

VALIDATION REPORT**GENERADORA MONTECRISTO, S.A.****VALIDATION OF THE PROJECT
ACTIVITY
MONTECRISTO HYDROELECTRIC
PROJECT****REFERENCE NUMBER: 2006/0002/CDM/01****REPORT NUMBER: 01**

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VALIDATION REPORT

Date of first issue: 2007-04-04	Reference No.: 2006/0002/CDM/01
Client: Enel Latin America Diagonal 6, 10-65 Zona 10, 01010 Guatemala	
Summary: <p>The Spanish Association for Standardization and Certification (AENOR) has carried out the validation of the Hydroelectric project "Montecristo" located in the municipality of Zunil, province of Quetzaltenango in Guatemala, on the basis of UNFCCC criteria for the CDM, as well as relevant decisions of the EB. The objectives of the validation are to confirm that the project follows the above criteria and the approved methodology and that the PDD presented by Generadora Montecristo, will lead to a realistic determination of the emissions reductions of the project activity. The scope of the validation covers the additionality assessment (financial barrier, technology and market), the environmental impact study and the stakeholder consultation. In addition it covers the baseline methodology, the calculation of the emission factor (ex-ante) and the monitoring methodology to quantify the emissions reductions during the operational life of the project.</p> <p>The validation, carried out by AENOR, involved a desk study of the PDD, associated documentation and the approved methodology, followed by a visit to Zunil and Mancomunidad de Municipios Metropoli de los Altos in Guatemala, where not only key personnel involved in the project, but also the representatives of residents and local authorities, were interviewed. Conformance with legal and environmental regulations was also confirmed and validation meetings were held with AMM.</p> <p>Clarifications on a number of issues were requested by AENOR according to desk review and on-site visit conclusions; these were amended satisfactorily by Generadora Montecristo and resulted in a new version of the original PDD.</p> <p>In the opinion of AENOR the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria, therefore the project shall be recommended for registration.</p>	

Report No.: 2006/0002/CDM/01		
Report title: MONTECRISTO HYDROELECTRIC PROJECT VALIDATION OF CDM PROJECT FOR GHG EMISSION REDUCTION BY HYDROELECTRIC GENERATION		
Members of the validation equipment Miguel Carrasco García Javier Vallejo Drehs		
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Indexing terms

Hydroelectric power plant, CO2, climate change, CDM project, Guatemala's national grid, GHG emissions

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Abbreviations

ACM0002	Approved consolidated baseline and monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources
AMM	Administrador de Mercado Mayorista (Wholesale market operator)
AMS-I.D	Grid connected renewable electricity generation
BM	Build Margin
CAR	Corrective Action Requested
CCGT	Combined Cycle Gas turbine
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification
DECISION 3/CMP.1	Modalities and Procedures for a Clean Development Mechanism as Defined in Article 12 of the Kyoto Protocol
DNA	Designated National Authority
EB	Executive Board of the CDM of the Kyoto Protocol
EIA	Environmental Impact Assessment
GHG	Greenhouse Gases
GWh _e	Electrical Giga Watt hour
GWh _t	Thermal Giga Watt hour
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MWh	Mega Watt hour
OM	Operating Margin
PDD	Project Design Document
tC	Carbon tones
tCO ₂	Carbon dioxide equivalent tones
TJ	Tera Joules
UNFCCC	United Nations Framework Convention on Climate Change

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Appendix A: Validation Protocol R/DCS/277

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1 INTRODUCTION

This validation concerns a project implemented by Generadora Montecristo in Guatemala to reduce emissions of CO₂ by generating renewable energy coming from hydro resources. The objectives of the validation exercise are to confirm that the project meets the necessary CDM criteria, that the project follows the approved methodology, AMS-I.D (Version 10), and that the proposals presented by Generadora Montecristo in the PDD will lead to a realistic determination of the emissions reductions.

The scope of the validation covers the additionality assessment (financial barrier, technology and market), the environmental impact study and the stakeholder consultation. In addition it covers the baseline methodology, the calculation of the emission factor (ex-ante) and the monitoring methodology to quantify the emissions reductions during the operational life of the project.

The project implies the installation of a 13.08 MW run-of-river power plant in the municipality of Zunil, province of Quetzaltenango in Guatemala. This plant will generate electric energy that would otherwise continue to be generated with fossil fuels power plants.

The validation team consists of the following members:

Mr. Miguel Carrasco García	AENOR	Team Leader. CDM Chief Validator. MSc Energy Technologies & PgD in Project Finance
Mr. Javier Vallejo Drehs	AENOR	CDM Chief Validator Engineer & MBA

Miguel Carrasco García (Mining Engineer, MSc Energy and Fuel Technologies, Post-graduate Diploma in International Project Finance and Environmental auditor) is Head of Operations in the Climate Change Unit of AENOR. He has participated in every validation and verification performed by AENOR in Africa, Central and South America, Europe and Asia. Other responsibilities include the participation in international conferences, technical training, identification of projects and the launch of start-ups in new carbon markets.

Before joining AENOR, he has worked in Itevelesa (Industrial services group), Red Eléctrica de España (Transmission system operator) and Aitemin (Research and industrial development firm of natural resources).

Javier Vallejo Drehs (Forestry Engineer, MBA in Instituto de Empresa) is responsible for the Climate Change Unit in AENOR. He has six years work experience in Standardization and Certification activities related with sustainable forest management, environmental risks analysis and assessment reports validation, sustainable reports validation and R+D standardization. He has participated in all the validations and verifications developed by AENOR and he is responsible for the accreditation of AENOR in CDM and JI. He has received extensive training in the CDM and JI validation processes and is responsible for training of new validation and verification personnel.

1.1 Objective

Generadora Montecristo has commissioned AENOR to validate Montecristo hydroelectric project. The validation serves as design verification and is a requirement of all Client projects. The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and it is considered as necessary to provide assurance of the quality of the project and its intended generation of certified emission reductions (CERs) to stakeholders.

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

1.2 Scope

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

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

- PDD, including baseline study and monitoring plan.
- Approved Methodology: AMS-I.D (version 10) and ACM0002 (version 6)
- Decision 3/CMP.1 and relevant decisions from the EB
- Environmental Impact Assessment of the project.
- Associated documentation (assumptions book, PIN, etc.)

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. AENOR, based on the Specific Code for the Processing and Conducting of Validation, Registration, Verification and Certification of Kyoto Protocol CDM Project Activities (IE/DCS/66.02), has used a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

1.3 GHG Project Description

The Montecristo Hydroelectric Project is a run-of-river hydroelectric project located in the municipality of Zunil, province of Quetzaltenango in Guatemala being developed by Generadora Montecristo. The project will have an installed capacity of 13.08 MW and will depend on the flow of water from the Samala River to generate electricity for the Guatemala Interconnected National System.

