main step-up Transformer of 12.2 MVA.</p> <p>A single Pelton turbine, twin jets, horizontal shaft, with a capacity of 9.577 MW.</p>
Project participants	Hidroeléctrica Choloma, S.A.	No Changes

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ER	21,760 tCO ₂ eq per year 152,320 tCO ₂ eq, in the first seven years crediting period.	18,926 tCO ₂ eq per year 132,482 tCO ₂ eq, in the first seven years crediting period.
Additionality	Barrier Analysis: • Uncertain Resource Availability • Energy Price Depression due to Coal Fired Generation Plants	Barrier Analysis: • Investment Barriers: Equity IRR post-tax
Starting date, crediting period	Starting date: 08/06/2010 Crediting Period: 01/12/2011-30/11/2018 (renewable)	Starting date: 24/06/2010 Crediting Period: 01/03/2013-29/02/2020 (renewable)
Others	AMS I.D version 16 "Grid connected renewable electricity generation" Tool to calculate the emission factor for an electricity system", version 2.0.0	AMS I.D version 17 "Grid connected renewable electricity generation" Tool to calculate the emission factor for an electricity system", version 2.2.1 Since the applied methodology and tool were updated, the description of section B.6.1 and the information of parameters in section B.6.2 and B.7.1 of the PDD were changed.

The mentioned changes are explained in the different sections of this validation report.

3.4 Project description

"Choloma Hydroelectric Project" is a hydroelectric plant with the following main technical features:

- An installed capacity of 9.7 MW.
- A Single Pelton turbine of 9.577 MW.
- A 9.7 MW generator.
- A main step-up Transformer of 12.2 MVA.
- a plant factor of 0.43
- A small artificial reservoir (water storage tank), with a diameter of 60 meters and a capacity of 20,000 cubic meters of live storage volume.
- 6 small water diversion dams at each of the four tributaries and on the Choloma River.
- A gross head of 461 meters.

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- A design flow of 2.5 m³/s
- 4 km of 69 kV transmission line, which will connect the Choloma substation with the existing Secacao substation, where the net electricity produced by the project activity will be delivered to the Guatemalan transmission grid.

The Choloma hydroelectric plant is located on the Choloma River, in the Department (State) of Alta Verapaz, around 200 km. North-east of Guatemala City, and will use the water flows from the Choloma River and its tributaries Secampana, Secampanita, Golondrinas and Caquipek.

The purpose of the Project is to generate electricity using renewable energy sources to be supplied to Guatemala's National Interconnected Electric System (SEIN).

The estimated electricity delivered by the project activity to the Guatemala's National Power Grid is 36.538 GWh per year with a load factor of 43%. After the assessment of the evidence provided by the PP/2//13/, AENOR confirms the load factor value included in the PDD has been calculated following the "Guidelines for the reporting and validation of plant load factors" version 01/25/.

The project activity avoids the emission to the atmosphere of approximately 18,926 tons of CO₂ per year, through the utilization of renewable resources to generate electric power, thus contributing to the mitigation of global climate change.

As established in the PDD, the project's contribution to sustainable development is not only related to electric generation from renewable resources and the subsequent reduction of pollutant emissions, but also to the social and economic benefits that will be introduced in the area.

The validation team has mainly checked the project design against the feasibility study/2/, the environmental impact statement/42/, construction permit/43/, permit for the use of the public properties/44/, different construction contracts and supply contracts/2/, interconnection permit/45/, and design maps/46/, validating that the PP can implement the project at the site mentioned in the PDD.

Finally, in order to verify that the project can be implemented by the PP and there are not risks for delays in the project implementation, AENOR requested to the PP a schedule for the implementation of the project and a letter from the AMM informing about the starting of commercial operations of the project activity. The different dates of the project activity are consistent with the starting date of the crediting period included in the latest version of the PDD and they show that there are not risks for delays.

All of the characteristics included in the PDD were checked during the on-site visit and against the maps and technical documentation submitted by PP.

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The final version of the PDD details the project's design in a precise manner, in accordance with the accuracy and completeness principles required for the CDM process.

AENOR's validation team states that the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity.

In conclusion, AENOR confirms that the project description, as included in the PDD, is sufficiently accurate and complete in order to comply with the requirements of the CDM and therefore in compliance with VVM paragraphs 58-64.

3.5 Baseline methodology

The final version of the PDD describes the baseline methodology, which is in conformance with the approved methodology AMS.I.D "Grid connected renewable electricity generation" version 17. The "Tool for the calculation of the emission factor of the electricity system" version 02.2.1 and the methodology ACM0002 (version 13.0.0) are also applied in accordance with provisions stated in the AMS I.D. The key conclusions about the correct application are summarised below.

The selected baseline and monitoring methodology previously approved by the CDM Executive Board is applicable to the project activity, and the used version is valid.

3.5.1 Applicability of the selected methodology to the project activity

The selected methodology AMS I.D. is applicable because the project activity fulfils all the eligibility criteria, as it is shown below:

AMS I.D Eligibility criteria	Application to the Project Activity	Justification/Evidence
<p>This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:</p> <p>(a) Supplying electricity to a national or a regional grid; or</p> <p>(b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.</p>	<p>The project activity uses water from the Choloma river as renewable resource to generate electric energy that is delivered to the National Electricity System.</p>	<p>This issue was checked against the environmental impact statement, power purchase agreement, interconnection permit, design maps and interviews carried out during the on site visit with DNA, MARN and AMM.</p>

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AMS I.D Eligibility criteria	Application to the Project Activity	Justification/Evidence
This methodology is applicable to project activities that: (a) Install a new power plant at a site where there was no renewable energy power plant operating 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).	The project activity is a Greenfield.	This issue was checked against the environmental impact statement, design maps, construction contracts and supply contracts. During the on site visit carried out to the project site, the audit team could check that there were no renewable energy power plant operating prior to the implementation of the project activity.
<p>Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <ul style="list-style-type: none"> • The project activity is implemented in an existing reservoir with no change in the volume of reservoir; • The project activity is implemented in an existing reservoir,⁷ where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m²; • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m². 	<p>The facility of the hydroelectric plant includes new multiple reservoirs, with a total area of 3,751.97 m² at maximum level and the power densities of each reservoir as well as of the whole power plant are greater than 4 W/m².</p>	<p>This issue was checked against the environmental impact statement, design maps, construction contracts and supply contracts. During the on site visit carried out to the project site, the audit team could check the civil works carried out in the different areas where will be built the water intake dams and the water storage tank.</p> <p>As per the information provided in section 3.5.4 of this report, the power density of the project activity is greater than 4 W/m².</p>
If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	<p>The project activity does not include both renewable and non-renewable components; and the project activity does not co-fire any fossil fuels.</p> <p>The project activity includes only a renewable component that does not exceed 15 MW. It consists of the construction and operation of the Choloma hydroelectric plant that has an installed capacity below 15 MW. The capacity of the electric generator is 9.7 MW.</p>	This issue was checked against the environmental impact statement, design maps, construction contracts and supply contracts.

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AMS I.D Eligibility criteria	Application to the Project Activity	Justification/Evidence
Combined heat and power (co-generation) systems are not eligible under this category.	Not applicable, the project activity is not a combined heat and power (cogeneration) system.	This issue was checked against the environmental impact statement and design maps.
In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project activity will not involve any addition of renewable energy generation units.	The project is a Greenfield.
In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	The project activity will not involve any retrofit or replacement.	The project is a Greenfield.

The latest version of the PDD adequately describes the different applicability conditions of the methodology and no deviation from the methodology has been necessary.

In conclusion, based on the site visit, interviews with the PP and stakeholders, and relevant documents provided and mentioned above, AENOR confirms the applicability of the selected methodology to the project activity.

The project activity is not expected to result in emissions other than those allowed by the methodology, and 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.

3.5.2 Project boundary

The boundary of the project activity is as per methodology definition AMS. I.D "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 latest version of the PDD in its section B.3, describes clearly that the spatial extent of the project boundary includes the power plant, including all its components, and the national electricity grid, where are included all the power plants connected physically to the Guatemala's National Power Grid.

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"Choloma Hydroelectric Project" will supply electricity to the Guatemala's National Interconnected Electric System (SEIN).

Choloma Hydroelectric Project's project boundary is the water intake structures, the power house, the interconnection substation, transmission line and the auxiliary facilities. In order to calculate the emission factor for the project activity, the SEIN is also included in the boundary of the project activity.

AENOR has validated the project boundary through the statistic report 2010 from AMM/48/ (Wholesale Market Administrator). AENOR confirms that all the plants included in the CERs calculation are within the project boundary.

3.5.3 Baseline identification

The final version of the PDD describes the baseline methodology, which is in conformance with the approved methodology AMS I.D, version 17.

Since the project activity is the installation of a new, grid-connected renewable power plant, the baseline scenario is the electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system". This definition is in accordance with AMS I.D methodology.

The assumptions and data used in the identification of the baseline scenario are appropriately justified, supported by evidence and can be deemed reasonable. In addition, relevant national and/or sectoral policies and circumstances are indicated in the final version of the PDD.

All data have been assessed by the validation team through the official information data provided by AMM (Wholesale Market Administrator) and MEM (Ministry of Energy and Mines). Thus, AENOR considers that baseline determination is transparent and reasonable.

3.5.4 Algorithms and/or formulae used to determine emission reductions

AENOR has assessed the calculations of project emissions, baseline emissions, leakage and emission reductions. Corresponding calculations were carried out based on the calculation spreadsheet/49/.

The parameters and equations presented in the latest version of the PDD and further documentation have been compared with the information and requirements presented in the methodology AMS I.D (Version 17) and respective tool. The equation comparison has been made explicitly following all the formulae presented in the calculation spreadsheet.

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The first version of the PDD submitted to GSC process included an estimated average of emission reductions of 21,760 tCO₂e per year during the first crediting period. The final version of the PDD includes an estimation of emission reductions of 18,926 tCO₂e per year for the first crediting period.

The difference between the values stated above is due to the formulae used for the ERs calculation in the first version of the PDD were not correct according to the applied methodology and tool. During the validation process, AENOR raised corresponding CARs and CLs in order to correct and clarify the inconsistencies found in the first version of the PDD. Those CARs and CLs raised are explained below.

The values presented in the latest version of the PDD are considered as reasonable based on the documentation reviewed, further references and the result of the interviews carried out. The baseline methodology and applied tool have been correctly applied following their requirements. The estimated amount of emission reductions can be confirmed as they have been replicated by the audit team using the information provided.

Baseline Emissions

According to the methodology AMS I.D version 17, the last version of the PDD states that the baseline emissions are calculated as the product of electrical energy baseline ($EG_{BL,y}$) of the electricity produced by the project activity multiplied by the grid emission factor, as it is shown in the formulae below:

$$BE_y = EG_{BL,y} * EF_{CO_2,grid,y}$$

Where:

BE_y = Baseline emissions in year y (tCO₂).

$EG_{BL,y}$ = Quantity of net electricity generation supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh).

$EF_{CO_2,grid,y}$ = CO₂ emission factor of the grid in year y (tCO₂/MWh).

Related to the value applied for the parameter $EG_{BL,y}$ after the assessment of the evidence provided by the PP, AENOR confirms that the value included in the PDD, 36,538 MWh per year, represents a reasonable estimation and it is appropriate.

According to the baseline methodology AMS I.D Version 17, the emission factor ($EF_{CO_2,grid,y}$) has been calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM), according to the six steps stated by the "Tool to calculate the emission factor for an electricity system" version 02.2.1

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Step 1.- Identify the relevant electricity system.

According to the boundary definition of the applicable methodology, as it is indicated in section 3.5.2 of this report, the last version of the PDD identify the Guatemala's National interconnected system (SNI) as the project electricity system and the Interconnected central American system as the connected electricity system. This issue was validated through the evidence provided by the official sources AMM and MEM and the information obtained in the interviews hold with staff of AMM.

For Operating Margin emission factor calculation, the emission factor of the imports is considered equal to 0 tCO₂ per MWh because the electricity imports come from connected electricity systems in other countries in Central America.

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

Option I has been chosen and only grid power plants are included in the calculation.

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

For the calculation of the OM emission factor $EF_{grid,OM}$, the simple adjusted OM emission factor calculation method has been correctly selected because low cost/ must-run projects constitute more than 50% of the total grid generation and there are not sufficient data available for using the Dispatch Data Analysis option.

Ex-post option is chosen for vintages of data. The Operating Margin emission factor will be updated annually during monitoring for the first crediting period. And it will be updated and calculated ex-ante at the renewal of the crediting period.

For the estimation of the OM and BM emission factors prior to the validation, 2010 data has been used, based on the most recent statistics available at the time of PDD submission.

Step 4.- Calculate the operating margin emission factor according to the selected method

It has been validated that simple adjusted OM is correctly calculated using option A (Calculation based on average efficiency and electricity generation of each plant), as the necessary data are totally available. Under this option, the emission factor of each power unit m ($EF_{EL,m,y}$) has been determined, using option A2, based on the CO₂ emission factor of the fuel type used and the efficiency of the power unit, due to only data on electricity generation and the fuel types used is available, as follows:

The determination of $EF_{EL,m,y}$ (or $EF_{EL,k,y}$) the emission factor of each power unit has been carried out following option A.2 of the applied tool as follows:

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

Where:

$EF_{EL,m,y}$ = CO_2 emission factor of power unit m in year y (tCO_2/MWh).

$EF_{CO_2,m,i,y}$ = Average CO_2 emission factor of fuel type i used in power unit m in year y (tCO_2/G).

$\eta_{m,y}$ = 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.

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

y = The relevant year as per the data vintage chosen.

Net electricity imports have been considered low-cost/must-run units k .

The emission factors for the fossil fuels type ($EF_{CO_2,m,i,y}$) used by the power plants have been obtained, following the procedures of the applied tool, from the 2006 IPCC Guidelines on National GHG Inventories/50/.

Default Efficiency factors ($\eta_{m,y}$) for power plants have been obtained from Annex 1 of the "Tool for the calculation of the emission factor of the electricity system" Version 02.2.1.

The simple adjusted OM emission factor ($EF_{grid,OM-adj,y}$) is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows:

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

Where:

$EF_{grid,OM-adj,y}$ = Simple adjusted operating margin CO_2 emission factor in year y (tCO_2/MWh).

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

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

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$EG_{k,y}$	= Net quantity of electricity generated and delivered to the grid by power unit k in year y (MWh).
$EF_{EL,m,y}$	= CO ₂ emission factor of power unit m in year y (tCO ₂ /MWh).
$EF_{EL,k,y}$	= CO ₂ emission factor of power unit k in year y (tCO ₂ /MWh).
k	= All low-cost must run grid power units serving the grid in year y.
m	= All power units serving the grid in year y except low-cost/must-run power units.
y	= The relevant year as per data vintage chosen

Calculation of Lambda (λ_y)

AENOR has validated that the Lambda factor is calculated according to the different steps defined in the applied tool, as follows:

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

For the calculation, only grid power units have been considered.

Hourly generation data of 2010 /51/ used in the calculation have been provided by the official source AMM. AENOR has replicated the calculation and the duration curves and the values obtained are deemed correct.

According to the tool, for grid power plants, $EG_{m,y}$ is determined as per the provisions in the monitoring tables. Data of the net electricity generation and energy imports have been obtained from official documents provided by AMM.

The value for the $EF_{Grid,OM-adj,y}$ included in the latest version of the PDD and the calculation spreadsheet is 0.688 tCO₂e/MWh

AENOR confirms that the operating margin emission factor ($EF_{Grid,OM-adj,y}$) has been calculated, according to the "Tool to calculate the emission factor for an electricity system" version 02.2.1, in a correct, transparent and conservative way. The latest version of the PDD includes a clear and complete explanation of the calculation, and all the formulae and factors used are deemed correct.

Step 5.- Calculate the build margin (BM) emission factor

According to the "Tool to calculate the emission factor for an electricity system" version 02.2.1, for the proposed project activity, option 2 has been chosen in terms of vintage of data so, for the first crediting period the BM emission factor ($EF_{grid,BM}$) will be updated annually, ex-post.

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The sample group of power units m used to calculate the build margin has been determined according to the following steps:

- Identify the set of five power units, excluding power units registered as CDM project activities that started to supply electricity to the grid most recently ($SET_{5-units}$) and determine their annual electricity generation ($AEG_{SET-5-units}$).
- Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}).
- Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20\%}$) and determine their annual electricity generation ($AEG_{SET-\geq 20\%}$).

Between $SET_{5-units}$ and $SET_{\geq 20\%}$, $SET_{\geq 20\%}$ is the set of power units that comprises the larger annual electricity generation (SET_{sample}), and it is the sample group of power units used to calculate build margin.

The validation team checked that this option has been correctly selected and that capacity additions from retrofits of power plants have not been included in the calculation of the build margin emission factor.

The build margin emissions factor has been calculated according to the tool using the following formula:

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

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 power generation data is available.

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Calculation of the $EF_{EL,m,y}$ has been carried out as it is explained above (following option A.2), using the most recent historical year for which power generation is available and using the power units m included in the build margin.

The emission factors for the fossil fuels type ($EF_{CO_2,m,i,y}$) used by the power plants have been obtained, following the procedures of the applied tool, from the 2006 IPCC Guidelines on National GHG Inventories.

Default Efficiency factors ($\eta_{m,y}$) for power plants have been obtained from Annex 1 of the "Tool for the calculation of the emission factor of the electricity system" Version 02.2.1.

The value for the $EF_{Grid,BM}$ included in the latest version of the PDD and the calculation spreadsheet is 0.348 tCO₂e/MWh

AENOR confirms that the build margin emission factor $EF_{Grid,BM}$ has been calculated, according to the "Tool to calculate the emission factor for an electricity system" version 02.2.1, in a correct, transparent and conservative way. The latest version of the PDD includes a clear and complete explanation of the calculation, and all the formulae are deemed correct.

Step 6.-Calculate the combined margin (CM) emissions factor.

The combined margin emissions factor has been calculated according to method a) Weighted Average CM of the applied tool as follows:

$$EF_{Grid,CM,y} = EF_{grid,OM,y} * w_{OM} + EF_{grid,BM,y} * w_{BM}$$

Where:

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

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

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

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

According to the tool, as the project activity involves hydro power generation, the value of the weightings for the first crediting period are $w_{OM} = 0.50$ and $w_{BM} = 0.50$

$$EF_{Grid,CM,y} = 0.688 \text{ tCO}_2/\text{MWh} \times 0.50 + 0.348 \text{ tCO}_2/\text{MWh} \times 0.50$$

$$EF_{Grid,CM,y} = 0.518 \text{ tCO}_2/\text{MWh}.$$

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As it has been explained above, the baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, and are calculated as follows:

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

$$BE_y = 36,538 \text{ MWh/year} * 0.518 \text{ tCO}_2/\text{MWh} = 18,926 \text{ tCO}_2/\text{year}$$

Project Emissions

According to the applied methodology (AMS I.D, version 17), for most renewable energy project activities, PE_y = 0. However, for hydro power plants with water reservoirs, project emissions have to be considered following the procedure described in the most recent version of ACM0002 (version 13).

