

	VALIDATION REPORT	
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**VALIDATION OF THE:  
CHAMELECÓN 280 HYDROELECTRIC PROJECT**

**Generación de Energía  
Renovable S.A. de C.V.  
(GERSA)  
(HONDURAS)**

**REPORT No.  
CDMVAL-023-06**

**DECEMBER 8<sup>TH</sup>, 2011**

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<i>Date of first issue:</i>	<i>04-03- 2011 Version 0</i>	<i>Project No.:</i>	<i>Pending</i>
<i>Approved by:</i>	<i>Internal Technical reviewer of ICONTEC</i>	<i>Organizational unit:</i>	<i>Instituto Colombiano de Normas Técnicas y Certificación – ICONTEC Carrera 37 52-95 Bogotá - Colombia</i>
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	<i>Client ref.:</i>		

*Summary:*

The Chamelecón 280 Hydroelectric Project is located in the municipality of Macuelizo, Santa Barbara Department, Honduras. The project consists of renewable electricity generation from a run-of-river small hydro power plant utilizing the Chamelecón River. It is expected that more than 246,000 tonnes CO<sub>2</sub>e emitted to the atmosphere will be avoided over a period of 7 years starting in November 2011. The resulting emission reductions from the project activity 35,352 tonnes of CO<sub>2</sub>e per year).

The new small hydro power plant consists of 2 turbines of 5.56MW capacity each, and has a total installed capacity of 11.12 MW, as eligibility threshold for small scale projects is 15 MW the propose project activity is classified as a small scale project. This generation unit will supply electricity to the national grid.


During the validation the Audit team raised 8 Corrective action requests (CAR's) and 8 Clarification request (CLA's), which were closed, as related in Validation Protocol Table 4.

All requirements related to methodology AMS I.D Version 16, additionality, baseline and monitoring plan in accordance with the VVM Version 01.2 and Kyoto protocol were validated and completed by the PPs in the Project Design Document Version 02.1.

ICONTEC has performed the validation of the project: Chamelecón 280 Hydroelectric Project in Honduras on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

The proposed project activity under validation process is based on methodology AMS-I-D, version 16<sup>1</sup>. The project involves grid connected renewable electricity generation.

<sup>1</sup> At the date of the submission for registration of this project, this methodology has been replaced by AMS. I.D version 17. Nevertheless projects can still be submitted for registration until February 17 th, 2012.

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The validation consisted of the following four phases: i) a desk review of the project design documents and documentation support, ii) On-site visit iii) follow up interviews with project stakeholders and iv) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is ICONTEC's opinion that the project Chamelecón 280 Hydroelectric Project, as described in the version 02.1 of the project design document (PDD) meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria, and correctly applies the baseline and monitoring methodology AMS-I-D, version 16. Hence, ICONTEC requests the registration of the project as CDM project activity.

<i>Report No:</i>	CDMVAL-023-06	<i>Subject Group:</i>	1	<i>Indexing terms:</i>	
<i>Report title:</i>					
	Validation report Chamelecón 280 Hydroelectric Project				Climate Change; Kyoto Protocol; Validation; Clean Development Mechanism, renewable sources

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This report should not be read without reference to the annexed Validation Protocol.

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## Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CERs	Certified emission reductions
CLA	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> eq	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
GHG	Greenhouse Gases
I	Interview
ICONTEC	Colombian Institute of technical standards and certification (Instituto Colombiano de Normas Técnicas y Certificación)
IPCC	Intergovernmental Panel on Climate Change
MoV	Means of verification
MP	Monitoring Plan
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
GERSA	Generation of Renewable Energy (Generación de Energía Renovable Sociedad Anónima)
ENEE	National Electric Power Company (Empresa Nacional de Energía Eléctrica)
SIN	Honduran National Interconnected System (Sistema Interconectado Nacional)
SERNA	Natural Resources and Environmental Secretariat (Secretaría de Recursos Naturales y Ambiente)
PPA	Power Purchasing Agreement
CHP	Chamelecón 280 Hydroelectric Project

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## 1. INTRODUCTION

Generación de Energía Renovable S.A. de C.V. (GERSA), has commissioned ICONTEC to perform the Validation of Chamelecón 280 Hydroelectric Project (hereafter called CHP).

During the validation the following activities were performed: desk review, on-site visit to the project place, interviews with stakeholders, national environmental authorities and review of documentation. This report summarizes the findings of the project validation, which was performed on the basis of VVM ver 1.2 of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

### 1.1 OBJECTIVE

The purpose of a validation is to have an independent third party to assess the project design. In general, the project baseline, monitoring plan, and the project activity compliance with relevant UNFCCC and host party's criteria. The project is validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

### 1.2 SCOPE

The validation scope involves the independent and objective revision to determine that the project design meets the following criteria:

- the UNFCCC criteria: The Kyoto Protocol Article 12 criteria, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by the CDM Executive Board, and
- Host Party criteria: National CDM requirements, including sustainable development priorities, and potential specific requirements contained in, for example, the Letter of approval (LoA) by the Designated National Authority, or project agreements between the involved parties.

ICONTEC, based on its ethics code and internal procedures for carrying out validation, verification and certification audits of CDM project activities (which, in turn, are based on the validation and verification manual) focused on the identification of significant risks for CER generation, and verification of the mitigation.

The validation does not mean to provide any consulting for the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

### 1.3 CDM PROJECT DESCRIPTION

Chamelecón 280 Hydroelectric Project (CHP) is located in the municipality of Macuelizo, Santa Barbara Department, Honduras. The project is an 11.12 MW hydropower project delivering electricity to the Honduran National Interconnected System (SIN, from its Spanish acronym), in an intended average amount of 55.7 GWh/year. It is expected that 247.464 thousands of tonnes

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CO<sub>2</sub>e emitted to the atmosphere will be avoided over a period of 7 years starting in November 2011. Therefore the project activity is classified as a small scale project.

The project consists of renewable electricity generation from a run-of-river small hydro power plant utilizing the Chamelecón River in Macuelizo, Honduras. The small hydro power plant consists of 2 turbines of 5.56MW capacity each, and has a total installed capacity of 11.12 MW. The Chamelecón Hydroelectric Power Plant utilizes tried-and-tested equipment in the form of Francis Horizontal Shaft turbines.

The plant does not have a reservoir to store water and relies on the natural water flow of the Chamelecón River (run-of-the-river).

The GHG project considered can be classified as a CDM project in the sector 1, Energy industries (renewable/non-renewable sources), according to the List of Sectoral Scopes of UNFCCC.

AMS.I.D, version 16, EB 54 “Grid connected renewable electricity generation” has been applied to this project.

The project will be developed by Generación de Energía Renovable S.A. de C.V. (GERSA).

## 2. VALIDATION METHODOLOGY

The validation consists of the following four phases:

- i) A desk review of the project design document
- ii) On-site visit
- iii) Follow up interviews with project stakeholders and national authorities
- iv) The resolution of outstanding issues and the issuance of the final validation report and opinion.

As mentioned in clause 1.2 of this report ICONTEC, based on its ethics code and internal procedures, carries out validation, verification and certification audits of CDM project activities (which, in turn, are based on the Validation and Verification Manual ver 1.2) focused on the identification of significant risks for CER generation, and verification of the mitigation.

These internal procedures define the validation protocol which consists of three tables (see Annex A).

The validation protocol resulting from the Validation of Chamelecón 280 Hydroelectric Project is enclosed in Annex A of this report.

Findings established during the validation can be seen as:

- a non-fulfillment of validation protocol criteria, or
- an identified risk to the fulfillment of the project objectives

The findings could take the form of a Corrective Action Request (CAR), Forward action request (FAR) or a Clarifications Request (CLA).

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Corrective action requests (CAR) are issued, where:

- i) the project participants have made mistakes which directly will influence the ability of the project activity to achieve real, measurable and additional emission reductions;
- ii) the CDM requirements have not been met; or
- iii) there is a risk that emission reductions cannot be monitored or calculated

A Forward Action Request is made to highlight issues related to project implementation that will require review during the next verification of the project activity.

A Clarification is required where information is insufficient, or not clear enough to establish whether a requirement is met.

## 2.1 REVIEW OF DOCUMENTS

The PDD submitted by GERSA and the additional background documents related to the project design and baseline were assessed during the validation.

Main documents reviewed are:

- Environmental Mitigation Contract signed between GERSA and SERNA on October 30<sup>th</sup>, 2009.
- Environmental License issued on November 9<sup>th</sup>, 2009.
- Letter acknowledging the participation of GERSA as project participant, by the Designated National Authority for Honduras, September 10<sup>th</sup>, 2010.
- Letter of approval by ENEE (Empresa Nacional de Energía Eléctrica, the Honduran National utility), issued on November 14<sup>th</sup>, 2010.
- National Letter of Approval by the Designated National Authority for Honduras, June 16, 2011.
- Letter by BANPAIS (Banco del País. S.A), acknowledging the importance of the CDM component to get financial support, issued on August 16<sup>th</sup>, 2010.
- Stakeholder consultation report, carried out on November 20<sup>th</sup>, 2009.
- Turbines and generator contract, signed on December 17<sup>th</sup>, 2009.
- Technical information about turbines and generators.
- Calculations about plant load factor and CHP generation, November 29<sup>th</sup>, 2010.
- CHP schedule, updated on December 29<sup>th</sup>, 2010.
- Official Journal of the National Congress of The Republic of Honduras, issued on July 30<sup>th</sup>, 2010, approving the CHP.
- Official Journal of the National Congress of The Republic of Honduras, issued on December 30<sup>th</sup>, 2010 publishing the Contract between ENEE and GERSA about power supply and energy generated with renewable resources.
- Line diagram that shows the connection of CHP with the Honduran National Interconnected System (SIN), August 26<sup>th</sup>, 2010. Emergency Plan, issued on August 30<sup>th</sup>, 2010.
- Report about calculation of emission factor of Honduran Grid, 2008, (Reporte del Cálculo del Factor de Emisiones del 2008 del Sistema Eléctrico de Honduras), August 2009, made by Geolingeniería S.A.
- Letter by GERSA which describes a proposal for CHP Connection to National grid, issued on February 18<sup>th</sup>, 2008.

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- Letter by ENEE, which responses the letter issued by GERSA on February 18<sup>th</sup>, 2008 regarding to CHP Connection to National grid, this letter is dated on April 29<sup>th</sup>/2009.
- Letter by GERSA which describes a proposal for CHP Connection to National grid, issued on March 11<sup>th</sup>, 2009.
- Letter by ENEE, which responses the letter issued by GERSA on March 11<sup>th</sup>, 2009 regarding to CHP Connection to National grid, this letter is dated on April 29<sup>th</sup>/2009.
- Loan Term sheet issued by Banpais on December 9<sup>th</sup>, 2009.
- Statement for Loan Agreement issued by ELCOLSA on June 16<sup>th</sup>, 2008.
- Spreadsheet with the balance income of ELCOLSA year 2009-2010.

