

Validation report of
LA CALERA BIODIGESTERS PROJECT

La Calera S.A.C.
Estuardo Masías Marrou
(PERÚ)
Corporación Andina de Fomento - CAF
(PERÚ)

REPORT N°
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DECEMBER, 2010

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<i>Approved by:</i>	Internal Technical reviewer of ICONTEC	<i>Organizational unit:</i>	Instituto Colombiano de Normas Técnicas y Certificación – ICONTEC Carrera 37 52-95 Bogotá - Colombia
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Summary:

ICONTEC has performed the validation of the project: “La Calera Biodigesters Project” in Perú 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 is located at La Calera Farm, Chincha, Ica, Peru. The main activity of the farm is egg production with around 4 million hens and the production of fruits. The amount of produced eggs corresponds to 20% of the total Peruvian egg production.

Currently, La Calera has around 4 million chickens. The number of animals increases annually on average by 5%. The confined waste of chickens drops under the hen cages. After the lifetime of the hens in one compartment - around one year - the accumulated manure is removed manually before a new hen population is put into a cage. Currently the daily manure production is 150 tons.

The purpose of the project is to reduce the methane emissions through an improved manure management: Four new biogas digesters will be built during the two project phases in order to eliminate the open lagoon system and to process part of the guano from the guano valley. The open lagoon will be covered through a membrane and will be used as a follow-up digestion in order to eliminate the remaining organic matter in the wastewater and recover the biogas from this digestion. The liquid and the solid phases of the digestion process will be used as fertilizer in the fruit production. The produced biogas will substitute the coal and LPG used at the chicken breeding unit and for egg carton production. In emergency cases the biogas will be flared in an enclosed flare.

The Methodologies applicable to the project activity under validation process is:

Type III: Other project activities

Category D: Methane recovery in animal manure management systems

Sectoral scope 15: Agriculture

As well as:

Type I: Renewable energy projects

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Category C: Thermal energy production with or without electricity
Sectoral scope 1: Energy industries (renewable - non-renewable sources)

The validation consisted of the following four phases: i) a desk review of the project design document, ii) follow up interviews with the owner of the project and stakeholders iii) request to the project responsible for clarification or further explanations on some specific aspects and iv) the resolution of outstanding issues and the issuance of the final validation report and opinion. As a part of the validation and before the desk review phase, the PDD of the project activity was made publicly available in UNFCCC webpage.

In summary, it is ICONTEC's opinion that the project "La Calera Biodigesters Project", as described in the version 1.2 of the Project Design Document, meets all relevant UNFCCC requirements for CDM and all relevant host country criteria, and correctly applies the baseline and monitoring methodology. Hence, ICONTEC requests the registration of the project as CDM project activity.

Report No:	CDMVAL-012-03	Subject Group:	Scope: 1 Scope: 15	Indexing terms:
Report title: Validation report of La Calera Biodigesters Project				Climate Change; Kyoto Protocol; Validation; Clean Development Mechanism, renewable energy, methane

Work carried out by	Eng. Juan Alberto Gracia (Lead Auditor) Zoo. Erika Urrego (Sectoral expert) Eng. Fernando Gómez (Energy Expert)		
Work verified by	Internal Technical reviewer of ICONTEC	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit <input type="checkbox"/> Limited distribution <input type="checkbox"/> Unrestricted distribution	
Date of this revision	03-12-2010		
Rev. No.:	03		
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This report should not be read without reference to the annexed Validation Protocol.

Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CERs	Certified emission reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ 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
La Calera S.A.C. and Estuardo Masías Marrou	Owners of the project and Project participants

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1. INTRODUCTION

La Calera S.A.C. and Estuardo Masías Marrou (private entities) and Corporación Andina de Fomento - CAF have commissioned ICONTEC to perform the validation of its CDM project: “La Calera Biodigesters Project”.

This report summarizes the findings of the validation of the project, which was performed on the basis of UNFCCC criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

According to specific CDM documentation of the project, it consists in to reduce the methane emissions through an improved manure management: Four new biogas digesters will be built during the two project phases in order to eliminate the open lagoon system and to process part of the guano from the guano valley. The open lagoon will be covered through a membrane and will be used as a follow-up digestion in order to eliminate the remaining organic matter in the wastewater and recover the biogas from this digestion. The liquid and the solid phases of the digestion process will be used as fertilizer in the fruit production. The produced biogas will substitute the coal and LPG used at the chicken breeding unit and for egg carton production. In emergency cases the biogas will be flared in an enclosed flare.

1.1 OBJECTIVE

According to CDM Modalities and Procedures (Decision 17/CP.7) the purpose of a validation is to have an independent third party to assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party's criteria that are 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 step to provide assurance to stakeholders of the quality of the project and the intended generation of certified emission reductions generation (CERs).

1.2 SCOPE

The validation scope involves an 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 preliminary approval 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 of EB-UNFCCC) focused on the identification of significant risks for CER generation, and verification of the mitigation.

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The validation does not mean to provide any consulting to 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

Project Parties	<p>: La Calera S.A.C. (Perú) Manuel Estuardo Masías Marrou (Perú)</p> <p>Corporación Andina de Fomento – CAF (Perú)</p>
Title of project activity	: La Calera Biodigesters Project
Project Entity	<p>: La Calera S.A.C.</p> <p>Hacienda La Calera Alto Laran Chincha – ICA Perú Phone: +511 99 400 96 39</p>
Location of the project activity	<p>: Alto Laran Municipality of Chincha Department of ICA Perú</p> <p>Coordinates: GPS are: 13°27.193'S 76° 01.820'W</p>
Methodology	<p>: AMS-III.D "Methane Recovery in animal manure management systems", Version 15 AMS-I.C "Thermal energy production with or without electricity", Version 16</p> <p>Following tools are used:</p> <ul style="list-style-type: none"> - "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28) - "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39). - "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion" (Version 02, EB 41)

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Project's crediting period : 7 years

Estimated amount of emission reductions over the chosen crediting period: 154,811 tonnes CO₂-eq

ICONTEC verified the proposed project is located at La Calera Farm, Chinchá, Ica, Peru. The main activity of the farm is egg production with around 4 million hens and the production of fruits. The amount of produced eggs corresponds to 20% of the total Peruvian egg production. La Calera farm has around 4 million chickens, the number of animals increases annually on average by 5%. The confined waste of chickens drops under the hen cages. After the lifetime of the hens in one compartment - around one year - the accumulated manure is removed manually before a new hen population is put into a cage. Currently the daily manure production is 150 tons.

ICONTEC verified that confined waste of the chickens drops under the hen cages and after the lifetime of the hens in one compartment - around one year - the accumulated manure is removed manually before a new hen population is put into the cage. At present the daily manure production is 154 tons. Around 85 tons of this manure goes to the so-called "guano valley" inside the property, where it is stocked. After 40 to 50 days the guano is air dried and used partially as fertilizer on the farm and partially sold. The semi-dry guano in this valley causes methane, nitrous oxide and particulate matter emissions. The amount of stocked guano in this valley varies between 3,500 and 4,500 tons. Around 27 tons of guano is daily mixed with water and stored in two open lagoons in order to produce "Biol" - a fluid fertilizer for the fruit tree plantations. The open lagoon system causes GHG emissions through methane releases. 25 tons of guano is daily pasteurized in a drum dryer and blended with fresh corn to chickenfeed.

About 16 tons of fresh guano goes to the existing two anaerobic digesters where biogas is produced for the heating of the chicken breeding. The two biodigesters are working with a low efficiency and need an important amount of reaction heat supplied through a coal boiler. The pasteurization and the old biodigesters are not within the project boundary.

The purpose of the project is to reduce the methane emissions through an improved manure management: four new biogas digesters will be built during the two project phases in order to eliminate the open lagoon system and to process part of the guano from the guano valley. The open lagoon will be covered through a membrane and will be used as a follow-up digestion in order to eliminate the remaining organic matter in the wastewater and recover the biogas from this digestion.

2. VALIDATION METHODOLOGY

The validation consists of the following four phases:

- i) A desk review of the project design documents
- ii) On-site visit
- iii) Follow up interviews with project stakeholders
- 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 assessment of “La Calera Biodigesters 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 (CL).

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.

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2.1 REVIEW OF DOCUMENTS

The PDD submitted by La Calera and CAF and the additional background documents related to the project design and baseline were assessed during the validation. Three versions of PDD were successively submitted by the project participant along the process, reacting to clarifications, corrective and forwards actions request of the DOE.

Main documents reviewed were:

- PDD, Version 1, 1.2 and 1.3
- Financial project assessment for the project activity (Additionality assessment)
- Emissions reduction calculations
- Maintenance records and procedures for monitoring equipment
- Quality assurance procedures
- Analysis of the related environmental impacts (Environmental impacts assessment)
- Letter approving the project issued by the Designated National Authority (25-11-2010)
- Letter confirming the voluntary participation of the parties
- Records on the early identification and considerations of the project as a CDM activity
- Comments of the interested parties received up to date and how these has been treated
- Records of the meeting to inform local stakeholders about the project activity
- Project construction and electrical plans

2.2 FOLLOW UP INTERVIEWS

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

Table 1. Follow up Interview

DATE	PLACE	INTERVIEW DELEGATE	ORGANIZATION	INTERVIEW TOPICS
20-02-2010	Interview with stakeholders LIMA (PERÚ)	Zinnia Ibañez Consultant Eco Consult Perú (Assessor PAMA) Jaime Álvarez Ministerio del Ambiente (DNA) Ricardo Gutiérrez Quiroz Agricultural environmental management director Ministerio de Agricultura	Ecoconsult (Assessor PAMA) Minambiente (DNA) Inrena (Environmental of water Authority) (Land Authority)	Further clarification on: - Environmental aspects of the project - Legal requirements of the CDM project activity - No objection letter to the project - Process of National Approval (register) of the project (Contribution to Sustainable Development) and voluntary participation of the parties.
21/22-02-2010	La Calera Farm (Department of ICA, Perú)	Estuardo Masías Manager of the project La Calera S.A.C. Mauricio Flores	LA CALERA S.A.C.	Further clarification on : - Establishment of the baseline,

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DATE	PLACE	INTERVIEW DELEGATE	ORGANIZATION	INTERVIEW TOPICS
		Chief of the project La Calera S.A.C. Susana Ricaute Consultant Ecotawa AG Camilo Rojas Consultant CAF		monitoring plan, and emission reduction calculation. - Comments of the interested parties received up to date and how these have been treated. - Environmental aspects of the project - Social benefits of the project. - Responsibility, authority and procedures for monitoring, measuring and reporting data. - Cross checking strategy to verify measurements of energy delivered to the grid - Establishment and applicability of the monitoring plan. - Training needs - Project design engineering facilities. - Technical and Operational issues of the plant - Social benefits of the project. - Operation procedures. - Corrective action plans for the CLA's, CAR's and FAR's.