Therefore, as Choloma hydroelectric project involves the construction of several new reservoirs (6 small water reservoirs resulting from the diversion dams of the intake areas and a daily regulation tank-reservoir), following the methodology ACM0002, the project emissions are related with power density (PD) that have been calculated as follows:

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

Where:

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

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

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

A_{PJ} = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m₂)

A_{BL} = Area of the single or multiple reservoirs in the surface of the water, before the implementation of the project activity, when the reservoir is full (m₂). For new reservoirs, this value is zero.

AENOR has validated the value of the parameter A_{PJ} included in the PDD for the calculation of the Power Density (PD) of the project activity through the evidence provided by the PP (reservoirs maps)/46/ and the value for the parameter A_{PJ} = 3,751.97 m², value obtained from the sum of the area of each reservoir, as it is shown in the last version of the PDD.

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The installed capacity of the hydro power plant after the implementation of the project activity $Cap_{PJ} = 9,700,000 \text{ W}$ was also verified as it has been explained in section 3.4 of this report.

After the evidence assessing, AENOR confirms that the calculation of the Power Density (PD) of the project activity included in the PDD, $PD = 2,585.3 \text{ W/m}^2$ is correct.

Following the methodology ACM0002, if the power density of the project activity (PD) is greater than 10 W/m^2 , then $PE_{HP} = 0$.

$PD = 2,585.3 \text{ W/m}^2 > 10 \text{ W/m}^2$, so $PE_{HP} = 0$.

According to the applied methodology, the only project emissions to be considered in the project activity are emissions from water reservoirs:

$$PE_y = PE_{HP,y} = 0$$

AENOR confirms that the calculation of the project emissions included in the latest version of the PDD is correct according to the applied methodology and all the formulae have been correctly described and used.

Leakage

According to the AMS-I.D. methodology (version 17), no leakage emissions are considered as the equipment is not transferred from another activity. AENOR has validated through the contract for "supply, start-up and testing of the main equipment contract" signed by Hidroeléctrica Choloma, S.A. and Gilkes [1] that the equipment to be installed in the project will be new.

Emission Reductions

According to the methodology AMS-I.D version 17, the emissions reductions have been calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emissions reductions in year y (t CO₂/year).

BE_y = Baseline emissions in year y (t CO₂/year).

PE_y = Project emissions in year y (t CO₂/year).

$$ER_y = 18,926 \text{ tCO}_2/\text{year} - 0 \text{ tCO}_2/\text{year} = 18,926 \text{ tCO}_2/\text{year}$$

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The baseline methodology AMS-I.D version 17, ACM0002 version 13 and the "Tool to calculate the emission factor for an electricity system" version 02.2.1 have been correctly applied to calculate project emissions, baseline emissions, leakages and emission reductions. All estimates of the baseline emissions can be replicated using the data and parameter values provided in the final version of the PDD.

The methodology for calculating emission reductions is transparently documented and complies with the requirement of the selected methodology and with tool to calculate the emission factor.

Finally, in order to validate the data and results included in the PDD, they have been checked by AENOR against the original source, and spreadsheet calculations have been reproduced by the validation team and the same results have been obtained achieving the transparency, accuracy and consistency principles required for the CDM projects.

Therefore, AENOR confirms that all assumptions and data used by the PP are listed in the final PDD, including their references and sources. Furthermore, all documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD, and all values used in the PDD are considered reasonable in the context of the proposed CDM project activity.

3.6 Additionality

3.6.1 Starting date of the project activity and prior consideration of the CDM

It was determined 24 June 2010 as the start date of the project activity which represents date of the signature of the contract for "Supply, Start-up and Testing of Turbine, Generator, Controls and Associated Equipment" /1/.

The PP has provided to AENOR the timeline of the project activity and the evidence to support it. The main milestones of the project are shown below:

Date	Milestone
March 2009	Feasibility Study Report /2/
9 June 2009	Prior consideration form sent to the UNFCCC /3/
9 June 2009	Prior consideration form sent to the Guatemalan DNA /4/
8 June 2010	Financial closing (investment decision date) /5/
24 June 2010	Signature of Contract for "Supply, Start-up and Testing of Turbine, Generator, Controls and Associated Equipment" (starting date)

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Date	Milestone
22 July 2010	Signature of Contract for construction and civil works /6/
27 January 2011	PP request the LoA of Guatemala for the proposed project activity /7/
23 March 2011	LoA of Guatemala /8/
21/05/2011 – 19/06/2011	Public stakeholder consultation of PDD "Choloma Hydroelectric Project"
01/03/2013 (expected)	Starting date of the crediting period

In the opinion of the AENOR validation team, this selected starting date is in line with EB66, Annex 63 /9/ as this will be the first financial commitment made by the project participants for implementation of the project activity.

Regarding the prior consideration of the CDM and taking into account the "Guidelines on the demonstration and assessment of prior consideration of the CDM" version 04 /10/, as the project starting date is after 2 August 2008 and the PDD has been submitted for global stakeholder consultation on 21 May 2011, i.e., after the project starting date, the PP has informed to the Host Party DNA (Guatemala) and UNFCCC in writing of the commencement of the project activity and of their intention to seek CDM status.

PP has provided to the validation team the notification letter to the Guatemalan DNA. In addition, AENOR has ensured that notification to the UNFCCC secretariat has been provided checking the publicly available list in the UNFCCC web page. Therefore, both Guatemalan DNA and UNFCCC notifications have been provided within six months of the project activity start date in compliance with the "Guidelines on the demonstration and assessment of prior consideration of the CDM".

Regarding the notification to UNFCCC secretariat, the PP made a mistake in the notification letter. As a result, in the Prior CDM webpage, the project title appears as "Hidroeléctrica Choloma" while the Entity Name appears as "Hidroeléctrica Choloma Project" instead of "Choloma Hydroelectric Project" and "Hidroeléctrica Choloma S.A" which are the names consistent with the PDD and LoA. Guatemalan DNA has confirmed by writing /32/ that both project titles and entity names refer to the same project. Therefore, the validation team of AENOR is convinced that that both project titles and entity names refer to the same project activity and therefore the requirement is fulfilled.

All evidence provided to the validation team are credible and reliable, hence in the opinion of the AENOR validation team the project activity was seriously considered in the decision to implement the project activity.

3.6.2 Analysis of the additionality

The additionality of Choloma Hydroelectric Project activity is demonstrated as required by the criteria outlined in the Guidelines on the demonstration of additionality of small-scale project activities, version 09.0 /11/ through demonstrating the existence of investment barriers. A detailed analysis of additionality is presented in section B.5 of the PDD.

While the continuation of current activities does not face any barriers, the construction of a new small-scale hydroelectric power plant faces investment barriers. AENOR assessment of the presented investment barriers is as follows:

(a) Investment Barriers: Since the project activity generates financial or economic benefits other than CDM related income, a benchmark analysis is applicable to evaluate the financial viability of the project.

Application of Benchmark Analysis

An IRR benchmark analysis has been used by the PP to demonstrate the additionality of the project activity. It has been demonstrated that the nominal equity IRR post-tax without CDM revenues is estimated to be 12.39%. The equity IRR is lower than the default nominal equity IRR benchmark post-tax of 17.488% adopted by the Project Participant derived from the value provided by the "Guidelines on the assessment of the investment analysis" version 05 for project activities under Group 1 in Guatemala of 12.50% raised by the average CPI long term forecast provided by the IMF for Guatemala of 4.988 /12/. The reference from IMF has been verified and crosschecked by AENOR and are found to be correct; hence, it has been accepted by the validation team.

The IRR benchmark of 17.488% is validated to be suitable for the project activity by AENOR's validation team in compliance with paragraph 12, Annex 5 of the EB62 report and paragraph 114 (b) of the VVM version 1.2.

Regarding the debt/equity finance structure, 50% debt and 50% equity financing have been assumed as a default by the PPs in compliance with paragraph 18, Annex 5 of the EB62 report and accepted by AENOR. Furthermore AENOR has checked that the interest rate applied by project participant in Equity IRR calculation for a repayment period of 10.25 years (the case of the proposed project) is 9.75%, which is the average value of the maximum and minimum interest offered by the bank as per the letter from the bank intended to award the loan /13/. The assumption is deemed appropriate thus accepted by the validation team. In add ion, the validation team has checked that with the application of the lower interest (7.5%) rate the equity IRR does not cross the benchmark.

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The IRR improves to 13.91% on considering CDM revenues, being, therefore, the financial returns of the proposed CDM project activity insufficient to justify the required investment.

The validation team verified that taxes and depreciation used in the investment analysis comply with Guatemalan legal requirements i.e. 31% value of the income tax, 10 year tax holidays for renewable generation and depreciation periods for civil works, machinery and equipment /14/15/.

Following Annex 5 of EB62 "Guidelines on the Assessment of Investment Analysis", it has been validated that the equity IRR calculation is not limited to the proposed crediting period and as that although a shorter period than the technical lifetime has been chosen the fair value of the project activity assets at the end of the assessment period is zero since they are fully depreciated according to local accounting regulations and that only the portion of the capital cost of the assets which is financed as equity is considered as the net cash outflow, that depreciation has been added back to net profits and that the cost of financing expenditures (i.e., loan repayments and interest) was included in the calculation of the equity IRR in the final version of the PDD and the IRR calculation spreadsheet /16/.

The project participant has assumed 4.988% as inflation which is consistent with the inflation applied to convert the benchmark to nominal terms. This inflation rate based was applied in order to pass all values to nominal terms. This assumption is deemed appropriate, thus accepted by the validation team of AENOR.

AENOR has verified and confirmed that the values used in the financial analysis are consistent with the value of the source and that information was available at the starting date of the project (24/06/2010) and was thus likely to have been considered in the decision given this short period of time between the investment decision /5/ and the action for the implementation of the project activity, it is unlikely in the context of the project that the input values would have materially changed. References are included in the PDD and IRR calculation spreadsheet.

The financial worksheets have been shown and verified to be correct. The assumptions used, the base documents and the financial calculations have also been verified.

In addition, during the assessment of this project, the reasonableness of the parameters used in the equity IRR calculation were analysed by comparison with similar projects signed as CDM projects in the same area and publicly available data, as follows:

VAT recovery

As the project participant has considered the VAT expenses in the initial investment, the project participant has considered as revenue an equivalent amount in concept of VAT recovery caused by the VAT-debit generated with the revenues from the commercialization of electricity, corrected by the annual VAT-credit

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sourced from the OPEX. This has been applied to all years until the VAT-credit of the initial investment is fully compensated.

The VAT-credit included as part of the initial investment cost and the OPEX was determined by applying a 12% of VAT to those expenses which should be charged with VAT; according to the "Guatemalan Value Added Tax Law" /33/ this is only applicable to purchase of goods and services of any kind, except those services rendered by vendors that operate abroad; imports of material, equipment and software. AENOR checked the VAT-credit calculations of the initial investment cost and the VAT-credit calculations of the OPEX and confirmed that it has been applied correctly in line with the "Law on Value Added Tax". Thus, AENOR has validated in the financial calculation that the VAT-credit has been determined and applied correctly.

The VAT-debit included in the financial model is the result of applying a 12% of VAT to the electricity revenues applied to all years until a compensation of VAT-credit is compensated. AENOR has verified in the financial model that the VAT-debit has been determined and applied correctly.

Furthermore, AENOR has verified that when not considering the VAT in the calculations, the IRR becomes 11.49% which is below the benchmark. AENOR confirms that the value applied is reasonable and based on the latest information available at the time of the investment decision

Total Investment costs

Investment costs have been taken from the Feasibility Study Report /2/ which provides an estimation of US \$21,878,038 corresponding to studies, designs, construction, equipment and its installation, bank fees, interests and taxes during construction. AENOR has checked that the sum matches with the amount stated in the financial model.

The comparison results confirm that the budgeted investment of 2,255 US\$/KW stated in the PDD is within the range of the investment per MW for similar registered CDM projects in Guatemala (see Table below) and also below the US \$2,900 /KW value provided by the IEA in its "World Energy Outlook 2008" /17/, hence conservative in the CDM additionality context, thus accepted by the validation team of AENOR.

In addition, PP has provided the up to date summary of the investment costs /18/ which shows that almost 99% of the static investment costs stated in the financial model are already committed.

Project	Capacity (MW)	Total Investment US \$1,000	Investment per MW US \$1,000

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Project	Capacity (MW)	Total Investment US \$1,000	Investment per MW US \$1,000
Project 172: Matanzas Hydroelectric Plant /19/	11.70	Not available	-
Project 174: San Isidro Hydroelectric Plant /20/	3.92	Not available	-
Project 606: El Canadá Hydroelectric Project /21/	43.00	59,860	1,392
Project 604: Candelaria Hydroelectric Project /22/	4.30	7,740	1,800
Project 5942: Palo Viejo Hydroelectric Project /23/	88.30	251,078	2,843
Choloma Hydroelectric Project	9.70	21,878	2,255

Table 6: Comparison of Investment per MW between hydropower projects in Guatemala.

Source: <http://cdm.unfccc.int/Projects/registered.html> and Project Proponent

According to the above project discussion, and since the value used in the financial analysis is consistent with the value of the source, it is AENOR's opinion that the total investment used in the PDD was reasonable, valid and applicable at the time of the investment decision.

Operations and Maintenance Costs

O&M costs have been correctly taken from the Operating plan budget /24/, which provides an estimation of US \$368,136 per year indexed annually to Guatemalan CPI.

The annual O&M costs/total static investment of the proposed project activity (2.98%) is compared with the similar registered CDM projects in Guatemala (between 2.97% to 6.18%) and found to be within the range , therefore accepted by the validation team of AENOR (see Table 7 below).

Project	Capacity (MW)	Annual O&M / Static Total Investment
Project 172: Matanzas Hydroelectric Plant	11.70	Not available
Project 174: San Isidro Hydroelectric Plant	3.92	Not available
Project 604: Candelaria Hydroelectric Project	4.30	2.97%

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Project	Capacity (MW)	Annual O&M / Static Total Investment
Project 606: El Canadá Hydroelectric Project	43.00	Not available
Project 5942: Palo Viejo Hydroelectric Project	88.30	6.13%
Choloma Hydroelectric Project	9.70	2.98%

Table 7: Comparison of Annual O&M cost/Total Static Investment between hydropower projects in Guatemala.

Source: <http://cdm.unfccc.int/Projects/registered.html> and Project Proponent

Based on above information, in AENOR's opinion the Annual O&M costs used in the PDD were reasonable, valid and applicable at the time of the investment decision.

Nevertheless, AENOR has validated that with zero O&M costs the benchmark is not crossed by the equity IRR.

Annual Power Generation

The hydropower plant capacity factor of 43.0% was found to be below the range of similar projects signed as CDM in the same area. Nevertheless, the electricity generation was taken from the plant load factor provided by PP to banks while applying the project activity for project financing [13], therefore, accepted by the validation team of AENOR.

Project	Capacity (MW)	Annual operation hours	Load Factor (%)
Project 172: Matanzas Hydroelectric Plant	11.70	3,932	44.9%
Project 174: San Isidro Hydroelectric Plant	3.92	4,082	46.6%
Project 604: Candelaria Hydroelectric Project	4.30	5,344	61.0%
Project 606: El Canadá Hydroelectric Project	43.00	4,047	46.2%
Project 5942: Palo Viejo Hydroelectric Project	88.30	4,196	47.9%
Choloma Hydroelectric Project	9.70	3,767	43.0%

Table 8: Comparison of the annual running hours among similar registered CDM projects in Guatemala

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Source: <http://cdm.unfccc.int/Projects/registered.html> and Project Proponent

Therefore, according to the "Guidelines for the reporting and validation of plant load factors" [25] and above cross-checking, AENOR consider that the annual grid-connected electricity generation is reasonable and appropriate.

Electricity Price

As mentioned in the PDD the PP signed a PPA for the first ten year of operation [26], resulting in an average price¹ of US \$92.50/MWh for the first year of operation of the proposed project activity. AENOR has checked the PPA and the calculations and found them to be correct. In the same way, after that date the energy will be sold on the sport market at US \$80 /MWh according to the electricity price forecasts for the period 2008-2022 stated in the "Plan de Expansion Indicativo del Sistema de Generacion 2008-2022/ Generation System Indicative Expansion Plan 2008-2022" issued by the CNEE [27]. In addition the project participant has assumed this electricity price would escalate at a rate equivalent to the Guatemalan average inflation long term forecast. The aforementioned assumptions are deemed appropriate thus accepted by the validation team of AENOR. Nevertheless, the validation team also checked that even with the application of the highest electricity price settled in the PPA, the equity IRR does not cross the benchmark.

AENOR has checked PPA and found the tariff values used in the financial model to be the same. Calculations were also found to be correct.

Furthermore, AENOR checked the PDDs of hydropower projects in Guatemala and found the value used in the investment analysis and the final PDD, to be the highest of the electricity prices for registered CDM projects.

Project	Capacity (MW)	Electricity Price (US\$/MWh)	Indexed (Y/N)
Project 172: Matanzas Hydroelectric Plant	11.70	Not available	-
Project 174: San Isidro Hydroelectric Plant	3.92	Not available	-
Project 604: Candelaria Hydroelectric Project	4.30	Not available	-
Project 606: El Canadá Hydroelectric Project	43.00	Not available	-

¹ The PPA settles both minimum and maximum electricity prices for all the 10 years of the agreement. PP assumes the yearly average price in the financial analysis which is deemed appropriate.

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Project	Capacity (MW)	Electricity Price (US\$/MWh)	Indexed (Y/N)
Project 5942: Palo Viejo Hydroelectric Project	88.30	70.00	No
Choloma Hydroelectric Project	9.70	92.50¹	Yes

Table 9: Comparison of the electricity among similar registered CDM projects in Guatemala

Source: <http://cdm.unfccc.int/Projects/registered.html> and Project Proponent

Therefore, AENOR considers that the value for the electricity price used for the IRR calculation as has been done in the PDD is appropriate and was valid and applicable at the time of the investment decision.

Capacity Price

In the same way, the PPA establishes that guaranteed power capacity of 5.07 MW will be sold at a fixed price of 7.25 US\$/kW-month during the first ten years of operation of the proposed project activity. Since the PPA only covers 10 years, the capacity price for the remaining years have been indexed to Guatemalan average inflation long term forecast. This assumption deems appropriate and reasonable, thus accepted by the validation team.

AENOR has checked PPA and found the capacity price used in the financial model to be the same. Calculations were also found to be correct.

Furthermore, AENOR checked the PDDs of hydropower projects in Guatemala and found the value used in the investment analysis and the final PDD, to be the highest of the capacity price for registered CDM projects, thus conservative.

Project	Capacity (MW)	Capacity Price (US\$/kW month)	Indexed
Project 172: Matanzas Hydroelectric Plant	11.70	Not available	-
Project 174: San Isidro Hydroelectric Plant	3.92	Not available	-
Project 604: Candelaria Hydroelectric Project	4.30	Not available	-
Project 606: El Canadá Hydroelectric Project	43.00	Not available	-
Project 5942: Palo Viejo Hydroelectric Project	88.30	2.82	Yes

¹ This is the tariff established in the financial model for the first year of operation. The average tariff during the operational lifetime of the Project activity is 97.81 US\$/MWh.

