

ASSESSMENT OPINION
POST REGISTRATION CHANGES

"Hidroelectrica Candelaria S.A."

Chile: CANDELARIA HYDROELECTRIC PROJECT

UNFCCC REFERENCE NUMBER: "0604"

AENOR Reference No: 2013/049/CDM/02

Validation opinion:	AENOR Reference No.:		Version of this document:	Date of this rev.:
	2013/049/CDM/02		2	11/11/2013
Project:	Title:		Registration date:	UNFCCC Reference
	Candelaria Hydroelectric Project		09/11/2006	0604
Project Participant(s):	Host Party: Guatemala		Other involved Parties: Switzerland	
	Hidroelectrica Candelaria S.A.		Ecoinvest Carbon S.A.	
Applied methodology/ies:	Title:		Code:	No revision
	Grid Connected renewable electricity generation		AMS-I.D	8
PDD:		Registered PDD	Revised PDD:	
	Version	7	7.1.	
	Date	07/09/2006	20/09/2013	
	Estimated emission reductions	18,922 tCO ₂ /year	18,922 tCO ₂ /year	
Previous versions of this document:			Version:	Date:
			1	02/10/2013
Validation of the changes was conducted	<input type="checkbox"/> Prior to the commencement of a verification of the project activity <input checked="" type="checkbox"/> When performing a verification of the project activity			
Summary of Post registration changes:	TYPE OF POST REGISTRATION CHANGE			Is prior approval by CDM EB required? (According to appendix 1 of PS)
	Temporary deviations	From	To	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
	Corrections			<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
	Changes to the start date of the crediting period			<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
	Permanent changes from the registered monitoring plan or applied methodology			<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not applicable
	Changes to the project design of a registered project activity			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not applicable
<ul style="list-style-type: none"> Change the capacity of the installed turbine according the data included in the nameplate. Include a footnote clarifying the installed capacity of the project activity. 				
<p>The Spanish Association for Standardisation and Certification (AENOR) has performed the assessment opinion on the post registration changes of the project "Candelaria Hydroelectric Project" (Registration Ref. No. 0604) to submit the changes as part of the request for issuance of the monitoring period from 01/06/2011 to 31/12/2012, in accordance with requirements of CDM Project Cycle Procedure (Version 05.0).</p> <p>AENOR was contracted to perform the verification for this monitoring period, and during the on site visit, the proposed changes were identified by the audit team.</p>				
Report prepared by:	Climate Change Unit. AENOR			

Abbreviations

AENOR	Spanish Association for Standardisation and Certification
AMM	Administrador del Mercado Mayorista (Wholesale Market Administrator)
AMS-I.D v8	Grid Connected renewable electricity generation
BM	Build Margin
CAR	Corrective action request
CDM	Clean development mechanism
CDM-EB	CDM Executive Board
CER	Certified emission reduction
CL	Clarification request
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DECISION 3/CMP.1	Modalities and Procedures for a Clean Development Mechanism as Defined in Article 12 of the Kyoto Protocol
DNA	Designated national authority
DOE	Designated operational entity
EB	Executive Board of the CDM of the Kyoto Protocol
ER	Emission reduction
FAR	Forward action request
GHG	Greenhouse gas(es)
GNEG	Guatemalan National Electric Grid
IPCC	Intergovernmental Panel on Climate Change
Km	Kilometre
Kv	Kilovolts
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring report
MW	Megawatt
MWh	Megawatt hour
NGO	Non-governmental Organisation
PA	Project Activity
PCP	Clean Development Mechanism Project Cycle Procedure (Version 05.0)
PDD	Project Design Document
PP	Project Participant
PS	Clean Development Mechanism Project Standard (Version 05.0)
tC	Carbon tonnes
tCO ₂ e	Carbon dioxide equivalent tonnes
UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM Validation and Verification Standard (version 05.0)

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1 INTRODUCTION

The project participant Hidroelectrica Candelaria S.A., has commissioned AENOR to carry out the verification and certification of emissions reductions generated by “Candelaria Hydroelectric Project” (the project) for the period from 01/06/2011 to 31/12/2012, and during the on site visit, the need of the proposed changes was identified by the audit team.

1.1 Objective

According to the Modalities and Procedures for the CDM (Decision 3/CMP1, paragraph 62g), the DOE contracted by the project participants to perform the verification shall identify and inform the project participants of any concerns relating to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information.

This assessment opinion contains the description of the post registration changes, including their nature, extent of the non-conforming monitoring and the proposed alternative monitoring of the project activity, as well as any other complementary information required by the PCP, PS and VVS, to submit the changes for for acceptance by the Board as part of the request for issuance.