## 2.2 FOLLOW UP INTERVIEWS

ICONTEC performed interviews with project stakeholders to confirm the selected information and to resolve issues identified during the desk review. The main topics of the interview are summarized in the Table 1.

**Table 1. Follow up Interview**

DATE	PLACE	INTERVIEW DELEGATE	ORGANIZATION	INTERVIEW TOPICS
16.08.2010 17.08.2010	GERSA OFFICE 'S AND VISIT ON SITE	MIGUEL E. ORTIZ (CHIEF SUPERVISOR GERSA)	GERSA	CONSTRUCTION
16.08.2010	GERSA OFFICE 'S	EDDY NOEL JUAREZ (GENERAL MANAGER)	GERSA	OPERATION AND GENERATION PLANT
16.08.2010	GERSA OFFICE 'S	MANUEL CAÑADAS (ELECTROMECHANICAL ENGINEER)	GERSA	OPERATION AND MAINTENANCE OF PLANT
16.08.2010	GERSA OFFICE 'S	SERGIO DEGENER (CDM CONSULTANT)	ANACONDA CARBON	PROJECT DEVELOPER
16.08.2010 17.08.2010	GERSA OFFICE 'S AND VISIT ON SITE	PILAR CRESPO (ENVIRONMENTAL ENGINEER AND CDM RESPONSABLE)	GERSA	PDD, ADDITIONALITY, BASELINE, CALCULATED
18.08.2010	SERNA	IRINA PINEDA (DIRECTOR OF EXTERNAL COOPERATION)	SERNA	AUTHORITY ENVIRONMENTAL
18.08.2010	ENEE	GERARDO SALGADO (DIRECTOR OF PLANNING AND DEVELOPMENT)	ENEE	EMISSION FACTOR OF HONDURAS

## 2.3 RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUESTS

Corrective action and clarification requests raised by ICONTEC, presented to the project participants were resolved by GERSA and ICONTEC. To guarantee the transparency of the validation process, the concerns raised and the responses provided by the project participants are documented in more detail in the validation protocol in Annex A.

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Since modifications to the project design document were necessary to resolve ICONTEC's concerns, the client decided to review the PDD and re-submit corrected versions of the PDD. After the period of public consultation (04-06-2010 to 03-07-2010) and after reviewing the version 02 and last version of the PDD (version 02.1), ICONTEC issued this validation report and opinion.

## 2.4 INTERNAL QUALITY CONTROL

This report, that includes the validation findings, underwent a technical review before being submitted to the project participants.

The Internal technical review and the quality control of the process was performed by an internal technical reviewer in accordance with ICONTEC internal procedures for carrying out validation, verification and certification audits of CDM project activities. The technical reviewers are qualified in accordance with ICONTEC qualification scheme for CDM validation and verification.

## 2.5 VALIDATION TEAM

The validation team consists of the following personnel:

**Table 2. Validation team**

ROLE/QUALIFICATION	LAST NAME	FIRST NAME	COUNTRY
Lead Auditor	Urrego Ortiz	Erika	Colombia
Auditor in Training	Ramírez Torres	Francy Milena	Colombia
Sectoral Technical expert	Gomez	Fernando	Colombia

The validation team is qualified in accordance with ICONTEC qualification scheme for CDM validation and verification. See Annex C.


## 3 VALIDATION FINDINGS

### 3.1 OVERVIEW

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Annex A.

### 3.2 PARTICIPATION REQUIREMENTS

The project participant is Generación de Energía Renovable S.A. de C.V.

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The participation of GERSA has been approved by the DNA of Honduras, letter of approval dated on 16/06/ 2011 /3/.

The host country meets all participation requirements, and the Designated National Authority of the host country has approved the project with the letter of approval describing as follows:

**Table 3. Approval letter**

Date of issue:	16/06/2011.	
Description:	It provides confirmation that the project contributes to the country in the search for sustainable development.	
Supporting documentation	Annex B	
Date of ICONTEC reception	16/06/2011 Sent by email for GERSA.	
Entity that sent the letter to ICONTEC	Project participants	Directly from the DNA
	X	
Means of validation employed to assess the authenticity	By means of phone call and email with Ms. Luz Flores Energy specialist of Energy General Direction of SERNA.	
ICONTEC Conclusion	<p>The Honduran Government sent us the letter of approval authorizing the participation of GERSA in this project, 16/06/2011.</p> <p>All parties involved have approved the project activity. The letter is authentic and valid for the proposed CDM project activity under validation. It confirms and it is unconditional with respect to:</p> <ul style="list-style-type: none"> <li>(a) The Party is a Party to the Kyoto Protocol;</li> <li>(b) Participation is voluntary;</li> <li>(c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country;</li> <li>(d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.</li> </ul>	

### 3.3 PROJECT DESIGN

The CDM project has been developed using the methodology AMS.I.D, version 16, EB 54 “Grid connected renewable electricity generation”.

According to this methodology the project boundaries are:

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The area where Chamelecón 280 hydroelectric power plant, diversion dam, and transmission lines are located. This would be near the Macuelizo Municipality in Santa Barbara Department, Honduras. As the transmission line will reach the SIN, the Honduran National Interconnected System, by interconnecting to the L-336 distribution line, the SIN will also be included in the project's boundary /12/. The project boundary has been determined by means of: documental review of line diagram showing the connection of CHP with the Honduran National Interconnected System (SIN) and contract signed between ENEE and GERSA about power supply and energy generated with renewable resources, on-site visit and an interview with Mr. Gerardo Salgado from ENEE /11/. According to that, ICONTEC is able to confirm that the identified boundary and the selected sources and gases are justified for the project activity.

The new small hydro power plant consists of 2 turbines of 5.56MW capacity each, and has a total installed capacity of 11.12 MW, therefore the project activity is classified as a small scale project, as eligibility threshold for small scale projects is 15 MW the propose project activity is classified as a small scale project.

The project complies with the applicability criteria of the methodology as was verified by ICONTEC, as follows:

**Table 4 Methodology for applicability conditions analysis**

Applicability condition	Means of validation
This project is an 11.12 MW hydroelectric power plant, installs a new power plant at a site where there was no renewable energy power plant operation.	<ul style="list-style-type: none"> <li>- On-site visit</li> <li>- Interview with ENEE</li> <li>- Documental Review of :</li> </ul>
CHP is a run-of-the-river power plant and as such uses no reservoir.	<ul style="list-style-type: none"> <li>• Calculations about plant load factor and CHP generation /8/.</li> <li>• Line diagram showing the connection of CHP with the Honduran National Interconnected System (SIN) /12/.</li> <li>• Contract between ENEE and GERSA about power supply and energy generated with renewable resources /11/.</li> </ul>

Besides that, ICONTEC verified that the project design document met 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)

### 3.4 BASELINE DETERMINATION

According to the methodology, the baseline corresponds to 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. The baseline emissions are the

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product of electrical energy baseline  $EG_{BL, y}$  expressed in MWh of electricity produced by the renewable generation unit multiplied by the grid emission factor.

The grid emission factor is furnished by SERNA, and it is calculated using the latest information provided by ENEE (Empresa Nacional de Energía Eléctrica, the Honduran National utility) at the start of validation. The grid emission factor is determined according to the procedures prescribed in the “Tool to calculate the emission factor for an electricity system” (version 02). The relevant electricity system is the Honduran national grid (SIN) and off-grid power plants are not considered in the emission factor calculations, as demonstrated in the PDD section B.6.1, steps 1 and 2. In Honduras, the low-cost/must-run resources constitute less than 50% of total grid generation on average over the last 5 years, as demonstrated in the PDD, section B.6.1, step 3. According to this, the “Simple OM” method has been correctly chosen to calculate the Operating Margin (OM) emission factor ( $EF_{grid, OM, y}$ ), and the ex ante option. As explained in the section B.6.1, step 4, the calculations are based on fuel consumption and net electricity generation data of each power plant/unit, (Option A1 of the Tool) for the data vintage 2006-2008.

To calculate the Build Margin (BM), most recent capacity addition that compromises 20% of the system generation and the ex ante option for the year 2008 have been chosen, as demonstrated in the PDD, section B.6.1, steps 5 and 6.

Combined Margin (CM) has been correctly calculated by averaging the OM and the BM, as explained in the PDD, section B.6.1, step 7.

For PDD version 1, used for desk review before the on-site visit, the DOE raised a CAR for Calculations of grid OM emission factor, because it was not aligned with the proper tool<sup>2</sup> instructions. In the on-site visit, the DOE has verified by interview with SERNA that the emission factor from the grid has been calculated by a consultancy company contracted by the DNA. Not all data are public available. The consultant report was handed in by SERNA directly to the audit team during the on-site visit. After analyzing and studying this information, the DOE closed this CAR. The grid emission factor has been evaluated as 0.6347 t CO<sub>2</sub>/MWh.

The DOE verified the “Data and parameters that are available at validation”, presented in the PDD, section B.6.2 by consulting directly the data source.

To estimate the baseline emissions prior to validation, the PP employed the grid emission factor just described (0.6347 t CO<sub>2</sub>/MWh), and the electrical energy baseline  $EG_{BL}$  has been correctly estimated in 55.7 GWh/year, the expected annual average generation, as presented in the project description. Thus, the estimated baseline emissions are 35,352 t CO<sub>2</sub>/year.

ICONTEC confirms that all information, assumptions and data used in the identification of the baseline scenario are relevant, appropriately justified, correctly quoted and interpreted, supported by evidence and can be deemed reasonable.

According to the previous description, ICONTEC found that the project participant has correctly applied the selected methodology with respect to the Baseline identification. The scenario selected reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the

<sup>2</sup> Tool to calculate the emission factor for an electricity system” (Version 02.1.0)

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absence of the proposed CDM project activity. All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

### 3.5 ADDITIONALITY

#### 3.5.1 Prior consideration of the CDM

The start date of the project was identified as 17/12/2009. This date corresponds to the signing of the turbines supply contract /7/. According to this date, the project is considered as a new project. In this framework, prior consideration of CDM is demonstrated through the fact that the Global Stakeholders Process has been started within the next 6 months after the start date of the project activity (04/06/2010). In accordance with the “Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM” (EB 49 Annex 22, Clause 2), a written notification to the Host Party DNA and the UNFCCC secretariat of the commencement of the project activity and of their intention to seek CDM status is not necessary.

In conclusion, the CDM project activity complies with the requirements of the latest version of the Guidance on prior consideration of CDM.