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Project	Capacity (MW)	Capacity Price (US\$/kW month)	Indexed
Choloma Hydroelectric Project	9.70	7.25¹	Yes

Table 10: Comparison of the capacity price among similar registered CDM projects in Guatemala

Source: <http://cdm.unfccc.int/Projects/registered.html> and Project Proponent

Therefore, AENOR considers that the value for the capacity price used for the IRR calculation as has been done in the PDD is appropriate and was valid and applicable at the time of the investment decision.

In order to confirm the conservativeness of both electricity and capacity prices, the validation team of AENOR has compared the monomic price (i.e. revenue per MWh generated) of the proposed project activity with the monomic price observed in other similar registered CDM projects in the region and found the value to be the highest among similar registered projects, thus conservative (see table 11 below).

Project	Capacity (MW)	Monomic Price (US\$/MWh)
Project 172: Matanzas Hydroelectric Plant	11.70	Not available
Project 174: San Isidro Hydroelectric Plant	3.92	Not available
Project 604: Candelaria Hydroelectric Project	4.30	53.30
Project 606: El Canadá Hydroelectric Project	43.0	Not available
Project 5942: Palo Viejo Hydroelectric Project	88.3	102.12
Choloma Hydroelectric Project	9.70	107.90²

Table 11: Comparison of the monomic price among similar registered CDM projects in Guatemala

Source: <http://cdm.unfccc.int/Projects/registered.html> and Project Proponent

Therefore, AENOR considers that the value of the monomic price used for the IRR calculation as has been done in the PDD is appropriate and was valid and applicable at the time of the investment decision.

Nodal Loss Factor

As per Commercial Coordination Norm No.7 /28/ issued by the Wholesale Electricity Market Administrator the electricity losses due to transportation shall be discounted from the revenues received by the electricity

¹ This is the capacity price established in the financial model for the first year of operation. The average capacity price during the operational lifetime of the Project activity is 8.56 US\$/kW-month.

² This monomic price includes nodal losses. Without nodal losses the monomic price would rise to 112.06 US\$/MWh.

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generator. According to the PPA, during the first ten years of operation this discount is shared at 50/50 rate between both parties. At the expiration of PPA, 100% of the discount is levied on the PP.

The nodal loss factor of 94.52% (which means a loss of 5.48% of the total electricity generated) has been taken from the higher annual average provided by AMM during the period June 2007-May 2010 at the substation where the project activity is going to be connected /29/, which is a conservative assumption in the CDM additionality context, hence accepted by the validation team.

In order to confirm the conservativeness on the nodal loss factor used, the validation team of AENOR has compared the nodal loss factor of the proposed project activity with the average nodal loss factors provided by AMM during year 2011 (91.74%)/30/ and for the first nine months of year 2012 (92.30%)/31/ for the same node and found the value used in the investment analysis and the final PDD, to be the highest, thus conservative and accepted by the validation team of AENOR.

Therefore, AENOR has verified and confirmed that the values used in the financial analysis are consistent with the value of the source and this information was available at the date of the investment decision and was thus likely to be considered in the decision.

Finally, the validation team checked that even when Nodal loss factor is 100% i.e. zero electricity losses, the Equity IRR does not reach the benchmark.

AMM toll charges and fees

AMM toll charges and fees have been correctly taken from the Operating plan budget /24/, which provides an estimation of US \$125,428 per year, divided in US \$115,428 for toll charges and US \$ 10,000 for fees, indexed annually to Guatemalan CPI. As per PPA during the first ten years of operation the toll charges shared at 50/50 rate between both parties. After that date, 100% of the toll charges are levied on the PP. Regarding AMM fee, 100% are levied on the PP. AENOR has verified and confirmed that the values used in the financial analysis are consistent with the value of the source and this information was available at the date of the investment decision and was thus likely to be considered in the decision.

Furthermore, the validation team checked that even when AMM toll charges and fees become zero, equity IRR does not reach the benchmark.

In summary, the variation of the AMM toll charges and fees is insignificant regarding the financial/economic attractiveness of the proposed project activity

Other operating costs

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Administrative expenses have been correctly taken from the Operating plan budget /24/ which provides an estimation of US \$117,250 per year, divided in US \$ 9.000 for Salaries & related worker benefits, US \$8,250 of Office Expenses and US \$100,000 for the Insurance, indexed annually to Guatemalan CPI. In the same way, property tax costs are estimated to be 5,940 US\$/year without annual escalation. AENOR has verified and confirmed that the values used in the financial analysis are consistent with the value of the source and this information was available at the date of the investment decision and was thus likely to be considered in the decision

The validation team checked that even when administrative expenses and property tax become zero, equity IRR does not reach the benchmark.

In summary, the variation of the administrative expenses and property costs are insignificant regarding the financial/economic attractiveness of the proposed project activity

Sensitivity Analysis

The final PDD includes a sensitivity analysis to demonstrate that the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions.

For this purpose, variations that would make the Equity IRR reach the benchmark for the parameters of investment costs, electricity price, electricity generation, capacity price and O&M costs have been considered, since these variables constitute more than 20% of either total project costs or total project revenues.

The sensitivity analysis shows that without the income from CER sales the IRR of the proposed project is also lower than the benchmark, even when the possible variations of the main parameters are considered. It was confirmed that the conclusion obtained in the analysis mentioned above highly suggests that the project activity is unlikely to be financially attractive.

In addition, AENOR has validated that higher variations in the parameters that would make the equity IRR reach the benchmark are not likely to occur due to the following facts:

- 18.60% decrease in the total investment costs. The PP provided an up-to-date summary of the investment costs /18/ which shows that almost 99% of the static investment costs stated in the financial model are already committed. In addition, the investment cost per MW of the project was found within the range of similar registered projects in the area; therefore, it is unlikely that the total investment will decrease by 18.60%, such that the equity IRR reaches the benchmark.
- >100% decrease in the total O&M costs. It means that even without operational and maintenance costs the equity IRR does not reach the benchmark.

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- 22.10% increase in electricity generation. The annual electricity output is taken from the value provided to banks while applying the project activity for project financing /13/. In addition the average load factor of the similar registered CDM projects is 49.32% (14.70% higher); therefore, it is unlikely that the load factor of the project will increase by 22.10%, such that the equity IRR reaches the benchmark.
- 22.10% increase in electricity price. The electricity price is not expected to increase as capacity prices have dropped in Guatemala due to the global economical crisis. Furthermore according to the forecast of the Electrical Energy National Commission (CNEE) presented in the "Indicative expansion plan of the generation system 2008-2022" /27/ the long term electricity prices are expected to decrease due to the new capacity additions and the expected connections with other grids e.g. Mexican grid, thus it is unlikely that the electricity price could increase by 22.10% to make the equity IRR reach the benchmark.
- 259.50% increase in capacity price. The capacity tariff or the capacity spot price is not expected to increase as capacity prices have dropped in Guatemala due to the global economical crisis. Furthermore according to the forecast of the Electrical Energy National Commission (CNEE) presented in the "Indicative expansion plan of the generation system 2008-2022" /27/ the long term capacity prices are expected to decrease due to the new capacity additions and the expected connections with other grids e.g. Mexican grid, thus it is unlikely that the capacity price could increase by 259.50% to make the equity IRR reach the benchmark

AENOR reviewed and confirmed all related documents. The assessments show clearly that investment is unlikely to be 18.60% lower, capacity price 259.50% higher, electricity price 22.10% higher and electricity generation 34.90% higher, while the required O&M costs variation scenario is unrealistic.

In summary, it is AENOR's opinion that the additionality of the project is sufficiently demonstrated based on the investment barrier analysis and thus it is sufficiently demonstrated that the project is not a likely baseline scenario and those emission reductions are therefore additional.

3.7 Monitoring Plan

The project is using the approved monitoring methodology AMS.I.D "Grid connected renewable electricity generation" version 17. The "Tool for the calculation of the emission factor of the electricity system" version 02.2.1 and the methodology ACM0002 (version 13.0.0) are also applied in accordance with provisions stated in the AMS I.D.

As stated in the approved methodology AMS.I.D, the monitoring parameters described in the monitoring plan of the final version of the PDD are the following:

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1. **$EF_{CO_2,y}$: CO_2 emission factor of the grid electricity in year y :** It will be calculated ex-post annually as the combined margin emissions factor ($EF_{Grid,CM,y}$), consisting of the combination of OM emissions factor ($EF_{Grid,OM,y}$) and BM ($EF_{Grid,BM,y}$) emission factor according to the procedures prescribed in the "Tool to calculate the emission factor for an electricity system", based on the latest information from AMM.
2. **$EG_{facility,y}$ ($EG_{BL,y}$) : *Quantity of net electricity supplied to the grid in year y* :** Electricity meters (main a back-up) will be used to monitor continuously this parameter, with hourly measurement and monthly recording. The meters should be authorized by the AMM, according to commercial norm no. 14/52/ and fulfill Norms IEC 687 or ANSI/IEEE 12.20., and they will be calibrated annually by a third party authorized by the AMM. The monitored data will be compared monthly with the commercial data (electricity invoices or AMM's Monthly Transactions Report) and with the data registered manually by the plant operator.

As stated in the "Tool for the calculation of the emission factor of the electricity system", the monitoring parameters are the following:

1. **$EF_{CO_2,m,i,y}$: *Average CO_2 emission factor of fuel type i used in power unit m in year y* :** Due to there are not available values provided by the fuel suppliers and regional or national default values, the project participant will monitor this parameter annually during the crediting period for the relevant year, using as data source the IPCC default values at the lower limit.
2. **$n_{m,y}$ and $n_{k,y}$: *Average net energy conversion efficiency of power unit m , in year y* :** Although the tool requires the monitoring of this parameter once for crediting period, the project participant has decided to state an annual frequency. The default values provided in the Annex 1 of the tool will be used.
3. **$EG_{m,y}$ and $EG_{k,y}$: *Net electricity generated by power plant/unit m or k in year y* :** These values will be determined annually during the crediting period for the relevant year, obtaining data from AMM's generation reports.

As stated in the methodology ACM0002, the monitoring parameters are the following:

1. **Cap_{PJ} : *Installed capacity of the hydro power plant after the implementation of the project activity*:** The monitoring would be performed annually, checking the information indicated on the manufacturer's nameplate of the generator.
2. **A_{PJ} : *Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full*:** The area of the multiple reservoirs formed by the diversion dams in the surface of the water, when the reservoirs are full, will be checked using the design maps with level curves and borders of each reservoir. The surface

area of the tank-reservoir is simple to establish as this structure is a circular tank of known dimensions (60 meter diameter), therefore their geometrical dimensions are checked. The monitoring would be performed annually.

3.7.1 Compliance of the monitoring plan with the approved methodology

As it is described above in this report, in the opinion of the AENOR team, all necessary parameters required by the applied approved methodologies and tool are contained in the monitoring plan of the final version of the PDD. They are clearly described, and the means of monitoring, described in the monitoring plan, comply with the requirements of the methodology. The monitoring of the parameters involved in the emission reductions has been established in a transparent and clear way. The monitoring plan of the final PDD details the information to be monitored regarding the data sources and recording frequency. Thus, the monitoring plan is in compliance with the applicable methodologies and tool. Furthermore, training actions, archiving, measuring and calculation procedures, equipment details, calibration frequency and maintenance needs are clearly mentioned.

For all the above reasons, the monitoring plan complies with the methodology AMS.I.D (Version 17), ACM0002 (version 13) and the "Tool to calculate the emission factor for an electricity system" (Version 02.2.1), and the requirements stated in the Validation and Verification Manual.

3.7.2 Implementation of the Monitoring Plan

In order to guarantee the implementation of the correct monitoring activities before the start of the first crediting period, the monitoring plan clearly defines the monitoring responsibilities and the people in charge of the emission reductions calculations will monitor, record and gather all the parameters and indicators involved in the emission reduction calculation. All the people involved in the monitoring process will be suitable qualified and they will receive an appropriate training in the CDM monitoring requirements.

On the other hand, procedures will be developed in order to the parameters, and the description included in the monitoring plan is in accordance with the applied methodologies and tool.

The project will include provisions for the maintenance and calibration of the equipment, and quality assurance and quality control procedures will be also taken into account.

The monitoring plan includes procedures for review of reported results data and internal audits. Also, a quality control is established to ensure monitoring accuracy.

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Therefore, AENOR confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and that the data management, 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.

For all the reasons stated above, AENOR considers that the project participant is able to implement the monitoring plan stated in the final version of the PDD.

3.8 Comments by Local Stakeholders

In order to meet the requirements established by the United Nations Framework Convention on Climate Change (UNFCCC), different meetings were organized with local residents to fulfil their necessity and right to be informed about the project.

All documentation related to the different meetings /53/ was provided to AENOR validation team. The most important matters of the stakeholders' consultation process are summarised below:

- On 08/06/2007, was held a meeting with 39 representatives from the Nuevo San Carlos, La Montañesa, Santa Lucía Secacao and Las Margaritas Semococh communities to inform about the project. During this meeting, a survey was developed in order to obtain opinions regarding the project activity.
- On 30/07/2007, was presented the Choloma Hydroelectric Project to the members of the Municipal Board, including the Mayor of the Municipality of the Senahú Township.
- On 13/09/2007, a meeting with leaders of COCODES took place. This meeting was attended by representatives of the Nuevo San Carlos, La Montañesa and Santa Lucía Secacao communities.
- On 18/09/2007, a meeting with members of the Municipal Board was held in the Municipality of San Antonio Senahú.
- On 17/02/2011, a Stakeholder Consultation to representatives from several nearby communities was undertaken

Local stakeholders' consultation was carried out by the PP prior to the publication of the PDD on the UNFCCC website, on 21/05/2011.

The main conclusions of the meetings and opinions collected are included in the PDD, section E.2. Thus, during the on site visit the AENOR team held interviews with those local stakeholders affected by the project in order to know their opinions about the implementation of the project. (See section 2.3).

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Section E.3. of the PDD include details of actions taken to take due account of the received comments. All different actions are divided in community infrastructure actions, community support actions and general infrastructure actions.

AENOR determines that the local stakeholders have been invited, a summary of the comments received and the project participants have taken due account of the comments received. Evidences of the meeting have been verified by the DOE team during the validation process.

All of these matters were verified during the on-site visit and they are in accordance with the project stakeholder consultation report. Moreover, no negative feedback was received, which was also verified during the on-site visit in the interviews with local people and local authorities.

Hence, in the opinion of the AENOR team the local stakeholder consultation process was suitability performed.

3.9 Environmental Impacts

As it is required by the environmental laws of Guatemala, "Choloma Hydroelectric Project" had to present an Environmental Impact Assessment Study (EIA).

An Environmental Impact Assessment for the Hydro Power plant, were carried out by the PP and presented to the MARN. The Environmental Approval for the project was obtained on 04/04/2008 through a resolution issued by the MARN with reference 1744-2008/ECM/MFG /47/.

In Section D of the PDD, the environmental impact assessment process has been correctly summarized. During the on-site visit, the representatives of the MARN and DNA of Guatemala were interviewed, and they confirmed the contribution of the project activity to the sustainable development of the area.

AENOR concludes that the PP has followed a correct analysis of environmental impacts in accordance with procedures as required by the host Party.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to Decision 4/CMP.1, the DOE shall make the PDD publicly available and also receive within 30 days, comments on the validation requirements from parties, stakeholders and UNFCCC accredited NGOs, and must also make those comments publicly available.

AENOR published the first PDD, version 1, on the CDM website on 21/05/2011 and invited to provide comments from parties, stakeholders and non-governmental organisations during 30 days. In this period,

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three comments were received for the project activity on the CDM website. These comments are available in the below link:

<http://cdm.unfccc.int/Projects/Validation/DB/KO73SWYTHCKI8RTB98PBYZIKVN41MO/view.html>

Moreover, the comments are included in the annex 3 of this validation report

Two comments (numbers 2 and 3) are identical and refer to India and Bhutan. Therefore, as the project activity is located in Guatemala rather than in the countries referred in the comments, they are considered not applicable.

The other comment is related to financial analysis and the overall validation process instead of specific issues related to the project. The same comment (identical) was sent to many projects over a 2.5-month period and indicates that the projects are not valid as CDM projects.

According to the VVM version 01.2, as received comments were not sufficiently substantiated and they indicated that the project activity did not comply with the CDM requirements, the validation team requested by email on 28/07/2011 /54/ further clarification from the entity providing the comments without receiving response. A reminder was sent on 13/12/2011 /55/ and no response was received again.

Although the comments cannot be considered applicable to the project activity, the DOE undertook the evaluation of the validity and applicability of the project as a CDM project, and during the validation process of the project activity took into account the comments received. The audit team reviewed all information related to the received comments and checked that the project activity complies with the CDM requirements and the national regulatory rules, as it has obtained the necessary permits and authorizations, as it is explained with more details in other sections of this report.

Therefore, the audit team considers that the comments have been correctly addressed.

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5 VALIDATION OPINION

AENOR has performed the validation of the "Choloma Hydroelectric Project" in Guatemala. The validation process was performed on the basis of all UNFCCC issues and criteria for CDM projects, the host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting. The conclusions of this report show that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

The validation consisted of the following three phases: i) a desk review of the project design, the baseline and the monitoring plans; ii) follow-up interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. In the course of the validation process, 9 corrective actions and 10 clarifications were raised; all have been successfully closed.

The project participant used the latest Guidelines on the demonstration of additionality of small-scale project activities", version 09.0 and "Guidelines on the demonstration and assessment of prior consideration of the CDM", version 04, to demonstrate the additionality of the project. The "Tool to calculate the emission factor for an electricity system" version 02.2.1 and the methodologies AMS.I.D version 17 and ACM0002, version 13.0.0 have also been applied to determine the emission reductions.

The review of the project design documentation and additional documents related to baseline and monitoring methodology, and the subsequent background investigation, follow-up interviews and review of comments by parties and stakeholders have provided AENOR with sufficient evidence to validate the fulfilment of the stated criteria.

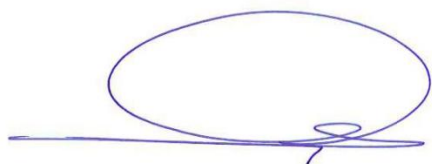
The conclusions can be summarised in detail as follows:

- The project is in line with all relevant host country criteria of Guatemalan DNA and with all relevant UNFCCC requirements for CDM. The LoA from Guatemala is dated 23/03/2011.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of project emission reductions has been carried out in a transparent and conservative manner, so that the calculated emission reductions per year of 18,926 tCO₂e are most likely to be achieved within the renewable crediting period.

In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria. The validation has been performed using a risk-based approach, as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, AENOR cannot be held liable by any party for decisions made or not made based on the validation opinion, which would go beyond the purpose.