1.2 Scope

The scope of the validation is to assess all changes from the project activity as described in the registered project design document, including their potential impact on the estimates of the emissions reductions, the level of accuracy of the monitoring activity, the additionality or scale of the project activity and the applicability and application of approved methodology.

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

- PDD and monitoring plan registered.
- PDD revised.
- Approved Methodology: AMS-I.D, version 8.0
- Decision 3/CMP.1 and relevant decision and guidelines from the EB
- CDM Validation and Verification Standard, version 05.0.
- Clean Development Mechanism Project Cycle Procedure, version 05.0.
- Clean Development Mechanism Project Standard, version 05.0.
- Associated documentation (manufacturer documentation, design documentation, agreements, etc.)

The validation scope is defined as an independent and objective review the post registration changes included in the revised project design document, including any other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. AENOR, based on the PCP, the PS and the VVS, has used a risk-based approach in the validation, focusing on the identification of significant risks for the project implementation and the generation of CERs.

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

1.3 Description of the Project Activity

Host Country:	Guatemala
Title of project activity:	Candelaria Hydroelectric Project
UNFCCC registration No:	0604
Project Participants:	Hidroelectrica Candelaria S.A. 16 Calle 0-26 Zona 14 Guatemala City - 01014 E-mail: rtormo@grupossecacao.com

Ecoinvest Carbon S. A.

Switzerland

Location of the project activity: The coordinates of the powerhouse are:
Latitude: 15.38695 N
Longitude: -89.75510 W.

Project's crediting period: 01/01/2007 to 31/12/2013 (First renewable period)

Verification period: 01/06/2011 to 31/12/2012

Project starting date: January 2005

The validation and previous verifications are summarised below:

Process	DOE	Crediting/Monitoring Period	Registration Date	Amount of CERs
Validation	DNV	01/01/2007 - 31/12/2013	09/11/2006	18,922 (tCO ₂ e)*
1 st verification	DNV	01/01/2007 - 31/01/2008	31/08/2009	22,164 (tCO ₂ e)
2 nd verification	AENOR	01/02/2008 - 31/05/2009	05/01/2011	23,558 (tCO ₂ e)
3 rd verification	AENOR	01/06/2009 - 31/05/2010	14/06/2012	19,950 (tCO ₂ e)
4 th verification	AENOR	01/06/2010 - 31/05/2011	02/04/2013	19,273 (tCO ₂ e)

* Annual average over the crediting period of estimated reductions

The Project is a run-of-river hydropower plant with an installed capacity of 4.3 MW that utilizes the water of the Trece Aguas River.

The installed capacity of the hydroelectric plant is determined and delimited by the capacity of the generator, which has an apparent power of 5,397 kVA and a power factor of 0.8. Therefore, 4.3 MW (5,397 kVA × 0.8) is the maximum output capacity of the generator.

The plant delivers electricity to the Guatemalan National Electric Grid and is connected to the grid through a 69 kilovolt transmission line. The plant also delivers part of its output locally through an existing 13.8-kilovolt distribution line owned by a utility serving this rural area, thus giving access to electricity to several local communities. This way, the project reduces CO₂ emissions by avoiding electricity generation by the fossil fuel-fired power plants connected to the grid.

The project is located near the city of Senahú, in the Alta Verapaz Department, Guatemala.

The construction of the Project began in January 2005 and the commissioning took place during June 2006 to successfully start power generation on 01/07/2006. Since then, the plant has been continuously operating and delivering energy to the National Grid, although the first crediting period started later, on 01/01/2007, after of the registration date of the project, on 09/11/2006.

2 METHODOLOGY

2.1 Appointment of team members and technical reviewers

The list of involved personnel and the qualification status are summarised in the table below. The appointment certificates are included in Annex 1.

Name	Qualification	
	Position on the team	Technical areas
Luis Javier ARRIBAS ALONSO	Chief Validator	TA 1.2
Luis ROBLES OLMOS	Validator	TA 1.2
M ^a Mercedes GARCÍA MADERO	Technical Reviewer	TA 1.2
José Luis FUENTES PÉREZ	Technical Reviewer	TA 1.2

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)
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

2.2 Review of Documentation

The desk review involved a review of:

- Project documentation: PDD registered and Validation Report.
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board.
- The applied monitoring methodology, paying close attention to the frequency of measurements, the quality of metering equipment and the quality assurance and quality control procedures.
- Project documentation: Registered PDD, revised PDD, validation report and previous verification report.
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board
- The Monitoring Plan and the applied monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment and the quality assurance and quality control procedures.
- The data and information presented to verify their completeness, including the monitoring Report and the measuring records of the different monitored parameters.
- The influence of data management and the quality assurance and quality control system on the generation and reporting of emission reductions.

A complete list of all documents reviewed is attached in section 5 of this report.