2.3 RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUESTS

Corrective action and clarification requests raised by ICONTEC, presented to the project participants in the preliminary validation report (version 0) were resolved through communication and meetings between ICONTEC and CAF. To guarantee the transparency of the validation process, the concerns raised the response provided by the project participants and the DOE analysis and conclusions are documented in more detail in the validation protocol in Annex A (Table 3).

Modifications to the project design document - PDD were necessary to resolve ICONTEC's concerns. As a result the final PDD version 1.3 was issued.

2.4 INTERNAL QUALITY CONTROL

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

The technical review and the quality control of the process were performed by the internal Committee in accordance with ICONTEC internal procedures for carrying out validation audits of CDM project activities. The Internal Committee members are qualified in accordance with ICONTEC qualification scheme for CDM validation and verification activities.

2.5 VALIDATION TEAM

The validation Team consists of the following members:

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Table 2. Validation team

ROLE/QUALIFICATION	LAST NAME	FIRST NAME	COUNTRY
Lead Auditor	Gracia	Juan Alberto	Colombia
Sectoral Agriculture Expert (15)	Urrego Ortiz	Erika	Colombia
Sectoral Energy Expert (1)	Gómez	Fernando	Colombia

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

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 (Table 1, 2 and 3).

3.2 PARTICIPATION REQUIREMENTS

The project activity is proposed by La Calera S.A.C. which is also the project owner and CAF. The host country is Perú.

The participation of each project participant has been approved by the DNA of Perú letter of approval dated on November 25, 2010.

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:	25/11/2010	
Description:	It provides confirmation that the project contributes to the country in the search for sustainable development	
Supporting documentation	PDD	
Date of ICONTEC reception	29/11/2010	
Entity that sent the letter to ICONTEC	Project participants	Directly from the DNA
		X
Means of validation employed to assess the authenticity	Document review and interview with Ministry of Environment of Perú.	
ICONTEC Conclusion	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:

- (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.

3.3 PROJECT DESIGN

ICONTEC has been capable of validating that the project has been designed according to the characteristics indicated and the equipments that were specified are being purchased for their installation as follows:

The description of baseline and the project scenarios concerning the guano flow as well as regarding the energy management systems was validated for the DOE. The spatial project boundary includes the geographical site of the livestock and manure management system, as well as all units using fossil fuels on the farm and which under the project case will use biogas. The project boundary was defined according to paragraph 8 of AMS-III.D.

3.4 BASELINE DETERMINATION

As the DOE was able to verify in field that La Calera project was applicable the two methodologies (mentioned below) as described in paragraph B.2 in Table 1 of the PDD.

AMS-III.D "Methane Recovery in animal manure management systems", Version 15

AMS-I.C "Thermal energy production with or without electricity", Version 16

Following tools are used:

- "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28)
- "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39).
- "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion" (Version 02, EB 41)

Baseline Scenario

The baseline scenario of "guano flow" was validated by the DOE is illustrated in figure 2 of the PDD. The confined waste of the chickens drops under the hen cages. After the lifetime of the hens in one compartment - around one year - the accumulated manure is removed manually before a new hen population is put into the cage. At present the daily manure production is 154 tons. Around 85 tons of this manure goes to the so-called "guano valley" inside the property, where it is stocked. After 40 to 50 days the guano is air dried and used partially as fertilizer on the farm and partially sold. The semi-dry guano in this valley causes methane, nitrous oxide and particulate matter emissions. The amount of stocked guano in this valley varies between 3,500 and 4,500 tons.

Around 27 tons of guano is daily mixed with water and stored in two open lagoons in order to produce "Biol" - a fluid fertilizer for the fruit tree plantations. The open lagoon system causes GHG emissions through methane releases. 25 tons of guano is daily pasteurized in a drum dryer and blended with fresh corn to chickenfeed. About 16 tons of fresh guano goes to the existing two anaerobic digesters where biogas is produced for the heating of the chicken breeding. The two biodigesters are working with a low efficiency and need an important amount of reaction heat supplied through a coal boiler. The pasteurization and the old biodigesters are not within the project boundary.

The two open lagoons of the baseline scenario will be covered with a membrane and then used as follow-up digesters of the reactors. Through this measure the CH₄-emissions of the lagoons can be eliminated. Furthermore, part of the guano that will be stocked in the baseline scenario will be digested in the biogas reactors and therefore CH₄-emissions in the guano valley will be reduced through the project activities.

The biogas that will be produced in the anaerobic biogas reactors will be used for the heat generation in the chicken breeding, egg carton production as well as for the heating of the new reactors. In emergency cases the biogas will be flared in an enclosed flare.

The old anaerobic biogas reactor is not integrated within the project boundary. The produced biogas from the old reactor is not calculated in the emission reduction. Therefore, this biogas will be measured with a flow meter before it is fed to the biogas network of the new digesters (see annex 4).

The egg carton production situated on the farm is within the project boundary. The carton production will increase according to the growth of the egg production due to market demand and not due to project activities.

The national electricity grid of Perú is integrated into the project boundary. The electricity consumption of the digester stirrers, some pumps and blowers as well as all the monitoring equipment are part of the project emissions.

Baseline emissions determination

The evaluation of the alternative scenarios to the proposed CDM project activity was carried out according to table 10.18 of the IPCC guidelines 2006, volume 4, in chapter 10. ICONTEC validated that the baseline definition with alternatives scenarios is summarized in the section B.4 - Table 2 of the PDD has a correct focus.

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ICONTEC was able to validate that the calculation of Baseline emissions of the manure management is in accordance with paragraph 9 of AMS-III.D and Baseline emissions of fossil fuel usage for heat generation are calculated based on paragraph 11 of AMS-I.C. i.e. the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission factor for the fossil fuel displaced.

3.5 DATA AND PARAMETERS TO BASELINE DETERMINATION

The DOE verified the data and parameters described in: “B.6.2. Data and parameters that are available at validation” of the PDD. For every Data/Parameter indicated, ICONTEC analyzed the original content under each heading.

- Data unit
- Description
- Source of data used
- Value applied
- Justification of the choice of data or description of measurement methods and procedures actually applied
- Any comment

3.6 ADDITIONALITY

ICONTEC could validate that the barriers identified include the investment barrier and a barrier due to prevailing practice. The main barrier identified is the investment barrier.

The additionality of the project is determined using the Attachment A to Appendix B of the simplified modalities and procedures for small scale project activities and EB 35 Annex 34 Guideline on “Nonbinding best practice examples to demonstrate additionality for SSC project activities”.

Investment Barrier

The section B.5 of the PDD determines if the project activity is financially feasible in absence of CER revenues.

The options as listed in the additionality tool include:

1. Simple cost analysis
2. Investment comparison analysis
3. Benchmark analysis

The DOE is able to validate that the option 1 is not appropriate because of the project activity generates income (savings) other than CER revenues such as coal saving in the Egg Carton Production Plant and LPG savings in the Chicken Breeding plant. By the other hand, the two project alternatives the project with our without revenue of CER have No investment, so the investment comparison analysis is not appropriate. . Therefore the DOE deems that the option 3 - benchmark analysis - is an appropriate analysis method choice.

Determine Suitable Indicator

DOE able to establish that the financial/economic indicator chosen is the IRR as it is considered as the most suitable indicator for the project type. The IRR is taken as it can be easily compared to a financial benchmark. The IRR is capable of comparing the investment decision of the project with a financial benchmark and thus gives an indication of the financial profitability of the investment. The NPV is also calculated by project responsible for information purposes.

The benchmark analysis is based on a standard market parameter: the local commercial lending rate (active interest rate) for Peruvian Soles as published by the Central Reserve Bank of Peru for the time of investment decision is taken. The DOE deems that this benchmark is appropriate as it is public and thus verifiable, a standard market parameter and relevant for the project. It is also in accordance with the recommendation given in the EB tool paragraph 11.

As validated by the DOE, the Guidance on the Assessment of Investment Analysis, included as Annex in the "Tool for the Demonstration and Assessment of Additionality", version 5.2, was used for all calculations, as explained next:

- The period of assessment taken is 20 years. This is in accordance with the Annex to the Tool point 3 where a maximum of 20 years is considered as appropriate. The technical lifetime of the equipment used in the project is 25 years.
- The fair value at the end of the period is considered as proportional to the remaining technical life-span of the equipment following GAAP (FAS157).
- Depreciation and other non-cash items such as amortization are not included when calculating the IRR and the NPV. The financial calculations are made excluding depreciation and finance costs. This is in accordance with the Annex to the Tool point 5.
- All calculations are based on data available as of June 15th 2008 i.e. before project start. This is in accordance with the Annex to the Tool point 6.
- The detailed data was available to the Validator, the EB and the UNFCCC secretariat but are not public domain, due to containing sensitive contractual data.
- The project cannot be developed by another entity as La Calera is the owner of the farms, the Guano, the space and also uses the biogas for internal purposes. However for case of transparency the local commercial lending rates are used to determine the financial viability of the project.
- Sensitivity analysis is made for all variables which constitute more than 20% of cost respectively revenue in accordance with the Annex to the Tool points 16 and 17 assuming 10% change of investment costs, 10% change of Guano value (affects income as well as expenses), 10% change of savings due to coal and 10% change of savings due to LPG.