DATE

27/12/2012

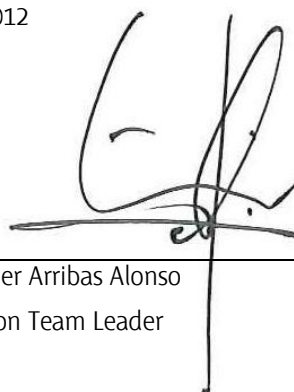


Luis Robles Olmos

Authorised person

DATE

27/12/2012



Luis Javier Arribas Alonso

Validation Team Leader

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6 CORRECTIVE ACTION REQUESTS, CLARIFICATIONS AND FORWARD ACTION REQUESTS

TITLE	Choloma Hydroelectric Project		
FINDING	CAR 1		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The section B.1 shall detail the correct tool used to calculate the emission factor of the electricity grid including its version. The calculation of the emission factor of the grid shall be also updated using this new version.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The calculation of the emission factor of the grid was updated using the version 2.2.0 of the "Tool to calculate the emission factor for an electricity system".		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	The updated spreadsheet "Calculation of the emission factor-version 2" is annexed to this document.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The PDD has been correctly updated with the version 2.2.0 of the referred tool. Nevertheless, this CAR 1 is pending on CL 4.		
PP RESPONSE #2	<i>This section shall be filled by the PP.</i>		
<i>Corrective action</i>	Pending on DOE Assessment on CL 4.		
<i>Evidences proposed</i>			
DOE Assessment #2	The version 2.2.0 of the "Tool to calculate the emission factor for an electricity system" was valid until 29/05/2012, therefore, the PDD and the spreadsheet with the calculation of the emission factor of the grid have to be updated, using the current version of the "Tool to calculate the emission factor for an electricity system".		
PP RESPONSE #3	<i>This section shall be filled by the PP.</i>		
<i>Corrective action</i>	The PDD and spreadsheet with the calculation of the emission factor of the grid have been updated using the latest version of the "Tool to calculate the emission factor for an electricity system".		

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<i>Evidences proposed</i>		
DOE Assessment #3	According to the "Guidelines for completing the simplified project design document (CDM-SSC-PDD) and the form for proposed new small scale methodologies (CDM-SSC-NM)" (version 05), section B.1. of the final version of the PDD, indicates the number and the version of the approved methodology that is used, and other sections of the PDD is referred the "Tool to calculate the emission factor for an electricity system", version 02.2.1, used to calculate the emission factor of the electricity grid, and the final version of the calculation spreadsheet has been updated using this same version of the tool.	
Conclusion <i>Tick the appropriate checkbox</i>	CAR CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CAR 2		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The starting date of the project activity is not stated in accordance with the latest version of the "Glossary of terms".		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The starting date of the project activity is stated in accordance with the latest version of the Glossary of terms in the version 3.4 of the CDM-PDD, attached to this document.		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	Starting date of the project activity is fixed by the date when the contract for "Supply, Start-up and Testing of Turbine, Generator, Controls and Associated Equipment" with Gilbert Gilkes & Gordon Ltd. (Gilkes) was signed, June 24, 2010. This contract was provided to the DOE during the on-site visit.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The starting date considered in the PDD is considered appropriate and in accordance with the Glossary of terms.		
Conclusion <i>Tick the appropriate checkbox</i>	CAR CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CAR 3		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	<p>The calculation of the emission factor of the national grid shall be corrected. Among other, following issues shall be corrected:</p> <ul style="list-style-type: none"> • The calculation of the Operating Margin emission factor shall be updated using data from 2010 since it was published in April 2011. • The calculation of lambda factor is not stated in accordance with the referred tool. • All the information included in the spreadsheets shall be stated in English language. • The emission factor and NCVs of the fuels are not chosen in accordance with provisions stated in the tool (IPCC default values at the lower limit of the uncertainty - 2006 IPCC Guidelines on National GHG Inventories) • The build margin emission factor is calculated using 2008 year, it shall be updated. 		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	<p>The calculation of the emission factor of the grid was corrected as follows:</p> <p>The calculation of the OM and BM factors were updated using data from 2010.</p> <p>The calculation of lambda was corrected.</p> <p>All the information in Spanish was translated to English.</p> <p>The IPCC default values were used at the lower limit of uncertainty.</p>		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	<p>The corrected spreadsheet "Calculation of the emission factor-version2" is attached to this document.</p> <p>The sections of the CDM-PDD regarding baselines emissions and emissions reductions were corrected.</p>		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	<p>The excel spreadsheet has been reviewed by the validation team and following issues shall be modified:</p> <ul style="list-style-type: none"> • There are Spanish words: sheet titled "GEN data-10", cells A47, A57, A77...etc. • The values of electricity generation of several agents (sheet GEN data - 10) do not coincide with the official values: 		

VALIDATION REPORT

"Choloma Hydroelectric Project"

	<p>Laguna 1, Laguna 2...etc.</p> <ul style="list-style-type: none"> • Clarification regarding the consideration of San Jose (coal) as low cost must run is required (sheet OM 10). • The data of energy produced 2010 of several centrals included in sheet named OM10 do not coincide with data included in sheet GEN data -10. • The origin of the load duration curve is required. • The calculation of lambda is not as transparent as it is required. Further clarification regarding the calculation of two values of lambda is required, since just one of them is the same than that calculated using the UNFCCC table.
PP RESPONSE #2	<i>This section shall be filled by the PP.</i>
<i>Corrective action</i>	<ul style="list-style-type: none"> • The Spanish words have been translated to English. • The data of produced energy was corrected in the spreadsheet, using generation data, downloaded from AMM's website. • An explanation of the operation of San José was provided to the validator. • The load duration curve is calculated from the demand data downloaded from AMM's website. • A description of the calculation method for lambda is included in the Excel spreadsheet.
<i>Evidences proposed</i>	
DOE Assessment #2	The final version of the calculation spreadsheet has updated correctly all requested issues and the calculation of the emission factor of the national grid is considered in accordance with the "Tool to calculate the emission factor for an electricity system" version 2.2.1.
Conclusion <i>Tick the appropriate checkbox</i>	<div> CAR CLOSED <input checked="" type="checkbox"/> </div> <div> To be checked during the first periodic verification <input type="checkbox"/> </div>

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CAR 4		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The list of the parameters available at validation shall be stated in accordance with the applied methodology and tool.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The tables regarding the installed capacity before the project activity (Cap_{BL}) and the area before the project activity (A_{BL}) were included.		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	Section B.6.2 of the CDM-PDD was modified.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	PP shall clarify the reason for the inclusion of some parameters that are not required by the applied methodology and Tool.		
PP RESPONSE #2	<i>This section shall be filled by the PP.</i>		
<i>Corrective action</i>	Parameters that are not required by the applied methodology and tool were removed from the PDD. They were mistakenly included.		
<i>Evidences proposed</i>			
DOE Assessment #2	The final version of the PDD includes all parameters available at validation that are required by the applied methodologies and tool.		
Conclusion <i>Tick the appropriate checkbox</i>	CAR CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CAR 5		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The monitoring methodology is not clearly indicated in the Monitoring section of the PDD.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	It was specified in the CDM-PDD that the monitoring of the emission reductions will be prepared according to the version 17 of the monitoring methodology ID for small-scale CDM project activity categories.		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	Section B.7.2 of the CDM-PDD.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The inclusion of the monitoring methodology is considered adequate, thus, CAR 5 is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	CAR CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CAR 6		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The description of each of the parameters shall be stated in accordance with the applied methodology and tool.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The tables of the monitoring parameters were completed in the CDM-PDD.		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	Section B.7.1 was modified.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	Section B.7.1 of the PDD shall include the parameters required by the "Tool to calculate the emission factor for an electricity system".		
PP RESPONSE #2	<i>This section shall be filled by the PP.</i>		
<i>Corrective action</i>	Parameters required by the "Tool to calculate the emission factor for an electricity system" applicable to the project activity were included in section B.7.1 of the PDD.		
<i>Evidences proposed</i>			
DOE Assessment #2	Section B.7.1 of the final version of the PDD includes the description of all parameters to be monitored that the applied methodologies (AMS. I.D version 17, ACM0002 version 13) and "Tool to calculate the emission factor for an electricity system" version 2.2.1 require and are applied to the project activity.		
Conclusion <i>Tick the appropriate checkbox</i>	CAR CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CAR 7		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Information regarding the consideration of Energia y Medio Ambiente as not project participant is required to be included in Section B.8.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	It was indicated that the consulting company is not a project participant.		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	Section B.8 of the CDM-PDD.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The detail included in the PDD regarding the no consideration of the company Energia y Medio Ambiente as project participant is considered enough and adequate.		
Conclusion <i>Tick the appropriate checkbox</i>	CAR CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CAR 8		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The spreadsheet of the financial analysis shall be transparent and traceable.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The spreadsheet of the financial analysis has been simplified and modified according to EB 62 Report Annex 5, Guidelines on the Assessment of Investment Analysis. The spreadsheet includes an "Assumptions" section, which was not included before.		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	The simplified spreadsheet of the financial analysis is attached to this document.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	Unprotected and traceable spreadsheet versions of the financial analysis has been provided		
Conclusion <i>Tick the appropriate checkbox</i>	CAR CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT
"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CAR 9		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Sensitivity analysis spreadsheet shall be provided in accordance with EB 62 Report Annex 5.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	Sensitivity analysis spreadsheet was modified according to EB 62 Report Annex 5, Guidelines on the Assessment of Investment Analysis.		
<i>It shall provide and identified the evidences proposed (if applicable)</i>	Results of this sensitivity analysis are visible on section B.5 of the Project Design Document.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	Unprotected and traceable spreadsheet versions of the sensitivity analyses have been provided		
Conclusion <i>Tick the appropriate checkbox</i>	CAR CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 1		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The calculation of the plant factor shall be clarified in order to demonstrate that it is in accordance with paragraph 3 of the Annex 11- EB 48.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The calculation of the plant load factor defined ex-ante in the CDM-PDD (43%) is in accordance with option (a) of the Annex 11-EB 48.		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	The document provided to the bank while applying the project activity for project financing contains the plant load factor stated in the CDM-PDD. The information contained in this document is confidential and it is provided to the DOE for validation purposes. (Info Memo)		
DOE Assessment #1 <i>The assessment shal encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The load factor included in the final version of the PDD is in accordance with the "Guidelines for the reporting and validation of plant load factors" version 01.		
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 2		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The Interconnection permit is required.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The Interconnection permit was issued until August 24, 2011.		
<i>It shall provide and identified the evidences proposed (if applicable)</i>	The Interconnection permit is attached to this document.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The interconnection permit has been provided and the information included in the PDD is considered consistent with it.		
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 3		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The starting date of the operation of the project activity shall be clarified and documented.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The registration of project activity will occur after the starting of operation, for that reason the starting date of the first crediting period was modified in section C.2.1.1 of the CDM-PDD.		
<i>It shall provide and identified the evidences proposed (if applicable)</i>	The starting date of commercial operations of the project activity was on October 30, 2011 as declared by the Wholesales Electricity Administrator in the letter issued on October 27, 2011; it is attached to this document.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The starting date of the crediting period has to be updated with a realistic date, in accordance with the estimated date of the project registration.		
PP RESPONSE #2	<i>This section shall be filled by the PP.</i>		
<i>Corrective action</i>	The starting date of the crediting period has been updated with a realistic date: 01.03.2013.		
<i>Evidences proposed</i>			
DOE Assessment #2	The starting date of the crediting period stated in the final version of the PDD has been updated with a realistic date, in accordance with the estimated date of the project registration.		
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 4		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The sheet prepared for the emission reduction calculation is not provided.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The updated spreadsheet "Calculation of the emission factor-version 2" is attached to the CDM-PDD.		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>			
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	Since the spreadsheets have been provided, this CL 4 is closed. Nevertheless, it assessment is detailed in CAR 3 resolution.		
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT
"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 5		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The no inclusion of the national electricity grid in the project boundaries should be clarified.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The boundaries of the project activity were modified according to the definition given in the Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories (version 17).		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	Section B.3 of the PDD is modified to clarify this question.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The graph has been modified and the electricity grid has been accordingly included in the boundaries of the project activity. Nevertheless, the graph is not correctly included since the transmission line has been removed.		
PP RESPONSE #2	<i>This section shall be filled by the PP.</i>		
<i>Corrective action</i>	The graph was corrected.		
<i>Evidences proposed</i>			
DOE Assessment #2	The national electricity grid has been included in the project boundaries. The boundary graph is correct.		
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 6		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The notification regarding the prior consideration to the DNA of Guatemala is required.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>			
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	Hidroeléctrica Choloma, S.A. informed Guatemala's Designated National Authority regarding the prior consideration of the CDM on June 9, 2009. The letter informing about the prior consideration of the CDM is attached to this document.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	Appropriate evidence has been provided.		
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 7		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	All the sources of information used for the additionality assessment shall be provided. The spreadsheets used for the IRR calculation shall be also provided.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The spreadsheet "Choloma Financial Projections" used for the IRR calculation is attached to this document.		
<i>It shall provide and indentified the evidences proposed (if applicable)</i>	The file "IRR_support-docs_Choloma", attached to this document, contains a compilation of the most representative contracts, quotations, commercial invoices and other financial projections, that support part of the financial assumptions.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The additionality assessment spreadsheets have been provided, nevertheless, this CL 7 is pending on the final assessment made by the validation team.		
PP RESPONSE #2	<i>This section shall be filled by the PP.</i>		
<i>Corrective action</i>	The spreadsheet of the financial analysis was simplified and modified in accordance with EB 62 Annex 5. An "Assumptions" section was included, referring to other documents attached to this document, which support the values used.		
<i>Evidences proposed</i>			
DOE Assessment #2	The spreadsheet of financial analysis has to be still improved with the proper data and information.		
PP RESPONSE #3	<i>This section shall be filled by the PP.</i>		
<i>Corrective action</i>	The spreadsheet of financial analysis was corrected with the proper data and information.		
<i>Evidences proposed</i>	A new version of the spreadsheet was sent to the validator.		

VALIDATION REPORT

"Choloma Hydroelectric Project"

DOE Assessment #3	Appropriate evidence has been provided	
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 8		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	An inconsistency regarding the surface area of the reservoir has been detected between the PDD and the documentation provided (CONASA contract, EIA). A clarification is required. Furthermore, the methodology used for the calculation shall be also referred in the corresponding section.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The formula to calculate the area of the reservoir (tank) was included in section B.6.3.		
<i>It shall provide and identified the evidences proposed (if applicable)</i>	<p>The real value of the reservoir area is calculated in the CDM-PDD according to the dimensions of the water reservoir tank. The contract with Desarrollos Metálicos, S.A. (constructor of the reservoir) provides the dimensions of the reservoir tank. This contract is attached to this document.</p> <p>The project design was optimized during its development, therefore the documents developed during the initial stage of the project have some variations regarding to the final design.</p>		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The calculations made in the PDD are in accordance with the applied methodology ACM0002. The data used for the calculation are consistent with the evidence provided, thus, it is considered that the inconsistency has been resolved.		
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 9		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	IRR calculations are included the financial cost of the Equity however only equity without financial cost should be included.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	Equity IRR calculation has been corrected, excluding financial cost of Equity. Consequently, Equity is reflected at the year of its injection.		
<i>It shall provide and identified the evidences proposed (if applicable)</i>			
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The spreadsheet of financial analysis has to be still improved with the proper data and information.		
PP RESPONSE #2	<i>This section shall be filled by the PP.</i>		
<i>Corrective action</i>	The spreadsheet of financial analysis was corrected with the proper data and information.		
<i>Evidences proposed</i>	A new version of the spreadsheet was sent to the validator.		
DOE Assessment #2	Appropriate evidence has been provided		
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT

"Choloma Hydroelectric Project"

TITLE	Choloma Hydroelectric Project		
FINDING	CL 10		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Period of assessment shall be clarified.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	According to the equipment operational lifetime, the expected operational lifetime of the project activity is 30 years. The period of assessment is 21 years in accordance with paragraph 3 of Annex 5 EB62 report.		
<i>It shall provide and identified the evidences proposed (if applicable)</i>	The manufacturer's certification on the operational lifetime of the equipment is attached to this document.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	Period of assessment has been clarified.		
Conclusion <i>Tick the appropriate checkbox</i>	CL CLOSED <input checked="" type="checkbox"/>	To be checked during the first periodic verification <input type="checkbox"/>	

VALIDATION REPORT
"Choloma Hydroelectric Project"

7 REFERENCES

Ref	Document Name	Author/Competent Authority
1	Contract for Supply, Start-up and Testing of Turbine, Generator, Controls and Associated Equipment (starting date)	PROJECT PROPONENT AND GILBERT GILKES & GORDON LTD.
2	Feasibility Study Report	PROJECT PROPONENT
3	Prior consideration form sent to the UNFCCC	PROJECT PROPONENT
4	Prior consideration form sent to the Guatemalan DNA	PROJECT PROPONENT
5	Financial closing (investment decision date)	PROJECT PROPONENT
6	Signature of Contract for construction and civil works	PROJECT PROPONENT & CONASA
7	PP request the LoA of Guatemala for the proposed project activity	PROJECT PROPONENT
8	Letter of Approval of the project activity dated 23/03/2011	MINISTERIO DE AMBIENTE Y RECURSOS NATURALES (MARN)
9	Glossary of the CDM terms version 07.0	CDM – EXECUTIVE BOARD
10	Guidelines on the demonstration and assessment of prior consideration of the CDM version 04	CDM – EXECUTIVE BOARD
11	Guidelines on the demonstration of additionality of small-scale project activities, version 09.0	CDM – EXECUTIVE BOARD
12	Guatemala inflation long term forecast	IMF
13	Syndicated Loan Term Sheet	BANCO G&T CONTINENTAL, S.A.
14	Tax and depreciation requirements Decree number 26-1992: Income tax law	GOVERNMENT OF GUATEMALA
15	10 year tax holidays for renewable generation Decree number 52-2003	GOVERNMENT OF GUATEMALA
16	Financial Analysis Choloma (Equity IRR calculation spreadsheet for the project)	PROJECT PROPONENT
17	World Energy Outlook 2008	IEA

VALIDATION REPORT

"Choloma Hydroelectric Project"

Ref	Document Name	Author/Competent Authority
18	Up-to-date summary of investment costs	PROJECT PROPONENT
19	Project 604: Candelaria Hydroelectric Project	CDM – EXECUTIVE BOARD
20	Project 172: Matanzas Hydroelectric Plant	CDM – EXECUTIVE BOARD
21	Project 174: San Isidro Hydroelectric Plant	CDM – EXECUTIVE BOARD
22	Project 606: El Canadá Hydroelectric Project	CDM – EXECUTIVE BOARD
23	Project 5942: Palo Viejo Hydroelectric Project	CDM – EXECUTIVE BOARD
24	Project Operation Plan Budget	PROJECT PROPONENT
25	Guidelines for the reporting and validation of plant load factors version 01	CDM – EXECUTIVE BOARD
26	Power Purchase Agreement	PROJECT PROPONENT AND ELECTRONOVA
27	Indicative expansion plan of the generation system 2008-2022	CNEE
28	Commercial Coordination Norm No.7	AMM
29	Interconnection diagram of Hidroeléctrica Choloma	PROJECT PROPONENT
30	Nodal loss factors for year 2011	AMM
31	Nodal loss factors for year 2012 (from January to September)	AMM
32	Guatemalan DNA confirmation letter that both the project titles refers to the same project activity	MINISTERIO DE AMBIENTE Y RECURSOS NATURALES (MARN)
33	Guatemalan Value Added Tax Law	PROJECT PROPONENT
34	PDD submitted for the GSC, version 1, dated 16/05/2011	PROJECT PARTICIPANT
35	PDD version 3.4 (final version), dated 5/12/2012	PROJECT PARTICIPANT
36	AMS I.D version 16 "Grid connected renewable electricity generation"	CDM – EXECUTIVE BOARD
37	AMS I.D version 17 "Grid connected renewable electricity generation"	CDM – EXECUTIVE BOARD

VALIDATION REPORT
"Choloma Hydroelectric Project"

Ref	Document Name	Author/Competent Authority
38	ACM0002 version 13 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"	CDM – EXECUTIVE BOARD
39	Tool to calculate the emission factor for an electricity system", version 2.2.1	CDM – EXECUTIVE BOARD
40	Clean Development Mechanism Validation and Verification Manual, version 01.2	CDM – EXECUTIVE BOARD
41	Instruction for Validation, Verification and Certification of Clean Development Mechanism (CDM) Project Activities (IE-DTC-039)	AENOR
42	EIA	PROJECT PROPONENT
43	Construction permit	PROJECT PROPONENT
44	Permit for the use of the public properties	PROJECT PROPONENT
45	Interconnection permit	PROJECT PROPONENT
46	Design maps	PROJECT PROPONENT
47	Project Approval Resolution nº 1744-2008/ECM/MFG	MARN
48	Statistic report 2010	AMM
49	Calculation of the emission factor spreadsheet, version 5	PROJECT PROPONENT
50	IPCC Guidelines on National GHG Inventories	IPCC
51	Hourly generation data of 2010	AMM
52	Commercial norm no. 14	AMM
53	Stakeholders' meeting reports	PROJECT PROPONENT
54	Request for clarification of comments received during the GSC	AENOR
55	Reminder of the request for clarification of GSC comments	AENOR

VALIDATION REPORT

"Choloma Hydroelectric Project"

ANNEX 1: CDM VALIDATION PROTOCOL

Validation Protocol

Project: "Choloma Hydroelectric Project"

Date of Completion: 2012/12/13

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VALIDATION PROTOCOL

PROJECT: "**Choloma Hydroelectric Project**"

PROJECT PARTICIPANT:

Hidroeléctrica Choloma, S.A.