#### 3.5.2 Additionality analysis

The additionality of the project activity has been assessed on the basis of the attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities

In this framework, the PP is required to demonstrate that the project activity would not have occurred due to at least one of the following barriers:

- Investment barrier
- Technological barrier
- Barrier due to prevailing practices / common practice
- Other barriers (including institutional barriers)

Investment barrier and institutional barriers are described in the PDD as follows. The views of the PDD are given too:

#### **Institutional Barriers**

The general institutional environment described in the PDD is related to unclear processes, political reluctance to modernize the regulatory framework (to incentivize renewable energy mostly) and prolonged, unreliable timeframes to complete permits and licenses. Under this scenario the project developers are faced with financial reluctance because of risks involved. The latest amendments to Decree 070-2007 “Law for the promotion of electrical energy generation from renewable sources” are still being discussed by the Legislature, which had approved the amendments requested by the renewable energy project developers, but was forced to review them after a partial veto from the Presidency. The validating on-site visit of ICONTEC coincided with congress discussions on these matters, and in Congress installations, ICONTEC had the

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opportunity to interview (Mr. Gerardo Salgado from ENEE) so ICONTEC is able to confirm the general view of the PP.

The above impediments do not exist in developing traditional type of projects, like thermal power plants, (approximately 66%) and large hydro plants, (approximately 34%) as included in the “Indicative Plan for Generation Expansion”<sup>3</sup> (Plan Indicativo de Expansión de Generación) for 2007 - 2020, the ENEE’s blueprint for electricity generation in Honduras.

Other types of institutional barriers that the project has had to face are:

- The approval by the National Congress of the Operation Contract. /10/
- The approval by the National Congress of the PPA Contract. /11/

On the other hand, the Interconnection authorization to the National Grid is a key document in the development of an energy project. Delays by ENEE /16/, /17/, /18/, /19/ in granting it postponed the PPA negotiations, which in turn, kept project financing formalization (the PPA is required by all local banks as future loan payment guarantee), according to the interview held with ENEE’s Planning and Development Director, the CDM development is important in order to get the approval for PPA by the National Congress of Honduras/4/. Further delays with this process would mean that GERSA would be unable to fulfill contractual obligations with suppliers and civil work company.

In validating these barriers, the DOE has taken into account that the same type of barriers has been faced by other projects registered under the CDM in Honduras including La Esperanza, Cuyamapa, Cuyamel, La Gloria, Cortecito, Cececapa and Yojoa.

The institutional barrier analysis has demonstrated that the project activity is prevented by barriers related to the general institutional environment in which new renewable energy projects have to be developed. Also, the analysis has demonstrated that the current practice to expand the national system (fossil fuel based thermal and large hydro), is not prevented by these barriers. Therefore, the DOE concludes that, at least from this point of view, the activity project CHP is additional.

## Investment barrier

Project financing has been one of the obstacles faced by the PP to go ahead with the project, due to reluctance of financial entities to support this type of project. This is not the case when traditional project types are involved. In fact, it has been demonstrated by the PP that, when developing an 80 MW thermal power plant, the group ELCOLSA, who owns GERSA company, was financed by three international banks; IFC, DEG from Germany and FMO from Netherlands. Local banks foresee high risks in hydro plants like CHP, as stated by Banpaís (local financing bank), according to letter verified by the DOE /5/. Besides, one of the risks then claimed by this bank, was the uncertainty of the PPA contract with ENEE, thus interlacing investment and institutional barriers. With the development as aCDM it is expected the project can surpass these kinds of obstacles. In conclusion, the CDM development is needed in order to carry out this type project.

<sup>3</sup> <http://www.enee.hn/PDFS/EstrategiaCentroamericana2020.pdf> Chapter IV

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A request for review has been raised for the project activity on November 3th, 2011 with following issues:

The DOE shall further justify the existence of investment and institutional barriers to the project activity, in particular: (i) how the DOE has validated that these barriers are project-specific; (ii) how the CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by any of the barriers; (iii) how the delay in the signature of the PPA can be considered as investment barrier. In doing so, the DOE shall provide transparent and documented evidence, and offer conservative interpretations of this documented evidence. Please refer to paragraph 115 (a) VVM. version 01.2 and paragraphs 4,5 and 9 of EB 50, annex 13.

## Responses:

### 1. How the DOE has validated that these barriers are project-specific;

#### a) Project specific institutional barriers

In the VR, it has been explained how the DOE validated the existence of a general institutional environment in Honduran energy sector, characterized by: unclear processes, political reluctance to modernize the regulatory framework in such a way to incentivize renewable energy, and prolonged and unreliable timeframes to complete permits and licenses, that prevents the execution of energy projects type as CHP is.

How specific issues of this institutional environment have prevented the execution of the CHP follows:

- **Prolonged and unreliable timeframes to complete permits and licenses and unclear processes:**

The Chamelecón hydroelectric project had to face the delay of the Interconnection authorization to the National Grid from ENEE. This key document in the development of an energy project did not materialize until April 2009, almost fourteen months after it was requested in February 2008.

After this process, and in order to get the PPA, the Chamelecón hydroelectric project had to face the hurdle of unclear processes, because on April 29 2009, ENEE informs GERSA that PPA negotiations will be suspended pending the resolution of issues with another private developer who requested interconnection on March 2009. On July 3<sup>rd</sup> 2009 ENEE informs GERSA of two possible solutions to an interconnection problem that was delaying the PPA. One solution was a short term approach that would be adopted by GERSA and the other was a longer term connection setup. On December 1<sup>st</sup> 2009 ENEE informs GERSA that it can continue to adopt the short term solution but that once ENEE has made the conditions for the long term connection setup possible, this long term solution would take precedence.

On the other hand, the Chamelecón hydroelectric project had to also face the delay in finalizing the Environmental Permit. This process began on June 2007 and was finally concluded when SERNA issued the permit on November 2009. These delays with Interconnection authorization to the National Grid and Environmental Permit generated

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delays and significant costs for the project developer. It is important to mention that if the Environmental License is not granted the project cannot be executed, causing further losses for the developer.

The final approval by the president of Honduras, and the publication in La Gaceta took finally place on 30/07/2010, which is the basis document to describe conclusion of the approval process.

- **Regulatory framework:**

After a delay of almost two years, the PPA was approved and the Interconnection authorization to the National Grid was granted. However, now uncertainty emerged regarding issues dealing with a Special Renewable Law modification, which had not been approved by Honduras Government even up to the date of onsite visit by the DOE, as explained in the VR. Even so, GERSA decided to proceed with PPA negotiations regardless of the outcome of this law, thus taking on further financial hardships and risks. The ELCOSA group started already with the investment on equity capital for the construction of roads and purchase of lands /20/ during the third quarter of 2008, doing so at own risk since the project could not be developed without the PPA approval and subsequent project finance. Once the PPA was approved, GERSA was in a position to secure project finance and was able to fulfill contractual obligations with suppliers and the civil work company.

- b) Project specific investment barriers

Project financing has been one of the obstacles faced by the PP to go ahead with the project due to reluctance of financial entities to support this type of project. Local banks foresee high risks in hydro plants like Chamelecón hydroelectric project, as stated by Banpaís (local financing bank), in a letter verified by ICONTEC/5/. It should also be noted that one of the risks then claimed by this bank, was the uncertainty of the PPA contract with ENEE, thus interlacing investment and institutional barriers. In conclusion, CDM development was necessary in order to carry out this project. GERSA, the company developing the project belongs to ELCOSA group. The financial balance for 2010 for the company shows a patrimony of \$57,000,000 USD /21/. The investment in the project (around \$34,500,000 USD) represents a high investment risk compared to the patrimony of the group. Up to date, the group has one other investment on a fossil fuel fossil plant, for which financing can be obtained with low difficulty using international funds, mainly because in case of bankruptcy, the electromechanical equipment can be easily sold in the market.

(2) How the CDM alleviates the identified barriers

- a) How the CDM alleviates the institutional barriers

Despite of the delays described above, ENEE/4/ and SERNA/3/ issued letters highlighting the importance of CDM development for the Chamelecón hydroelectric project in order to surpass the hurdles faced with securing the Interconnection authorization to the National Grid and the Environmental Permit.

- b) How the CDM alleviates the investment barrier

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CDM helps overcome the investment barrier by ensuring that the project will be developed under international standards, therefore helping the decision makers of the banks approve this financing due to the lower perceived risks, this sentiment was stated by Banpais in its letter issued on August 16<sup>th</sup> 2010 /5/, which was mentioned earlier. Furthermore, the importance in the development of the CDM can be found in the records of ELCOSA board meetings and resolutions (16/06/2008) /20/, which states that the development of the project as CDM is crucial for ELCOSA to provide equity for the development of the project. This resolution was also submitted to GERSA's general manager via a letter. ELCOSA began to provide significant equity to cover expenses such as the purchasing of lands, building of roads and completion of studies. This investment was executed in parallel with the start of negotiations with Anaconda Carbon for the development of the CDM component in August 2008.

- 3 .How the delay in the signature of the PPA can be considered as investment barrier

GERSA has experienced difficulties in attaining a power purchasing agreement (PPA) with ENEE. ENEE did not grant GERSA the right to sell the power output from the project activity to the Honduran National Utility until April 24, 2010 after sizable delays and additional costs. Once the PPA was approved, GERSA was able to secure financing and able to fulfill contractual obligations with suppliers and the civil work company.

### **Additionality conclusion**

According to the barriers described above, it has been verified that the project activity would otherwise not be implemented due to the existence of institutional and investment barriers.

### **3.6 MONITORING PLAN**

As described in the section B.7.2 of the PDD, the Monitoring Plan (MP) for CHP consists of metering and verifying the electricity generated by the renewable energy technology.

#### **Overview**

The main electricity meters for determining the electricity delivered to the GRID will be installed at the interconnection point in a switching substation to be located in Chiquila; Santa Bárbara. The amount of electricity delivered to the substation will be monitored by two electricity meters in order to double check the measurements. Such meters will keep track of both incoming and outgoing electricity.

The meters that will be used in the Chamelecón HPP are factory-calibrated as proven by the calibration guarantee sheet provided by the manufacturer. The meter has an accu-measure digital sensing technology which provides unmatched accuracy, auto calibration, temperature compensation, among others and a diagnostic mode. Beyond that, the electricity meters will be calibrated at least once every three years. Data will be measured continuously and at the end of each month the monitoring data will be filed in both electronic (frozen data) and hard copy. Besides, CHP has an emergency plan in order to avoid the data loss.

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In the view of ICONTEC, this monitoring plan fully complies with the requirements of the methodology.

Additionally, ICONTEC was able to verify that an operation and personnel structure has been defined, which will support equipment management and data capture.