As a result of the Benchmark analysis, in the table 9 of the PDD the following results are shown:

IRR base case without CER revenues 10%, IRR with CER revenues 34% and Benchmark 24%.

The results demonstrate that while the project is not profitable without CER revenues, it gives an excellent return above the benchmark, if CDM is included. Therefore, the access to CDM finance is thus decisive for project success and implementation.

Prevailing Practice Barrier

DOE able to validate that the biodigesters are not used commonly for hen farms due to Guano having different properties compared to residues from swine or cattle farms. In Peru no other case is known where hen farms use biodigesters. The challenges of this plant are the usage of pure chicken manure as input with high nitrogen content and a gas as output with high content of H₂S. Given this starting point and the objective to integrate the plant into the agricultural production process a new plant concept has been designed with a sophisticated feed in system, gas treatment and a treatment of residuals to allow direct injection into the irrigation system. According to the system designers (SMART Utilities Solutions of Germany) this plant design is unique not only in Peru but in Latin America.

The above argues and rationales were found correct, so the DOE deems that they provide a fully demonstration of additionality. In conclusion, it has been verified that the project is not the most likely baseline scenario. Hence, the emission reductions occurring from the project are deemed additional to those that would occur in the absence of the project activity.

3.6.1 CDM Prior Considerations

ICONTEC had access to the documents as evidence during the validation process.

The additionality of the project is determined using the Attachment A to Appendix B of the simplified modalities and procedures for small scale project activities and EB 35 Annex 34 Guideline on “Non-binding best practice examples to demonstrate additionality for SSC project activities”.

The project starting date is before validation start and It was considered the date of construction of the new digester (01/04/2009). Project starting date is after August 2nd 2008. According to the “Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM”, version 03 (EB 49) new project activities starting after August 2nd 2008 must notify the DNA and the UNFCCC in writing of the commencement of the project activity. The project was announced to the UNFCCC secretariat on 30/10/2008. The UNFCCC confirmed reception of the announcement. As the project was subsequently stopped and changed in technology a new announcement was made at 6th of August 2009 to UNFCCC. Furthermore, the project was announced on 7th of September 2009 to the Secretary of Environment (DNA of Peru).

3.7 MONITORING PLAN

The DOE verified that a Monitoring Plan was included in the PDD, Section B.7 “Application of the monitoring methodology and description of the monitoring plan”.

A monitoring manual has been made for La Calera project. The manual contains responsibilities and a data sheet for all data to be measured with the following information:

- Data unit
- Data collection method including detailed procedure
- QA/QC

- Data storage
- Frequency of collection
- Information source

Table B.7.1 “Data and parameters monitored” contains all necessary parameters, with adequate descriptions as to: Source of data, Measurements procedures, Monitoring frequency and QA/QC procedures to be applied.

In Annex 4 of the PDD the Monitoring Plan is further described under four sections, where the main issues correspond to: Use of the MP by the Project Operator, Measurement and Calculation of Emission Reductions, Calculating Emission Reductions, Operational and Monitoring Obligations, Data Requirements and Project Database, and Description of responsibilities and roles.

Based on these descriptions and on documental verifications, the DOE deems technical and organizational design previsions and circumstances are given to put in practice adequately the Monitoring Plan proposed, such that emission reductions resulting from the La Calera project can be reported ex-post and verified.

3.8 CALCULATION OF GHG EMISSION REDUCTIONS

ICONTEC able validate that the emission reductions of the project activity due to manure management was calculated according to the small-scale methodology AMS-III.D. The emission reduction due to fuel substitution is based on the small-scale methodologies AMS-I.C.

BASELINE EMISSIONS

Baseline emissions are the sum of baseline from manure management emissions (calculated using AMS.III.D.) and from fossil fuel consumption emissions (calculated using AMS.I.C.).

$$BE_y = BE_{CH_4,y} + BE_{therm,y}$$

where:

BE_y Baseline emissions in year y (tCO₂e)
 $BE_{CH_4,y}$ Baseline emissions in year y due to manure management (tCO₂e)
 $BE_{therm,y}$ Baseline emissions in year y due to thermal heat generation for production facility (tCO₂e)

Baseline emission due to manure management

Baseline emissions from manure management according to paragraph 9 of AMS-III.D.:

$$BE_{CH_4,y} = GWP_{CH_4} * D_{CH_4} * D_{CH_4} * UF_b * \sum_{j,LT} MCF_j * B_{0,LT} * N_{LT,y} * VS_{LT,y} * MS\%_{BL,j,y}$$

where:

$BE_{CH_4,y}$ Baseline emissions in year “ y ” (tCO₂e)
 GWP_{CH_4} Global Warming Potential (GWP) of CH₄ (21)

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D_{CH_4}	CH ₄ density (0.00067 t/m ³ at room temperature (20 °C) and 1 atm pressure resp. 0.000717 t/m ³ at 0°C and 1 atm).
LT	Index for all types of livestock
j	Index for animal waste management system
MCF_j	Annual methane conversion factor (MCF) for the baseline animal waste management system “j”
$B_{0,LT}$	Maximum methane producing potential of the volatile solid generated for animal type “LT” (m ³ CH ₄ /kg dm)
$N_{LT,y}$	Annual average number of animals of type “LT” in year “y” (numbers)
$VS_{LT,y}$	Volatile solids for livestock “LT” entering the animal manure management system in year “y” (on a dry matter weight basis, kg dm/animal/year)
$MS\%_{Bl,j,y}$	Fraction of manure handled in baseline animal manure management system “j” in the year y
UF_b	Model correction factor to account for model uncertainties (0.94)

Due to lack of country-specific data concerning the maximum methane-producing capacity of the manure (B_0) default values were used according to paragraph 10 of the AMS-III.D.

There are neither country-specific volatile solids (VS) published nor country-specific intake rates for poultry available. Therefore, the default value of table 10A-9 in the annex of chapter 10, volume 4 of the IPCC guidelines 2006 has been used.

The methane conversion factors (MCF) are chosen according to table 10-17 of the 2006 IPCC guidelines for National GHG inventories, volume 4, chapter 10. The manure system was selected according to the evaluation made in table 2 of the PDD. The annual average temperature at La Calera is 20.9°C. Two MCF were selected: 4% for solid storage, 78% for open lagoons.

The fraction of manure handled is calculated in annex 3 of the PDD. The baseline values for both, the lagoon system as well as the solid storage manure management change over time due to the increasing animal population and therefore also the increasing manure amount. The absolute amount of manure to the *new* digesters is stable for phase 1 and for phase 2 (start operation of new digester 3/4) of the project (46 resp. 85 tons/d). The details of the $MS\%_{baseline}$ for the two systems are listed in Annex 3 of the PDD.

Both $B_{0,LT}$ and the volatile solids (VS) are the default values listed in table 10A-9 of the IPCC. For B_0 and VS the values of developed countries have been applied according to paragraph 13 of AMS-III.D. La Calera fulfils all four conditions mentioned in this paragraph:

- The hens originates from France (source: The Distribution and commercialization of hens companies).
- The farm uses formulated feed rations (FFR) at all stages of growth and production of hens
- The use of the FFR is proved and can be validated.
- The average weight of the hens of La Calera is even higher than the default value given for hens in the developed countries (source: The Distribution and commercialization of hens companies).

The annual average number of animals ($N_{LT,y}$) are determined according to paragraph 16 of AMS-III.D.:

$$N_{LT,y} = N_{da,y} * \left[\frac{N_{p,y}}{365} \right]$$

Where:

$N_{LT,y}$	Annual average number of animals in the year "y" (numbers)
$N_{da,y}$	Number of days animal is alive in the farm in the year "y" (numbers)
$N_{p,y}$	Number of animals produced annually of type "LT" for the year "y" (numbers)

The number of hens in La Calera Farm increases by 5% annually and thus also the amount of manure. Details are listed in annex 3.

Baseline emissions due to the use of fossil fuel

In the baseline heat required for the production process of the factory is produced by coal for the egg-carton production. Furthermore, part of the heat generation of the chicken breeding is based on LPG. In the project activity the fossil fuels of the two processes will be substituted through biogas from the new digesters. The biogas from the old digester is not integrated in the baseline calculation as mentioned before.

The determination of baseline emissions due to fossil fuel usage follows AMS.I.C. and includes three components:

$$BE_{therm,y} = BE_{cartonheat,y} + BE_{chickheat,y}$$

where:

$BE_{therm,y}$	Baseline emissions from steam/heat displaced by the project activity during the year y; (tCO _{2e})
$BE_{cartonheat,y}$	Baseline emissions from heat displaced by the project activity in the egg-carton production during the year y; (tCO _{2e})
$BE_{chickheat,y}$	Baseline emissions from heat displaced by the project activity in the chicken breeding during the year y; (tCO _{2e})

The baseline emissions of the thermal heat consumption are determined as per paragraph 15 of AMS-I.C.

$$BE_{thermal,CO_2,y} = \frac{EG_{thermal,y}}{\eta_{BL,thermal}} x EF_{FF,CO_2}$$

Where:

$BE_{thermal,CO_2,y}$	Baseline emissions from steam/heat displaced by the project activity during the year y; (tCO _{2e})
$EG_{thermal,y}$	Net quantity of steam/heat supplied by the project activity during the year y; TJ
EF_{FF,CO_2}	CO ₂ emission factor of the fossil fuel that would have been used in the baseline plant; tCO ₂ / TJ

$\eta_{BL,thermal}$

Efficiency of the plant using fossil fuel that would have been used in the absence of the project activity

The $EG_{thermal,y}$ in both production units is calculated based on the biogas with a methane concentration of 60% and the NCV of methane. The methane concentration is assumed by the technology supplier (source: Information provided by the manufacturer of the technology and reviewed by the validation team)

In the chicken breeding a part of the LPG will be substituted through the biogas of the new digesters. The biogas amount of the old digesters which is used since years for the chicken breeding is not included in the baseline calculation.