The Montecristo hydroelectric project will produce an average of 52.364 GWh annually, which will be sold in the spot market at market rates.

Its contribution to sustainable development is summarized as follows:

Environment:

- Reduction of GHG emissions by displacing energy production using fossil fuels, about 35,189 t CO₂ by using renewable resources for the generation of electrical energy.
- Preservation of Samala River Basin through a cooperation agreement with the Mancomunidad Metropoli de Los Altos and/or other organizations to carry out a solid waste management plan.

Economic:

- Creation of employment through the operation of the hydroelectric plant and conservation river basin activities.

Social:

- Improvement of the quality of life of nearby communities through the pollution reduction by means of the solid waste management plan.

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The hydroelectric starts with a conveyance system that collects Samala power flows, downstream of El Canada Hydroelectric. The power flows are conveyed by a system including 750 m of low pressures pipe, a 16,000 m³ regulating reservoir and 1,700 m of high pressures penstock to the powerhouse. The powerhouse is connected by a 69 kV transmission line to El Canada substation which it links to the 69 kV Interconnected National System.

Montecristo hydroelectric project:

- Installed capacity: 13.08 MW
- No. of turbines: 2
- Technology: Francis turbine
- Average annual generation: 52.364 GWh
- Manufacturer: VA Tech Bourier Hydro
- Flow at maximum power: 7 m³ / s
- Expected operational lifetime: 50 years
- Power line: 69 kV

2 METHODOLOGY

The validation of the project was started in May 2006 and concluded in April 2007. The validation was performed in the manner of an audit, where a desk review of the PDD was first undertaken against the approved methodology and CDM and other relevant criteria. The desk review was followed by a site visit to Generadora Montecristo, AMM and other key stakeholders in Guatemala. Some information was also obtained from selected experts in the field.

In order to ensure transparency, a validation protocol was customized for the project, according to Specific Code IE/DCS/66.02. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, provides details and clarifies the requirements a CDM project is expected to meet
- it ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1. The completed validation protocol is enclosed in Appendix A to this report.

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Validation Protocol Table 1: Mandatory Requirements			
Requirement	Reference	Conclusion	Cross reference
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification is used when the validation team has identified a need for further clarification.

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the validation team should be summarized in this section.	This section should summarize the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

Figure 1 Validation protocol tables

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2.1 Review of Documents

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

The PDD underwent several revisions. To address the clarification requests that arose from the desk review and on-site visit, Generadora Montecristo revised the project design document submitted in May 2006 and developed a final version (version 3) submitted in April 2007.

The final validation findings presented in this report related to the project as described in the project design document submitted in April 2007.

2.2 Follow-up Interviews

AENOR conducted interviews with project developers in Guatemala to confirm selected information and to resolve issues identified in the document review.

From 2006-11-20 to 2006-11-24 representatives from Generadora Montecristo, AMM, Mancomunidad de Municipios Metropoli de los Altos and the local authority of Zunil were interviewed in Guatemala during the on-site validation.

The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization Person/Position	Interview topics
GENERADORA MONTECRISTO <ul style="list-style-type: none"> - Juan Carlos Mendez: Managing Director. Enel Guatemala - Fernando Rios: Power Marketing Analyst. CDM responsible for Montecristo - Florencio Gramajo: Montecristo plant manager CDM Consultancy <ul style="list-style-type: none"> - Alaide Gonzalez: CDM & Energy consultant 	<ul style="list-style-type: none"> ➤ Enel Guatemala and Generadora Montecristo (Markets, core business, environmental policy, renewable projects, carbon market strategy, etc.). ➤ Background market situation in Guatemala (fossil Vs hydro production, installed hydroelectric capacity, droughts, , etc.). ➤ Electricity market of Guatemala (system, agents, fuels, transmission fees, renewable projects promotion, etc.). ➤ Montecristo engineering design (technology, location, transmission line, etc.). ➤ Additionality assessment (financial barrier, technology and market). ➤ PIN of Montecristo (objective, project description, baseline and barriers) ➤ Financial barrier (Assumptions book, discounted cash flow, investment, energy output, annual revenues and operational costs, renewable energy and taxes, CERs revenues, , etc.). ➤ Technological barrier (rainfall statistics, water source, deforestation, etc.). ➤ Market (PPA, spot market, etc.). ➤ Ex-ante baseline determination: OM & BM (power plants, electricity production, start of operation, fuels, efficiencies, ...). ➤ EIA approval and related conditions. ➤ Project's sustainable development contribution. ➤ Consultation with municipality's authorities, land owners and other stakeholders. ➤ DNA's approval.

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Interviewed organization Person/Position	Interview topics
AMM - Yury Omar Urbina: System Operation Division	<ul style="list-style-type: none">➤ Background market situation in Guatemala (fossil Vs hydro production, installed hydroelectric capacity, droughts, etc.).➤ Electricity market of Guatemala (system, agents, fuels, transmission fees, renewable projects promotion, etc.).➤ Ex-ante baseline determination: OM & BM (power plants, electricity production, start of operation, fuels, efficiencies, ...).
LOCAL STAKEHOLDERS Zunil Municipality - Hilario Félix Pérez García. Zunil Major Mancomunidad de Municipios Metropoli de los Altos - Augusto René Escobar: La Esperanza Major. Mancomunidad chairman - Ursula Escobar - Reina Polanco	<ul style="list-style-type: none">➤ Opinion about the project “Montecristo” and the promoter➤ Opinion about the hydroelectric power plants.➤ Knowledge of the EIA.➤ Benefits for the community.➤ Priority social needs➤ Local jobs➤ Consultation with municipality’s authorities, land owners and other stakeholders.➤ Use of natural resources➤ Forest management➤ Solid waste management plan➤ Conservation of the river basin➤ Legal framework

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this validation phase was to resolve the requests for corrective actions and clarifications and any other outstanding issues that needed to be clarified for AENOR’s positive conclusion on the project design. Clarification Requests raised by AENOR were resolved during communications between Generadora Montecristo and project participants with AENOR. To guarantee the transparency of the validation process, the concerns raised and responses given are summarized in chapter 3 below and documented in more detail in the validation protocol in Appendix A.

Since modifications to the Project design were necessary to resolve AENOR’s concerns, the Client decided to revise the documentation and finally resubmitted the project design documentation in April 2007. After reviewing the revised and resubmitted project documentation, AENOR issued this final validation report and opinion.

3 VALIDATION FINDINGS

The main findings of the validation are stated in the following sections. The validation findings for each validation subject are presented as follows:

- 1) The findings from the desk review of the original project design documents and the findings from interviews during the on-site visit are summarized. A more detailed record of these findings can be found in the Validation Protocol in Appendix A.
- 2) Where AENOR had identified issues that needed clarification or that represented a risk to the fulfillment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A.