With this information, the interviews, the desk review, the layout and the on-site visit, the DOE was able to validate that the project participants have the ability to implement the monitoring plan.

### 3.7 CALCULATION OF GHG EMISSIONS REDUCTIONS

In accordance with the methodology AMS I.D/version 16, emission reductions are to be calculated as:

$$ER_y = BE_y - PE_y$$

Where:

$ER_y$  = Emission reductions in year y (t CO<sub>2</sub>e/y)

$BE_y$  = Baseline emissions in year y (t CO<sub>2</sub>/y)

$PE_y$  = Project emissions in year y (t CO<sub>2</sub>e/y)

Baseline emissions are to be calculated as validated by the DOE in the section 3.4 of this report.

Project emissions accounted by this activity project are to be calculated by using the following equation:

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

Where

$PE_{HP,y}$  = Project emissions from water reservoirs of hydro power plants in year y (tCO<sub>2</sub>e/y)

$PE_y = PE_{HP,y} = 0$  This kind of project does not have any emissions associated to its operation

So that,

$$ER_y = BE_y$$

The respective formulation as presented in the PDD is deemed equivalent by the DOE.

According to this information the total GHG emission in absence of the project is 35,352 tonnes of CO<sub>2</sub>e annual average for the first 7-year crediting period.

### 3.8 ENVIRONMENTAL IMPACTS

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In order to get an environmental permit, GERSA has carried out activities properly described in the PDD Version 02.1 (Page 13). One of these activities is the development of the Environmental Mitigation Contract signed between SERNA and GERSA /2/. This document describes all analysis of the environmental impacts of the project activity made by GERSA and assessed by SERNA, as well as the mitigation measures for every environmental impact described in this Environmental Mitigation Contract.

ICONTEC reviewed this contract and by means of interview with SERNA's personnel, ICONTEC is able to confirm that the project participants have undertaken an analysis of environmental impacts in accordance with the requirements requested by the Honduran Government.

### 3.9 COMMENTS BY LOCAL STAKEHOLDERS

GERSA carried out the Stakeholder Consultation for the CHP project on November 20, 2009 with a strong attendance of 104 individuals. The Consultation was developed as an open caucus and was announced by the Macuelizo Municipality in Santa Barbara. The objective of the consultation was to review the project and determine the mechanisms for the management of the CHP watershed natural resources. The DOE verified the execution of this meeting by the attendance listings attached to the PDD and the meeting minutes /6/.

ICONTEC, by means of documental review, is able to confirm that the local stakeholders considered relevant for the CHP activity were invited, likewise GERSA has taken due account of comments received and have described this process in the PDD.

In general, ICONTEC determined that the community knows the project and agrees to perform it

## 4. GLOBAL STAKEHOLDERS CONSULTATION

The PDD version 01 submitted by GERSA, was made publicly available at UNFCCC website during a 30 days period from 04-06-2010 to 03-07-2010.

Parties, stakeholders and NGOs were invited to provide comments through the website. No comments were received during the public consultation.

## 5. VALIDATION OPINION

ICONTEC has performed a validation of the Chamelecón 280 Hydroelectric project, in Honduras. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the Project Design Documentation and the subsequent follow up interviews has provided ICONTEC with sufficient evidence to determine the fulfillment of the stated criteria.

The project activity is being proposed by Generación de Energía Renovable S.A. de C.V. (GERSA). Honduras has provided approval of voluntary participation and meets all requirements to participate in CDM. The Honduran DNA confirmed that the project helps in achieving sustainable development.

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The project correctly applies the methodology: AMS.I.D version 16 Grid connected renewable electricity generation.

The project consists of renewable electricity generation from a run-of-river small hydro power plant utilizing the Chamelecón River in Macuelizo, Honduras. It is demonstrated that the project reduces anthropogenic emissions of GHG that would have occurred in the absence of the project. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average of 35,352 tonnesCO<sub>2</sub>e per year over the selected 7 years. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved because the underlying assumptions do not change.

In summary, it is ICONTEC's opinion that Chamelecón 280 Hydroelectric project in Honduras, as described in the PDD version 02.1, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AMS.I.D version 16 Grid connected renewable electricity generation. ICONTEC thus requests the registration of the project as a CDM project activity."

Bogotá, December 8<sup>th</sup>, 2011



Diego Caballero  
Conformity Assessment Director  
ICONTEC

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## 6. REFERENCES

Documents provided by the project proponent that relate directly to the project

- /1/ CDM Project Design Document, including Baseline Methodology and the Monitoring Plan.
- /2/ Environmental Mitigation Contract signed between GERSA and SERNA.
- /3/ Letter acknowledging the participation of GERSA as project participant, by the Designated National Authority for Honduras dated 10/09/2010.
- /4/ Letter of approval by ENEE (Empresa Nacional de Energía Eléctrica, the Honduran National utility). acknowledging the importance of the CDM component to get the PPA approval, issued on November 14<sup>th</sup>, 2010.
- /5/ Letter by BANPAIS (Banco del País. S.A) acknowledging the importance of CDM component to get financial support.
- /6/ Stakeholder consultation report.
- /7/ Turbines and generator contract.
- /8/ Calculations about plant load factor and CHP generation.
- /9/ Chamelecón 280 Hydroelectric project schedule.
- /10/ Official Journal from The Republic of Honduras, issued 30-07-2010, approving the Chamelecón 280 Hydroelectric project.
- /11/ Contract between ENEE and GERSA about power supply and energy generated with renewable resources.
- /12/ Line diagram that shows the connection of CHP with the Honduran National Interconnected System (SIN).
- /13/ Emergency Plan.
- /14/ Spread Sheet "ER Calculation Chamalecon.xlsx."
- /15/ National of Approval Letter, by the Designated National Authority for Honduras dated 16/06/2011.
- /16/ Letter by GERSA which describes a proposal for CHP Connection to National grid, issued on February 18<sup>th</sup>, 2008.
- /17/ Letter by ENEE, which responses the letter issued by GERSA on February 18<sup>th</sup>, 2008 regarding to CHP Connection to National grid, this letter is dated on April 29<sup>th</sup>/2009.
- /18/ Letter by GERSA which describes a proposal for CHP Connection to National grid, issued on March 11<sup>th</sup>, 2009.
- /19/ Letter by ENEE, which responses the letter issued by GERSA on March 11<sup>th</sup>, 2009 regarding to CHP Connection to National grid, this letter is dated on April 29<sup>th</sup>/2009.
- /20/ Statement for Loan Agreement issued by ELCOLSA on June 16<sup>th</sup>, 2008.
- /21/ Spreadsheet with the balance income of ELCOLSA year 2009-2010.
- /22/ Loan Term sheet issued by Banpais on December 9<sup>th</sup>, 2009

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Background documents related to the design and/or methodologies employed in the design or other reference documents

- /23/ Methodology AMS I.D (Version 16).
- /24/ Validation and Verification Manual, VERSION 1.2. UNFCCC.
- /25/ Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities.
- /26/ Tool for the demonstration and assessment of additionality, Version 05.2, dated August 26<sup>TH</sup>,2008.
- /27/ Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM, Version 3, dated September 11<sup>th</sup>, 2009.
- /28/ Guidelines for objective demonstration and assessment of barriers. Version 01

**ANNEX A. VALIDATION PROTOCOL**
**TABLE 1. MANDATORY REQUIREMENTS FOR CLEAN DEVELOPMENT MECHANISM (CDM) PROJECT ACTIVITIES**

<b>REQUIREMENT</b>	<b>Reference</b>	<b>CONCLUSION</b>	<b>Cross Reference / Comment</b>
1. <i>The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3</i>	<i>Kyoto Protocol Art. 12.2</i>	OK	<i>The project does not assist Parties included in Annex I.</i>
2. <i>The project shall assist non-Annex I Parties in achieving sustainable development and the project has obtained confirmation by the host country that the project assists in achieving sustainable development</i>	<i>Kyoto Protocol Art. 12.2, Procedures for Small Scale CDM Project Activities §23a</i>	OK	<i>Letter of approval. National Environmental Authority. Honduras, 16/06/2011.</i>
3. <i>The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC</i>	<i>Kyoto Protocol Art. 12.2.</i>	OK	<i>The project assists non - annex I parties.</i>
4. <i>The project shall have the written approval of voluntary participation from the designated national authorities of each party involved</i>  <i>Each letter confirms that:</i> <i>(a) The Party is a Party to the Kyoto Protocol;</i> <i>(b) Participation is voluntary;</i> <i>(c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country;</i> <i>(d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.</i>	<i>Kyoto Protocol Art. 12.5a, Procedures for Small Scale CDM Project Activities §23a</i> <i>V/V Manual art.44 to 48</i>	OK	<i>The project “Chamalecón 280 Hydroelectric” already received the Letter of Approval, dated 16/06/2011, from the Honduras DNA indicating that the project is voluntary and contributes to sustainable development of the country.</i>
5. <i>The emission reductions shall be actual, measurable and give long-term benefits related to the mitigation of climate change</i>	<i>Kyoto Protocol Art. 12.5b</i>	OK	<i>Section A.4.3 in PDD</i>
6. <i>Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity</i>	<i>Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43</i>	OK	<i>Section B.5. in PDD</i>
7. <i>In case that public funding from Parties included in Annex I is used for the project activity, these parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations</i>	<i>Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2</i>	N.A.	<i>There is not public funding involvement for the project.</i>

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
of these parties			
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and procedures §29	OK	SERNA is the National Environmental Authority of Honduras is the designated national authority for the Clean Development Mechanism by UNFCCC Secretariat.
9. The host party and the participant Annex I Party shall be a party to the Kyoto protocol	CDM Modalities and Procedures § 30, 31b	OK	Honduras ratified the Kyoto protocol on July of 2000.
10. The participant Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	N.A.	No Annex 1 party involved.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol article 5 and 7	CDM Modalities and Procedures §31b	N.A.	No Annex 1 party involved.
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity (if applicable)	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c Decision -/CMP.2, paragraph 28,	OK	Section A.4.5. in PDD
13. The project design document shall conform with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A V/V manual art. 55	OK	The PDD version 2.1 was elaborated based on Project Design Document template for Small-Scale project activities version (EB 28 Annex 34).
14. The proposed project activity shall conform to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Section B on the Table 2 requirements checklist of the validation protocol
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Version 02.1 of PDD, Clause E, has a summary of comments by local stakeholders invited.

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Section D of the PDD
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available (45 days for A/R projects)	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d.	OK	<p>The PDD version 01 submitted by Gersa and Anaconda carbon was made publicly available at ICONTEC's climate change website and UNFCCC website and Parties, stakeholders and NGOs were invited to provide comments through the CDM website during a 30 days period from 2010 06 04 to 2010 07 03.</p> <p>No comments were received</p>
18. The project participants are listed in tabular form in section A.3 of the PDD and this information is consistent with the contact details provided in annex 1 of the PDD.	V/V Manual art.51	OK	The project participants are listed in section A.3 and this information is consistent with the contact details provided in annex 1 of the PDD.