The equipment efficiency in the chicken breeding and egg carton production is assumed as 100% (*default efficiency in accordance with Paragraph 18c of AMS.I.C). This approach is conservative.

The new digesters will also be heated with the biogas of the new digesters. The heating energy for the new digesters is not integrated in the baseline calculation as this heating is based on the project activity therefore being project emissions.

PROJECT EMISSIONS ($PE_y, ex\ ante$)

$$PE_y = PE_{PL,y} + PE_{flare,y} + PE_{power,y}$$

ICONTEC validated that the calculation of the project emissions is in accordance with the methodologies. All the detailed calculations of the project emission are listed in Annex 3 of the PDD.

LEAKAGE

No leakage calculation is required according to paragraph 21 of the small-scale methodology AMS.III-D.

No leakage is considered for the fuel switching part in accordance with AMS.I.C paragraph 27 as the energy efficiency technology equipment is not transferred from another activity.

EMISSION REDUCTIONS

The emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y Emission reductions in the year y (tCO₂e)
 BE_y Baseline emissions in the year y (tCO₂e)

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PE_y Project activity emissions in the year y (tCO₂e)

Ex post emission reductions are calculated based on the lowest value of the following:

(i) The amount of biogas fuelled, flared or gainfully used (MD_y) minus the electricity consumption due to the project activity during each year of the crediting period, that is monitored *ex post*

(ii) *Ex post* calculated baseline minus project emissions based on actual monitored data for the project activity ($N_{LT,y}$, $MS\%_{i,y}$ and W_{site}).

$$ER_{y,es-post} = \min \left[\left(BE_{y,ex-post} - PE_{y,ex-post} \right), \left(MD_y - PE_{power,y,ex-post} \right) \right]$$

Where:

$ER_{y,ex-post}$	Emission reductions achieved by the project activity based on monitored values for year “y” (tCO ₂ e)
$BE_{y,ex-post}$	Baseline emissions calculated using formula 1 using ex post monitored values of $N_{LT,y}$ and if applicable $VS_{LT,y}$
$PE_{y,ex-post}$	Project emissions calculated using formula 4 using ex post monitored values of $N_{LT,y}$, $MS\%_{i,y}$ and if applicable $VS_{LT,y}$
MD_y	Methane captured and destroyed or used gainfully by the project activity in year “y” (tCO ₂ e)
$PE_{power,y,ex-post}$	Emissions from the use of fossil fuel or electricity for the operation of the installed facilities based on monitored values in the year “y” (tCO ₂ e)

The project uses gainfully the methane in the egg carton production and chicken breeding. All the combusted biogas in these processes will be measured separately. Furthermore, in emergency cases the biogas will be flared using the conditions of the flaring process.

MD_y will be calculated as follows:

$$MD_y = BG_{burnt,y} \times w_{CH4,y} \times D_{CH4,y} \times FE_y \times GWP_{CH4}$$

Where:

MD_y	Methane captured and destroyed/gainfully used by the project activity in the year y (tCO ₂ e)
$BG_{burnt,y}$	Biogas flared/combusted in year y (m ³)
$w_{CH4,y}$	Methane content in the biogas in the year y (mass fraction)
D_{CH4}	Density of methane at the temperature and pressure of the biogas in the year y (tonnes/m ³)
FE_y	Flare efficiency in year y (fraction)

3.9 ENVIRONMENTAL IMPACTS

ICONTEC validated that all the activities from La Calera Farm, including the biodigesters project, must fulfill the current environmental legislation within the poultry industry established by the environmental authority. La Calera has developed the environmental suitability and management plan (Programa de Adecuación y Manejo del Medio Ambiente, PAMA) and an environmental impact assessment (Estudio de Impacto Ambiental, EIA), which will be presented for approval to the relevant authorities. In this particular case, the PAMA and the EIA must be approved by the Head of the Environmental Affairs of the Natural Resources Institute (Instituto Nacional de Recursos Naturales, INRENA) of the Secretary of Agriculture.

The biodigesters installation for guano digestion within the biogas production has a positive impact when replacing fossil fuels used at the farm.

There is no existence of significant negative impacts. However, the environmental suitability and management plan (PAMA) and the environmental impact assessment, EIA will be submitted to the environmental authority.

The positive impacts are given by the substitution of fossil fuels and the elimination of methane emissions combined with bad odor.

3.10 COMMENTS BY LOCAL STAKEHOLDERS

Project Briefings have been given to La Calera Farm workers, as well as to the National Institutes of Natural Resources (INRENA) and the District Major of Alto Larán. Two meetings took place on October 16 of 2008, within La Calera installations in the Alto Larán Region. Project explanations were given at these meetings, to assistants that held discussions about it afterwards.

ICONTEC validated that no negative comments or complaints regarding environmental or social impacts of the project were expressed by any of the local stakeholders, hence no corrective measures are considered to be required.

4. COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD version 01 submitted by La Calera S.A.C. and CAF with the name: “La Calera Biodigesters project” was made publicly available at ICONTEC’s climate change website and UNFCCC website:

Parties, stakeholders and NGOs were invited to provide comments through the CDM website during a 30 days period from 22-12-2009 to 20-01-2010.

No negative comments or complaints regarding environmental or social impacts of the project were expressed by any of the local stakeholders, hence no corrective measures are considered to be required.

5. VALIDATION OPINION

ICONTEC has performed a validation of the “Calera Biodigesters Project”. 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 La Calera S.A.C., Manuel Estuardo Masías Marrou and CAF. Peruvian DNA has provided approval of voluntary participation and meets all requirements to participate in CDM. The Peruvian DNA confirmed that the project helps in achieving sustainable development.

The project correctly applies the methodologies:

AMS-III.D "Methane Recovery in animal manure management systems", Version 15

AMS-I.C "Thermal energy production with or without electricity", Version 16

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 22,116 tonnes CO₂eq per year over the selected 7 years crediting period. 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.

Bogotá, December 03, 2010



Fabio Tobón
Executive 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. Version 1.
- /2/ Legal applicable requirements of the project activity:
 - Ley General del Ambiente (General environmental law) Law # 26811
 - Ley General de Aguas (Water environmental law) Decree Law # 17752
 - Ley General de Residuos Sólidos (General law of solid waste) Law # 27314
 - Reglamento de estándares nacionales de calidad ambiental del aire (Environmental air quality) D.S. # 074-2001-PCM
 - Reglamento de estándares nacionales de calidad ambiental para ruido (Environmental quality standards for noise) D.S. # 085-2003-PCM
 - Reglamento sanitario del sistema avícola (Health Regulation poultry system) D.S. # 029-2007-AG
 - Reglamento de control y erradicación de la enfermedad de New Castle (Control and eradication of Newcastle disease) D.S. # 010-2003-AG
 - Plan de acción para la prevención de la enfermedad de influenza aviar en el Perú. (Disease prevention influenza aviar) R.J.# 230-2002 AG-SENASA.
- /3/ Purchase order of equipments, material or goods.
Specifications of the hens provided by the Distribution and commercialization companies.
- /4/ Letter of Approval, dated 25-11-2010 from the Peruvian DNA (Ministry of Environment).
- /5/ - Emission reductions calculation model
- Investment analysis model (summary)
- /6/ Records on the meeting to inform local stakeholders about the project activity (invitations, list of stakeholder invited, attendance sheet record)
- /7/ - "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28)
- "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39).
- "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion" (Version 02, EB 41)
- /8/ Functions' of technical personnel for the operation (Internal procedure)

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

- /9/ AMS-III.D "Methane Recovery in animal manure management systems", Version 15
AMS-I.C "Thermal energy production with or without electricity", Version 16
- /10/ Validation and Verification Manual of EB-UNFCCC (1.2).

ANNEX A. VALIDATION PROTOCOL

TABLE 1. MANDATORY REQUIREMENTS FOR 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	Yes, this project will assist Parties.
2. 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	Kyoto Protocol Art. 12.2, Procedures for Small Scale CDM Project Activities §23a	Partial OK	Letter of approval.(LoA) was issued by the Environmental Ministry for the project on November 25, 2010. Perú ratified the Kyoto Protocol in 2001.
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Yes, it is Peruvian project and this project contributes to sustainable development.
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved Each letter confirms that: (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.	Kyoto Protocol Art. 12.5a, Procedures for Small Scale CDM Project Activities §23a V/V Manual art.44 to 48	OK	Letter of approval of Perú (LoA) was issued by the Environmental Ministry for the project on November 25, 2010, indicating that the project is voluntary and contributes to sustainable development of the country.
5. The emission reductions shall be actual, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Yes, the emission reductions are calculated in chapter B.6 of the PDD and estimation of emission reductions is 22,116 per year of tonnes CO ₂ e in 7 years.

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
6. 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	Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43	OK	This project is additional, cannot be developed in the absence of CDM.
7. 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 of these parties	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	There is no public funding.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and procedures §29	OK	The Peruvian Environmental Ministry is DNA 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	The Party has ratified the Kyoto Protocol on 2001.
10. The participant Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	There is not an Annex I Party.
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	OK	There is not an Annex I Party.
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	The proposed project activity qualifies for small scale project as defined in Appendix B of M&P for small scale project activities (UNFCCC, 2006). Section B.2 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 is conforming to the latest template and guidance from the CDM Executive Board available at the website, for the date of the project.