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3) Where Clarification or Corrective Action Requests have been issued, the exchanges between project participants and AENOR to resolve these Clarification or Corrective Action Requests are summarized.

4) The conclusions for validation subject are presented.

The final validation findings are related to the project design as documented and described in the revised and resubmitted project design documentation.

3.1 Project Design and Additionality

The Montecristo project is a downstream cascade plant of the existing and operating El Canada Hydro plant. The power plant is designed to operate as a peaking plant providing 13.08 MW of power daily. The annual plant energy output is projected to average 52 GWh that will be sold on a merchant plant basis at market rates including capacity payments for the peak generation periods as well as through short-term (1-3 year) contracts with commercializers and/or large industrial users.

The PDD justifies that the project itself is not a likely baseline scenario through the demonstration of its additionality by identifying financial barriers, technology and market barriers.

Montecristo conceived the development under the CDM and the revenues from the CERs sale since the beginning. On June 14, 2002, the International Bank for Reconstruction and Development acting as the Trustee of the Prototype Carbon Fund signed a Letter of Intent (LOI) to buy all emission reductions generated by the Montecristo project from the date of commercial operation. On the other hand, a PIN was also presented to other carbon funds, being the main characteristics of the project in line with those exposed in the present PDD (objective of the project, project description, baseline and barriers).

From an investment perspective, Montecristo presents an IRR of 12,83% considering the sale of CERs as part of the annual revenues what it is greater than the equity cost (11,6%).

The figures indicated in the PDD are in line with the Assumptions Book of Montecristo provided to the validation team during the on-site visit in Guatemala. Relevant variables have been considered in its calculation and hypotheses are reasonable:

- Macro-economic parameters: Electricity prices escalation are analysed and exchange rate Quetzal-US Dollar estimation is based on the 1991-2004 yearly average exchange rates.
- Costs include the engineering, procurement and construction costs, considering also contingencies and pre-development commitments. No imports duties are expected as a result to the exemptions provided by the Renewable Incentives Law.
- The energy output is estimated considering the annual availability with planned and unplanned outages; and a dispatch factor of 47,28%. The average total annual output is 52,360 GWh. This estimation is also based on hydrology and flow series.
- The electricity sales are based on a market study and the operation design of El Canada. The analysis is also incorporating rate projections. The analysis concludes that the level of certainty related to these tariff projections are high since rates on the Guatemala market are based on marginal costs and the expectation in the short term for the market is to tighten due to limited new capacity and 5% growth in demand. The sensitivity analysis of + and – 5% is based on factors that could affect these figures such as general hydrology, volatility of international fuel markets, increased transactions in the regional electricity market and increase of installed capacity in Guatemala with lower cost of generation.
- An annual capacity shortfall penalty has been assumed based on El Canada.
- Emission rights revenues are included with a reasonable range of prices according to carbon markets.

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- Operating costs are based on comparable cost for other Enel Latin America operating projects, including project insurance (property damage, third party liability, business interruption, etc.), rent & lease, maintenance costs, etc.
- The study also includes asset depreciation, tax holiday, legal reserves, etc.
- The equity cost has been calculated according to a well recognized method, the CAPM (Capital Asset Pricing Model) considering a recognized free-risk reference, i.e. the USA bonus, an expected market return of 9% and a β of 0.74 based on calculations from Prof. Damodaran.

With regard to the technological barrier, Montecristo hydroelectric project faces production risks compared to thermal plants due to variation on hydrologic cycles what brings additional uncertainties to the forecasted incomes. Moreover, the lack of a long term PPA is also introducing price volatility since Montecristo should participate in the spot market.

Technological and market barriers faced by the project are supporting the financial barrier. The sale of the CERs will not only contribute to meet the financial obligations of the project but will promote the preservation of the Samala River Basin and therefore it will improve the energy generation.

3.2 Baseline

The PDD describes the baseline methodology, which is in conformance with the approved baseline methodology AMS-I.D “Grid connected renewable electricity generation” (version 10) and ACM0002 (version 6) for grid-connected electricity generation from renewable sources. The key conclusions about the correct application are summarized below.

Montecristo hydroelectric project, complying with Guatemala’s Electricity framework Law, will supply electricity for Guatemala Interconnected National System. The main source of data of the grid is AMM.

The baseline emission factor (EF_y) has been calculated ex-ante according to the three steps stated in ACM0002 (Version 6). The Operational Margin (OM) and the Build Margin (BM) have been calculated and combined to obtain the Baseline Emission factor.

The simple OM has been selected and the OM is calculated as the generation-weighted average emissions per electricity unit (tCO₂/MWh) of all generating sources serving the system, not including low-operating cost and must-run power plants. The reason for selecting the simple OM method among the other methods (simple adjusted OM, average OM and dispatch data analysis OM) is that low-cost must run resources constitute less than 50% of total grid generation and detailed data to apply dispatch method is not available in Guatemala.

For the purpose of determining the Build Margin (BM) emission factor, the spatial extent is limited to the project electricity system. The group of plants considered is the power plant capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. This option comprises the larger annual generation.

Power plant capacity additions registered as CDM project activities in Guatemala such as “Las Vacas”, “Matanzas”, “San Isidro” and “Canada” have been excluded from all calculations.

Other variables considered such as the net calorific values and carbon content are from IPCC 2006 Guidelines for National Greenhouse Gas Inventories.

3.3 Monitoring Plan

The project applies the methodology for “Grid connected renewable electricity generation”, AMS-I.D (version 10). This category comprises renewable energy generation units, such as hydro that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.

The project meets conditions, specifically: the total output that shall not exceed the limit of 15 MW and the grid, which the project activity is connected to, is clearly identifiable.

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In accordance with the methodology requirements, the MP consists of metering the electricity generated by the renewable technology. Moreover it provides information about frequency, responsibility and authority for controlling, correct deviations and reporting during the crediting period of the following:

- Electricity generation from the hydroelectric power plant

To ensure the quality of the data, in particular those that are measured, the data can be cross checked with sales receipt from the grid.

The project's greenhouse gasses emissions will be negligible, thus there will be no need to monitor leakage and it will not be taken into account when calculating ERs.

3.4 Calculation of GHG Emissions

The methodologies for calculating emission reductions are transparently documented and comply with existing good practice. The calculation methods applied to the determination of emission reduction are explained in detail in the PDD and they follow the procedures laid down in the approved methodology. The project consists of a hydroelectric power plant with an installed capacity of 13.08 MW that is foreseen to generate an average of 52,364 GWh of electricity per year. In the absence of the project, the same level of demand for electricity would be met by fossil-fuel power generation with associated GHG emissions of an estimated 0.672 tCO₂/MWh (fixed ex-ante). The average annual emission reductions to be achieved by the project are 35,189 tCO₂/year.