2.3 Site Visits

As part of the verification process of the fifth monitoring period, on 11 and 12 June 2013, Luis Javier Arribas Alonso and Luis Robles carried out the on-site visit, including visits to the facilities of the project. Also, during the on-site visit the verification team was able to complete:

- An assessment of the implementation and operation of the project activity as per the PDD registered.
- A review of information flows for generating, aggregating and reporting the monitoring parameters.
- A cross-check between information provided in the monitoring report and data from other sources such as plat log books, inventories, purchase records or similar data sources.
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology.
- A review of calculations and assumptions made in determining the GHG data and emissions reductions.
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the Monitoring Plan in the PDD.

2.4 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 from 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 POST REGISTRATION CHANGES

3.1 Remaining issues, CARs, FARs from Previous Validation or Verification

During the validation, the DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose FARs might have been raised. No such issues were identified for this project.

Any other findings have been taken into account.

3.2 Temporary deviations from the registered monitoring plan and/or applied methodology

3.2.1 Description

It is not necessary to request temporary deviations.

3.2.2 Applicable period for proposed deviations (inclusive)

Start date of the earliest included deviation: Not applicable.

End date of the latest included deviation: Not applicable.

3.2.3 Assessment

Not applicable.

3.3 Corrections

3.3.1.1 Description

It is not necessary to make any corrections to project information or parameters fixed at validation as described in the registered PDD.

3.3.1.2 Assessment

Not applicable.

3.4 Permanent Changes from the registered monitoring plan or applied methodology

3.4.1.1 Description

No permanent changes from the registered monitoring plan or applied methodology have been requested.

3.4.1.2 Assessment

Not applicable.

3.5 Changes to project design of registered project activity

3.5.1.1 Description

During the verification process of the fifth monitoring period, the audit team identified that the project design in the implementation of the project activity was not conformed with the description contained in the

registered PDD, as it was found a little difference between the power rating of the installed turbine, with 4.456 MW, and the value indicated in the registered PDD, with 4.3 MW.

The project participants have documented in a revised PDD (v07.1 – 20/09/2013) the following proposed changes, in accordance with the requirements of the Project standard:

- 1) In section A.3 has been updated the installed capacity, and the value of 4.3 MW has been changed by the value of 4.456 MW, according with the information of the nameplate of the installed turbine.
- 2) In the page 4 of the revised PDD, section A.3), a footnote has been included, clarifying that the installed capacity of the plant is determined and delimited by the capacity of the generator, which has a maximum output capacity of 4.3 MW (result of multiplying the apparent power of 5,397 kVA and the power factor of 0.8).

3.5.1.2 Assessment

According to the paragraph 224 of the current version of the PS, the changes in the effective output capacity due to increased installed capacity, which were identified by the audit team, correspond with a type of changes to the project design of the registered PDD.

The audit team considers that this difference is not significant and the determination of the emission reductions of the project activity is not affected, as it does not cause any impact on the installed capacity of the project, because according to the criterion stated in the paragraph 82(a) of the current version of "Clean development mechanism project standard", the installed capacity of the project is determined by the power rating of the installed generator of 4,317.6 kW, which is equivalent to the installed capacity indicated in the registered PDD.

Therefore, the proposed changes in the revised PDD do not impact on the applicability of the methodology under which the project activity was registered, the compliance of the monitoring plan with the applied methodology, the level of accuracy and completeness in the monitoring of the project activity, its additionality and scale, as is required in the paragraph 225 of the PS, and as consequence, the paragraph 6 of the PS can be applied and the changes can be submitted as part of the request for issuance in accordance with the Project cycle procedure.

Following the requirement of the paragraph 209 of the PS, the project participants have reflected the proposed changes in a new version of the registered PDD (version 7.1). The audit team could check that the description included in the revised PDD reflects the implementation, operation and monitoring of the modified project activity currently.

The audit team has reviewed that the proposed changes do not adversely affect the conclusions of the validation report of the registered PDD with regard to:

- a) The additionality of the project activity, as the financial barriers used in the validation process have not been changed.
- b) The scale of the project activity, as the installed capacity of the project activity has not been changed. The installed capacity is determined and delimited by the capacity of the generator of 4.3 MW, which has not been changed.
- c) The applicability and application of approved baseline methodology under which the project activity has been registered, as the technology (renewable energy generation units) and boundaries (the project supply electricity to an electricity distribution system, the national grid, and displacing fossil fuel fired generating units) of the project activity have not been changed.
- d) The compliance of the monitoring plan with the applied monitoring methodology, as the monitoring plan has not been changed.