Validation Type	
<input checked="" type="checkbox"/> Validation of a Project Activity	
Validation Team: Luis Javier Arribas (Chief Validator) Freddy Garro (Validator) Mercedes García Madero (Validator) Marcelino Pellitero Martínez (Validator)	
Version of this Validation Protocol: 04	Date: 2012/12/13

Validation Protocol

Project Title: Choloma Hydroelectric Project

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CHECKLIST TOPIC / QUESTION	MoV/Ref. *	COMMENTS	Draft Conclusion	Final Conclusion
A. GENERAL DESCRIPTION OF PROJECT ACTIVITY				
A.1. Approval				
A.1.1 Have all the Parties involved in the project activity provided a written Letter of Approval of the project activity?	DR I	There is one party involved in the project activity, Guatemala, but not considered as project participant. In accordance with the national procedure for the approval of the CDM project activities, the Letter of Approval has been awarded by the Natural resources and Environment Ministry (Ministerio de Ambiente y Recursos Naturales) on 23/03/2011.	OK	OK
A.1.2 Do the Letters of Approval confirm that: <ul style="list-style-type: none"> The Party is a Party to the Kyoto Protocol The participation is voluntary The CDM project activity contribute to the sustainable development (host Party) The title of the project activity is precise and coincides with the title included in the PDD? 	DR	Yes, the Letter of Approval of Guatemala confirms that Guatemala is a party of the Kyoto Protocol, its participation is voluntary and the CDM project activity will contribute to achieve sustainable development. The title of the project activity indicated in the LoA coincides with the title included in the PDD.	OK	OK
A.1.3 Has the Letter of Approval be obtained from the project participants or directly from the DNA? In case that it has been obtained from the project participant, how has been assessed its authenticity?	DR I	The Letter of Approval has been obtained from the project participant. Its authenticity has been assessed in an interview with representatives of the DNA during the on site visit.	OK	OK
A.1.4. If either LoA contains additional specification or conditions of the project activity, then has the request for registration been based on the documents specified in the LoA?	DR	No additional specification is detailed in the LoA.	OK	OK

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A.1.5. If the LoA references a specific version of the Validation Report or PDD and this version cannot be submitted, then has either of the following been submitted? a) a statement indicating final LoA has not been received, or b) an updated Validation Report/ PDD	DR I	No specification of versions of documents is included in the Letter of Approval.	OK	OK
A.2. Project participants				
A.2.1. Is the form of required for the indication of project participants correctly applied in the PDD?	DR	Yes, the form used for the indication of the project participant is correctly applied in the PDD.	OK	OK
A.2.2. Is the participation of all project participants approved by a Party to the Kyoto Protocol?	DR	Yes, the project participant is approved by the DNA of Guatemala as it is detailed in the LoA. It is in accordance with the national procedure of approval of CDM project activities as it was crosschecked during the on site visit.	OK	OK
A.2.3. Is all information on participants / Parties provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	DR	Yes. The contact details included in Annex 1 is consistent in all sections of the PDD.	OK	OK
A.2.4. Are any other project participants approved but not listed in the PDD?	DR	No, the approved project participant is consistently listed in the PDD.	OK	OK
A.3. Project Design Document				
A.3.1. Does the used project title clearly enable to identify the unique CDM project activity? Is it consistent in all section of the PDD and in all documents?	DR	Yes. The project title enables to know about the project activity and it is consistent in all the PDD.	OK	OK

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A.3.2. Is there any indication concerning the version number and the date of the version?	DR	Yes. The PDD published for global stakeholder consultation process had version number 01 and dated 16/05/2011. The final version of the PDD had version number 3.4. and dated 05/12/2012	OK	OK
A.3.3. Is this consistent with the time line of the project's history?	DR	Yes, the date and version of the PDD is consistent with the timeline of the project activity. A schedule of the implementation of the project activity has been provided and the dates stated in the PDD are consistent with it.	OK	OK
A.3.4. Is the PDD prepared in accordance with the latest template and requirements from the CDM Executive Board?	DR	The format of the PDD used (Version 03) is in accordance with the last format published in the UNFCCC webpage.	OK	OK
A.3.5. Has the PDD been published for Global Stakeholder Consultation (GSC) in UNFCCC website?	DR	Yes, the project design document has been made publicly available on 21/05/2011 in UNFCCC web site.	OK	OK
A.3.6. Have there been any comments during the GSC process?	DR	Yes, there have been three comments to the project activity. Two of them are the same, and were referring to India and Bhutan, thus are considered mistaken / non applicable. The third one is referring the financial analysis and overall validity of the project activity. The same comment (identical) was sent to 171 projects over a 2.5-month period, calling the projects unethical and invalid CDM projects. The comment is difficult to consider valid; regardless of this, the DOE is undertaking to evaluate the validity and applicability of the project as a CDM project.	OK	OK
A.3.7. Have them correctly addressed by the validation team?	DR	Comments were acknowledged. The validation team has contacted them through e-mail, and no answers were received. A reminder has been sent to the stakeholders; nevertheless, no answer has been received. Therefore, the audit team considers that the comments have been correctly addressed.	OK	OK

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A.4. Description of the project activity The PDD (section A.2) shall contain a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity.				
A.4.1. Is the description delivering a transparent overview of the project activities? Is the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity?	DR	The description delivers a transparent overview of the project activity. The contract with the technical supplier has been provided and the data of the PDD coincide with it. The elements included in the PDD cover all relevant issues of the project activity.	OK	OK
A.4.2. What proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	DR I	Following documentation have been provided to demonstrate the current situation of the project activity: <ul style="list-style-type: none"> • Construction permit. 18/06/2007. • Environmental Impact Assessment approval. 04/04/2008. • Construction contract signed with CONASA. 22/07/2010. • Permit for the use of the public properties (Energy and Mining Ministry). 30/09/2010. • Signed contract for the construction of the reservoir-tank. Desarrollos Metalicos, S.A. 01/10/2010. • Signed contract with GILKES, electromechanical supplier. 16/06/2010. • Feasibility Report, March, 2009. Hidroelectrica Choloma, S.A. CL 1 – The calculation of the plant factor shall be clarified in order to demonstrate that it is in accordance with paragraph 3 of the Annex	CL 1 CL 2	OK

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		11- EB 48. CL 2 – The Interconnection permit is required. The project participant has provided proper evidence to justify the load factor of the project activity, in accordance with the “Guidelines for the reporting and validation of plant load factors” version 01. The Interconnection permit has been provided and it is considered as an appropriate proof to demonstrate the current situation. Therefore, CL 1 and CL 2 are closed.		
A.4.3. Is the information provided by these proofs consistent with the information provided by the PDD?	DR	Once CL 1 and CL 2 have been clarified, it is considered that the information provided by the proofs is consistent with data provided in the PDD.	CL 1 CL 2	OK
A.4.4. Has the validation team conducted a physical site inspection to confirm the description of the PDD? If not, justify.	DR	Yes. AENOR conducted interviews with project developers in Guatemala to confirm selected information and to resolve issues identified in the document review. On 13, 21 and 24 June 2011, the main stakeholders were interviewed. Representatives of the Designated National Authority and representatives of COCODES and the communities were also interviewed during this on site visit in Guatemala.	OK	OK
A.4.5. If the proposed CDM project activity involves the alteration of an existing installation or process, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation?	DR	No, “Choloma Hydroelectric project” is a Greenfield project activity.	OK	OK
A.4.6. In the case of greenfield project activity, is the project design described sufficiently by means of specifications,	DR	Yes, as it has been previously detailed, the contracts with the suppliers have been provided and they describe the technical characteristics of the project activity. Furthermore, following drawings have been	OK	OK

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drawings and manuals?		provided: <ul style="list-style-type: none"> Choloma drawing intake: HCH010-HACH022. Rivers intake drawings: HC101, HCH121, HCH141 and HCH161. Steel water tank drawings: HCH130-HCH155. Penstocks drawings: HCH201. 		
A.4.7. Does the PDD explain how the proposed project activity reduces greenhouse gas emissions (i.e. what type of technology is being employed, what measures are undertaken as part of the project activity, etc);	DR	Yes, the employed technology is sufficiently explained in the PDD.	OK	OK
A.5. Technical description of the project activity The PDD (section A.4) shall contain a clear description of the project activity that provides the reader a clear understanding of the technical aspects of its implementation.				
<i>A.5.1. Location of the project activity</i>				
A.5.1.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)? Are the latitude and longitude on the site indicated (decimal points)?	DR	Yes. The physical location and boundaries of the project are clearly defined in the PDD. The decimal geographical coordinates of the location are provided in the PDD.	OK	OK
A.5.1.2. How is it ensured and/or demonstrated that the project proponents can implement the project at this site	DR I	As it is stated in Section A.4.2, conformance with relevant legislation has been audited during the on-site visit. The Construction permit, the permit for the use of the public properties and different signed	OK	OK

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(ownership, licenses, contracts etc.)?		contracts with the suppliers has been assessed in order to check the implementation of the project.		
<i>A.5.2. Category of the project activity</i>				
A.5.2.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 of decision 3/CMP.1 on the modalities and procedures for the CDM?	DR	Yes. The project activity qualifies as small scale category since the installed capacity (9.7 MW in accordance with the PDD published for GSC) is below 15 MW (the threshold stated for small scale project activities).	OK	OK
A.5.2.2. To which category(ies) does the project activity belonging to? Is this category correctly identified and indicated?	DR	Yes, The project activity qualifies as Type I: Renewable Energy Projects, Category D. Grid connected renewable electricity generation.	OK	OK
A.5.2.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	DR	Yes, as it is stated in the section A.4.2 of the PDD, the project activity qualifies as Type I: Renewable Energy Projects, Category D. Grid connected renewable electricity generation. Thus, as it has been previously detailed, in accordance with the categories defined for small scale project activities.	OK	OK
A.5.2.4. In the case of a small scale project activity, is it justified that it is not a debundled component of a larger project activity?	DR	In accordance with the PDD, the project activity is not a debundled component of a larger activity according to Appendix C of the <i>Simplified Modalities and Procedures for Small Scale CDM project activity</i> since there is not any other CDM project activity within 1 Km as it was checked during the on site visit and against the UNFCCC web site. There is another hydroelectric project activity registered as CDM, Candelaria Hydroelectric project activity, registered in 2006 as it has been crosschecked in the UNFCCC website. Thus, the justification that the project activity is not a debundled component of a larger project activity is considered correct and transparent.	OK	OK

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A.5.2.5. In case of small scale project activities, is the estimate of emissions reductions increasing during the crediting period? In affirmative case, have project participants demonstrated in the CDM-SSC-PDD that the project activity characteristics are defined in a way that precludes project activities to go beyond the limits for SSC Project activities (as stipulated in paragraph 3 of the General Guidelines to SSC CDM methodologies)?	DR	No, the annual estimation of emission reductions will be the same during the crediting period as it is detailed in the PDD, Section A.4.3.	OK	OK
<i>A.5.3. Technology to be employed by the project activity</i>				
A.5.3.1. Does the description of the technology to be applied provide sufficient and transparent input/information to evaluate its impact on the greenhouse gas balance? And, is the explanation how the project will reduce greenhouse gas emission transparent and suitable?	DR	Once CL 1 and CL 2 have been clarified, it is considered that the description of the technology included in the PDD provides sufficient and transparent information. The explanation of how the project will reduce greenhouse gas emissions is transparently included also in the PDD.	CL 1 CL 2	OK
A.5.3.2. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period? If so, does the project make provisions for meeting training and maintenance needs?	DR	As it is stated in the PDD, the General Manager would authorize CDM consultants for training, validation and verification activities.	OK	OK
A.5.3.3. Is a schedule available for the implementation of the	DR	Yes, a schedule has been provided dated on 15/06/2011. Nevertheless, the starting of the operation is not detailed in it.	CL 3	OK

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project and are there any risks for delays? Is the schedule consistent with the starting date of the crediting period?		CL 3 - The starting date of the operation of the project activity shall be clarified and documented. A letter from the Wholesales Electricity Administrator (30/10/2011) declares the starting of commercial operations. Thus, the registration of the project activity will occur after the registration as CDM. Therefore, CL 3 is clarified.		
<i>A.5.4. Estimated amount of emission reductions over the chosen crediting period</i>				
A.5.4.1. Is the form required for the indication of projected emission reductions correctly applied?	DR	The correct form has been used for the emission reduction.	OK	OK
A.5.4.2. Are the figures provided consistent with other data presented in the PDD?	DR	No spreadsheet prepared for the emission reduction calculation has been provided. CL 4 – The sheet prepared for the emission reduction calculation shall be provided. Once receiving the calculation spreadsheet in accordance with the “Tool to calculate the emission factor for an electricity system”, it is considered the CL clarified.	CL 4	OK
<i>A.5.5. Public funding of the project activity</i>				
A.5.5.1. In case of public funding from Annex I Parties is it confirmed that such funding does not result in a diversion of official development assistance?	DR I	There is no Official Development Assistance in this project and the project will not receive any public funding from Parties included in Annex I.	OK	OK
A.5.5.2. Is all information provided consistent with the details	DR	Yes, information provided is consistent.	OK	OK

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given in remaining chapters of the PDD (in particular annex 2)	I			
B. BASELINE AND MONITORING METHODOLOGY				
B.1. Title and reference of the approved baseline and monitoring methodology				
B.1.1. Are reference number, version number, and title of the approved baseline and monitoring methodology clearly indicated?	DR	<p>Yes. The selected baseline methodology is AMS.I.D <i>"Grid connected renewable electricity generation"</i> (version 16) as it is clearly referenced in the PDD published for Global Stakeholder Consultation.</p> <p>Due to the project activity has not been registered before the limit date to use the AMS.I.D version 16, the project participant updated the PDD, and the final version of the PDD has been developed in accordance with the methodology AMS.I.D version 17, which is the most recent version applicable.</p>	OK	OK
B.1.2. Is the applied version the most recent one and / or is this version still applicable?	DR	<p>The applied version is not the most recent one, nevertheless, valid until 03 February 2012, in accordance with the EB 61 meeting report paragraph 24.</p> <p>However, as the project activity has not been registered before the limit date to use the AMS.I.D version 16, the project participant updated the PDD, and the final version of the PDD has been developed in accordance with the methodology AMS.I.D version 17, which is the most recent version applicable.</p>	OK	OK
B.1.3. Does the PDD refer to the corresponding tools with their latest approved versions?	DR	<p>The Section B.1 does not refer any tool. On the other hand, in other sections of the PDD, it is referred the <i>"Tool to calculate the emission factor for an electricity system"</i>, nevertheless the version is not valid.</p> <p>CAR 1 – The section B.1 shall detail the correct tool used to calculate the emission factor of the electricity grid including its version. The calculation of the emission factor of the grid shall be also updated</p>	CAR 1	OK

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		<p>using this new version.</p> <p>The final version of the PDD referred the version 02.2.1 of the “Tool to calculate the emission factor for an electricity system”, used to calculate the emission factor of the electricity grid. This version is not the latest current version, although the project activities can submit the request for registration with this version 02.2.1 until eight months from 22/07/2013</p> <p>Therefore, the CAR 1 is closed.</p>		
B.1.4. Have any sources of greenhouse gas emissions been identified by the DOE ,within the project boundary following project implementation, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, and which are not addressed by the applied methodology?	DR	No, all the sources of greenhouse gas emissions has been correctly identified in the PDD.	OK	OK
B.2. Applicability of the selected methodology to the project activity				
B.2.1. Are the chosen tools considered applicable in accordance with the design of the project and the provisions of the applied methodology?	DR	<p>As it is established in Section B.2 of the PDD, approved baseline methodology AMS.I.D is applicable to the generation activities that use renewable sources to supply electricity to the national electricity grid..</p> <p>Three main characteristics of Choloma project activity imply the use of the AMS.I.D methodology:</p> <ul style="list-style-type: none"> • New hydroelectric power plant. • Generation capacity of 9.7 MW. • Connected to the national system through a substation. 	CAR 1	OK

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		<ul style="list-style-type: none">The project will have installed new reservoirs and the power density of the power plant is greater than 4 W/m².										
B.2.2. Is the choice of the methodology correctly justified by the PDD and is the project in conformance with all applicability criteria of the applied methodology?	DR	Yes, the justification of the choice of the methodology is clearly included in the PDD. The analysis of each one of the applicability conditions of the methodology is included in section B.2.	OK	OK								
B.2.3 Has been applied the specific guidance provided by the CDM Executive Board in respect to the approved methodology?	DR	No, there is not any additional guidance applicable to this project activity.	OK	OK								
Fill in the required amount of sub checklists for applicability criteria as given by the methodology applied and comment at least every line answered with “No”												
B.2.4. Criterion 1 - <i>This category comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that (a) supply electricity to a national or a regional grid (b) supply electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling:</i> The project activity is a hydroelectric plant which electric energy produced will be delivered to the National Electricity System through the Secacao interconnection substation.	DR	<table><tr><th>Applicability checklist</th><th>Yes/No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Evidence provided?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table>	Applicability checklist	Yes/No	Criterion discussed in the PDD?	Yes	Evidence provided?	Yes	Compliance verified?	Yes	OK	OK
Applicability checklist	Yes/No											
Criterion discussed in the PDD?	Yes											
Evidence provided?	Yes											
Compliance verified?	Yes											
B.2.5. Criterion 2 - <i>This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating 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):</i>	DR	<table><tr><th>Applicability checklist</th><th>Yes/No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr></table>	Applicability checklist	Yes/No	Criterion discussed in the PDD?	Yes	OK	OK				
Applicability checklist	Yes/No											
Criterion discussed in the PDD?	Yes											