The system boundary for the proposed project is the Guatemala Interconnected National System, which is considered appropriate since information on the characteristics of the grid is available to calculate emission reductions using the simple OM method described in ACM0002 (Ver. 6).

Formulas and factors used to calculate the Operating Margin and the Build Margin are properly described in the PDD and are considered correct and transparent.

Electricity production, technology and fuel are based on official data from AMM. During the on-site visit in Guatemala, different interviews were scheduled and official files were provided to the validation team:

- Files "Generación 2003", "Generación 2004" and "Generación 2005" from AMM provide information regarding plants, energy production, technology, fuel, etc.
- "Capacidad_instalada", available on the AMM's web, provides data related to the power output and start date of operation of the power plants.
- Type of coal consumed by San Jose power plant has been confirmed by operator as bituminous coal.
- Other variables such as density, net calorific values, carbon content, etc. are from well-recognized sources such as EIA and IPCC.
- Data related with cogeneration production and harvest season comes from Cengicaña (Center for the research and capacity of the sugar cane in Guatemala). During the harvest season, 71% of the fuel consumed comes from the bassage meanwhile the remaining 29% is fuel oil n°6. During the non-harvest season, 100% of the fuel consumed is fuel oil. AMM confirmed that all the production coming from the bassage has to be dispatched and paid.
- The majority of the power plants efficiency has been obtained directly from operators, the remaining from a benchmark analysis considering relevant parameters such as technology, location, power output of the power plant, type of fuel, operator and start of operation. Benchmark analysis is based on official data from the Ministry of Environment and Natural Resources of El Salvador.

Uncertainties and risks associated with the data used in the project to calculate baseline emissions arise from accuracy of official data from Guatemala and Salvador.

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3.5 Environmental Impacts

According to Guatemalan law, proposals for electricity generation with hydro sources must undertake an environmental impact study. The authorization for Montecristo hydroelectric project was granted by the Ministry of Environment and Natural Resources on 2003-05-20 (Res. No. 376-2003/CRMM/OZ).

It is clearly stated that the small hydroelectric project “Montecristo” has received the EIA approval according to the environmental law of Guatemala.

The EIA approval confirms relevant parameters described in the PDD such as:

- Power of the project: 13.08 MW
- Type of turbine technology
- Location of project
- Water intake
- No significant environmental impacts

Moreover, the sponsor is implementing important environmental initiatives such as a solid waste management plan and the conservation of the river basin.

3.6 Comments by Local Stakeholders

In November 2006, the validation team visited the project location where different meetings were held with local stakeholders. Residents and representatives of Zunil and Mancomunidad de Municipios Metropoli de los Altos were interviewed on 2006-11-21.

The objective of the Mancomunidad de Municipios Metropoli de los Altos is to concentrate efforts to deal with relevant issues a single municipality cannot face alone. It has four main action lines:

- Administration
- Land management
- Natural resources and environment risk management
- Social and economical development

The project is clearly in line with priority needs of the area and it was clear the support from the official representatives to the project. The main benefits that will bring to the community are the use of natural resources and the creation of local employment. Moreover, it was highlighted the effort of the promoter to promote a solid waste management plan to collect and treat all the residues that are dumped to the river daily.

The opinion and comments from official representatives of Zunil and the Mancomunidad are summarized below:

- The overall opinion on the project and the promoter management is very positive.
- The project is fulfilling the legal framework.
- The project will contribute to the development of the municipality.
- There is a clear need for new local jobs opportunities and projects such as Montecristo will help to reduce the employment rate in the area.
- The use of natural resources is essential for Guatemala.
- The project is addressing one of the most important needs, a waste management program.

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4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to Decision 3/CMP.1, the validator shall make publicly available the PDD and receive, within 30 days, comments on the validation requirements from parties, stakeholders and UNFCCC accredited NGOs and make them publicly available.

AENOR published the project documents on CDM website (<http://unfccc.cdm.int>) on 2006-05-06 and invited comments by Parties, stakeholders and non-governmental organizations. No comments were received.

5 VALIDATION OPINION

AENOR has performed a validation of the “Montecristo hydroelectric project” in Guatemala. The validation was performed on the basis of UNFCCC criteria 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, the on-site visit and the subsequent follow-up interviews have provided AENOR with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. Moreover, AENOR has already received the written approval of voluntary participation from the DNA and the host Party confirmation that the project activity assists in achieving sustainable development of Guatemala. The project will hence be recommended by AENOR for registration with the UNFCCC.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the financial, technological and market barriers and common practice in Guatemala demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project will be implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

The validation is based on the information made available to us and the engagement conditions detailed in this report.

 VALIDATION REPORT

6 REFERENCES

Category 1 documents: Documents provided by the project proponents that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the determination conclusions.

Category 2 documents: Background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents have been used to check project assumptions and confirm the validity of information given in the category 1 documents.

Category	Ref	Document Name	Date	Author/Competent Authority
1	1	PDD Montecristo Hydroelectric Project	2007-03	Enel Guatemala
2	2	Methodology AMS-I.D Version 10	2006-12-23	CDM - Executive Board
2	3	ACM0002 (Version 6) - Consolidated methodology for grid-connected electricity generation from renewable sources ---	2006-05-19	CDM - Executive Board
2	4	Appendix B of the simplified modalities and procedures for small-scale CDM project activities		CDM - Executive Board
2	5	Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities		CDM - Executive Board
2	6	Determining the occurrence of debundling		CDM - Executive Board
2	7	Kyoto Protocol – Status of ratification		UNFCCC
1	8	Montecristo small hydroelectric power plant specifications	2006	Enel Guatemala
1	9	Montecristo Assumptions Book	2005-01	Enel Guatemala
1	10	Letter of Intent: El Canada and Montecristo Projects	2002-06-14	World Bank
1	11	PIN Montecristo Hydroelectric Project	2003-10-31	Enel Guatemala
1	12	Installed generating capacity	2006-12	AMM
1	13	Electricity system information (power plants, start of operation, fuel, technology, etc.) 2002, 2002, 2004 and 2005		AMM
1	14	Efficiency data of Duke Energy International power plants	2005-02-02	Duke Energy
1	15	Efficiency data of EGEE power plants	2005-02-03	EGEE
1	16	Efficiency data of TEGO power plants	2005-01-28	TEGO Energy
1	17	Efficiency data of CEE	2005-02-11	CEE
1	18	Certificate of analysis: Orimulsion	2005-05-25	BVQI
1	19	Cogeneration Statistics Report	2005-01	CENGICAÑA
1	20	API gravities		EIA
1	21	Other power plant data		Electricity market agents