**TABLE 2. REQUIREMENTS CHECKLIST (ACCORDING VALIDATION AND VERIFICATION MANUAL)**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
<b>General Description of Project Activity</b> The project design is assessed.					
<b>1. Approval</b>					
All Parties involved have approved the project activity.					
A letter of approval has been issued by the respective Party's DNA and include the confirmation of: (a) The Party is a Party to the Kyoto Protocol; (b) Participation is voluntary; (c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country; (d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.	VVM 1. Approval	I DR	SERNA issued the letter of approval for CHP on 16/06/2011.	OPEN CAR 1	OK
<b>2. Participation</b>					
All project participants have been listed in a consistent manner in the project documentation, and their participation in the project activity has been approved by a Party to the Kyoto Protocol.	VVM 3. Participation PDD A.3 Annex 1	I DR	Generación de Energía Renovable S.A. de C.V. (GERSA) is involved in the project activity and its participation has been approved by SERNA. issued on September 10 <sup>th</sup> , 2010	OK	OK
The approval of participation has been issued from the relevant DNA	VVM 3. Participation Letter of approval	DR	DNA designated in for Honduras is SERNA: Natural Resources and Environmental Secretary (Secretaría de Recursos Naturales y Ambiente) and the approval of participation has been issued (Annex 2 CONSTANCIA MDL_SERNA_GERSA).	OK	OK
<b>3. Project design document</b>					
3.1 The PDD used as a basis for validation shall be prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website.	PDD	DR	The PDD has been elaborated in the final version the template approved by the board	Open CAR 2 CAR 5	OK

3.2 Does the PDD correctly describe the project boundary, including the physical delineation? (components and facilities used to mitigate GHG's)	PDD B.3	I DR	The project boundary is the area of where Chamelecón 280 hydroelectric power plant, diversion dam and transmission lines are located. This project boundary is correctly described.	OK	OK
3.3. Will the project result in technology transfer to the host country?	PDD A.2	DR I	Yes, Helping SIN to displace expensive generation fired by heavy fuel, diesel, and coal and to reduce GHG emissions, while increasing demand for local labor	OK	OK
3.4 Does the project require extensive initial training and maintenance efforts in order to work as intended during the project period? Does the project make provisions for meeting training and maintenance needs?	PDD B.7.2	I DR	No, extensive initial training and maintenance efforts are not necessary in order to work as intended during the project period.	OK	OK
<b>4. Project description</b>					
4.1 The PDD contains a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.	PDD A.2 A.4	I DR	Yes, the PDD provides the reader with information necessary to understand clearly the activities to be undertaken by the project.  However, according to the on-site visit, the whole communities affected with the development of this project are not described in the PDD Clause A.4.1.3.  Besides that, technical information was required by the DOE in order to verify the information provided in the PDD.	OPEN CAR 3 CLA 2 CAR 4 CLA 7	OK
4.2 Duration of the Project/ Crediting Period Are the project's starting date and operational lifetime clearly defined and reasonable?	PDD C.2	DR I	Yes, the starting date of the first crediting period is November 14 <sup>th</sup> , 2011. In order to assess the starting date of the first crediting period, ICONTEC asked the PP for a schedule with a progress about the project.	OPEN CLA 3	OK
4.3 Is the assumed crediting period clearly defined and reasonable (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	PDD C.2.1.2	DR I	Yes, the crediting period is reasonable for 7 years.	OK	OK

<b>5. Baseline and monitoring methodology</b>					
<b>5.1 General requirements</b> <i>The baseline and monitoring methodologies selected by the project participants comply with the methodologies previously approved by the CDM Executive Board.</i>	PDD B.1 AMS.I.D Version 16	DR	Yes, the project applies the small scale methodology AMS.I.D version 16.	OK	OK
5.1.1 <i>Is the selected monitoring methodology in line with the approved methodology and is applicable for this project?</i>	PDD B.7 AMS.I.D Version 16	DR	The monitoring methodology is the one approved. It is described in Chapter B.7. Application of a monitoring methodology and description of the monitoring plan del PDD.	OK	OK
<b>5.2 Applicability of the select methodology to the project activity</b> <i>The methodology is correctly quoted and applied by comparing it with the actual text of the applicable version of the methodology available on the UNFCCC CDM website.</i>	PDD B.2 AMS.I.D Version 16	DR	In section B.2. of the PDD it is explained why the project activity refers to AMS.I.D Version 16. It fulfills the criteria of total installed capacity of less than 15 MW.	OK	OK
<b>5.3 Project boundary</b> <i>The project boundary, including the physical delineation of the proposed CDM project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM project activity.</i>	PDD B.3.	DR	The Project includes a physical delineation of the activities scope included in the calculation of project and the baseline emissions.  In order to assess this information the DOE asked for a plane and explanation about Project connection to the National Grid.	OPEN CLA 3	OK
5.3.1 <i>Have been all sources and GHGs required by the methodology included within the project boundary?</i>	PDD B.3	DR I	During the visit to the project the information of Chapter B.3 was validated regarding GHG sources included in the methodology.	OK	OK
<b>5.4 Baseline identification</b> <i>The PDD identify the baseline for the proposed CDM project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity.</i>	PDD B.4	DR	This project has been calculated on the basis of the latest information provided by ENEE (Empresa Nacional de Energía Eléctrica, the Honduran National utility). This information includes data up to 2008.	OK	OK

			ICONTEC found that all information, assumptions and data used in the identification of the baseline scenario are relevant, appropriately justified, correctly quoted and interpreted, supported by evidence and can be deemed reasonable.		
5.4.1 Is the application of the methodology and the discussion and determination of the chosen baseline transparent and conservative?	PDD B.4	DR	Yes, ICONTEC found that all information, assumptions and data used in the identification of the baseline scenario are transparent and conservative.	OK	OK
5.4.2 Are the assumptions and data used in the identification of the baseline scenario relevant, justified appropriately, correctly quoted and interpreted, supported by evidence and can be deemed reasonable?	PDD B.4	DR	Yes, ICONTEC found that all information, assumptions and data used in the identification of the baseline scenario are relevant, appropriately justified, correctly quoted and interpreted, supported by evidence and can be deemed reasonable.	OK	OK
5.4.3 Are relevant national and/or sectoral policies and circumstances taken into account?	PDD A.2	DR	Yes, the national policy to manage and dispose of solid residues was taken into account in the project, and the legislation applicable was referenced in Chapter A.2. of the PDD.	OK	OK
5.4.4 Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	PDD B.5	DR I	In accordance with attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, the project proponent demonstrated that the project activity would not have occurred anyway due to at least one of the following barriers: <ul style="list-style-type: none"> <li>• Institutional barrier</li> <li>• Investment barrier</li> </ul>	OK	OK
5.4.5 Does the steps taken and equations applied to calculate baseline emissions, comply with the requirements of the selected baseline and monitoring methodology.	PDD 6	DR	Formulae and equations used for calculating baseline emissions comply with the monitoring	OK	OK

	and Annexes		methodology.		
<b>5.5 Algorithms and/or formulae used to determine emission reductions</b>  <i>The steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions shall comply with the requirements of the selected baseline and monitoring methodology.</i>	PDD 6 and Annexes	DR	<i>Formulae and equations used for calculating baseline emissions comply with AMS.I.D (Version 16) and the Tool to calculate the emission factor for an electricity system (V.2)</i>	OK	OK
5.5.1 The equations and parameters in the PDD have been correctly applied by comparing them to those in the selected approved methodology.	PDD 6 and Annexes	DR	<p><i>After desk review carried out by ICONTEC, it is found that calculations of grid OM emission factor should be revised in order to get conformity with the "Tool to calculate the emission factor for an electricity system" (Version 01.1).</i></p> <p><i>In on-site visit, SERNA delivered directly to DOE the calculation report about the emission factor from the Grid, this calculation has been calculated by a consultancy company contracted by the DNA. Not all data is public available. The PDD version 2.1 has been updated to be in line with the latest available tool for calculating the emission factor.</i></p> <p><i>Formulae and equations used for calculating baseline emissions comply with AMS.I.D (Version 16) and the Tool to calculate the emission factor for an electricity system (V.2)</i></p>	OPEN CAR 7 CLA 8	OK
<b>6 Additionality of a project activity</b>					
<b>6.1 Prior consideration of CDM</b>					
6.1.1 Is the start date of the project in accordance with the "Glossary of CDM terms"?	PDD C.1.1	DR	<p><i>Yes, the start date of the project complies with the definition in the Glossary of CDM terms.</i></p> <p><i>The start date of the project activity is the signing of the turbines supply contract (December 17, 2009).</i></p>	OPEN CAR 5	OK

			<i>During the onsite visit a CAR was raised asking for support about the Starting date specified in the PDD</i>		
<i>6.1.2 If the project start date is prior to the date of publication of the PDD for stakeholder comments, have been demonstrated that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity?</i>	<i>PDD C.1.1</i>	<i>DR I</i>	<i>CDM consideration is demonstrated by the fact that the global stakeholder process has been started on June 04, 2010, which is less than 6 months after the starting date of the project activity. CDM prior consideration requirements as for EB49 annex 22 have been met.</i>	<i>OK</i>	<i>OK</i>
<i>6.1.3 Has the project been correctly identified as a new or existing project</i>	<i>PDD A.4.2</i>	<i>DR I</i>	<i>Yes, the project has been correctly identified as a new project.</i>	<i>OK</i>	<i>OK</i>
<i>6.1.4. Does the evidence indicates: a) awareness of the CDM project prior to the project activity start and that benefits were a decisive factor to proceed with the project, b) reliable evidence that indicates that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation, and c) Does the CDM project activity comply with the requirements of the latest version of the Guidance on early consideration of CDM?</i>	<i>PDD B.5</i>	<i>DR I</i>	<i>The project indicates that it is feasible only with CDM resources.  The DOE was able to verify the continuing and real actions that are taken into account in the CDM project, see B.5 of the PDD.  The use of last version of the Guidance on early consideration of CDM was verified.</i>	<i>OK</i>	<i>OK</i>
<b>6.2 Identification of alternatives</b>					
<i>6.2.1. Is the list of alternatives included as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity?</i>	<i>PDD B.5</i>	<i>I DR</i>	<i>The Chamelecón 280 Hydroelectric Project reduces anthropogenic emissions of GHG that would have occurred in the absence of the project. The additionality of the project activity has been assessed on the basis of the attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities</i>	<i>OK</i>	<i>OK</i>
<i>6.2.2 Does the list contains all plausible alternatives that the DOE, on the basis of its local and sectoral knowledge, consider to be viable means of supplying the outputs or services that are</i>			<i>N.A</i>		