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
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.2 in PDD.
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	Section E in PDD
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	La Calera has developed the environmental suitability and management plan (Programa de Adecuación y Manejo del Medio Ambiente, PAMA) and an environmental impact assessment (Estudio de Impacto Ambiental, EIA), which will be presented for approval to the relevant authorities. In this particular case, the PAMA and the EIA must be approved by the Head of the Environmental Affairs of the Natural Resources Institute (Instituto Nacional de Recursos Naturales, INRENA) of the Secretary of Agriculture
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	The PDD version 01 submitted by La Calera S.A.C. and CAF 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 22-12-2009 to 20-01-2010. No comments were received.
18. The project participants are listed in tabular form in section A.3 of the	V/V Manual art.51	OK	There are consistent with the

REQUIREMENT	Reference	CONCLUSION	Cross Reference / Comment
<i>PDD and this information is consistent with the contact details provided in annex 1 of the PDD.</i>			<i>contacts.</i>



TABLE 2 REQUIREMENTS CHECKLIST (ACCORDING VALIDATION AND VERIFICATION MANUAL)

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
General Description of Project Activity The project design is assessed.					
1. Approval					
All Parties involved have approved the project activity.	PDD and LoA	DR	All the PP has voluntary participation.	OK	OK
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.	PDD	I DR	Letter of approval of Perú (LoA) was issued by the Environmental Ministry for the project on November 25, 2010, indicating that the project is voluntary and contributes to sustainable development of the country.	OK	OK
2. Participation					
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.	PDD A.3 Annex 1	I DR	The following parties are involved in the project activity and have been approved by a Party to the Kyoto Protocol : La Calera S.A.C.(Perú) Manuel Estuardo Masías Marrou (Perú) CAF (Perú)	OK	OK
The approval of participation has been issued from the relevant DNA	Letter of approval UNFCCC	DR	DNA designated in Perú is the Environmental Ministry. Letter of approval of Perú (LoA) was issued by the Environmental Ministry for the project on November 25, 2010, indicating that the project is voluntary and contributes to sustainable development of the country.	OK	OK
3. Project design document					

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	OK	OK
3.2 Does the PDD correctly describe the project boundary, including the physical delineation? (components and facilities used to mitigate GHG's	PDD	DR I	Yes, the project boundaries are defined with precision. The project activity will be in La Calera Farm, Chincha Alta, Alto Laran district, Chincha Province, Region of Ica - Peru.	OK	OK
3.3. Will the project result in technology transfer to the host country?	PDD A.2	DR I	Yes, the project engineering design reflects current good practices through the technology used.	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	DR I	During the installation process and the initial operation periods there will be necessary support from technology providers. Regarding training issues, the personnel receipt the necessary training.	OK	OK
4. Project description					
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	DR	Yes, the PDD provides the reader with information necessary to understand clearly the activities to be undertaken by the project.	OK	OK
4.2 Duration of the Project/ Crediting Period Are the project's starting date and operational lifetime clearly defined and reasonable?	PDD B.5.	DR I	Yes, the starting date of the first crediting period is May 1, 2011 or according with the registration of the project.	OK	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, renewable for a total of three crediting periods, up to 21 years.	OK	OK
5. Baseline and monitoring methodology					
5.1 General requirements The baseline and monitoring methodologies selected by the	PDD	DR	Yes, the project applies the small scale	OK	OK

project participants comply with the methodologies previously approved by the CDM Executive Board.	B.1 AMS-III-D AMS I C		methodology: AMS-III-D and AMS I C		
5.1.1 Is the selected monitoring methodology in line with the approved methodology and is applicable for this project?	PDD B.7 AMS-III-D AMS I C	DR	The monitoring methodology is approved. It is described in Chapter B.7. "Application of a monitoring methodology and description of the monitoring plan" of the PDD	OK	OK
5.2 Applicability of the select methodology to the project activity 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.	PDD B.2 AMS-III-D AMS I C	DR	Formulae and equations used for calculating baseline emissions comply with the following methodologies: AMS-III.D "Methane Recovery in animal manure management systems", Version 15 AMS-I.C "Thermal energy production with or without electricity", Version 16 Following tools are used: - "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28) - "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39). "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02, EB 41)	OK	OK
5.3 Project boundary 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.	PDD B.3.	DR	The Project includes a physical delineation of the activities scope included in the calculation of project and the baseline emissions.	OK	OK

5.3.1 Have been all sources and GHGs required by the methodology included within the project boundary?	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
5.4 Baseline identification 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.	PDD B.4	DR	<p>Formulae and equations used for calculating baseline emissions comply with the following methodologies:</p> <p>AMS-III.D "Methane Recovery in animal manure management systems", Version 15 AMS-I.C "Thermal energy production with or without electricity", Version 16</p> <p>Following tools are used:</p> <ul style="list-style-type: none"> - "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28) - "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39). <p>"Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02, EB 41) 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.</p>	OK	OK
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 D.1 and D.2	DR	Yes, the national policy to manage was taken into account in the project, and the legislation applicable was referenced in Chapter D. 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	Yes, the PDD presents more than one scenario.	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 Annex	DR	Formulae and equations used for calculating baseline emissions comply with the monitoring methodology.	OK	OK
5.5 Algorithms and/or formulae used to determine emission reductions 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.	PDD Annex	DR	Formulae and equations used for calculating baseline emissions comply with the following methodologies: AMS-III.D "Methane Recovery in animal manure management systems", Version 15 AMS-I.C "Thermal energy production with or without electricity", Version 16 Following tools are used: <ul style="list-style-type: none"> - "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28) - "Tool to calculate baseline, project and/or leakage emissions from electricity 	OK	OK

			consumption" (Version 01, EB 39). - "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02, EB 41)		
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 Annex	DR	Formulae and equations used for calculating baseline emissions comply with the following methodologies (Spreadsheet Baseline calculation): AMS-III.D "Methane Recovery in animal manure management systems", Version 15 AMS-I.C "Thermal energy production with or without electricity", Version 16 Following tools are used: - "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28) - "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39). - "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02, EB 41)	OK	OK
6 Additionality of a project activity					
6.1 Prior consideration of CDM					
6.1.1 Is the start date of the project in accordance with the "Glossary of CDM terms"?	PDD B.5.	DR	Yes, the start date of the project complies with the definition in the Glossary of CDM terms.	OK	OK
6.1.2 If the project start date is prior to the date of publication of the PDD for stakeholder comments, have been	PDD	DR	The DOE verified that the demonstration of the CDM prior consideration had all the support	OK	OK

demonstrated that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity?	B.5.	I	documentation.		
6.1.3 Has the project been correctly identified as a new or existing project	PDD A.4.2	DR I	Yes, the project has been correctly identified as a new CDM project.	OK	OK
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?	PDD B.5	DR 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.	OK	OK
6.2 Identification of alternatives					
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?	PDD B.5 Step 1.	DR	Yes, the Alternatives are included without being registered as CDM project.	OK	OK
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 to be supplied by the proposed CDM project activity?	PDD B.5 Step 1.	DR	Yes, the project presents the alternatives that are possible in the Peruvian context.	OK	OK
6.2.3 Does the alternative comply with all applicable and enforced legislation?	PDD B.5.	DR	Yes, although in Perú specific legislation does not exist for this type of projects, the development of the activities addressed the fulfillment of legal requirements that could be applicable.	OK	OK
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	PDD B.5.	DR	Alternatives identified are credible and can occur in the context of the Peruvian context.	OK	OK

by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required)?					
6.3 Investment analysis (if applicable)					
<p>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)?</p>	PDD B.5	DR	<p>The project used the simple cost analysis defined in the tool for the demonstration and assessment of additionality", Version 05.2, dated August 26th, 2008, with this methodology it is demonstrated that the project is not economically feasible without CDM resources.</p> <p>The options as listed in the additionality tool include:</p> <ol style="list-style-type: none"> 1. Simple cost analysis 2. Investment comparison analysis 3. Benchmark analysis 	OK	OK
<p>6.3.2 Which approach has been selected to demonstrate 6.3.1?</p> <p>(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;</p> <p>(b) The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative;</p> <p>(c) The financial returns of the proposed CDM project activity would be insufficient to justify the required investment.</p>	PDD B.5	DR I	<p>As a result of the Benchmark analysis, in the table 9 of the PDD the following results are shown (see Financial spreadsheet):</p> <p>IRR base case without CER revenues 10% IRR with CER revenues 34% Benchmark 24%</p>	OK	OK
6.3.3 Have the parameters of the financial calculations been correctly used?	PDD B.5	DR I	As a result of the Benchmark analysis, in the table 9 of the PDD the following results are	OK	OK

			shown: IRR base case without CER revenues 10% IRR with CER revenues 34% Benchmark 24%		
6.3.4 Is the benchmark suitably applied?			N.A.		
6.3.5 Are the assumptions appropriate and the financial calculations correct?	PDD B.5	DR I	Yes, financial calculations are correct according to the information presented in the interview (See the financial calculation spreadsheet).	OK	OK
6.4 Barrier analysis (if applicable)			N.A.		
6.4.1 Does the CDM project activity face barriers that prevent the implementation of this type of projects?			N.A.		
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.		
6.5 Common practice analysis (For proposed large-scale CDM project activities, unless the proposed project type is first-of-its kind)			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.		
7 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.					
7.1 Is the selected monitoring plan in line with the approved methodology and are applicable for this project?	PDD B.7	DR I	Yes, the monitoring plan is in accordance with the follows methodologies: AMS-III.D "Methane Recovery in animal manure management systems", Version 15	OK	OK