VALIDATION REPORT

Category	Ref	Document Name	Date	Author/Competent Authority
1	22	EIA approval: RES. No. 376-2003/CRMM/OZ	2003-05-20	Ministry of Environment and Natural Resources
2	23	Reforested areas	2006-10-26	Enel Guatemala
2	24	Environmental audits	2006-01-25	Solel Boneh Guatemala
2	25	Envriomantal supervision report	2006-03-13	Bioenlaces
2	26	Grid connection approval: RES CNEE-43-2006	2007-04-07	Comisión Nacional de Energía Eléctrica
2	27	Grid connection studies approval: RES CNEE-32-2004	2004-02-27	Comisión Nacional de Energía Eléctrica
2	28	Construction license	2005-02-10	Municipality of Zunil
2	29	Water use right	2005-05-03	Ministry of Energy and Mines
2	30	Right of way	2005-01-07	
1	31	IPCC Guidelines for National Greenhouse Gas Inventories	2006	IPCC
1	32	DNA approval of Guatemala	2006-10-10	DNA of Guatemala
2	33	Annual Electricity Report 2005	2006	AMM
2	34	Annual Electricity Report 2004	2005	AMM
2	35	Annual Electricity Report 2003	2004	AMM
2	36	Annual Electricity Report 2002	2003	AMM

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VALIDATION REPORT

ANNEX A

VALIDATION PROTOCOL

**SMALL-SCALE CDM VALIDATION
PROTOCOL****GENERADORA MONTECRISTO, S.A.****VALIDATION OF THE SMALL-
SCALE PROJECT ACTIVITY****“MONTECRISTO HYDROELECTRIC
PROJECT”****REFERENCE NUMBER: 2006/0002/CDM/01****REPORT NUMBER: 02**

Validation Type	
Validation of a project activity	
Validation team: Miguel Carrasco García Javier Vallejo Drehs	
Address: C/ Génova, 6 28004 Madrid Tlf: +34 91 4326004	Date: 2007-04-04

Table 1 Mandatory Requirements for Small Scale Clean Development Mechanism (CDM) Project Activities

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference/ Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12.2	OK	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	Table 2, Section A.3 Letter of approval by the Guatemala's DNA, dated 2007-01-08
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	OK	Table 2, Section E.4.1
4. The project shall have written approval of voluntary participation from the designated national authorities of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	Letter of approval by the Guatemala's DNA, dated 2007-01-08
5. Private and/or public entities shall have the authorization to participate in the CDM by the DNA of the party in which the entity is a legal entity.	CDM Modalities & Procedures §33	OK	Letter of approval by the Guatemala's DNA, dated 2007-01-08
6. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference/ Comment
7. Reduction in GHG emissions must 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	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	OK	Table 2, Section B.2.1
8. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech Accords (Decision 17/CP.7)	OK	There is not foreseen to receive or seek any public funding from any Annex I party and AENOR has not come across any indication about ODA during the validation process.
9. Parties participating in the CDM shall designate a national authority for the CDM	Marrakesh Accords (CDM modalities §29)	OK	The DNA of Guatemala is under the Ministry of Environment and Natural Resources
10. The host country and the Annex I Party shall be a Party to the Kyoto Protocol	Marrakesh Accords (CDM modalities §30)	OK	Date of ratification 1999/10/05 Source: UNFCCC
11. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	N/A	No Annex I Party is yet identified.
12. 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 I Party is yet identified.
13. 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	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference/ Comment
14. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	
15. The proposed project activity shall confirm 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	Table 2, Section A.1.3 and B.1
16. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G
17. 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	Table 2, Section F
18. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD has been published on the UNFCCC CDM web site. Parties, stakeholders and NGOs were through the CDM web site invited to provide comments from 2006-05-06. No comments were received.