<i>to be supplied by the proposed CDM project activity?</i>					
6.2.3 Does the alternative comply with all applicable and enforced legislation?			N.A		
6.2.4. Have credible alternatives been identified to the project activity in order to determine the most realistic baseline scenario (unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required)?			N.A		
<b>6.3 Investment analysis (if applicable)</b>					
6.3.1 If investment analysis has been used to demonstrate the additionality of the proposed CDM project activity, Does the PDD provide evidence that the proposed CDM project activity would not be: (a) The most economically or financially attractive alternative; or (b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs)?			N.A		
6.3.2 Which approach has been selected to demonstrate 6.3.1?  (a) The proposed CDM project activity would produce no financial or economic benefits other than CDM-related income. Document the costs associated with the proposed CDM project activity and the alternatives identified and demonstrate that there is at least one alternative which is less costly than the proposed CDM project activity;  (b) The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative;  (c) The financial returns of the proposed CDM project activity would be insufficient to justify the required investment.			N.A		
6.3.3 Have the parameters of the financial calculations been correctly used?			N.A		

6.3.4 Is the benchmark suitably applied?			N.A		
6.3.5 Are the assumptions appropriate and the financial calculations correct?			N.A		
<b>6.4 Barrier analysis (if applicable)</b>					
6.4.1 Does the CDM project activity face barriers that prevent the implementation of this type of projects?	PDD B.5	I DR	Yes, the project participant demonstrated that the project activity would not have occurred anyway due to investment barrier and institutional barrier	OK	OK
6.4.2 Does the CDM project activity face barriers that do not prevent the implementation of at least one of the alternatives?			N.A.		
<b>6.5 Common practice analysis (For proposed large-scale CDM project activities, unless the proposed project type is first-of-its kind)</b>			N.A.		
6.5.1 Is the project activity widely observed and commonly carried out in the region?			N.A.		
6.5.2 If similar and operational projects are already widely observed and commonly carried out in the defined region, are there essential distinctions between the proposed CDM project activity and the other similar activities?			N.A.		
<b>7 Monitoring Plan</b>					
The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
7.1 Is the selected monitoring plan in line with the approved methodology and are applicable for this project?	PDD B.7	DR I	The monitoring plan complies with the methodology. The simplified baseline and monitoring Methodology AMS.I.D. v16	OK	OK
7.2 Are the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified?	PDD B.7	DR I	Yes, data and control means are sufficient to monitor emissions reduction.  However in the former PDD the design and brand of measurement equipment were described, so the DOE asked the PP to modify the description in order to describe the measurement equipment's	OPEN CLA 6	OK

			performance		
<b>7.3 Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
7.3.1 Does the monitoring plan provide for the collection and filing of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	PDD B.6.3	DR I	No leakage effects need to be accounted under this methodology. So: $L_y=0$	OK	OK
<b>7.4 Monitoring of Leakage</b> <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
7.4.1 Does the monitoring plan provide for the collection and filing of all relevant data necessary for determining leakage?			N.A		
7.4.2 Are the choices of leakage indicators reasonable?			N.A		
7.4.3 Will it be possible to monitor the specified GHG leakage indicators?			N.A		
7.4.4 Will the indicators give opportunity for real measurement of leakage effects?			N.A		
<b>7.5 Monitoring of Baseline Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
7.5.1 Does the monitoring plan provide for the collection and filing of all relevant data necessary for determining baseline emissions during the crediting period?	PDD B.6.3	DR I	Yes, the total emission reductions of the project are calculated on the basis of the equations and parameters presented and explained in section B.6.1 of PDD. Baseline information for the combined margin emission factor is presented in Annex 3 of PDD.	OK	OK
7.5.2 Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	PDD B.6.3	DR I	Yes, the indicators are reasonable.	OK	OK
7.5.3 Will it be possible to monitor the specified baseline	PDD	DR	Yes, the total emission reductions of the project are	OK	OK

indicators?	B.6.3	I	calculated on the basis of the equations and parameters presented and explained in section B.6.1 of PDD. Baseline information for the combined margin emission factor is presented in Annex 3 of PDD.  Taking into account November 2011 as a starting date of a 7 year crediting period, emission reductions calculations for year 2011 and 2018 refer to the fraction of the respective year that is covered by the crediting period.		
7.5.4 Will the indicators give opportunity for real measurements of baseline emissions?	PDD B.6.3	DR I	Yes, some indicators will be able to be measured in real time.	OK	OK
<b>7.6 Project Management Planning</b> <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
7.6.1 Is the authority and responsibility of project management clearly described?	PDD B.7.2	DR I	Yes, Chapter B.7.2 describes the authority and responsibility for the personnel of the project.	OK	OK
7.6.2 Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD B.7.2	DR I	Yes, Chapter B.7.2 describes the authority and responsibility for the personnel of the project and ENEE.	OK	OK
7.6.3 Are procedures for training of monitoring personnel identified?	PDD B.7.2	DR I	The data management and energy monitoring personnel will be trained at the moment of joining the company. Further trainings will be held every 6 months.	OK	OK
7.6.4 Are procedures for emergency preparedness for cases where emergencies can cause unintended emissions identified?	PDD B.7.2	DR I	Yes, Chapter B.7.2 takes into account the controls for emergency situations.	OPEN CAR 8	OK
7.6.5 Are procedures for calibration of monitoring equipment identified?	PDD B.7.2	DR I	Yes, Chapter B.7.2 indicates how the equipment calibrations will be done.	OK	OK
7.6.6 Are procedures for maintenance of monitoring equipment	PDD	DR	Yes, Chapter B.7.2 indicates how the equipment	OK	OK

<i>and installations identified?</i>	<i>B.7.2</i>	<i>I</i>	<i>calibrations will be done.</i>		
<i>7.6.7 Are procedures for monitoring, measurements and reporting identified?</i>	<i>PDD B.7.2</i>	<i>DR I</i>	<i>Yes, Chapter B.7.2 identifies the measurements, monitoring and reports that will be performed.</i>	<i>OK</i>	<i>OK</i>
<i>7.6.8 Are procedures for day-to-day records handling identified (including what records to keep, storage area of records and how to process performance documentation)?</i>	<i>PDD B.7.2</i>	<i>DR I</i>	<i>Yes, Chapter B.7.2 indicates that the monitoring is performed on line and in real time.</i>	<i>OK</i>	<i>OK</i>
<i>7.6.9 Are procedures for dealing with possible monitoring data adjustments and uncertainties identified?</i>	<i>PDD B.7.2</i>	<i>DR I</i>	<i>Yes, Chapter B.7.2 indicates the procedure to be followed.</i>	<i>OK</i>	<i>OK</i>
<i>7.6.10 Are procedures for internal audits of GHG project compliance with operational requirements, where applicable, identified?</i>	<i>PDD B.7.2</i>	<i>DR I</i>	<i>Yes, Chapter B.7.2 indicates the procedure to perform internal audit.</i>	<i>OK</i>	<i>OK</i>
<i>7.6.11 Are procedures for project performance review identified?</i>	<i>PDD B.7.2</i>	<i>DR I</i>	<i>Yes, Chapter B.7.2 indicates the procedure to be followed.</i>	<i>OK</i>	<i>OK</i>
<i>7.6.12 Are procedures for corrective actions identified?</i>	<i>PDD B.7.2</i>	<i>DR I</i>	<i>Yes, Chapter B.7.2 indicates the procedure to be followed.</i>	<i>OK</i>	<i>OK</i>
<b>7.7. Calculation of CDM Emissions by Source</b> <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
<b>7.7.1 Project GHG Emissions</b> <i>The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.</i>					
<i>7.7.1.1 Are all aspects related to direct and indirect GHG emissions captured in the project design?</i>	<i>PDD B.6.3</i>	<i>DR</i>	<i>Yes the project addressed the direct and indirect emissions.</i>	<i>OK</i>	<i>OK</i>
<i>7.7.1.1.2 Have all relevant GHG and sources been evaluated?</i>	<i>PDD B.6.3</i>	<i>DR I</i>	<i>Yes, all the sources were evaluated.</i>	<i>OK</i>	<i>OK</i>
<i>7.7.1.3 Do the methodologies for calculating project emissions comply with existing good practices?</i>	<i>PDD B.6.3</i>	<i>DR I</i>	<i>Yes, the GHG emission reduction achieved by the project activity is calculating the CO2 emission factor</i>	<i>OK</i>	<i>OK</i>

			(EF <sub>grid,CM,y</sub> ) for the displacement of electricity generated by power plants in Homduran electricity system during a given year. It is calculated ex ante by using the formulae: $ER_{y, power} = BE_{y, power} - PE_{y, power} - Leakage_{y, power}$		
7.7..1.4 Are the calculations documented in a complete manner?	PDD B.6.3	DR I	Yes, the validation of calculations for emissions reduction in ton CO <sub>2</sub> e during 2011 - 2018, was done in a complete manner	OK	OK
7.7..1.5 Have conservative assumptions been used?	PDD B.6.3	DR I	Yes, the project is conservative.	OK	OK
7.7..1.6 Are uncertainties in the project emissions estimates properly addressed?	PDD B.6.3	DR	Yes, the emissions estimates are properly addressed.	OK	OK
<b>7.8 Leakage</b> <i>It is assessed whether there are leakage effects and they have been properly assessed, i.e. change of an emission which occurs outside the project boundary and which are measurable and attributable to the project.</i>					
7.8.1 Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	PDD B.6.3	DR I	No leakage effects need to be accounted under this methodology. So: $L_y=0$	OK	OK
7.8.2 Have these leakage effects been properly accounted for in calculations (If applicable)?			N.A		
7.8.3 Are the calculations documented in a complete and transparent manner (If applicable)?			N.A		
7.8.4 Have conservative assumptions been used when calculating leakage (If applicable)?			N.A		
7.8.5 Are uncertainties in the leakage estimates properly addressed (If applicable)?			N.A		

**7.9 Baseline GHG Emissions**

*The validation of ex-ante estimated GHG emissions focuses on transparency and completeness of calculations.*