The audit team has been able to verify that the installed turbine has not been changed since the starting date of the project activity, and according to the registered PDD and the nameplate of the installed turbine, it was installed during June of 2006, when the installation of electromechanical equipment was carried out. Therefore, the changes would have been known prior to registration of the project activity.

The changes took place likely because the installed turbine was the one supplied by the manufacturer who provided a turbine with a capacity the most similar to the one required by the project participants in their design documentation, in this case, slightly higher than the requirement.

As it was explained above, this difference is not significant because it does not cause any impact on the overall operation/ability of the project activity to deliver emission reductions as stated in the PDD, as the installed capacity of the project does not change, because it is determined by the power rating of the installed generator of 4.3 MW, equivalent to the installed capacity indicated in the registered PDD.

Therefore, AENOR determines that the proposed changes to the project activity comply with the requirements established in the Project Standard.

AENOR verification team could check during the on-site visit that in all the other key design elements of the project (penstock length, net head, tunnel length, etc.) no changes have been done.

3.6 Changes to start date of crediting period

3.6.1.1 Description

Project participants do not want to request changes to start date of crediting period.

3.6.1.2 Assessment

Not applicable.

4 VALIDATION OPINION

AENOR was contracted to perform the verification of the project "Candelaria Hydroelectric Project" (Registration Ref. No. 0604) for the monitoring period from 01/06/2011 to 31/12/2012, and during the on site visit, the proposed changes were identified by the audit team.

AENOR has performed the validation of the proposed changes according to the approved methodology "AMS-I.D, version 8.0: Grid Connected renewable electricity generation", VVS (Version 05.0), PS (version 05.0) and PCP (Version 05.0).

AENOR planned and performed its work to obtain the information and explanations considered necessary to provide sufficient evidence to give reasonable assurance that the level of accuracy of GHG emission reductions. This assessment opinion is prepared on the basis of the revised PDD and compared with the registered PDD of the project activity which is not adversely affected. This assessment included:

- Collection of evidence supporting the reported data
- Checking whether the provisions of the revised PDD, were consistently and appropriately applied.

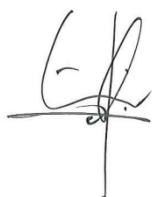
Furthermore, AENOR confirms that:

The proposed revision issues have been described, and an assessment has been provided to substantiate the reason for each of the proposed revision issues of the registered PDD, using objective evidence.

The proposed changes to the registered PDD have been included by the project participants in the revised PDD and comply with the requirements of the Project Standard.

The corrected information is an accurate reflection of actual project information, improving the accuracy of information provided and consistency in the registered PDD, comply with the requirements of the applied methodology.

Madrid, 11 November 2013



Luis Javier Arribas Alonso

Chief Validator



Luis Robles Olmos

Authorised person

5 REFERENCES

1	PDD registered version 7
2	Revised PDD dated on 20/09/2013 (version 7.1)
3	Validation Report
4	AMS-I.D (version 8): "Grid connected renewable electricity generation"
5	Nameplate of generator
6	Nameplate of turbine
7	Hourly measurements downloaded from the meters
8	As-built drawings of the project activity
9	Validation and Verification Manual (VVS) version 05.0
10	Clean Development Mechanism Project Cycle Procedure (Version 05.0)
11	CDM Project Standard version 05.0

ANNEX 1. APPOINTMENT CERTIFICATES

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for “Candelaria hydroelectric Project”

Madrid, 11/11/2013

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 verification 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: N/A

Technical areas related with the project activity:

TA1.2: Energy generation from renewable energy sources.



José Luis TEJERA OLIVER
CDM Operational Director

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for “Candelaria Hydroelectric Project”

Madrid, 11/11/2013

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 verification process of the above mentioned project activity:

Name: **Luis Robles Olmos**

CDM Chief Validator: Yes

CDM Validator: Yes

CDM Chief Verifier: N/A

CDM Verifier: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

TA1.2: Energy generation from renewable energy sources.



José Luis TEJERA OLIVER
CDM Operational Director

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for "Candelaria hydroelectric Project"

Madrid, 11/11/2013

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 verification process of the above mentioned project activity:

Name: **M^a Mercedes García Madero**

CDM Chief Validator: Yes

CDM Validator: Yes

CDM Chief Verifier: N/A

CDM Verifier: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

TA1.2: Energy generation from renewable energy sources.



José Luis TEJERA OLIVER
CDM Operational Director

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for "Candelaria hydroelectric Project"

Madrid, 11/11/2013

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 verification process of the above mentioned project activity:

Name: **José Luis Fuentes Pérez**

CDM Chief Validator: Yes

CDM Validator: Yes

CDM Chief Verifier: N/A

CDM Verifier: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

TA1.2: Energy generation from renewable energy sources.



José Luis TEJERA OLIVER
CDM Operational Director