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. Project Description The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
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?	1 2 4 8 22	DR I	Montecristo is a run of river hydroelectric plant of 13.08 MW, built in the Samala River Basin, located about 192 km west of Guatemala City. Power output shall be confirmed during the on-site visit.	GL1	OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	1 6 8 22	DR I	According to the PDD: - Matanzas Hydroelectric plant located 120 km from the Montecristo plant - San Isidro Hydroelectric plant located 128 km on direct line from the Montecristo plant - El Canada Hydroelectric Plant is located 2 km upstream from Montecristo powerhouse. Debundling conditions will be assessed during the on-site visit.	GL2	OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	1 8 22	DR	The project is classified as ID category (Grid connected renewable electricity generation).	OK	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	1 8 22	DR I	The Montecristo hydroelectric plant is located 192 km west of Guatemala City and 12 km south of Quetzaltenango City. It can be accessed through the road between Retalhuleu and Quetzaltenango.	OK	OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	1 8 22	DR	The components and facilities boundaries are clearly defined in the PDD. Electricity from renewable sources is generated by a run of the river hydroelectric plant with a daily regulation reservoir, using two Francis turbines and two synchronous generators, for a total capacity of 13.08 MW.	OK	OK
A.2.3. Does the project design engineering reflect current good practices?	1 8 22	DR I	The project design engineering reflects good practices. The promoter has extensive experience in the development and operation of hydroelectric power plants.	OK	OK
A.2.4. Will the project result in technology transfer to the host country?	1 8 22	DR I	To be clarified during the on-site visit.	CL3	OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	1 8 22	DR I	The promoter has extensive experience in the management of hydropower plants in Guatemala and other countries.	OK	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	1 8 22 23 24 25	DR I	It will contribute to the preservation of Samala River Basin through a cooperation agreement with the Mancomunidad Metropoli de Los Altos and/or other organizations to carry out a Solid Waste Management Plan. By means of this cooperation agreement, Generadora Montecristo, S.A, will strength the local synergies in order to find solutions to protect the Samala River, where are dumped the solid wastes and the municipal wastewater generated by the second city with more population in Guatemala. It contributes to poverty reduction by creating employment through the operation of the hydroelectric plant and conservation river basin activities. These benefits will be assessed during the on-site visit.	GL4	OK
A.3.2. Will the project create any adverse environmental or social effects?	1 8 22 23 24 25	DR I	According to the PDD, the Environmental Impact Assessment reveals that the construction and operation of Montecristo Hydroelectric Plant implies temporal and non-significative environmental impacts that could be mitigated and corrected observing the Environmental Management Plan. EIA approval has to be provided.	GL5	OK
A.3.3. Is the project in line with sustainable development policies of the host country?	1 32	DR I	The approval letter of the Guatemala's DNA has to be provided.	GL6	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.3.4. Is the project in line with relevant legislation and plans in the host country?	1 8 22 26 27 28 29 30	DR I	Conformance with relevant legislation shall be audited during the on-site visit: - General Law for Electricity 1996 - Construction licence granted by Municipality - Water use right - Electricity connection right	GL7	OK
B. Project Baseline The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	1 2 3	DR	The baseline methodology selected is the most up-to-date one included in Appendix B of the annex II to decision 4/CMP.1 about simplified modalities and procedures for small-scale CDM project activities.	OK	OK
B.1.2. Is the baseline methodology applicable to the project being considered?	1 2 3	DR	The project is a renewable electricity generation project for a grid (appendix B, Type ID) and the capacity of the power plan does not exceed 15 MW. Power output shall be confirmed during the on-site visit.	GL4	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	1 8 9 10 11	DR I	<p>The PDD identifies financial, technological and market barriers, according to the attachment in Appendix B for small-scale projects, to demonstrate that the project activity itself is not a likely baseline scenario.</p> <p>According to the PDD, the sale of CERs was considered from the inception of the project, having made different approaches to negotiate an Emissions Reduction Purchase Agreement.</p> <p>The CDM incentive was seriously considered during the design phase of the project to overcome barriers, and proof of it is the fact that the cash flow due CERs sale was considered in the financial model of the project</p> <p>During the on-site visit, these barriers will be assessed along with the related documentation.</p>	CL8	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	1 2 3 12 13 14 15 16 17 18 19 20 21	DR I	The proponent has to clarify the following issues: - Data from the most recent 3 years (plants, date of operation, power output, energy production, fuel, imports, etc.) - Must-run plants ("take or pay" contract). Cogenerations using bassage (harvest season and non-harvest season, fuel, etc.) - Efficiency plant data - IPCC values (carbon content, oxidation factors, etc.) - Other CDM projects in Guatemala - OM & BM calculation - Other sources	CL9	OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	1 2 3 33 34 35 36	DR I	The PDD calculates an operating emission factor and the build margin emission factor for Guatemala's national grid. By the application of these factors, energy policies and trends are included. Moreover, the baseline will be revised every 7 years to review the current information and reassess applicability of the baseline methodology	OK	OK
B.2.4. Is the baseline selection compatible with the available data?		DR I	See B.2.2	CL9	OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	1 33 34 35 36	DR I	The baseline scenario would be to construct a mix of power plants including a high percentage of fossil fuel power plants.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Monitoring Plan The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
B.3. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
B.3.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	1 2 8	DR	The selected methodology is in accordance with monitoring methodology AMS I.D. of appendix B to decision 4/CMP.1.	OK	OK
B.3.2. Is the monitoring methodology applicable to the project being considered?	1 2 8	DR I	The appropriateness of the monitoring methodology is justified in part D.2 of the PDD.	OK	OK
B.3.3. Is the application of the monitoring methodology transparent?	1 2 8	DR I	The only data to be monitored is the “Electricity generation exported to grid”. The PDD describes clearly data collection systematic, responsibilities and data origin.	OK	OK
B.3.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	1 2 8	DR I	The future achieved reductions will be calculated from operational data.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.4. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
B.4.1. Are the choices of project emission indicators reasonable?	1 8	DR I	N/A	OK	OK
B.5. Monitoring of Leakage It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
B.5.1. If applicable, are the choices of leakage indicators reasonable?	1 8	DR	N/A	OK	OK
B.6. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
B.6.1. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	1 2 3	DR I	N/A. The emission factor has been calculated ex-ante.	OK	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.7. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
B.7.1. Is the authority and responsibility of project management clearly described?	1 8	DR I	The authority and responsibility for project operation, monitoring and reporting is under ENEL Latin America.	OK	OK
B.7.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	1 8	DR I	The responsibility and authority on monitoring measurements are clearly described in the PDD. - General Manager is responsible of the Monitoring Plan. - Plant Manager of Montecristo hydroelectric is responsible of the electric energy measurement. - The Marketing Analyst engineer of Generadora Montecristo, S.A. is in charge of the monitoring process.	OK	OK
B.7.3. Are procedures identified for training of monitoring personnel?	1 8	DR I	Personnel who carry out the monitoring function are trained continuously as is indicated in the monthly training planning. New personnel have to follow up a training program and are formed in the specific skills required to carry out the Monitoring Plan.	OK	OK
B.7.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	1 8	DR I	No relevant GHG emissions emergency situations are expected to occur.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.7.5. Are procedures identified for calibration of monitoring equipment?	1 8	DR I	Measurement of the electric energy generated by the plant is made through a meter and a process that complies with the Commercial Coordination Norm No. 14 of the AMM. The equipment accuracy will be audited annually by the Administrador del Mercado Mayorista (AMM) as of 2007, using a reference gauge, as is indicated in the AMM measurement equipment calibration procedure.	OK	OK
B.7.6. Are procedures identified for maintenance of monitoring equipment and installations?	1 8	DR I	Measurement of the electric energy generated by the plant is made through a meter and a process that complies with the Commercial Coordination Norm No. 14 of the AMM.	OK	OK
B.7.7. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	1 8	DR	There are procedures identified for day-to-day record handling in the PDD.	OK	OK
B.7.8. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	1 8	DR	Specific procedures are envisaged in the PDD.	OK	OK
B.7.9. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	1 8	DR I	The monitoring plan includes an internal audit procedure and a non-conformance and corrective/preventive actions procedure.	OK	OK
B.7.10. Are procedures identified for corrective actions?	1 8	DR I	The monitoring plan includes an internal audit procedure and a non-conformance and corrective/preventive actions procedure.	OK	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Calculation of GHG emission 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.					
B.8. Project GHG Emissions The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
B.8.1. Are all aspects related to direct and indirect project emissions captured in the project design?	1 2 4 8	DR I	N/A	OK	OK
B.9. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.					
B.9.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	1 2 3 8	DR	N/A	OK	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10. Baseline GHG Emissions The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
B.10.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?		DR I	See B.2.2.	CL9	OK
B.10.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?		DR I	See B.2.2.	CL9	OK
B.10.3. Have all relevant greenhouse gases and sources been evaluated?		DR I	See B.2.2.	CL9	OK
B.10.4. Do the methodologies for calculating baseline emissions comply with existing good practice?		DR I	See B.2.2.	CL9	OK
B.10.5. Are the calculations documented in a complete and transparent manner?		DR I	See B.2.2.	CL9	OK
B.10.6. Have conservative assumptions been used?		DR I	See B.2.2.	CL9	OK
B.10.7. Are uncertainties in the baseline emissions estimates properly addressed?		DR I	See B.2.2.	CL9	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.11. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
B.11.1. Will the project result in fewer GHG emissions than the baseline case?	1 2 3 8	DR I	As it is shown in the PDD, the project will result in fewer GHG emissions reduction.	OK	OK
C. Duration of the Project / Crediting Period It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	1	DR	The starting date of the project activity is clearly defined, 2005-01-31. The operational lifetime defined is 50 years.	OK	OK
C.1.2. Is the crediting period clearly defined (seven years with two possible renewals or 10 years with no renewal)?	1	DR	A renewable crediting period with seven years per crediting period has been selected.	OK	OK
D. Environmental Impacts It is assessed whether environmental impacts of the project are sufficiently addressed.					
D.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	1 8 22 23 24 25	DR I	An Environmental Impact Assessment was made in observance to Guatemalan Law for Protection and Improvement of the Environment. The EIA approval has to be provided.	CL5	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.1.2. Does the project comply with environmental legislation in the host country?	1 8 22 23 24 25	DR I	The Environmental Impact Assessment was made in observance to Guatemalan Laws. The assessment was approved by the Comisión Nacional de Ambiente (National Commission of the Environment) on May 20, 2003. The EIA approval has to be provided.	OK	OK
D.1.3. Will the project create any adverse environmental effects?		DR I	See A.3.2.	CL5	OK
D.1.4. Have environmental impacts been identified and addressed in the PDD?		DR I	See A.3.2.	CL5	OK
E. Comments by Local Stakeholder Validation of the local stakeholder consultation process.					
E.1.1. Have relevant stakeholders been consulted?	1 8 22 23	DR I	Consultation with the interested parties was carried out during September 28 and 29, and between October 10 and 14, year 2002. A total of 100 interviews were made to all inhabitants. The communities where the surveys were carried out are Zunil, El Palmar y San Felipe, as well as Santa Maria de Jesús y San Miguelito Calahuache. An on-site visit to the project location and interviews with local authorities has been requested by the validation team.	CL10	OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	1 8 22 23	DR I	In addition to surveys indicated previously, a press release was published in two newspapers in order to know the stakeholders comments about the environmental assessment study before the construction of the plant facility.	OK	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	1 8 22 23	DR I	Stakeholder consultation is needed by the local regulations and it has been carried out during the EIA development. The EIA approval has to be provided.	CL5	OK
E.1.4. Is a summary of the comments received provided?	1 8 22 23	DR	A summary of the comments received is included in the PDD. An on-site visit to the project location and interviews with local authorities has been requested by the validation team.	CL10	OK
E.1.5. Has due account been taken of any comments received?	1 8 22 23	DR I	An on-site visit to the project location and interviews with local authorities has been requested by the validation team.	CL10	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
<p>CL1</p> <p>Montecristo is a run of river hydroelectric plant of 13.08 MW, built in the Samala River Basin, located about 192 km west of Guatemala City.</p> <p>Power output shall be confirmed during the on-site visit.</p>	<p>A.1.1</p> <p>B.1.2</p>	<p>The power output has been confirmed with the following official approvals:</p> <ul style="list-style-type: none"> - EIA Approval. RES. No. 376-2003/CRMM/OZ - Electricity connection right. Res. CNEE-43-2006 <p>The project meets the criteria to be qualified as a small scale project</p>	CL1 is solved
<p>CL2</p> <ul style="list-style-type: none"> - Matanzas Hydroelectric plant located 120 km from the Montecristo plant - San Isidro Hydroelectric plant located 128 km on direct line from the Montecristo plant - El Canada Hydroelectric Plant is located 2 km upstream from Montecristo powerhouse. <p>Debundling conditions will be assessed during the on-site visit.</p>	A.1.2	<p>An on-site visit to the project location was organised by the project promoter where the distance to the El Canada hydroelectric plant was validated.</p> <p>On the other hand, the grid connection approval and the authorization to exploit the hydro resource demonstrate that the project has been promoted independently.</p> <p>Montecristo is not a debundled from a large-scale project activity.</p>	CL2 is solved
<p>CL3</p> <p>Will the project result in technology transfer to the host country?</p> <p>To be clarified during the on-site visit</p>	A.2.4	<p>Technical documentation was provided during the visit to the plant.</p> <p>Turbines were manufactured by VA Tech Bourier Hydro. Electricity generators were manufactures by Leroy Somer.</p>	CL3 is solved