7.9.1 Are the baseline emission boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	PDD B.6.	DR I	The boundaries of the project are clearly defined.	OK	OK
7.9.2 Are all aspects related to direct and indirect baseline emissions captured in the project design?	PDD B.6.	DR I	Yes, direct and indirect baseline emissions were addressed.	OK	OK
7.9.3 Have all relevant GHG and sources been evaluated?	PDD B.6.	DR I	Yes the project assessed all the sources.	OK	OK
7.9.4 Do the methodologies for calculating baseline emissions comply with existing good practices?	PDD B.6.	DR I	Yes, the project complies with good practices of the methodology AMS.I.D version 16 "Grid connected renewable electricity generation".	OK	OK
7.9.5 Are the calculation documented in a complete and transparent manner?	PDD Annex 3	DR I	Yes. Please find background information regarding the calculation in PDD section B.6.3.	OK	OK
7.9.6 Have conservative assumptions been used	PDD B.6.	DR I	Yes, conservative data has been taken.	OK	OK
7.9.7 Are uncertainties in the baseline emissions estimates properly addressed?	PDD B.6.	DR I	Emissions estimates were properly calculated.	OK	OK
7.9.8 Does the steps taken and equations applied to calculate baseline emissions comply with the requirements of the selected baseline and monitoring methodology.	PDD Annex 3	DR I	Yes. Please find background information regarding the calculation in PDD section B.6.3.	OK	OK
<b>7.10 Emission Reductions</b>					
<i>Validation of ex-ante estimated emissions.</i>					
7.10.1 Will the project result in fewer GHG emissions than the baseline scenario?	PDD B.4	DR I	The baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-	OK	OK

			connected power plants and by the addition of new generation sources.		
7.10.2 Does the steps taken and equations applied to calculate emission reductions comply with the requirements of the selected baseline and monitoring methodology?	PDD Annex 3	DR I	Yes. Please find background information regarding the calculation in PDD section B.6.3.		
<b>8 Sustainable development</b> <i>The project's contribution to sustainable development is assessed.</i>					
8.1 The letter of approval by the DNA of the host Party confirms the contribution of the proposed CDM project activity to the sustainable development of the host Party.	Letter of approval	DR	The letter of was issued on 16/06/2011 by the Honduras DNA.	OPEN CAR 1	OK
8.2 Will the project create other environmental or social benefits than GHG emission reductions?	PDD A.2	DR	The project generates positive impacts like: <ul style="list-style-type: none"> <li>• Generating direct and indirect jobs, businesses and local services;</li> <li>• Improvement of the roads that can be used by the local citizens.</li> </ul>	OK	OK
8.3 Will the project create any adverse environmental or social effects?	PDD D.1	DR	Through the Environmental Impact Assessment, the project participant has identified the following environmental impacts: <ul style="list-style-type: none"> <li>• Waste management</li> <li>• Noise an vibrations</li> <li>• Water quality</li> <li>• Air Quality</li> <li>• Soil erosion</li> <li>• Fish population and diversity</li> </ul>	OK	OK
8.4 Is the project in line with sustainable development policies of the host country?	PDD Section D	DR	There are not legal requirements that demand to do it.	OK	OK
8.5 Is the project in line with relevant legislation and plans in	PDD	DR	Yes, the project is in line with relevant legislation and	OK	OK

<i>the host country?</i>	<i>Section D.</i>		<i>plans in Honduras</i>		
<b>9 Local stakeholders consultation</b>					
9.1 Have relevant stakeholders been consulted?	PDD E.1	DR I	Yes, all relevant stakeholders were consulted. However, the former version of the PDD submitted to UNFCCC website, did not include the information about stakeholder's comments, as meetings, consultations, observations and answers.	OPEN CAR 6	OK
9.2 Have appropriate media been used to invite comments by local stakeholders?	PDD E.1	DR I	The notification was done by invitations to community members, representatives of the municipality and regional government, the regional environmental institution), among others	OK	OK
9.3 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?	PDD E.1	DR	The consultation process is not required by the authorities of the country, however this was done by invitation to the local environmental authority.	OK	OK
9.4 Is a summary of the stakeholder comments received /provided?	PDD E.2	DR	In section E.2 a summary of stakeholder comments is found.	OK	OK
9.5 Has due account been taken of any stakeholder comments received?	PDD E.3	DR	Comments or questions by the stakeholders were considered.	OK	OK
9.6 Were the stakeholder invited to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC webs?	Validation report Section 4.	DR	Yes, the PDD was made publicly available at UNFCCC website during a 30 days period from 04-06-2010 to 03-07-2010 . Parties, stakeholders and NGOs were invited to provide comments through the website. No comments were received during the public consultation.	OK	OK
<b>10 Environmental impacts</b>					
10.1 Does the host country legislation require analysis of the environmental impacts of the project activity?	PDD D.1.	DR	Yes, SERNA always require the evaluation of the environmental impacts for this type of project.	OK	OK

10.2 Does the project comply with environmental legislation in the host country?	PDD D.1.	DR	Yes, the project comply with environmental legislation in Honduras	OK	OK
10.3 Will the project create any adverse environmental impacts?	PDD D.1.	DR	Through the Environmental Impact Assessment, the project participant has identified the following environmental impacts: <ul style="list-style-type: none"> <li>Waste management</li> <li>Noise an vibrations</li> <li>Water quality</li> <li>Air Quality</li> <li>Soil erosion</li> <li>Fish population and diversity</li> </ul>	OK	OK
10.4 Have environmental impacts been identified and addressed in the PDD?	PDD D.1.	DR	Yes, the environmental impacts have been addressed in PDD However, the mitigation measures contract must be included as reference document.	OPEN CLA 1	OK
<b>SPECIFIC VALIDATION ACTIVITIES</b>					
<b>A.1 SMALL SCALE PROJECT ACTIVITY (IF APPLICABLE)</b>					
A.1.1 Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM (Decision-/CMP.2 (Further guidance relating to the clean development mechanism) revises the definitions for small-scale CDM project activities referred to in paragraph 6 (c) of decision 17/CP.7.)?	PDD B.2 AMS.1.D Version 16	DR	In section B.2. of the PDD it is explained why the project activity refers to AMS.I.D Version 16. It fulfills the criteria of total installed capacity lower than 15 MW, which is established by the methodology.	OK	OK
A.1.2 The small scale project activity is not a debundled component of a larger project activity?	PDD A.4.5	DR I	No, the small scale project activity is not a debundled component of a larger project activity. The project owner has not developed other projects within 1 km.	OK	OK
A.1.3 Does the proposed project activity conforms to one of the project categories defined for small scale CDM project activities?	PDD B.2	DR	Yes, the proposed project activity qualifies for small scale project as defined in Appendix B of M&P for small scale project activities (UNFCCC, 2006).	OK	OK



## CHECK LIST OF VALIDATION OF CDM PROJECT ACTIVITY

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MoV: Means of verification

DR: Document review

I: interview

**Validation Protocol Table 4: Resolution of Corrective Action, Forward Action and Clarification Request**

<b>Report clarifications and corrective action requests</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation conclusion</b>
<p>CAR 1:</p> <p><i>The project doesn't have the DNA approval letter</i></p>	<p><i>Kyoto Protocol</i>  <i>Art. 12.5a,</i>  <i>Procedures for Small</i>  <i>Scale CDM Project</i>  <i>Activities §23a</i>  <i>V/V Manual art.44 to 48</i></p>	<p><i>The approval letter of Honduras can only be applied with the draft report and a further confirmation of the DOE. The document will be provided before requesting registration of the project activity. Please fill Annex No.1 "Reporte de Validación" requested by DNA". Annex No.2 "Constancia MDL_SERNA_GERSA" demonstrates that SERNA is waiting for the DNA approval letter request.</i></p>	<p><i>Validation Team Response:</i></p> <p><i>National letter of approval issued by SERNA on June 16th/2011, was sent to ICONTEC on June 29th/2011 and ICONTEC could verified by email, and phone call its authenticity.</i></p> <p><i>Validation Team Conclusion:</i>  <b>CLOSED</b></p>
<p>CAR 2:</p> <p><i>The PDD was not developed with the latest version of the methodology AMS.I.D version 16, from the CDM Executive Board available on the UNFCCC CDM website.</i></p>	<p><i>Page 4 of PDD</i></p>	<p><i>The PDD has been updated; the latest version of AMS.I-D available has been used in the revision (version 16).</i></p> <p><i>Furthermore, supporting documents for the assessment of the barriers (institutional and investment) are provided: See files Annex No.3 "Nota ENEE Chamelecón" and Annex 4 "Constancia MDL Banpais_CHA"</i></p>	<p><i>Validation Team Response:</i></p> <p><i>The DOE can verify that the methodology version used by the PP was updated in the PDD version 2.1 according to the procedures, steps and guidelines used in the baseline and project emission calculations</i></p> <p><i>Validation Team Conclusion:</i>  <b>CLOSED</b></p>
<p>CAR 3:</p>	<p><i>Clause A.4.1.3. of PDD</i></p>	<p><i>The chapter of local stakeholder consultation has been filled with the complete information on the affected</i></p>	<p><i>Validation Team Response:</i></p>

*The whole communities affected with the development of this project are not describe (Laguna Seca Community and La Playa Community)*

CLA 1:

*The mitigation measures contract, must be included as reference document*

37(c) of the CDM modalities and procedures  
Clause D.1 of the PDD

*communities. All communities were contacted, no negative comments were received.*

*See file: Annex No.5 "Socializacion y Consulta Publica\_CHA"*

*The reference to the document has been included in page 29 of the PDD.*

*Clause A.4.1.3 mentioned the whole communities affected by the development of this project*

*Validation Team Conclusion:  
CLOSED*

*Validation Team Response:*

*In Clause D.1 the Environmental Mitigation Contract signed between SERNA and GERSA has been mentioned the*

*Validation Team Conclusion:  
CLOSED*

CLA 2:

*Design characteristics concerning turbines and generators installed capacity must be clarified. Also, data about design water flow and hydraulic head must be added.*

Clause A.4.2. of PDD

*The requested information has been corrected and included in the revised PDD. See file: Annex No.6 "Datos tecnicos en contrato turbinas\_CHA"*

*Validation Team Response:*

*Design characteristics concerning turbines and generators installed capacity have been clarified. Also, data about design water flow and hydraulic head according to information found in the on-site visit were included.*

*Validation Team Conclusion:  
CLOSED*

CAR 4:

*Plant load factor used to estimate annual plant generation must be demonstrated.*

Clause A.4.2. of PDD

*The plant load factor is based on hydrological historical data, please see file: Annex No.7 "Calculo de la*