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The project activity is a new hydroelectric plant at a site where there was no renewable energy power plant operating prior to its implementation.		<table><tr><td>Evidence provided?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table>	Evidence provided?	Yes	Compliance verified?	Yes						
Evidence provided?	Yes											
Compliance verified?	Yes											
<p>B.2.6. Criterion 3 - <i>Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</i></p> <ul style="list-style-type: none">• <i>The project activity is implemented in an existing reservoir with no change in the volume of reservoir;</i>• <i>The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m²;</i>• <i>The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m².</i> <p>The project activity will have installed a new small artificial reservoir (water storage tank), as daily regulation reservoir, and 6 small water diversion dams at the intake areas of each of the four tributaries and on the Choloma River, and the power density of the power plant and of each reservoir is greater than 4 W/m².</p>	DR	<table><tr><th>Applicability checklist</th><th>Yes/No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Evidence provided?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table>	Applicability checklist	Yes/No	Criterion discussed in the PDD?	Yes	Evidence provided?	Yes	Compliance verified?	Yes	OK	OK
Applicability checklist	Yes/No											
Criterion discussed in the PDD?	Yes											
Evidence provided?	Yes											
Compliance verified?	Yes											
<p>B.2.7. Criterion 4 - <i>In the case of biomass power plants, no other biomass types than renewable biomass are to be used in the project plant:</i></p> <p>The project activity is not a biomass power plant; therefore, this criterion is not applicable to the project activity.</p>	DR	<table><tr><th>Applicability checklist</th><th>Yes/No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>n/a</td></tr></table>	Applicability checklist	Yes/No	Criterion discussed in the PDD?	n/a	OK	OK				
Applicability checklist	Yes/No											
Criterion discussed in the PDD?	n/a											

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		<table><tr><td>Evidence provided?</td><td>n/a</td></tr><tr><td>Compliance verified?</td><td>n/a</td></tr></table>	Evidence provided?	n/a	Compliance verified?	n/a						
Evidence provided?	n/a											
Compliance verified?	n/a											
<p>B.2.8. Criterion 5 - <i>If the new unit has both renewable and non-renewable components (e.g., a wind diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW:</i></p> <p>The project activity will have installed only renewable components, using water as renewable resource, and the installed capacity is below 15 MW. Therefore, this criterion is not applicable.</p>	DR	<table><tr><th>Applicability checklist</th><th>Yes/No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>n/a</td></tr><tr><td>Evidence provided?</td><td>n/a</td></tr><tr><td>Compliance verified?</td><td>n/a</td></tr></table>	Applicability checklist	Yes/No	Criterion discussed in the PDD?	n/a	Evidence provided?	n/a	Compliance verified?	n/a	OK	OK
Applicability checklist	Yes/No											
Criterion discussed in the PDD?	n/a											
Evidence provided?	n/a											
Compliance verified?	n/a											
<p>B.2.9. Criterion 6 - <i>Combined heat and power (co-generation) systems are not eligible under this category:</i></p> <p>The project activity is a new hydroelectric plant; therefore, this criterion is not applicable.</p>	DR	<table><tr><th>Applicability checklist</th><th>Yes/No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>n/a</td></tr><tr><td>Evidence provided?</td><td>n/a</td></tr><tr><td>Compliance verified?</td><td>n/a</td></tr></table>	Applicability checklist	Yes/No	Criterion discussed in the PDD?	n/a	Evidence provided?	n/a	Compliance verified?	n/a	OK	OK
Applicability checklist	Yes/No											
Criterion discussed in the PDD?	n/a											
Evidence provided?	n/a											
Compliance verified?	n/a											

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<p>B.2.10. Criterion 7 - <i>In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct6 from the existing units:</i></p> <p>The project activity is a new hydroelectric plant; therefore, this criterion is not applicable, as the project activity does not involve any addition.</p>	DR	<table><tr><th>Applicability checklist</th><th>Yes/No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>n/a</td></tr><tr><td>Evidence provided?</td><td>n/a</td></tr><tr><td>Compliance verified?</td><td>n/a</td></tr></table>	Applicability checklist	Yes/No	Criterion discussed in the PDD?	n/a	Evidence provided?	n/a	Compliance verified?	n/a	OK	OK
Applicability checklist	Yes/No											
Criterion discussed in the PDD?	n/a											
Evidence provided?	n/a											
Compliance verified?	n/a											
<p>B.2.11. Criterion 8 - <i>In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW:</i></p> <p>The project activity is a new hydroelectric plant; therefore, this criterion is not applicable, as the project will not be a retrofit or replacement.</p>	DR	<table><tr><th>Applicability checklist</th><th>Yes/No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>n/a</td></tr><tr><td>Evidence provided?</td><td>n/a</td></tr><tr><td>Compliance verified?</td><td>n/a</td></tr></table>	Applicability checklist	Yes/No	Criterion discussed in the PDD?	n/a	Evidence provided?	n/a	Compliance verified?	n/a	OK	OK
Applicability checklist	Yes/No											
Criterion discussed in the PDD?	n/a											
Evidence provided?	n/a											
Compliance verified?	n/a											
<p>B.2.9. Was there a request for clarification, revision or deviation made for the adopted methodology in relation to the proposed project activity?</p> <p>If so, were the correct procedures provided by the CDM EB followed?</p>	DR	No, there was not any request for clarification.	OK	OK								
B.3. Description of the Project Boundary												

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B.3.1 Are all the sources and gases included in the project boundary of the project activity (baseline scenario, project scenario and leakage) in accordance with the applied methodology?	DR	Yes, the PDD correctly addresses all sources and gases included in the project boundary.	OK	OK
B.3.2. Are the inclusion or exclusion of the sources of gases correctly justified?	DR	Yes, the sources of gases are correctly justified.	OK	OK
B.3.3. Do the spatial and technological boundaries as verified on-site comply with the discussion provided by the PDD?	DR	<p>Since the project activity is a Greenfield project activity, the future location of the project was visited by the validation team, and the definition is in accordance with the situation verified. Nevertheless, although the transmission line is considered in the boundaries, the national electricity grid is not included.</p> <p>CL 5 – The no inclusion of the national electricity grid in the project boundaries should be clarified.</p> <p>CL 5 is closed.</p> <p>The final version of the PDD describes the spatial and technological boundaries in accordance with the applied methodology AMS.I.D and the information obtained during the on site visit by the audit team.</p>	CL 5	OK
B.3.4. In case of grid connected electricity projects, is the relevant grid correctly identified in accordance with EB guidance and the underlying methodology?	DR	<p>No, the national electricity grid is not included in the boundaries definition as it has been previously detailed.</p> <p>Once clarified the CL 5, the final version of the PDD identified</p>	CL 5	OK

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		correctly the national electricity grid of Guatemala, as the relevant grid of the project activity, as the applied methodology AMS.I.D and the "Tool to calculate the emission factor for an electricity system" require.		
B.4. Description of the baseline scenario identification				
B.4.1. Is the baseline scenario clearly described?	DR	Yes, the baseline scenario is described as <i>"the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources."</i> Thus, it is described in accordance with the methodology and tool.	OK	OK
B.4.2. Have there been other alternative scenarios considered? Is it justified the selected scenario as the most likely one?	DR	The applied methodology AMS. I.D identified the baseline scenario. Therefore, it is not necessary to consider other alternative scenarios.	OK	OK
B.4.3. Does the PDD follow the steps to determine the baseline scenario required by the methodology?	DR	The baseline scenario has been determined in accordance with the applicable methodology.	OK	OK
B.4.4. Has the baseline scenario been determined using conservative assumptions where possible?	DR	The baseline scenario has been determined in accordance with the applicable methodology.	OK	OK
B.4.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies? (<i>Note: refer Annex 3 EB 22</i>). Are they listed in the PDD?	DR I	Yes. Relevant national laws are detailed in the PDD, and the validation team has crosschecked them during the on site visit.	OK	OK
B.4.6 If alternatives are excluded: a.- Is sufficient evidence/ justification provided to support	DR	Not applicable	N/A	N/A

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every exclusion of alternatives? Is it reasonable? b.- Is it shown that at least one credible and feasible alternative does not face a barrier? Is this reasonable?				
B.4.7 Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	DR	Yes, the determination of the baseline scenario is compatible with the data provided by the Energy Market Regulating Authority.	OK	OK
B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):				
B.5.1 Is the start date defined in accordance with the "Glossary of CDM terms"? What evidence is provided to verify that this was the official start date? Is this considered reliable and reasonable?	DR	<p>The starting date of the project activity has been stated as 08/06/2010, the date of the financial closure. This date is not considered in accordance with the latest version of the Glossary of terms, since the financial closure does not imply any expenditure related with the implementation.</p> <p>CAR 2 – The starting date of the project activity is not stated in accordance with the latest version of the "Glossary of terms".</p> <p>The starting date has been modified and stated in accordance with the Glossary of terms as 24/06/2010, the date when the contract for "Supply, Start-up and Testing of Turbine, Generator, Controls and Associated Equipment" with Gilbert Gilkes & Gordon Ltd. (Gilkes)" was signed. It is considered as reasonable and reliable.</p> <p>CAR 2 is closed</p>	CAR 2	OK
B.5.2 Is it a new project activity (start date on or after August 2008) or an existing project?	DR	As it is stated in the final PDD, since the starting date is 24/06/2010, it is considered as new project activity.	CAR 2	OK
B.5.3 For a new project which does not require a new	DR	Since the start date of the project is beyond 2 August 2008, as per the	CL 6	OK

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<p>methodology and has not published its PDD for stakeholder comments prior to the start date, then:</p> <p>a. Have the project proponents informed the DNA and/or UNFCCC secretariat in writing? How has this notification been verified? (i.e. confirmation from the DNA or UNFCCC)</p> <p>b. Was the notification made within 6 months of the project activity start date?</p> <p>c. Does the letter/ notification indicate the precise geographic location and provide a brief description of the proposed project?</p> <p>d. Have the project proponents informed the DNA and/ or UNFCCC secretariat of the progress of the project activity every subsequent two years after the initial notification?</p>		<p>paragraph 2 of the “ <i>Guidelines on the demonstration and assessment of prior consideration of the CDM</i>”, the project participant has to inform the Host party DNA and the UNFCCC secretariat in written about the CDM consideration of the project activity.</p> <p>The validation team has checked that the notification to the UNFCCC secretariat was made on 09/06/2009.</p> <p>CL 6 - The notification regarding the prior consideration to the DNA of Guatemala is required.</p> <p>The notification has been provided and it was made before the starting date, thus, it is considered correct.</p> <p>CL 6 is closed</p>		
<p>B.5.4 For an existing project which has a start date prior to the publication of the PDD for global stakeholder comments, has the project proponent provided the following:</p> <p>a. Evidence of awareness of the CDM prior to the project activity start date and that the benefits of the CDM were a decisive factor in the decision to proceed with the project? (e.g. Board minutes, notes etc) Is this sufficient?</p> <p>b. Reliable evidence that demonstrates real actions were</p>	DR	Not applicable	N/A	N/A

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taken to secure CDM status in parallel with the project's implementation? (e.g. contracts with consultants for CDM/PDD/methodology services, ERPAs, correspondence with CER buyers, DOEs, DNAs or the UNFCCC). Is this sufficient?				
B.5.5. Is the project additionality assessed according to the applicable methodology? Detail the Tool used to demonstrate the Additionality of the project activity.	DR	<p>CL 7 – All the sources of information used for the additionality assessment shall be provided. The spreadsheets used for the IRR calculation shall be also provided.</p> <p>Appropriate evidence has been provided</p> <p>CL 7 is closed.</p> <p>Yes, the additionality is assessed according to the latest version of the “Guidelines on the demonstration of additionality of small-scale project activities”.</p>	CL 7	OK
B.5.6. In the case of a small scale project activity, is the additionality justified according to the applicable CDM requirements specific for small scale project activities?	DR	Yes, the PDD justifies that the project itself is not a likely baseline scenario due to the existence of barriers.	CL 7	OK
B.5.7 Have realistic and credible alternatives been identified providing comparable outputs or services?	DR	<p>The project applies the “Guidelines on the demonstration of additionality of small-scale project activities”.</p> <p>Taking into account the VVM 01.2, as the approved methodology prescribes de baseline scenario, no further analysis is required in the identification of alternatives</p>	OK	OK
B.5.8. Is the project activity without CDM included in these alternatives?	DR	Not applicable. The project applies the “Guidelines on the demonstration of additionality of small-scale project activities”.	N/A	N/A

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B.5.9. Is a discussion provided for all identified alternatives concerning the compliance with applicable laws and regulations?	DR	Not applicable. The project applies the "Guidelines on the demonstration of additionality of small-scale project activities".	N/A	N/A
B.5.10. In case of using a FSR as a basis of the decision, is this analysis made in accordance with the EB Guidance?	DR	Not applicable. The project activity does not use a FSR as a basis of the decision.	N/A	N/A
B.5.11. In case the PDD argues that specific laws are not enforced in the country or region: Is evidence available concerning that statement?	DR	Not applicable.	N/A	N/A
B.5.12. In case of applying step 2 / investment analysis of the additionality tool: Is the analysis method identified appropriately?	DR	CL 9 - IRR calculations are included the financial cost of the Equity however only equity without financial cost should be included. Appropriate evidence has been provided CL 9 is closed. Yes, the analysis method defined for demonstrating investment barriers is the benchmark analysis.	CL 9	OK
B.5.13. In case of Option I (simple cost analysis): Is it demonstrated that the activity produces no economic benefits other than CDM income? a. Are the assumptions for all alternatives compared consistent (including discount rates if applicable)?	DR	Not applicable.	N/A	N/A
B.5.14. In case of Option II (investment comparison analysis):	DR	Not applicable.	N/A	N/A

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Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)? a. Are the assumptions for all alternatives compared consistent (including discount rates if applicable)?				
B.5.15. In case of Option III (benchmark analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)? a. If an IRR indicator is used, is the choice of benchmark appropriate to the type of IRR calculated? (b. Is the choice of benchmark or discount rate justified with supporting evidence for its appropriateness?	DR	The financial indicator has been clearly identified in the final PDD as Equity IRR post-tax, the benchmark has been derived from the default values of the Guidelines on the assessment of investment analysis	CL 9	OK
B.5.16 If risk premiums are applied in the development of the benchmark, are they reasonable and justified?	DR	Yes, they are reasonable and appropriate.	CL 9	OK
B.5.17 Do the project participants justify the period of assessment in the context of the underlying project activity?	DR	CL 10 – Period of assessment shall be clarified. Period of assessment has been clarified and stated as 21 years in accordance with paragraph 3 of Annex 5 EB62 report. CL 10 is closed. Yes, the period of assessment is justified.	CL 10	OK
B.5.18 Is the period of assessment appropriate?	DR	Yes, the period of assessment is appropriate	CL 10	OK
B.5.19 Is any residual value of the project activity assets	DR	Residual value is considered zero in the analysis which is consistent	OK	OK

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included in the analysis? Are residual value calculations reasonable and justified and consistent with local accounting rules or international best practice?		with local accounting rules.		
B.5.20 Are depreciation and other non-cash items related to the project activity deducted from net profits used for calculating the financial indicator (e.g. IRR, NPV)?	DR	Yes, they have been deducted in estimating gross profits but they have been added back for the purpose of calculating the Equity IRR post-tax	OK	OK
B.5.21 Is the treatment of taxation consistent with the chosen benchmark? (i.e. taxation should only be treated as an expense in the IRR/NPV calculation if the chosen benchmark is intended for post-tax calculations?	DR	Yes, it is consistent.	OK	OK
<p>B.5.22 Recommended project: If the implementation of the project ceased and then recommenced due to consideration of the CDM, then:</p> <p>a. Are input values valid and applicable at the time of making the decision to recommence the project?</p> <p>b. Are capital costs incurred prior to the revised project activity start date input as the recoverable value of the assets (limited to the potential reuse/ resale of tangible assets)?</p> <p>c. How has the fair market value of the capital expenditures been calculated and validated? (e.g. by chartered specialists).</p>	DR	Not applicable.	N/A	N/A

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Is this fair market value reasonable and justified? d.- Is the book value as well as the expectation of the potential profit or loss included in the fair value calculation?				
B.5.23 Has the project participant supplied unprotected and traceable spreadsheet versions of all investment analysis?	DR	CAR 8 - The spreadsheet of the financial analysis shall be transparent and traceable. Unprotected and traceable spreadsheet versions of the financial analysis have been provided CAR 8 is closed	CAR 8	OK
B.5.24 From the investment analysis provided, is it possible to reproduce the results?	DR	Yes, it is possible.	CAR 8	OK
B.5.25 Costs of financing expenditures (i.e. loan repayments and interest) should only be included in the cashflow as costs if an equity IRR is used, not if a project IRR is used. Are interest payments taken into account in the calculation of tax, if the benchmark is for after-tax comparison?	DR	Since the PP uses equity IRR post-tax, the cost of financing expenditures are included. Yes, interest payments are taken into account since the chosen benchmark is for after-tax comparison.	CAR 8	OK
B.5.26 If an Equity IRR has been used, is the debt portion of the investment cost included as a cash outflow? (i.e. as well as interest costs and principle repayments – double counting)	DR	No, it has not been considered.	CAR 8 CL 10	OK
B.5.27 Sensitivity analysis:	DR	CAR 9 - Sensitivity analysis spreadsheet shall be provided in	CAR 9	OK

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<p>a. Are all variable and critical costs and revenues in the analysis included in the sensitivity analysis?</p> <p>b. Is the assessed range of variations reasonable in light of the reliability of the estimated input values and the likely range?</p> <p>c. Is the sensitivity analysis possible to reproduce?</p>		<p>accordance with EB 62 Report Annex 5.</p> <p>Unprotected and traceable spreadsheet versions of the sensitivity analyses have been provided</p> <p>CAR 9 is closed</p> <p>All critical costs and revenues are included in the sensitivity analysis. The assessed range of variation is reasonable and the sensitivity analysis is possible to reproduce.</p>		
<p>B5.28 Are input values used in all the investment analysis valid and applicable at the time of the investment decision taken by the project participant?</p> <p>Is the time of investment decision appropriately justified by evidences?</p>	DR	<p>Yes, they are valid and applicable. The investment decision is appropriately justified.</p>	CL 7	OK
<p>B5.29 Does the PDD present the investment analysis in a transparent manner and provide all the relevant assumptions (preferably in the CDM-PDD form, or in separate annexes to the CDM-PDD)</p>	DR	<p>Yes, the investment analysis is presented in a transparent manner.</p>	CL 9	OK
<p>B5.30 Have the listed input values been consistently applied in all calculations?</p>	DR	<p>Yes, they have been consistently applied.</p>	CL 7	OK
<p>B5.31 Are all references made in the investment analysis correctly referenced/ sourced? Have these sources been verified?</p>	DR	<p>Yes, they are correctly referenced/ sourced and they have been verified.</p>	CL 7	OK