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<p>CL4</p> <p>It will contribute to the preservation of Samala River Basin through a cooperation agreement with the Mancomunidad Metropoli de Los Altos and/or other organizations to carry out a Solid Waste Management Plan. By means of this cooperation agreement, Generadora Montecristo, S.A, will strength the local synergies in order to find solutions to protect the Samala River, where are dumped the solid wastes and the municipal wastewater generated by the second city with more population in Guatemala.</p> <p>It contributes to poverty reduction by creating employment through the operation of the hydroelectric plant and conservation river basin activities.</p> <p>These benefits will be assessed during the on-site visit.</p>	A.3.1	<p>During the on-site visit to the project, different interviews were scheduled with the Mancomunidad de Municipios Metropoli de los Altos and the local authority of Zunil.</p> <p>Both official representatives expressed the support to the project and the benefits that will bring to the community:</p> <ul style="list-style-type: none"> - a solid waste management plan - conservation of the river basin - creation of employment - use of natural resources 	CL4 is solved
<p>CL5</p> <p>According to the PDD, the Environmental Impact Assessment reveals that the construction and operation of Montecristo Hydroelectric Plant implies temporal and non-significative environmental impacts that could be mitigated and corrected observing the Environmental Management Plan.</p> <p>EIA approval has to be provided.</p>	<p>A.3.2</p> <p>D.1.1</p> <p>D.1.3</p> <p>D.1.4</p> <p>E.1.3</p>	<p>The EIA received the approval from the Ministry of Environment and Natural Resources in 2003-05-20.</p> <p>The EIA approval, RES. No. 376-2003/CRMM/OZ, has been provided to the validation team.</p>	CL5 is solved

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<p>CL6</p> <p>The approval letter of the Guatemala's DNA has to be provided.</p>	A.3.3	<p>The LoA has been provided to the validation team. Letter of approval by the Guatemala's DNA, dated 2007-01-08</p>	CL6 is solved
<p>CL7</p> <p>Conformance with relevant legislation shall be audited during the on-site visit:</p> <ul style="list-style-type: none"> - General Law for Electricity 1996 - Construction licence granted by Municipality - Water use right - Electricity connection right 	A.3.4	<p>The conformance with relevant legislation was audited with the documentation provided by the promoter during the on-site visit:</p> <ul style="list-style-type: none"> - Public properties use right (water) by the Ministry of Energy and Mines - Electricity connection study approval Res. CNEE-32-2004 by the National Commission of Electrical Energy - Electricity connection right Res. CNEE-43-2006 by the National Commission of Electrical Energy - Municipality license by the municipality of Zunil <p>Moreover, the interview with the representative of the Municipality of Zunil confirmed the fulfilment of the law framework of the project.</p>	CL7 is solved