			<p>AMS-I.C <i>"Thermal energy production with or without electricity", Version 16</i></p> <p>Following tools are used:</p> <ul style="list-style-type: none"> - <i>"Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28)</i> - <i>"Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39).</i> - <i>"Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02, EB 41)</i> 		
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.	OK	OK
7.3 Monitoring of Project Emissions <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.7.1	DR I	Yes, the equipment to be used for collection of GHG measuring data during the period of the project is included in B.7.1	OK	OK
7.4 Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>	PDD B.6.3	DR I	No leakage effects need to be accounted under these methodologies.		
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		
7.5 Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.	PDD	DR I	AMS-III.D "Methane Recovery in animal manure management systems", Version 15 AMS-I.C "Thermal energy production with or without electricity", Version 16 Following tools are used: <ul style="list-style-type: none"> - "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28) - "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39). - "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02, EB 41) 		
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 quantity of methane projected to be generated during a given year is estimated using a multi-phase model, based on a first order decay (FOD) model. The default values are given by the IPCC 2006 Guidelines.	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 indicators?	PDD B.6.3	DR I	Yes, it will be possible because is in accordance with the follow methodologies: AMS-III.D "Methane Recovery in animal manure management systems", Version 15	OK	OK

			<p>AMS-I.C "Thermal energy production with or without electricity", Version 16</p> <p>Following tools are used:</p> <ul style="list-style-type: none"> - "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28) - "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39). - "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02, EB 41) 		
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
7.6 Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
7.6.1 Is the authority and responsibility of project management clearly described?	PDD	DR I	Yes, This responsibilities are defined and included in the internal procedures.	OK	OK
7.6.2 Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD	DR I	Yes, This responsibilities are defined and included in the internal procedures.	OK	OK
7.6.3 Are procedures for training of monitoring personnel identified?	PDD	DR I	Yes, it is included in the internal procedures. . The training will be provided to the personnel.	OK	OK
7.6.4 Are procedures for emergency preparedness for cases where emergencies can cause unintended emissions identified?	PDD	DR I	Yes, Chapter B.7.2 takes into account the controls for emergency situations.	OK	OK
7.6.5 Are procedures for calibration of monitoring equipment identified?	PDD	DR	Yes, Chapter B.7.2 and in the internal procedures are indicated how the equipment calibrations will be	OK	OK

		I	done.		
7.6.6 Are procedures for maintenance of monitoring equipment and installations identified?	PDD	DR I	Yes, Chapter B.7.2 and in the internal procedures are indicated how the equipment calibrations will be done.	OK	OK
7.6.7 Are procedures for monitoring, measurements and reporting identified?	PDD	DR I	Yes, Chapter B.7.2 and in the internal procedures are identified the measurements, monitoring and reports that will be performed.	OK	OK
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)?	PDD	DR I	Yes, Chapter B.7.2 indicates that the monitoring is performed on line and in real time.	OK	OK
7.6.9 Are procedures for dealing with possible monitoring data adjustments and uncertainties identified?	PDD	DR I	Yes, Chapter B.7.2 indicates the procedure to be followed.	OK	OK
7.6.10 Are procedures for internal audits of GHG project compliance with operational requirements, where applicable, identified?	PDD	DR I	Yes, Chapter B.7.2 indicates the procedure to perform internal audit.	OK	OK
7.6.11 Are procedures for project performance review identified?	PDD	DR I	Yes, Chapter B.7.2 indicates the procedure to be followed.	OK	OK
7.6.12 Are procedures for corrective actions identified?	PDD	DR I	Yes, Chapter B.7.2 indicates the procedure to be followed.	OK	OK
7.7. Calculation of CDM Emissions by Source 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.					
7.7.1 Project GHG Emissions The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.					
7.7..1.1 Are all aspects related to direct and indirect GHG emissions captured in the project design?	PDD B.6.3	DR	Yes the project addressed the direct and indirect emissions.	OK	OK
7.7.1.1.2 Have all relevant GHG and sources been evaluated?	PDD	DR	Yes, all the sources were evaluated.	OK	OK

	B.6.3	I			
7.7..1.3 Do the methodologies for calculating project emissions comply with existing good practices?	PDD B.6.3	DR I	<p>AMS-III.D "Methane Recovery in animal manure management systems", Version 15</p> <p>AMS-I.C "Thermal energy production with or without electricity", Version 16</p> <p>Following tools are used:</p> <ul style="list-style-type: none"> - "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28) - "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01, EB 39). - "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02, EB 41) 	OK	OK
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 CO2e during 2011 - 2018, was done by verifying the data registered on the spreadsheet of the baseline emissions calculation,, applied by the Project developer.	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
7.8 Leakage 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.					
7.8.1 Are leakage calculation required for the selected project	PDD	DR		OK	OK

category and if yes, are the relevant leakage effects assessed?	B.6.3	I	No leakage effects need to be accounted under this methodology.		
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.3.	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.3.	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.3.	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.3.	DR I	Yes, it does. In the spreadsheet of the baseline calculation there is a description of this.	OK	OK
7.9.5 Are the calculation documented in a complete and transparent manner?	PDD Annex 3	DR I	Yes, a spreadsheet detailing the calculation is provided for validation. Please find background information regarding the calculation in PDD section B.6.3 above.	OK	OK

7.9.6 Have conservative assumptions been used	PDD B.3.	DR I	Yes, conservative data have been taken.	OK	OK
7.9.7 Are uncertainties in the baseline emissions estimates properly addressed?	PDD B.3.	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, a spreadsheet detailing the calculation was provided for validation. See the spreadsheet baseline calculation of the project.	OK	OK
7.10 Emission Reductions Validation of ex-ante estimated emissions.					
7.10.1 Will the project result in fewer GHG emissions than the baseline scenario?	PDD B.4	DR I	Yes, the results of the project's baseline emissions correspond fewer than the baseline.	OK	OK
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, a spreadsheet detailing the calculation is provided for validation. See the spreadsheet for the baseline calculation.	OK	OK
8 Sustainable development The project's contribution to sustainable development is assessed.					
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	Yes, the letter of approval by the DNA confirms the contribution of the project to the sustainable development.	OK	OK
8.2 Will the project create other environmental or social benefits than GHG emission reductions?	PDD Section D	DR	The project generates positive impacts by decreasing the generation of nasty smells and the emissions of GHG to the atmosphere.	OK	OK

8.3 Will the project create any adverse environmental or social effects?	PDD Section D	DR	Installation and operation of the equipment being part of the CDM project do not generate negative environmental impacts; therefore the environmental impact assessment was not carried out.	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 the host country?	PDD Section D	DR	There are not legal requirements that demand to do it.	OK	OK
9 Local stakeholders consultation					
9.1 Have relevant stakeholders been consulted?	PDD Annex 5	DR I	Yes, all relevant stakeholders were consulted. Please see the list of participants in Annex 5 of the PDD.	OK	OK
9.2 Have appropriate media been used to invite comments by local stakeholders?	PDD Annex 5	DR	The notification was done by invitations to community members, representatives of the municipality and regional government, the regional environmental institution,, universities, and NGOs 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 Annex 5	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 Section E.2 Annex 5	DR	In section E.2 and Annex 5 a summary of stakeholder comments is found.	OK	OK

9.5 Has due account been taken of any stakeholder comments received?	PDD Section E.2 Annex 5	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 22-12-2009 to 20-01-2010 . Parties, stakeholders and NGOs were invited to provide comments through the website. No comments were received during the public consultation.	OK	OK
10 Environmental impacts					
10.1 Does the host country legislation require analysis of the environmental impacts of the project activity?	PDD D.1.	DR	The environmental impacts will controlled during the construction activities and these have the supervision of the local environmental authorities.	OK	OK
10.2 Does the project comply with environmental legislation in the host country?	PDD D.1.	DR	There is not Peruvian environmental legislation with which the project has to comply with.	OK	OK
10.3 Will the project create any adverse environmental impacts?	PDD D.1.	DR	Installation and operation of the equipment being part of the CDM project do not generate negative environmental impacts; therefore the environmental impact assessment was not carried out. The environmental impacts are controlled during the construction activities and these have the supervision of the local environmental authorities.	OK	OK
10.4 Have environmental impacts been identified and addressed in the PDD?	PDD D.1.	DR	The project generates positive impacts.	OK	OK
SPECIFIC VALIDATION ACTIVITIES					

A.1 SMALL SCALE PROJECT ACTIVITY (IF APPLICABLE)


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-III-G Version 6	DR	In section B.2. of the PDD it is explained why the project activity refers to: AMS-III.D "Methane Recovery in animal manure management systems", Version 15 AMS-I.C "Thermal energy production with or without electricity", Version 16 And fulfills the criteria of total capacity lower than 60,000 tonnes CO ₂ -eq in every year of the first crediting period.	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

A.2 AFFORESTATION AND REFORESTATION (A/R) PROJECT ACTIVITIES UNDER THE CDM
A.2.1 Project Boundary

A.2.1.1 Does the PDD correctly describe the project boundary, including the physical delineation to the proposed afforestation or reforestation CDM project activity under the control of the project participants?			NA		
A.2.1.2 Does the project participants have for all areas of land planned for A/R CDM project activity, the control over afforestation or reforestation in accordance with the guidance specified in the EB 44 report, annex 16.42?			NA		

A.2.1.3 Does each discrete area of land has a unique identification?			NA		
A.3.1.4 Does the control include at minimum the exclusive right, defined in a way acceptable under the legal system of the host country?			NA		
A.2.2 Selection of carbon pools					
Is the carbon pool selected in accordance with the selected methodology?			NA		
A.2.3 Eligibility of land					
Is the land within the planed project boundary eligible for an A/R CDM project?			NA		
A.2.4 Conservative choice and application of default data					
The application of default data in estimation of the net anthropogenic GHG removals by sinks results is conservative.			NA		
The guidelines on conservative choice and application of default data in the net anthropogenic GHG removals by sinks has been applied correctly in order to prevent any overestimation of reduction in anthropogenic emissions.			NA		
A.2.5 Approach proposed to address non permanence					
Does the PDD describe the approach proposed to address non permanence in accordance with paragraph 38 of the modalities and procedures for afforestation or reforestation CDM projects?			NA		
A.2.6 Timing of management activities, including harvesting cycles and verifications.					
Do the forest management plan and the monitoring plan ensure that a systematic coincidence of verification and peaks in carbon stocks is avoided?			NA		
A.2.7 Socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems					