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B.5.32 Have financial calculations been verified by: assessing all parameters and assumptions against the available evidence and expertise; crosschecking the parameters against 3 rd party or publicly available sources; reviewing feasibility reports, public announcements and annual financial reports; assessing the correctness of computations and the sensitivity analysis?	DR	Yes, all the parameters and assumptions have been verified against available evidence and 3 rd or public available sources.	CL 7 CAR 9	OK
B.5.33 Have values from a feasibility study report (FSR) approved by national authorities been used? If so: a. Has the FSR been the basis of the decision to proceed with the investment in the project? How has this been verified? b. Are the values used in the PDD and associated annexes valid and consistent with the FSR? c. 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)?	DR	Not applicable. The project activity does not use a FSR as a basis of the decision.	N/A	N/A
B.5.34. In case of applying step 3 (barrier analysis) of the additionality tool: Is a complete list of barriers developed that prevent the different alternatives to occur?	DR	Yes a complete list of barriers has been developed.	OK	OK

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B.5.35. Do any such identified barriers have a clear and direct impact on the financial returns of the project activity? (these are not barriers and should be assessed in the investment analysis)	DR	Yes, they have a direct impact on the financial returns of the project activity and they have been assessed in the investment analysis.	OK	OK
B.5.36 Are the identified barriers real and substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics?	DR	Not applicable.	N/A	N/A
B.5.37. Is it clearly explained how approval of the project in the CDM would enable the proposed project activity to surmount the barrier? Is the rationale reasonable and justified with evidence?	DR	Yes it is clearly explained and reasonable	OK	OK
B.5.38. Does the review of relevant background information on the nature of the company(ies) and entity(ies) involved in the financing and implementation of the project sufficiently justify that the barriers related to the lack of access to capital, technologies and skilled labour are real?	DR	Not applicable.	N/A	N/A
B.5.39 Has common practice analysis been undertaken?	DR	Not applicable. The project applies the latest version of the "Guidelines on the demonstration of additionality of small-scale project activities".	N/A	N/A
B.5.40 Is the geographical and temporal scope of the	DR	Not applicable. The project applies the latest version of the "Guidelines on the demonstration of additionality of small-scale	N/A	N/A

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common practice analysis appropriate for the assessment related to the project activity's technology or industry type?		project activities".		
B.5.41 Have all comparable projects been included in the common practice analysis If some projects have been excluded as non comparable, is the exclusion reasonable and justified?	DR	Not applicable. The project applies the latest version of the "Guidelines on the demonstration of additionality of small-scale project activities".	N/A	N/A
B.5.42 Have similar and operational projects other than CDM project activities been undertaken in the region?	DR	Not applicable. The project applies the latest version of the "Guidelines on the demonstration of additionality of small-scale project activities".	N/A	N/A
B.5.43 Are these widely observed and commonly carried out? If so: a. How have the essential distinctions with the proposed CDM project activity been assessed? b. Are such distinctions justified with sufficient evidence? c. If inaccessibility of data is the reason why some projects have not been included in the analysis, is justification of this claim provided?	DR	Not applicable. The project applies the latest version of the "Guidelines on the demonstration of additionality of small-scale project activities".	N/A	N/A
B.5.44 Overall, is the proposed CDM project activity considered common practice?	DR	Not applicable. The project applies the latest version of the "Guidelines on the demonstration of additionality of small-scale project activities".	N/A	N/A

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B.5.45. Is it demonstrated/justified that the project activity is not a likely baseline scenario?	DR	Yes, it is demonstrated.	OK	OK
B.6. Emissions reductions				
<i>B.6.1. Explanation of methodological choices</i>				
B.6.1.1. Is it explained how the procedures provided in the methodology are applied by the proposed project activity?	DR	<p>Yes. Detailed procedures used for the emission reductions calculation are stated in Section B.6.1. of the PDD. The methodology AMS.I.D version 16 and the “Tool to calculate the emission factor for an electricity system” have been used.</p> <p>However, as the project activity has not been registered before the limit date to use the AMS.I.D version 16, the project participant updated the PDD, and the final version of the PDD has been developed in accordance with the methodology AMS.I.D version 17, which is the most recent version applicable and the “Tool to calculate the emission factor for an electricity system”, version 02.2.1.</p>	CAR 1	OK
B.6.1.2. Is every selection of options offered by the methodology correctly justified and is this justification in line with the situation verified on-site?	DR	Yes, the options chosen are correctly justified and they are in line with the characteristics of the project activity.	CAR 1	OK
B.6.1.3. Are the formulae required for the determination of emissions reductions correctly presented and used? (<i>Open excel, trazability of data, etc</i>)	DR	<p>The validation team has been provided with an excel file named “Calculation of the emission factor of the grid Guatemala choloma_V1”. The calculation is not made in accordance with the applied tool.</p> <p>CAR 3 – The calculation of the emission factor of the national grid shall be corrected. Among other, following issues shall be corrected:</p> <ul style="list-style-type: none"> The calculation of the Operating Margin emission factor shall be updated using data from 2010 since it was published in 	CAR 3	OK

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		<p>April 2011.</p> <ul style="list-style-type: none"> • The calculation of lambda factor is not stated in accordance with the referred tool. • All the information included in the spreadsheets shall be stated in English language. • The emission factor and NCVs of the fuels are not chosen in accordance with provisions stated in the tool (<i>IPCC default values at the lower limit of the uncertainty - 2006 IPCC Guidelines on National GHG Inventories</i>) • The build margin emission factor is calculated using 2008 year, it shall be updated. <p>The final version of the calculation spreadsheet has updated correctly all requested issues and the calculation of the emission factor of the national grid is considered in accordance with the "Tool to calculate the emission factor for an electricity system" version 2.2.1. The audit team could verify the traceability of data and the correct presentation of formulae used in the spreadsheet.</p> <p>The final version of the PDD correctly presents all formulae required for the determination of emissions reductions.</p> <p>CAR 3 is closed.</p>		
B.6.1.4 Are all the data and assumptions listed in the PDD and are appropriate and calculations result in a conservative estimate of emission reductions?	DR	The audit team verified that all the data and assumptions listed in the final version of the PDD and calculation spreadsheet are appropriate and calculations result in a conservative estimation of emission reductions.	CAR 3	OK
<i>B.6.2. Data and parameters that are available at validation</i>				
B.6.2.1. Is the list of parameters presented in chapter B.5.1	DR	The list is not stated in accordance with the methodology AMS.I.D or the "Tool to calculate the emission factor of an electricity grid".	CAR 4	OK

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considered to be complete with regard to the requirements of the applied methodology? Is all the information required for each parameter included?		<p>CAR 4 – The list of the parameters available at validation shall be stated in accordance with the applied methodology and tool.</p> <p>The list included in the modified version of the PDD is in accordance with the applied methodology and tool. All the information required is also included.</p> <p>CAR 4 is closed.</p>		
B.6.2.2. Are all the data derived from official data sources or replicable records and have been correctly quoted?	DR	Yes, all the data derived from official data sources, such as IPCC 2006, AMM and the applied methodologies and tool. The data have correctly quoted.	CAR 4	OK
B.6.2.3. For each parameter: a. Title in line with Methodology? b. Data unit correctly expressed? c. Appropriate description? d. Source clearly referenced? (and appropriate?) e. Correct value provided? f. Has this value been verified? g. Choice of data correctly justified? h. Measurement method correctly described?	DR	<p>Yes, the required information of each of the parameter is included in the final PDD, and it is in accordance with the applied methodologies and tool.</p> <p>The only data and parameters available at validation and that they will not be monitored, are the required by the methodology ACM0002 to determine the project emissions from water reservoirs of the project activity. These parameters are the following:</p> <p>The installed capacity of the hydro power plant (Cap_{BL}) and the area of the reservoir measured in the surface of the water (A_{BL}) before the implementation of the project.</p> <p>Due to the project activity is a Greenfield; the value applied for both parameters is zero.</p> <p>All information required by the methodology applied, such as title, units, description, source are correctly included in the final version of the PDD.</p>	CAR 4	OK
B.6.2.4. Will the data and parameters result in a conservative estimate of emissions reductions?	DR	Yes. The data and parameters result in a conservative estimate of emission reductions.	CAR 3 CAR 4	OK

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B.6.3 Calculation of GHG Emission Reductions – Baseline Emissions <i>It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>				
B.6.3.1 Are the calculations documented according to the approved methodology and in a complete and transparent manner?	DR	Section B.6.3. of the final version of the PDD has documented the calculations of the emission reductions, baseline and project emissions and leakage, in a complete and transparent manner, considering conservative assumptions and addressing uncertainties, according to the requirements established by the methodologies applied, AMS. I.D and ACM0002, and the “Tool to calculate the emission factor for an electricity system”.	CAR 3	OK
B.6.3.2. Have conservative assumptions been used when calculating the baseline emissions?	DR	The audit team could verify that the assumptions used in the calculation of the baseline emissions have taken into account conservative criteria.	CAR 3	OK
B.6.3.3 Are uncertainties in the baseline emission estimates properly addressed?	DR	Uncertainties have been properly addressed in the baseline emission estimates.	CAR 3	OK
B.6.3.4. Is additional background information on baseline data provided in Annex 3 of the PDD? Is this information consistent with data presented by other sections of the PDD?	DR	Additional baseline information has been included in Annex 3. This information is consistent with data presented by other sections of the PDD and the calculation spreadsheet.	CAR 3	OK
B.6.4 Calculation of GHG Emission Reductions – Project Emissions <i>It is assessed whether the project emissions are stated according to the</i>				

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<i>methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>				
B.6.4.1 Are the calculations documented according to the approved methodology and in a complete and transparent manner?	DR	<p>Yes, project emission calculations are made in the PDD, sections B.6.1 and B.6.3.</p> <p>CL 8 – An inconsistency regarding the surface area of the reservoir has been detected between the PDD and the documentation provided (CONASA contract, EIA). A clarification is required. Furthermore, the methodology used for the calculation shall be also referred in the corresponding section.</p> <p>The inconsistency has been clarified, and the evidence provided. The calculations are made in accordance with the applied methodology and tool and documented in a transparent way.</p> <p>CL 8 is closed.</p>	CL 8	OK
B.6.4.2. Have conservative assumptions been used when calculating the project emissions?	DR	The assumptions made are in accordance with the applied methodologies and tool.	CL 8	OK
B.6.4.3 Are uncertainties in the project emission estimates properly addressed?	DR	No uncertainties have been detected.	CL 8	OK
<i>B.6.5. Calculation of GHG Emission Reductions – Leakage</i> <i>It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>				
B.6.5.1 Are the leakage calculations documented according	DR	Yes, the no consideration of leakage in the calculations has been documented in the PDD in a complete manner. It is considered stated	OK	OK

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to the approved methodology and in a complete and transparent manner?		in accordance with the methodology AMS.I.D.		
B.6.5.2. Have conservative assumptions been used when calculating the leakage emissions?	DR	Not applicable since no leakage are considered.	OK	OK
B.6.5.3. Are uncertainties in the leakage emission estimates properly addressed?	DR	Not applicable since no leakage are considered.	OK	OK
<i>B.6.6. Ex-ante calculation of emission reductions</i>				
B.6.6.1. Are the GHG calculations documented in a complete and transparent manner? Are all the calculations correct?	DR	Section B.6.3. of the final version of the PDD has documented the calculations of the emission reductions, in a complete and transparent manner, according to the requirements established by the methodologies applied, AMS. I.D and ACM0002, and the "Tool to calculate the emission factor for an electricity system". The final version of the calculation spreadsheet the correct calculations, according to the applied methodologies and tool, and are consistent with the calculations documented in the final version of the PDD.	CAR 3	OK
B.6.6.2. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	DR	Yes. The data provided in all chapters of the final version of the PDD are consistent between them.	CAR 3	OK
<i>B.6.7. Summary of the ex-ante estimation of emission reductions</i>				
B.6.7.1. Will the project result in fewer GHG emissions than the baseline scenario?	DR	The project will result in fewer GHG emissions than the baseline scenario as it is demonstrated in the Section B.6 of the PDD.	OK	OK

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B.6.7.2. Are the emissions reductions projected in line with the envisioned time schedule for the project' implementation and the indicated crediting period?	DR	The emission reductions projected are considered in line with the envisioned time schedule for the project' implementation.	OK	OK
B.7. Application of the monitoring methodology and description of the monitoring plan				
<i>B.7.1. Description of the monitoring plan</i>				
B.7.1.1 Is the monitoring plan documented according to the approved methodology and relevant tools and in a complete and transparent manner?	DR	Yes, the selected monitoring methodology is AMS.I.D "Grid connected renewable electricity generation". Nevertheless, it is not clearly indicated in the Monitoring Section of the PDD. CAR 5 – The monitoring methodology and the tool are not clearly indicated in the Monitoring section of the PDD. The monitoring methodology has been correctly included and it is considered transparently documented in the PDD. CAR 5 is closed.	CAR 5	OK
B.7.1.2. Does the monitoring methodology provide a consistent approach in the context of all parameters to be monitored and further information provided in the PDD?	DR	Yes, all the parameters are considered in the Monitoring Plan in accordance with the applied methodology and tool.	OK	OK
B.7.1.3. Does the monitoring plan provide a clear description of the organization structure involved in monitoring activities and their responsibilities?	DR	The organizational scheme has been included in the PDD detailing the responsibilities of the different stages. Therefore, it is considered that the monitoring plan states a real and clear description of the organizational structure.	OK	OK
B.7.1.4. If applicable: Does annex 4 provide useful information enabling a better understanding of the	DR	Additional information has been included in Annex 4.	OK	OK

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envisioned monitoring provisions?				
B.7.1.5. Is the registration, monitoring, measurement and reporting procedure defined?	DR	Yes, registration, monitoring and measurement activities are forecasted in the Monitoring Plan section.	OK	OK
<i>B.7.2 Compliance of the monitoring plan with the approved methodology</i>				
B.7.2.1 Is the list of parameters considered to be complete with regard to the requirements of the applied methodology? Are all of them clearly described in the monitoring plan and in accordance with the methodology and tools?	DR	<p>Yes, four parameters are considered in the monitoring plan:</p> <ul style="list-style-type: none"> • Net electricity supplied to the grid ($EG_{facility,y}$) • Installed capacity of the hydro power plant after the implementation (CAP_{PI}) • Area of the reservoir measured in the surface of the water, after the implementation (A_{PI}). • CO2 emission factor of the grid electricity ($EF_{CO2,y}$) <p>They are not described in accordance with the applied methodology and tool since the default values of several parameters used for the calculation of $EF_{grid,y}$ of the IPCC are referred instead the lower limit of uncertainty.</p> <p>CAR 6 – The description of each of the parameters shall be stated in accordance with the applied methodology and tool.</p> <p>The final version of the PDD has included a complete list of monitoring parameters and they are clearly described in the monitoring plan in accordance with the applied methodologies and tool.</p> <p>CAR 6 is closed.</p>	CAR 6	OK
B.7.2.2. Does the monitoring plan provide for the collection	DR	Yes, the Monitoring plan of the PDD provides the information for the	OK	OK

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and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period?		collection and archiving of all the data required in the applied methodologies and tool.		
<p>B.7.2.3. For each parameter, is the:</p> <p>a. Title in line with methodology?</p> <p>b. Data unit correctly expressed?</p> <p>c. Parameter appropriately described?</p> <p>d. Source clearly referenced?</p> <p>e. Correct value provided for the purpose of PDD estimations?</p> <p>f. Has this value been verified?</p> <p>g. Measurement methods correctly described and in line with the methodology/tools?</p> <p>h. Correct reference to standards (i.e. for calibration and maintenance)?</p> <p>i. Indication of accuracy provided?</p> <p>j. QA/QC procedures described?</p> <p>k. QA/QC procedures appropriate?</p>	DR	<p>The PDD submitted for GSC, does not include all the parameters required by the applied methodologies and tool as it has been previously detailed.</p> <p>The final PDD includes all the information required by the methodologies and tool for each one of the monitoring parameters.</p> <p>The parameter included in the final version of the PDD and required by the AMS.I.D version 17 is the “Quantity of net electricity” (EG_{facility,y}). This parameter will be monitored continuously, measured hourly and recorded at least monthly. Measurements will be undertaken using energy meters (one main meter and one backup meter), authorized by the AMM, which will be calibrated annually. Measurement results shall be crosschecked with records for sold/purchased electricity (electricity invoices or AMM’s Monthly Transactions Report).</p> <p>Other parameters required by the methodology AMS.I.D version 17, are only applicable to retrofit or project activities that involve a retrofit or consumption of fossil fuel or biomass. None of these cases is applicable to the project activity of Choloma, as it is a new hydroelectric plant.</p> <p>According to the AMS.I.D version 17, parameters relevant to reservoir based hydro plants shall be monitored following the most recent version of ACM0002. Therefore, the parameters required by the ACM0002 version 13 are the following:</p> <ul style="list-style-type: none"> • “Installed capacity of the hydro power plant after the implementation of the project activity” (Cap_{PI}). The value of this parameter will be monitored annually. • “Area of the single or multiple reservoirs measured in the surface 	CAR 6	OK

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		<p>of the water, after the implementation of the project activity, when the reservoir is full" (A_{P1}): The area of the multiple reservoirs formed by the diversion dams in the surface of the water, when the reservoirs are full, will be checked using the design maps with level curves and borders of each reservoir. The surface area of the tank-reservoir is simple to establish as this structure is a circular tank of known dimensions (60 meter diameter), therefore their geometrical dimensions are checked. The monitoring would be performed annually.</p> <p>The parameter TEG_y is not applicable, as "Choloma Hydroelectric Project" has a power density greater than 10 W/m^2.</p> <p>The parameter required by the AMS.I.D version 17 "CO₂ emission factor of the grid electricity in year y ($EF_{CO_2,y}$)", will be calculated ex-post and updated annually during the monitoring for the first crediting period, as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM), according to the "Tool to calculate the Emission Factor for an electricity system". Therefore, the monitored parameters required by the tool, taking into account that the method to determine the OM is the simple adjusted OM, and the option A2 has been used to determinate of $EF_{EL,m,y}$ (or $EF_{EL,k,y}$), are the following:</p> <ul style="list-style-type: none">• CO₂ emission factor of fossil fuel type i used in power unit m in year y ($EF_{CO_2,m,i,y}$): This parameter will be monitored annually, and IPCC default values at the lower limit will be used.• Net electricity generated by power plant/unit m or k in year y ($EG_{m,y}$ and $EG_{k,y}$): This parameter will be monitored annually, and data obtained from AMM's generation reports will be used.• Average net energy conversion efficiency of power unit m or k in year y ($\eta_{m,y}$ and $\eta_{k,y}$): Although the tool requires to monitor this parameter once for crediting period, the project participant has decided to state an annual frequency. The default values provided in the Annex 1 of the tool will be used.		
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		Therefore, the information detailed in the final version of the PDD about the title, units, description, source, values used for the purpose of PDD estimations, measurement methods, and other information required by the applied methodologies and tool, is considered correct, appropriate, clear and in line with the applied methodologies and tool.		
<i>B.7.3 Implementation of the Monitoring Plan</i>				
B.7.3.1 Do the means of monitoring of each of the parameters included in the plan complies with the requirements of the methodology?	DR	Yes. The means of monitoring of each of the parameter complies with the applied methodology and tool.	CAR 6	OK
B.7.3.2. Is the measurement equipment described and deemed appropriate?	DR	Yes. For the monitoring of the net electricity supply, in accordance with the PDD, electric energy meters with accuracy and technical specifications according to Wholesale Market Administrator (AMM) standards will be installed in the project site. For the monitoring of the emission factor of the grid, the spreadsheet used for the ex-ante calculation shall be used.	OK	OK
B.7.3.3. Are procedures identified for maintenance of monitoring equipment and installations? Are provisions regarding the calibration intervals included in the monitoring plan?	DR	Yes, procedures for maintenance of the monitoring equipment have been detailed in the Monitoring Plan. The frequency of the calibrations is stated as once a year.	OK	OK
B.7.3.4. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with	DR	The verification of the measurements of the net electricity supplied to the grid is forecasted. Procedures to deal with erroneous measurement are also detailed in the Monitoring Plan.	OK	OK