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<p>CL8</p> <p>The PDD identifies financial, technological and market barriers, according to the attachment in Appendix B for small-scale projects, to demonstrate that the project activity itself is not a likely baseline scenario.</p> <p>Moreover the sale of CERs was considered from the inception of the project, having made different approaches to negotiate an Emissions Reduction Purchase Agreement.</p> <p>The CDM incentive was seriously considered during the design phase of the project to overcome barriers, and proof of it is the fact that the cash flow due CERs sale was considered in the financial model of the project</p> <p>During the on-site visit, these barriers will be assessed along with the related documentation.</p>	<p>B.2.1</p>	<p>The PIN of the project has been provided to the validation team. The PIN was finalised on 2003-10-31 and revised on 2004-06-01.</p> <p>The main characteristics of the project are in line with those exposed in the present PDD:</p> <ul style="list-style-type: none"> - Objective of the project - Project description (power output, estimated generation, location, technology, etc.) - Baseline and barriers <p>The letter of intent for the Montecristo project from the World Bank, dated 2002-06-14, has been also provided to the validation team.</p> <p>With regard to the financial barrier identified in the PDD:</p> <ul style="list-style-type: none"> - The figures indicated in the PDD are in line with the Assumptions Book of Montecristo provided to the validation team. - The Assumptions Book applies the valuation methodology post tax Discounted Cash Flows (DCF) considering relevant variables to estimate the main issues (future cash flows, taxes and cost of capital). - The assumptions considered include: <ul style="list-style-type: none"> a) Macroeconomic parameters <ul style="list-style-type: none"> - Electricity prices escalation - Exchange rate b) Development and construction <ul style="list-style-type: none"> - Costs - Capital expenditures during operations - EPC Costs c) Technical assumptions <ul style="list-style-type: none"> - Capacity and energy output 	<p>CL8 is solved</p>

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		<p>d) Revenues</p> <ul style="list-style-type: none"> - Electricity sales - Rate projections - Energy sold: market requirements - Emission Rights revenues - Electricity Sector charges <p>e) Operating Costs</p> <p>f) Taxation and accounting</p> <p>g) Debt and working capital</p> <p>The final version of the PDD maintains the figures but modifies the writing to clarify some issues (cost of capital, CAPM, hurdle rate, etc.)</p> <p>With regard to the technological barrier, Montecristo hydroelectric plant faces production risks compared to thermal plants due to variation on hydrologic cycles. This brings additional uncertainties to the forecasted incomes.</p> <p>The new PDD is also incorporating a map showing the dynamic of land cover and the deforestation rate in the area of the project.</p> <p>With regard to the market barrier, Montecristo does not have a PPA and will be participating in the spot market with the corresponding price volatility.</p> <p>Technological and market barriers faced by the project are supporting the financial barrier explained in detailed. The sale of the CERs will not only contribute to meet the financial obligations of the project but will promote the preservations of the Samala River Basin that will improve the energy generation.</p>	<p>Page 23</p>

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<p>CL9</p> <p>The proponent has to clarify the following issues:</p> <ul style="list-style-type: none"> - Data from the most recent 3 years (plants, date of operation, power output, energy production, fuel, imports, etc.) - Must-run plants ("take or pay" contract). Cogenerations using bassage (harvest season and non-harvest season, fuel, etc.) - Efficiency plant data - IPCC values (carbon content, oxidation factors, etc.) - Other CDM projects in Guatemala - OM & BM calculation - Other sources 	<p>B.2.2</p> <p>B.10</p>	<ul style="list-style-type: none"> - Data from the most recent 3 years (plants, date of operation, power output, energy production, fuel, imports, etc.) <p>During the on-site visit, the promoter organised a meeting with representatives of AMM that provided to the validation team relevant information of the electricity market in Guatemala.</p> <p>Files "Generación 2003, 2004 and 2005" provide information regarding plants, energy production, imports, etc.</p> <p>"Capacidad_instalada", available on the AMM's web, provides data related to the power output and start date of operation of the power plants.</p> <p>Type of coal consumed by San Jose power plant has been confirmed by operator as bituminous coal.</p> <p>Final PDD uses for the baseline calculation data from 2003, 2004 and 2005 and adjusts some slight discrepancies with the data (electricity production of some plants, imports, etc.).</p> <ul style="list-style-type: none"> - Must-run plants ("take or pay" contract). Cogenerations using bassage (harvest season and non-harvest season, fuel, etc.) <p>Data related with cogeneration production and harvest season comes from Cengicaña (Center for the research and capacity of the sugar cane in Guatemala).</p> <p>During the harvest season, 71% of the fuel consumed comes from the bassage meanwhile the remaining 29% is fuel oil nº6. During the non-harvest season, 100% of the fuel consumed is fuel oil.</p> <p>AMM confirmed that all the production coming from the bassage has to be dispatched and paid.</p>	<p>CL9 is solved</p>
		<p>The promoter</p>	<p>Page 24</p> <p>R/DCS/276.00</p>

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		<ul style="list-style-type: none"> - Efficiency plant data The majority of the power plants efficiency has been obtained directly from operators, the remaining from a benchmark analysis considering relevant parameters such as technology, location, power output of the power plant, type of fuel, operator and start of operation. Benchmark analysis is based on official data from the Ministry of Environment and Natural Resources of El Salvador. - IPCC values (carbon content, oxidation factors, etc.) The new PDD uses the values contained in the IPCC 2006. - Other CDM projects in Guatemala CDM projects, already registered such “Canada”, “Las Vacas”, “San Isidro” or “Matanzas”, have been excluded in the new PDD from the calculations according to the methodology. - Other sources The project promoter has provided the analysis certificate of the density of the fuel “orimulsion”. - OM & BM calculation The OM and BM calculation has been changed taking into account the previous modifications. The PDD calculates now the OM as the full generation-weighted average for the years 2003, 2004 and 2005. 	

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<p>CL10</p> <p>Consultation with the interested parties was carried out during September 28 and 29, and between October 10 and 14, year 2002. A total of 100 interviews were made to all inhabitants.</p> <p>The communities where the surveys were carried out are Zunil, El Palmar y San Felipe, as well as Santa Maria de Jesús y San Miguelito Calahuache.</p> <p>An on-site visit to the project location and interviews with local authorities has been requested by the validation team.</p>	<p>E.1.1</p> <p>E.1.4</p>	<p>During the on-site visit to the project, different interviews were scheduled with the Mancomunidad de Municipios Metropoli de los Altos and the local authority of Zunil.</p> <p>Both official representatives expressed the support to the project and the benefits that will bring to the community:</p> <ul style="list-style-type: none"> - a solid waste management plan - conservation of the river basin - creation of employment - use of natural resources 	<p>CL10 is solved</p>

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