<i>The documentation submitted to the DOE contains the analysis of the socio-economic impacts and environmental impacts, including impacts on biodiversity and natural ecosystems, and impacts outside the project boundary of the proposed A/R project activity.</i>			NA		
A.3 PROJECT DESIGN OF SMALL-SCALE A/R PROJECT ACTIVITIES					
<i>A.3.1 The small scale A/R project activities use the A/R requirements describe above.</i>			NA		
<i>A.3.2 The project activity qualifies as a proposed small-scale A/R CDM project activity and complies with the threshold for the proposed small-scale A/R projects.</i>			NA		
<i>A.3.4 The project activity complied with one of the types of small-scale A/R project activities defined in appendix B of the annex to decision 6/CMP.1.</i>			NA		
<i>A.3.5 The baseline, monitoring methodology and the methodology are applied correctly.</i>			NA		
<i>A.3.6 The proposed CDM project activity is not a part of a debundled large-scale A/R project activity, in accordance with the rules defined in appendix C of the annex to decision 6/CMP.1.</i>			NA		
<i>A.3.7 The proposed CDM project activity has been developed or implemented by low-income communities and individuals as confirmed by the host Party.</i>			NA		
A.4 PROGRAM OF ACTIVITIES					
<i>A.4.1 Operational and management arrangements for the PoA. The operational management arrangements are suitable for the PoA, and the coordination/management has controls of all records and information related to the implementation of individual CPAs.</i>			NA		
<i>A.4.2 Eligibility criteria for CPAs The eligibility criteria in the POA-ADD are sufficient and</i>			NA		

	CHECK LIST OF VALIDATION OF CDM PROJECT ACTIVITY	51 of 67
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<i>include inter alia the means to demonstrating the additionality of the CPA and the applicability of the applied methodology.</i>					
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MoV: Means of verification

DR: Document review

I: interview

Validation Protocol Table 3: Resolution of Corrective Action, Forward Action and Clarification Request

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request			
Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
<p>CAR 1</p> <p>The written approval of the voluntary participation and the national registry of the Project by the Designated National Authority in accordance with Kyoto Protocol are not available.</p>	Kyoto Protocol	<p>Project Owner Response:</p> <p>The PDD was submitted to the DNA of Peru. Peruvian DNA issued the LoA on 25-11-2010.</p>	<p>Validation Team Response:</p> <p>The LoA was received by the Peruvian DNA (29-11-2010)</p> <p>Validation Team Conclusion:</p> <p>CLOSED</p>
<p>CAR 2</p> <p>The authority and responsibility for project management, registration of data, monitoring, measurement and reporting are not clearly described.</p> <p>There is not training plan defined for personnel responsible for the project activity.</p>	PDD and VVM	<p>Project Owner Response:</p> <p>The organizational set-up in annex 4 of the PDD shows the different responsibilities and how the project is managed. Unfortunately, the figure A4-1 was too small to catch all the important details. Therefore, figure A4-1 has been expanded and the layout of the PDD adapted. Furthermore, the different responsibilities are more detailed explained in the adjusted PDD.</p> <p>Also the training plan has been integrated</p>	<p>Validation Team Response:</p> <p>He developed a monitoring manual to give response to the related roles and responsibilities. Additionally, we included all aspects of protocols and procedures for project development.</p> <p>Validation Team Conclusion:</p> <p>Closed</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request

Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
		<p>in the adapted PDD.</p> <p>The monitoring manual was adjusted to the changes in the PDD and the manual was handed over to the DOE.</p> <p>The organigram with responsible persons has been eliminated from Annex 4</p>	
<p>CAR 3</p> <p>There are not procedures identified for day-to-day records handling (including what records to keep, storage area for records and how to process the performance documentation).</p> <p>There are not procedures identified for corrective actions.</p> <p>Neither there are procedures identified for calibration and maintenance of monitoring equipment.</p>	PDD	<p>Project Owner Response:</p> <p>The responsibilities and duties of each sector have been integrated in the PDD. The detailed work order for the monitoring must be elaborated through the main CDM responsible person because the daily procedure must be integrated in the daily farming process.</p> <p>Working orders will be supplied at the first verification.</p> <p>Corrective orders will be defined and are content of follow-up trainings.</p> <p>The calibration of all monitoring equipment must be made annually through an independent and accredited institute. The overall responsibility will be at the CDM project manager, Mr. Mauricio Flores. The different sector responsible persons have to organize it (see responsibilities in annex 4) according to</p>	<p>Validation Team Response:</p> <p>He developed a Monitoring Manual to give response to the related roles and responsibilities. Additionally, we included all aspects of protocols and procedures for project development.</p> <p>Validation Team Conclusion:</p> <p>Closed</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request

Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
		<p>the overall time-schedule. The following equipment must be monitored:</p> <ul style="list-style-type: none"> - 6 biogas flowmeters - 1 CH4 gas analyzer - all weighing equipment for guano - 3 flowmeters for liquid (liquid guano, water) - 1 temperature measure equipment of flare <p>The monitoring manual was adjusted to the changes in the PDD and the manual was handed over to the DOE.</p>	
<p>CAR 4</p> <p>Clause B.7.1 of the monitoring plan in the section QA/QC does not establish a preventive planning for the operation and measuring equipment that assures the reliability of the measurements included in the monitoring plan.</p> <p>Calibrations must be done with analysis of accredited laboratories.</p>	PDD	<p>Project Owner Response:</p> <p>The calibration of the monitoring equipment was added in the corresponding parameters of clause B.7.1, section QA/AC.</p> <p>A maintenance plan for all monitoring equipment will be integrated into the monitoring manual. This manual is handed over to the DOE.</p>	<p>Validation Team Response:</p> <p>The information that was not complete was completed in the tables in paragraph B.7.1.</p> <p>Validation Team Conclusion:</p> <p>Closed</p>
CLA 1	AMS-III.D 2(a)	<p>Project Owner Response:</p> <p>The biol coming from the digesters</p>	<p>Validation Team Response:</p> <p>The information that clarifies this issue</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request

Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
The project owner must show how he will do the disposal of the liquid phase sewage sludge after separating it before sending it to the lagoons.		<p>goes directly to the hill lagoon were it sediments. La Calera takes the biol from the upper levels of the lagoon and brings it to the second lagoon (river lagoon) that acts as deposit of the biol going to the irrigation system. The sludge from the lower part of the lagoons will be pumped to a centrifuge. The liquid part thereafter goes back to the lagoon and the solid (biosol) part is brought to the fields as solid fertilizer.</p> <p>Chapter A.4.2. has been adapted with this information.</p>	<p>was included in the PDD (A.4.2).</p> <p>Validation Team Conclusion:</p> <p>Closed</p>
<p>CLA 2</p> <p>The project owner should know the amount of minerals (N, P, K) that are brought to the fields to avoid contamination.</p>	AMS-III.D 2(a)	<p>Project Owner Response:</p> <p>The recommendation of analyzing the biol concerning N, P and K cannot be found in the mentioned methodology. Of course it must be secured that the minerals of the biol (or through solid sludge are not contaminating water sources (river or groundwater). But with the proposed analyses of minerals it cannot be proved that the water is not contaminated. Contamination is related to the way of</p>	<p>Validation Team Response:</p> <p>The methodology seeks to ensure that the application of sludge on the sold complies with appropriate conditions and procedures that do not result in methane emissions</p> <p>Validation Team Conclusion:</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request

Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
		<p>irrigating or bringing solid fertilizer to the field (old farming problem). Therefore we do not see any requests for analyzing these minerals regularly or integrate it into the monitoring.</p> <p>With the drop irrigation system in which the liquid fertilizer (biol) is brought to the fruit-trees drop by drop the retention time of the biol in the upper layers of the soil is long enough that all the nutrient are adsorbed in the soil or in the plants. With this irrigation system groundwater contaminations can be excluded.</p>	Closed
<p>CLA 3</p> <p>In clause B.7.1 of the Monitoring plan, in section QA/QC of the parameter Soils/sludge the organic compounds to be annually monitored for demonstrating the removal of more than 95% of them are not defined.</p> <p>Additionally, the QA/QC procedures for</p>	AMS-III.D 2 (b)	<p>Project Owner Response:</p> <p>The PDD has been adjusted for this parameter.</p> <p>The monitoring manual was adjusted according to the changes in the PDD and the manual was handed over to the DOE.</p>	<p>Validation Team Response:</p> <p>The information that was not complete was completed in the tables in paragraph B.7.1.</p> <p>Validation Team Conclusion:</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request

Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
this parameter that are defined in this section of the PDD do not allow assuring the reliability of the results obtained.			Closed
<p>CLA 4</p> <p>The following editorial inconsistencies were found:</p> <ul style="list-style-type: none"> - In section A.2 paragraph 5 it is indicated that figures 3 and 4 show the location of the flare, but these figures were not found. - The abbreviation for the variable "Fraction of manure handled in baseline animal manure management system "j" (MF%Bl,j)" used in section A.1.2 differs from that defined in B.7.1 for this parameter (MS%). - In the description of the data value for MS% parameter in section B.7.1 of PDD it is not clear the annex where the Table A.3.2 can be found, and the reference to the figure A4-3 of the Annex 4 about the description of the measuring 		<p>Project Owner Response:</p> <p>All inconsistencies have been eliminated in the adjusted PDD. The adjusted PDD version was sent to the DOE.</p>	<p>Validation Team Response:</p> <p>He revised the text of the PDD and eliminating the inconsistencies that had been identified.</p> <p>Reported twice variable DCH4 in the Baseline emission due to manure management.</p> <p>Validation Team Conclusion:</p> <p>Closed</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request

Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
<p>method is not correct.</p> <ul style="list-style-type: none"> - The source of data for the parameter BGflare,y in section B.7.1 was not included. - In section A.2.1 of Annex 3 the formula for BECH4,y has the parameter DCH4 repeated. 			
<p>CLA 5</p> <p>In the reference AMS-III.D.7 of Table 1: "Applicability of Methodologies Used for the Project Situation", the average value of emission reductions 22,239 tCO2/a is not correct regarding quantity and measuring unit.</p>	AMS-III-D.7	<p>Project Owner Response:</p> <p>The correct value has been inserted. It was an editorial mistake due to different emission reduction estimations within the project development.</p>	<p>Validation Team Response:</p> <p>The correction was made in the text of the PDD.</p> <p>Validation Team Conclusion:</p> <p>Closed</p>
<p>CLA 6</p> <p>The procedures for QA/QC of the parameter "Fraction of manure handled in animal manure management system j in year y (MS%) and the consumed energy (ECy) that are defined in this section of the PDD do not allow assuring the reliability of the results obtained.</p>	PDD	<p>Project Owner Response:</p> <p>This must be a misunderstanding. ECy is the electricity consumption based on the in-built capacity estimated according to paragraph 28 of AMS-III.D. ECy has never been compared with MS% because ECy is a purely calculated value. The QA for the total amount of guano</p>	<p>Validation Team Response:</p> <p>He was not comparing ECy with MS%, indicates that neither of these two variables are clearly defined in the PDD.</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request

Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
		<p>must be carried out according to AMS-III.D over the animal population. There is a correlation between biogas produced in the new digesters and the guano input in this new digesters. The comparison over years can be made in order to see if there are differences.</p> <p>We agree that the QA/QS cannot be assured with this comparison. MS% relies on the total guano flow and historical data. The historical data have been approved through the validation and therefore the QA can be limited to the QA of the total amount of guano.</p> <p>The PDD was adjusted accordingly.</p> <p>The monitoring manual was adjusted to the changes in the PDD and the manual was handed over to the DOE.</p>	<p>Validation Team Conclusion:</p> <p>Closed</p>
<p>CLA 7</p> <p>In section B.7.1 for QA/QC of the parameter "Flare efficiency in hour" there</p>	PDD	<p>Project Owner Response:</p> <p>We agree and adjusted the QA/QC paragraph of this parameter.</p>	<p>Validation Team Response:</p> <p>The correction was made in the text of</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request


Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
is not consistency in establishing an annual control to the flow meter by and external entity.		The monitoring manual was adjusted to the changes in the PDD and the manual was handed over to the DOE.	the PDD. Validation Team Conclusion: Closed
<p>CLA 8</p> <p>Formula (7) in the PDD is intended to be the project emissions due to physical leakage of biogas ($PE_{PL,y}$), but the term used is $BE_{CH,y}$</p> <p>It is required to clarify the formula (7) of the PDD, referred to project emissions due to physical leakage of biogas</p>	PDD	<p>Project Owner Response:</p> <p>The formula has been corrected in the PDD.</p>	<p>Validation Team Response:</p> <p>The correction was made in the text of the PDD.</p> <p>Validation Team Conclusion: CLOSED</p>
<p>CLA 9</p> <p>Formula (9) in the PDD is intended to be the project emissions due to electricity consumption ($PE_{power,y}$), but</p>	PDD	<p>Project Owner Response:</p> <p>The formula has been corrected in the PDD.</p>	<p>Validation Team Response:</p> <p>The correction was made in the text of the PDD.</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request

Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
<p>the term used is BE_{power}</p> <p>It is required to clarify the formula (9) of the PDD, referred to project emissions due to electricity consumption.</p>			<p>Validation Team Conclusion:</p> <p>Closed</p>
<p>CLA 10</p> <p>In the LEAKAGE Section of the PDD (page 31) it is said that “<i>No leakage is considered for the fuel switching part in accordance with AMS.I.C paragraph 27 as the energy efficiency technology equipment is not transferred from another activity</i>”. Nevertheless, paragraph 27 is not referred to Leakage emissions. Clarification must be given.</p>	PDD	<p>Project Owner Response:</p> <p>The reference in the PDD was wrong. The right article concerning the leakages is paragraph 28 not 27. The PDD has been adjusted.</p>	<p>Validation Team Response:</p> <p>The correction was made in the text of the PDD.</p> <p>Validation Team Conclusion:</p> <p>Closed</p>
<p>CLA 11</p> <p>In the EMISSION REDUCTIONS</p>	PDD	<p>Project Owner Response:</p> <p>The references for the used</p>	<p>Validation Team Response:</p> <p>The correction was made in the text of the PDD.</p>

Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request

Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
Section of the PDD, eq. 11 (page 31), the following definition is given: <i>"PEy,ex-post: Project emissions calculated using formula 4..."</i> Nevertheless, formula 4 is not referred to Project emissions. Clarification must be given.		equitation were wrong. The PDD has been corrected with the right references.	Validation Team Conclusion: Closed
CLA 12 It is required to explain the underlying criterion in the Emission reduction calculations using the formula 11 of the PDD.	PDD	Project Owner Response: The explanations concerning the ex-post calculation are added to the PDD.	Validation Team Response: The correction was made in the text of the PDD. Validation Team Conclusion: Closed
CLA 13 Since first step in Additionality analysis is the identification of alternatives, a summary of results of alternatives studied under Section B.4. (Description of baseline and its development) must be included in Section B.5 of	PDD	Project Owner Response: Summary of conclusion of chapter B4 has been added to not be repetitive.	Validation Team Response: The correction was made in the text of the PDD. Validation Team Conclusion: Closed

	CHECK LIST OF VALIDATION OF CDM PROJECT ACTIVITY	63 of 67
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Validation Protocol Table 3: Resolution of Clarification, Corrective and Forward Action Request			
Report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Validation conclusion
the PDD (Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the project activity).			

CLA: Clarification request, CAR: Corrective Action Request, FAR: Forward Action Request

ANNEX B
Annex 2
CV's of Verification Team

Lead Auditor
Eng. Juan Alberto Gracia

Chemical Engineer. National University of Colombia (1991)
Environmental Management Specialist – Libre University (Colombia)
DQS and EOQ Register of Environmental Auditor (Germany)

1992 – 1998

Responsible for Standardization Technical Committees in the areas of chemical products, paint products, food products (fresh and processed); Quality air test, quality water test, quality soil test, solid waste management, hazard material, Environmental Management systems (ISO 14000 series).

1998 - 2006

Administrative and technical management of Certification Staff for supporting the Department Director, especially in Environmental Certification ISO 14001 services.

Qualified as a Quality Lead auditor and Environmental Lead auditor; besides, ISO 9001 and ISO 14001 audits as lead auditor.

Performing of more than 200 audits of ISO 9001 and 150 audits of ISO 14001 in chemical, food, oil, petrochemical industrial sectors and waste disposal in landfill.

2003 - 2006

Coordination, structuring, implementation and criteria definition related to the service of validation and verification of CDM project activities.

Fellowship in Prototype Carbon Fund of World Bank about CDM procedures and methodologies (Washington and Geneva).

Conduction of validation and verification audits, being part of the DNV audit team, of the CDM Project Activities for: Río Amoya, La Vuelta y La Herradura, and Jepirachi.

2006 - 2009

Conduction as a GHG Lead auditor of:

- Verification of three verification periods of Santa Ana Hydroelectric plant project
- Verification of two verification period of Agua Fresca Multipurpose and Environmental Services Project
- Verification of Río Azul landfill gas project
- Verification of two verification periods of La Vuelta and la Herradura Hydroelectric Project
- 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 Verification of Monomeros Nitrous Oxide Abatement Project

- Validation of Cueva Maria Hydroelectric Project
- Validation of Methane Gas Capture and Fuel Switching at Compañía Argentina de Levaduras S.A.I.C. Plant Project
- Validation of Installation of a high-pressure/high-efficiency bagasse boiler to cogenerate heat and power
- Validation of Paysandú Clean Energy project
- Verifications of two verification periods of Monómeros Nitrous Oxide Abatement Project
- Verification of the La Joya Hydroelectric project
- Verification of the Landfill gas to energy facility at the Nejapa landfill site, El Salvador
- Verification of the RIMA fuel switch in Bocaiúva
- Verification of the La Venta II project
- Re-Validation Cervecería Hondureña methane capture project
- Verification of the all first crediting period of Cervecería Hondureña methane capture project
- Verification of the Guyana Skeldon Bagasse Cogeneration Project
- Validation of the Pardos Small Hydro Plant and LOGICarbon CDM Project
- Validation of the Pequí and Sucupira SPHs Plant and LOGICarbon CDM Project
- Validation of the Cambará and Embaúba SHPs Plant and LOGICarbon CDM Project
- Validation of the Improving energy efficiency in a new Gas Plant in Gibraltar – Colombia
- Validation of the Montenegro Landfill gas recovery and flaring
- Validation of the Pirgua Landfill gas recovery and flaring

CDM Auditor

Zoo Erika Urrego

Zootechnician

UNIVERSIDAD AGRARIA DE COLOMBIA

Specialist on 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 stated on 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 to reduce methane (CH₄) emissions issued by animal waste. To be aware of the Ecuadorian and Chilean methodologies already approved by the CDM's Executive Board for Hog Breeding Sector 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 to identify 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 unities 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 Chamelecon project
- Validation of Macano hydroelectric project
- Verification of Doña Juana Landfil 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 two verification periods of Agua Fresca Multipurpose and Environmental Services Project
- Verification of two verification of La Vuelta and la Herradura Hydroelectric Project
- Verification of one verification period of La Venta II project
- 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
- Validation of Cueva Maria Hydroelectric Project
- Validation of Installation of a high-pressure/high-efficiency bagasse boiler to cogenerate heat and power
- Validation of La Calera Biodigesters Project