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erroneous measurements or lack of data?				
B.7.3.5. Is the monitoring Plan sufficient to ensure the verification of a proper implementation of the monitoring plan?	DR	Once CAR 5 and CAR 6 have been solved it is considered that the Monitoring Plan is sufficient to ensure the verification of a proper implementation.	CAR 5 CAR 6	OK
B.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)				
B.8.1. Is there any indication of a date when the baseline and monitoring was determined?	DR	Yes. Section B.8 details the date of completion of the baseline methodology.	OK	OK
B.8.2. Is this consistent with the time line of the PDD history?	DR	The date of the baseline completion is 08/04/2011, in accordance with the edition of the PDD (16/05/2011). Nevertheless, it is not in accordance with data presented in the baseline development section, neither the calculation of the emission factor of the grid. The final version of the PDD, version 3.4 dated 05/12/2012, is stated that the date of the baseline completion is 05/12/2012. This date is consistent with the time line of the PDD history. Data presented in the baseline development section of this final version is in accordance with data presented in the calculation of the emission factor of the grid.	CAR 3 CL 7	OK
B.8.3. Is the information on the person(s)/entity(ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	DR	Yes, the company Energia y Medio Ambiente has been detailed, and the contact details are also considered.	OK	OK

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B.8.4. Is information provided whether this person / entity is also considered a project participant? <i>(Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM))</i>	DR	<p>No information regarding the consideration of Energía y Medio Ambiente has been provided in Section B.8.</p> <p>CAR 7 - Information regarding the consideration of Energía y Medio Ambiente as not project participant is required to be included in Section B.8.</p> <p>The information regarding whether this person is not considered as project participant is included in the final version of the PDD.</p>	CAR 7	OK
C. DURATION OF THE PROJECT ACTIVITY / CREDITING PERIOD				
C.1. Duration of the project activity				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	DR	<p>The starting date has been stated as 08/06/2010, the date of the financial closure. As it has been stated in section B.5.1, this date is not considered in accordance with the latest version of the Glossary of terms, since the financial closure does not imply any expenditure related with the implementation. Furthermore, no evidence has been provided.</p> <p>Once CAR 2 has been closed.</p> <p>It is considered that the starting date was on 24/06/2010, date when the contract for "Supply, Start-up and Testing of Turbine, Generator, Controls and Associated Equipment" with Gilbert Gilkes & Gordon Ltd. (Gilkes) was signed.</p> <p>Therefore, in the final version of the PDD, the starting date and the operational lifetime of the project activity are clearly defined and reasonable.</p>	CAR 2	OK
C.2. Choice of the crediting period and related information				

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C.2.1. Is the assumed crediting period clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)? And, is the starting date of the crediting period corrected considered?	DR	The starting date of the crediting period has been stated as 01/12/2012. It is considered reasonable and in accordance with the timeline of the project activity. The crediting period will be a renewable 7 years period.	OK	OK
D. ENVIRONMENTAL IMPACTS				
D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts				
D.1.1. Has the analysis of the environmental impacts of the project activity been sufficiently described in the PDD?	DR	In Section D of the PDD, it is detailed the environmental impact assessment process of "Choloma hydroelectric project". The EIA was approved by the Ministerio de Medio Ambiente y Recursos Naturales (Ministry of Environment and Natural Resources, MARN) on 04/04/2008, and it was crosschecked during the on site visit through an interview with the representatives of the MARN. The validation team was provided with the EIA, and with the approval of it made by the MARN.	OK	OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, has an EIA been approved?	DR	Yes, as it was crosschecked during the on site visit, in accordance with the Law for protection and Improvement of the environment an EIA has to be developed and approved by the Ministry of Environment and Natural Resources, MARN.	OK	OK
D.1.3. Will the project create any adverse environmental effects? Has any environmental impact identified as	DR	The detail of the impacts has been included in the PDD, no significant impacts have been considered as it is concluded also in the EIA.	OK	OK

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significant?				
D.1.4. Are transboundary environmental impacts identified in the analysis?	DR	No trans boundary impacts have been detected.	OK	OK
D.1.5. Does the project comply with any other environmental legislation in the host country?	DR	During the on site visit, the representatives of the MARN were interviewed, and they confirmed that the project activity complies with the current environmental legislation.	OK	OK
D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party.				
D.2.1. Have the identified environmental impacts been addressed in the PDD sufficiently?	DR	No significant impacts have been considered as it is concluded also in the EIA.	OK	OK
E. STAKEHOLDERS' COMMENTS				
E.1. Brief description how comments by local stakeholders have been invited and compiled				
E.1.1. Have relevant local stakeholders been consulted prior to the publication of the PDD? Is the exact date of the	DR	Different consultation stakeholder processes were carried out during 2007-2011. The CDM consultation process was made on 17/02/2011 as it is included in the PDD and crosschecked against the documentation provided:	OK	OK

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consultation process included in the PDD?		<ul style="list-style-type: none"> • Minutes of the meetings. • Agenda. • List of attendance. • Pictures of the whole process 		
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	DR	Yes, since the participation of the communities was high, it is considered that the media was appropriate.	OK	OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	DR	Yes, the first three meetings were made as part of the Environmental Impact Assessment process. The third one was made in a voluntary way in order to accomplish with the CDM requirements.	OK	OK
E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	DR	Yes, the process is transparent detailed and in a complete manner. During the on site visit different representatives of the communities, COCODES, and the company were interviewed, and all the information included in the PDD was crosschecked with them.	OK	OK
E.2. Summary of the comments received				
E.2.1. Is a summary of the stakeholder comments received provided?	DR	Yes, a summary has been transparently included in the PDD.	OK	OK
E.3. Report on how due account was taken of any comments received				
E.3.1. Has due account been taken of any stakeholder comments received?	DR	Yes. Regarding the expressed and observed need that local communities have with the lack of adequate water distribution systems, and the absent action by the local and national governments (Municipality of Senahú and Federal Government ministries), the	OK	OK

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		<p>Project company is evaluating different alternatives on how to assist, recognizing the strong and direct relationship that exists between inadequate water and elevated health problems, general child development and lower living standards due to time and effort required to collect water.</p> <p>Continuous assistance is provided to the Municipality of Senahú, and the local communities.</p> <p>Furthermore, Choloma will join the efforts with the existing Secacao and Candelaria hydroelectric power companies, in maintaining and stocking a community health center that was built by these companies to tend to the nearby population (of 4,000+) regarding non-emergency health care, including pregnancy and child-birthing assistance.</p>		
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***MoV/Ref: Means of Validation and references of background documents.**

ANNEX 2: CERTIFICATES OF QUALIFICATION

CERTIFICATE OF QUALIFICATION

Subject: Validation and Technical Review Team for Choloma Hydroelectric Project"

Madrid, 27/12/2012

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the validation process of the above mentioned project activity:

Name: Luis Javier Arribas Alonso

CDM Chief Validator: YES

CDM Validator: YES

CDM Chief Verifier: N.A.

CDM Verifier: N.A.

External Technical Expert: YES

Technical areas related with the project activity: TA 1.2 Energy generation from renewable energy sources



José Luis TEJERA OLIVER
CDM Operational Director

CERTIFICATE OF QUALIFICATION

Subject: Validation and Technical Review Team for Choloma Hydroelectric Project"

Madrid, 27/12/2012

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the validation process of the above mentioned project activity:

Name: Freddy Alejandro Garro Flores

CDM Chief Validator: NO

CDM Validator: YES

CDM Chief Verifier: N.A.

CDM Verifier: N.A.

External Technical Expert: YES

Technical areas related with the project activity: TA 1.2 Energy generation from renewable energy sources



José Luis TEJERA OLIVER
CDM Operational Director

CERTIFICATE OF QUALIFICATION

Subject: Validation and Technical Review Team for Choloma Hydroelectric Project"

Madrid, 27/12/2012

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the validation process of the above mentioned project activity:

Name: María Mercedes García Madero

CDM Chief Validator: YES

CDM Validator: YES

CDM Chief Verifier: N.A.

CDM Verifier: N.A.

External Technical Expert: YES

Technical areas related with the project activity: TA 1.2 Energy generation from renewable energy sources



José Luis TEJERA OLIVER
CDM Operational Director

CERTIFICATE OF QUALIFICATION

Subject: Validation and Technical Review Team for Choloma Hydroelectric Project"

Madrid, 27/12/2012

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the validation process of the above mentioned project activity:

Name: Marcelino Pellitero Martínez

CDM Chief Validator: YES

CDM Validator: YES

CDM Chief Verifier: N.A.

CDM Verifier: N.A.

External Technical Expert: YES

Technical areas related with the project activity: TA 1.2 Energy generation from renewable energy sources



José Luis TEJERA OLIVER
CDM Operational Director

CERTIFICATE OF QUALIFICATION

Subject: Validation and Technical Review Team for Choloma Hydroelectric Project"

Madrid, 27/12/2012

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the validation process of the above mentioned project activity:

Name: Alfonso Medrano Gutierrez

CDM Chief Validator: YES

CDM Validator: YES

CDM Chief Verifier: N.A.

CDM Verifier: N.A.

External Technical Expert: YES

Technical areas related with the project activity: TA 1.2 Energy generation from renewable energy sources



José Luis TEJERA OLIVER
CDM Operational Director

CERTIFICATE OF QUALIFICATION

Subject: Validation and Technical Review Team for Choloma Hydroelectric Project"

Madrid, 27/12/2012

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the validation process of the above mentioned project activity:

Name: Elena Llorente Pérez

CDM Chief Validator: YES

CDM Validator: YES

CDM Chief Verifier: N.A.

CDM Verifier: N.A.

External Technical Expert: YES

Technical areas related with the project activity: TA 1.2 Energy generation from renewable energy sources



José Luis TEJERA OLIVER
CDM Operational Director

CERTIFICATE OF QUALIFICATION

Subject: Validation and Technical Review Team for Choloma Hydroelectric Project"

Madrid, 27/12/2012

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the validation process of the above mentioned project activity:

Name: José Antonio Gesto Vilacoba

CDM Chief Validator: YES

CDM Validator: YES

CDM Chief Verifier: N.A.

CDM Verifier: N.A.

External Technical Expert: YES

Technical areas related with the project activity: TA 1.2 Energy generation from renewable energy sources



José Luis TEJERA OLIVER
CDM Operational Director

ANNEX 3: GSC COMMENTS

No. Comment	Submitted by	Comment	Response by DOE
1	zhong zhou li	<p>It is evident from the PDD that the values are consistent and it is definitely forged and cooked up values to show a non CDM project as a CDM project. What is this?</p> <p>DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also.</p> <p>After careful study of PDD it is found that DPR/FR is in different versions made and submitted with different purposes to different agencies which is totally unacceptable, illegal and unethical.</p> <p>PP/Consultant may show some undertaking letter from bank manager to DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE. While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other parties by the PP/Consultant is same as the one submitted to DOE.</p> <p>In this particular project there is clear cut evidence that DPR/FR values are changed/ fabricated mischievously and intentionally.</p>	<p>According to the VVM (Version 01.2), validation team has taken into account the comment received and details of actions taken to take due account of the comment as following:</p> <p><u>1. Document review:</u></p> <p>During the on-site visit, validation team received the original FSR of the proposed project, dated in March 2009, together with other documents requested by the audit team for validating that the project description was in compliance with the information and requirements included in the permits, agreements and authorizations obtained by the project participant for the project activity.</p> <p>Validation team also checked all documents related to the local stakeholders consultation and can confirm that the process was carried out by the PP in accordance with the CDM requirements. The audit team did not find any negative comment or similar comment as the received during the GSC process.</p>

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		<p>This must be probed fully.</p> <p>DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes.</p> <p>Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes. DOE must not accept any reports and undertakings from PP/Consultant. DOE must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts. DOE to write to the party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant. This project is a fabricated and fake CDM project and must be rejected by the DOE right away. DOE should not support this kind of projects otherwise CDM EB should suspend this DOE for at least one year.</p>	<p><u>2. Interview:</u></p> <p>Validation team interviewed staff from DNA of Guatemala and MARN, who confirmed that information provided to DOE from the FSR for validation was consistent with the information received and evaluated by for the approval of the project activity as CDM project (LoA obtained on 23/03/2011) and its environmental permit (EIA approbation on Resolution nº 1744-2008/ECM/MFG).</p> <p><u>3. On-site Visit to the project site.</u></p> <p>During the on-site visit to the project site, the audit team held interviews with those local stakeholders affected by the project in order to know their opinions about the implementation of the project, and negative comments or similar comments as the received during the GSC process were not received.</p> <p>Validation team confirms that:</p> <ul style="list-style-type: none"> - There is no evidence to indicate that the FSR provided by the PP for validation is different to the document submitted to other entities or organizations. - Moreover, validation team also notices that the same comments for other proposed CDM projects are also

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			<p>submitted by Mr. zhong zhou li in the same period of time when Mr. zhong zhou li raised comments for this project. Therefore, validation team has reason to believe that the comments submitted by Mr. zhong zhou li are not for this project specifically.</p> <p>Therefore, validation team considers that the comment raised by Mr. zhong zhou li is not relevant with the proposed project.</p>
2	lawrance	<ol style="list-style-type: none"> 1) Layout of power transmission lines from the generation to the consumer with the metering system is not shown. It should include the distance of transmission lines. DOE has to check the meters are installed to monitor electricity generated, net electricity used in Bhutan, net electricity exported to India. Pls. clarify. 2) The status of the construction & commission of the project is not stated in the PDD. 3) What is the basis of calculation for transmission loss, auxiliary consumption and transformer losses? What is the length of transmission line? 4) The project is claimed to be run of river hydro project. So the calculation of reservoir is wrong. The criterion 3 is applicable only to pumped storage or accumulation hydro projects. What does reservoir refer to as per PP? 	<p>According to the VVM (Version 01.2), validation team has taken into account the comments received and details of actions taken to take due account of the comment as following:</p> <p>The project activity is located in Guatemala instead of India, as the received comment refers.</p> <p>The final version of the PDD, version 3.4., includes a detailed description of the main technical features of the project activity, including information on the transmission line and electric meters to be install.</p> <p>During the on site visit the audit team could check that the construction status of the project was in line with the construction permit and the schedule provided to the audit team, and the different dates included in the final version of the PDD.</p>

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		<p>5) The justification of opting out alternative 3 and alternative 4 is not justified adequately. It should be based on latest published data and figures. Refer B.4. Pls. clarify.</p> <p>6) The bilateral agreements, PPA with India are the documents, DOE to check thoroughly.</p> <p>7) Date of investment decision should be at the time of DPR preparation. So, the basis of the cost escalation factors at a later date for CDM consideration is not valid. Pls. clarify. Refer B5. Step 3a. (Investment barrier).</p> <p>8) How the CDM benefit will alleviate the technical barriers. As per additionality tool, if the barriers are not alleviated by CDM, then the project is not additional.</p> <p>9) Emission factor for state is not calculated.it should be made available to DOE to clearly validate this value. Emission factor for India is not as per "Tool for emission factor for the system".</p> <p>10) Electricity generated by the project, auxiliary consumption, transmission losses, transformer losses, net electricity exported to India, net electricity exported to the grid. These parameters to be monitored continuously and to be cross checked with sale receipts.</p> <p>11) The Meth mentions that if investment analysis option is</p>	<p>The determination of the baseline emissions, project emissions (including the calculation of reservoirs), leakage have been checked, and the audit team found that it is in accordance with the applied methodologies and tools, and it is described correctly in the final version of the PDD.</p> <p>The additionality of the project activity is demonstrated as required by the criteria outlined in the Guidelines on the demonstration of additionality of small-scale project activities, version 09.0 through demonstrating the existence of investment barriers, as is detailed in section B.5 of the final version of the PDD.</p> <p>The audit team checked that the load factor included in the final version of the PDD is in accordance with the "Guidelines for the reporting and validation of plant load factors" version 01.</p> <p>The validation team found that other issues of the comment are not applicable to the project activity.</p>

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		<p>used, apply the following:</p> <p>a) Apply an investment comparison analysis, as per Step 3 of the .Combined tool to identify the baseline scenario and demonstrate additionality, if more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P3;</p> <p>b) Apply a benchmark analysis, as per Step 2b of the .Tool for the demonstration and assessment of additionality. If more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P2.</p> <p>But PP failed to apply like this. Pls. clarify.</p> <p>12) PLF should be based on EB48 Annex 11 guideline which says 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); But PDD doesn't demonstrate how PLF has been arrived at.</p> <p>13) Whether PLF includes machine shutdown, machine availability. Whether grid availability is accounted for in the calculation of gross generation. To my surprise, critical parameter like PLF is missing from the PDD. How DOE has</p>	

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		<p>allowed this.</p> <p>14) Common practice analysis should be based on EB 39 Annex 10 (Additionality tool). Each step of common practice analysis should be fulfilled as per tool.</p> <p>15) Emission reduction calculation should be based on EB 50 Annex 14 "Tool for emission factor for the electricity system.</p> <p>16) Whether only one set of main meter, check meter set is enough for three projects. The monitoring parameters need to be checked by DOE.</p> <p>17) The main meter and check meter technical parameters like accuracy level, make, etc. needs to be mentioned in the PDD.</p>	
3	lawrance	<p>1) Layout of power transmission lines from the generation to the consumer with the metering system is not shown. It should include the distance of transmission lines. DOE has to check the meters are installed to monitor electricity generated, net electricity used in Bhutan, net electricity exported to India. Pls. clarify.</p> <p>2) The status of the construction & commission of the project is not stated in the PDD.</p> <p>3) What is the basis of calculation for transmission loss,</p>	<p>This comment is the same as the previous comment.</p> <p>Please, see the response to the second comment.</p>

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