*Generación y el factor de planta\_CHA"*

*Validation Team Response:*

*The information delivered by the PP was analyzed and studied,*

CLA 3:	Section C of PDD	An updated schedule is attached to this response. See file: Annex No.8 "Cronograma de Actividades_CHA actualizado 29 dic 10"	so, according to that hydrological historical data, the plant load factor has been demonstrated
A schedule with project progress must be included			Validation Team Conclusion: CLOSED
			Validation Team Response:
			The updated schedule, delivered by GERSA, evidences the project progress according to information found in the on-site visit
			Validation Team Conclusion: CLOSED
CAR 5:	Clause C.1.1 of PDD	The starting date of the project is defined as 17/12/2009, supported by the order of the turbines. Early consideration of CDM is demonstrated through the fact that the GSP has been started within the next 6 months after start date of the project activity (04/06/2010). This information is included in the PDD. See file: Annex No.9 "Date of the electromechanical contract"	Validation Team Response:
Starting date specified in the PDD submitted must be supported. In this way the prior consideration date must be included as presented in the PDD too.			GERSA has delivered to the DOE a copy of turbines supply contract, this information supports the start date of the project activity (December 17, 2009). Therefore, early consideration of CDM is demonstrated through the fact that the Global stakeholder consultation has been started within the next 6 months after the start date of the project activity.
			Validation Team Conclusion: CLOSED

<p>CAR 6:</p> <p><i>The information about stakeholder's comments like meetings, consultations, observations and answers has not been included in the PDD.</i></p>	<p>Section E of PDD</p>	<p><i>The respective chapter of the PDD has been completely updated. Further information on the stakeholder comments and the responses given has been included in the revised PDD.</i></p>	<p>Validation Team Response:</p> <p><i>Information about stakeholder's comments like meetings, consultations, observations and answers, has been included in the PDD according to information found in on-site visit.</i></p>
<p>CLA 4:</p> <p><i>Project connection to the National Grid must be described.</i></p>	<p>Clause B.7.2 of PDD</p>	<p><i>An explanation of the connection to the NATIONAL GRID was included in the revised PDD, with a sketch for understanding. See page 10 of the PDD.</i></p>	<p>Validation Team Conclusion: CLOSED</p> <p>Validation Team Response:</p> <p><i>A line diagram and a description about Project connection to the National Grid have been included in section B.7.3 of PDD</i></p>
<p>CAR 7:</p> <p><i>Calculations of grid OM emission factor must be revised in order to get conformity with the "Tool to calculate the emission factor for an electricity system" (Version 01.1)</i></p>	<p>Clause B.6.1 of PDD</p>	<p><i>The emission factor from the GRID has been calculated by a consultancy company contracted by the DNA. Not all data are public available. The PDD has been updated to be in line with the latest available tool for calculating the emission factor. Such report was handed in by DNA directly to the audit team during the on-site visit.</i></p>	<p>Validation Team Conclusion: CLOSED</p> <p>Validation Team Response:</p> <p><i>After analyzing and studying the report delivered by SERNA, the DOE found the information in the PDD version adequate for Calculations of grid OM emission factor.</i></p> <p>Validation Team Conclusion: CLOSED</p>
<p>CLA 5:</p> <p>IN-P-CC-001-F-02 Version 02</p>	<p>PDD</p>	<p><i>Document record of the PDD is included</i></p>	<p>Validation Team Response:</p>

*A Table describing the document record must be included.*

*in the first chapter.*

*A document record has been included in section A.1 of PDD*

*Validation Team Conclusion:  
CLOSED*

CLA 6:

*Clause B.7.2 of PDD*

*The description of the measurement equipment must be modified in order to describe its performance, also its design and brand.*

*The monitoring chapter has been updated to be in line with the monitoring system as it will be performed by the company.*

*Validation Team Response:*

*The description provided by the PP in clause B.7.2 of the PDD is aligned with the information found in the on-site visit and describes a training program for monitoring personnel.*

*Validation Team Conclusion:  
CLOSED*

CLA 7:

*Clause A.4.1.4 of PDD*

*The physical location must be enhanced in order to determine boundaries, communities affected, etc.*

*The physical locations, including UTM coordinates has been included in the revised PDD.*

*Validation Team Response:*

*The physical location has been enhanced by using UTM coordinates.*

*Validation Team Conclusion:  
CLOSED*

CAR 8:

*Clause 7.6.4 of Validation Protocol*

*A contingency Plan, including Risk Analysis and Management Plan must be included.*

*Risk assessment has been included in Annex 4 of the PDD.*

*Validation Team Response:*

*Please also see file: Annex No. 10 "Sistema de Emergencia\_CHA"*

*The Emergency Plan delivered by the PP and included in the PDD (Annex 4) has been developed considering a risk*

CLA 8:

*Data and parameters that are available for validation of emission reductions must be verified with the information available in SERNA*

*Clause B.6.2 of PDD*

*The emission factor calculation data has been corrected in order to be in line with the official information available for the DOE.*

*analysis and describes a management plan in order to avoid data loss.*

*Validation Team Conclusion:  
CLOSED*

*Validation Team Response:*

*Data and parameters related to emission reduction have been updated in accordance with the information available in SERNA. This updating process modified the estimation of emission reductions, now this value is 35,352 tCO<sub>2</sub>eq.*

*Validation Team Conclusion:  
CLOSED*

## **ANNEX B. NATIONAL LETTER OF APPROVAL**

## **ANNEX C. CVs of the Verification Team**

### **Lead Auditor Zoo. Erika Urrego**

Zootechnician  
UNIVERSIDAD AGRARIA DE COLOMBIA  
Specialist in Environmental Management System  
UNIVERSIDAD EXTERNADO DE COLOMBIA

#### **Work Experience**

2006 – Actual

ICONTEC

Environmental and Quality Lead Auditor. To prepare and perform the certification services assigned as per her Career Plan qualification, according to the procedures. To provide guidance to the certification costumers about the technical aspects of the assigned services provision. To participate in changing or designing Certification services, by changing or creating the respective procedures.

2003 – 2006

ASOCIACION COLOMBIANA DE PORCICULTORES-FNP

To coordinate the activities to be performed by the Environmental Window Program in the various country areas. To allocate and execute resources engaged under the Cleaner Production agreements signed together with several environmental authorities.

To lead the CDM project, focused on the reduction of methane (CH<sub>4</sub>) emissions issued by animal waste. To be aware of the Ecuadorian and Chilean methodologies already approved by the CDM Executive Board for Hog Breeding Sector in order to elaborate a proposal for the hog breeding sector together with the Ministry of Environment, Housing and Territorial Development in order to join farms to CDM projects.

2001 – 2002

FICHTNER GmbH & Co. KG

To prepare, design and apply surveys focused on the identification of power consumption in the sector of slaughter, processed meat and food concentrate for animals

1998 – 2001

Regional Environmental Authority (CAR Sumapaz)

To support the environmental management units on technical concepts of processes, permissions, sanctions, control, monitoring and assessment in the proper and timely management of the Sumapaz area's natural resources.

#### **CDM Experience**

2006

Consultancy:

- Presentation of proposals for developing CDM in the farming and animal husbandry industry

2008

CDM Auditor:

- Validation of the La Calera Biodigesters Project
- Validation of the ECC methane capture and combustion from AWMS at dairy farms in Mexico – I
- Validation of the La vegona project
- Validation of Chamelecón project
- Validation of Macano hydroelectric project
- Verification of Doña Juana Landfill gas recovery
- Validation of the Montenegro Landfill gas recovery and flaring
- Validation of the Pirgua Landfill gas recovery and flaring

### **Sectoral Specialist**

**Eng. Fernando Gómez Gómez**

Electrical Engineer. Universidad Nacional of Colombia (1967)  
Master of Power Systems - Instituto Tecnológico de Monterrey (Mexico) (1970)  
EAFIT Financial Specialist (Colombia) (1984)

ECONOMETRÍA S.S. - Technical Advisory

Technical Advisory to Unidad de Planeación Minero Energética to incorporate international electrical interconnections into the Colombian electrical planning carried by UPME, October 2002 - March 2003 (including use of SUPEROLADE, MPODE, NEPLAN and REAL models).

ECOENERGIA S.S. ESP - Founding Member and Manager

Management of private projects of generation, distribution and commercialization of power.

Unidad de Planeación Minero Energética - UPME-: Elaboration of Catalog of Generation Projects for National Energy Plan, October 1996 - October 1997.

AUDITORES ENERGÉTICOS - AENE LTDA

Advisory to the company in the application of the new regulatory scheme of Colombian electrical sector to private and public entrepreneurial management through the following studies:

Development of competent rate models, October 1994 - March 1995

CORELCA: Determination of marginal costs and development of innovative rate structures for power generation companies and big industrial customers, October 1994 - March 1995.

CORELCA: Development and application of rate models to prepare proposal on power sale in the wholesale market, July 1995 - September 1995.

EMPRESA DE ENERGIA DE BOGOTÁ - EEB

Positions:

Chief of the Department of generation planning, interconnection and sub-transmission, 1978 - 1979.

Chief of Electric Planning Division, 1979 - 1986.

Assistant for Technical Sub-management, 1986 - 1987

Chief of Special Projects Division, 1987

Chief of expansion and Development Division, 1987 - 1994

Management Advisor, 1994

INTERCONEXIÓN ELÉCTRICA S.A - ISA

1976 - 1978

Engineer Specialist in electric planning research and development of models for planning and operation of electric systems.

National Coordinator of Colombian electric system planning in the project "Study of Electric Power Sector (Estudio del Sector de Energía Eléctrica), ESEE" winner of the National Award of Engineering.

## **Experience in CDM activities:**

2006 – 2010

Participation as an Energy expert in:

- Verification of three verification periods of Santa Ana Hydroelectric plant project
- Verification of first verification period of Agua Fresca Multipurpose and Environmental Services Project
- Verification of two verification of La Vuelta and la Herradura Hydroelectric Project
- Verification of
- Verification of Rio Amazon Woods residues power plant
- Verification of Cristalino small hydroelectric power plant project
- Verification of Faxinal small hydro project in Faxinal dos Guedes
- Validation of El Bote small hydroelectric plant project

## **Auditor in Training Eng. Francy Ramírez**

Electrical Engineer  
UNIVERSIDAD DE LOS ANDES  
Specialist on Social Assessment of Projects  
UNIVERSIDAD DE LOS ANDES

## **Work Experience**

2005 – Actual

ICONTEC

Standardization Professional. Plan, coordinate, perform and ensure achievement of the national standardization committees' program. These committees address subjects as: electrical facilities, electrical power quality, electrical transformers, appliances for substations and medium and high voltage, electrical devices and fixtures, protection against atmospheric electric discharges and energy management. Elaborate technical standards. Develop and control special assigned projects. Participate in regional and international standardization programs.

2002 – 2005

CODENSA S.A ESP

Supervise work on field and upload results into the central information system, evaluate performed inspections, conciliate with contractors, address the inspections' result to the several areas of the company, charge inspections and electrical works to the company's customers, coordinate and support on field the commercial technicians, provide technical training to the technical personnel, administrative support to the Division of Commercial Processes and Control of Loss, maintain the database for internal management of Inspections. Lead the Project for Improvement of Commercial Process in Cundinamarca Regional Office.