Appendix A[1] to the simplified modalities and procedures for small-scale CDM project activities

CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL SCALE PROJECT ACTIVITIES (SSC-PDD)
Version 01 (21 January, 2003)

Introductory Note

1. This document contains the clean development mechanism project design document for small-scale project activities (SSC-PDD). It elaborates on the outline of information in appendix B "Project Design Document" to the CDM modalities and procedures (annex to decision 17/CP.7 contained in document FCCC/CP/2001/13/Add.2) and reflects the simplified modalities and procedures (herewith referred as simplified M&P) for small-scale CDM project activities (annex II to decision 21/CP.8 contained in document FCCC/CP/2002/7/Add.3).

2. The SSC-PDD can be obtained electronically through the UNFCCC CDM web site (http://unfccc.int/cdm/ssc.htm), by e-mail (cdm-info@unfccc.int) or in print from the UNFCCC secretariat (Fax: +49-228-8151999).

3. Explanations for project participants are in italicized font *(e.g. explanation)*.

4. The Executive Board may revise the SSC-PDD if necessary. Revisions shall not affect small-scale CDM project activities validated prior to the date at which a revised version of the SSC-PDD enters into effect. Versions of the SSC-PDD shall be consecutively numbered and dated. The SSC-PDD will be available on the UNFCCC CDM web site in all six official languages of the United Nations.

5. In accordance with the CDM modalities and procedures, the working language of the Board is English. The completed SSC-PDD shall therefore be submitted to the Executive Board in English.

6. Small-scale activities submitted as a bundle, in accordance with paragraphs 9 (a) and 19 of the simplified M&P for small-scale CDM project activities, may complete a single SSC-PDD provided that information regarding A.3 (*Project participants*) and A.4.1 *(Location of the project activity)* is completed for each project activity and that an overall monitoring plan is provided in section D.

7. A small-scale project activity with different components eligible to be proposed[2] as a small-scale CDM project activity may submit one SSC-PDD, provided that information regarding subsections A.4.2 (*Type and category(ies) and technology of project activity*), and A.4.3 (*brief statement on how anthropogenic emissions of greenhouse gases (GHGs) by sources are to be reduced by the proposed CDM project activity)* and sections B *(Baseline methodology)*, D *(Monitoring methodology and plan)* and E

[1] This appendix has been developed in accordance with the simplified modalities and procedures for small-scale CDM project activities (contained in annex II to decision 21/CP.8, see document FCCC/CP/2002/7/Add.3) and it constitutes appendix A to that document. For the full text of the annex II to decision 21/CP.8 please see http://unfccc.int/cdm/ssc.htm).

[2] In paragraph 7 of simplified M&P for small-scale CDM project activities, on clarifications by the Executive Board on small-scale CDM project activities, the Board agreed that in a project activity with more than one component that will benefit from simplified CDM modalities and procedures, each component shall meet the threshold criterion of each applicable type, e.g. for a project with both a renewable energy and an energy efficiency component, the renewable energy component shall meet the criterion for "renewable energy" and the energy efficiency component that for "energy efficiency".

(Calculation of GHG emission reductions by sources) is provided separately for each of the components of the project activity.

8. If the project activity does not fit any of the project categories in appendix B of the simplified M&P for small-scale CDM project activities, project proponents may propose additional project categories for consideration by the Executive Board, in accordance to paragraphs 15 and 16 of the simplified M&P for small-scale CDM project activities. The project design document should, however, only be submitted to the Executive Board for consideration after it has amended appendix B as necessary.

9. A glossary of terms may be found on the UNFCCC CDM web site or from the UNFCCC secretariat by e-mail (cdm-info@unfccc.int) or in print (Fax: +49-228-8151999).

CONTENTS

A. General description of project activity

A.1 Title of the project activity:

Santa Rosa ("the project").

A.2 Description of the project activity:

(Please include in the description
- the purpose of the project activity
- the view of the project participants on the contribution of the project activity to sustainable development (max. one page).)

The proposed project is a bundle of 3 small run-of-river hydropower plants located in Lima-Peru in the Santa Rosa Irrigation[3] in the Sayán District. The purpose of the project is renewable electricity generation to be supplied to the National Interconnected Electric Grid (*"SEIN")*. The project's installed capacity and projected yearly average generation is 4.1 MW and 30.1 Gigawatts hours ("GWh"), respectively[4].

	Installed Capacity (MW)	Expected Electricity Generation (GWh/yr)
Santa Rosa I	1.1	7.9
Santa Rosa II	1.5	12.0
Santa Rosa III	1.5	10.2
The project	4.1	30.1

Source: The project's feasibility study.

The project is expected to displace 96,915 tons of carbon dioxide equivalent ("tCO2e") in the first 7-year crediting period, generating an equivalent amount of certified emission reductions ("CERs"). The project takes advantage of 3 canal rapids in the 30-km water channel[5] derived from the Huara[6] River by means of the Santa Rosa irrigation water intake, to the irrigation site. Santa Rosa I, II and III are in a cascade, located in three slopes of 29.05 meters, 50 meters, and 50 meters net head; with a nominal water flow of 5.25m^3/s, 4.5 m^3/s, and 4.5 m^3/s, respectively. The design of the project provides for a power house for each turbine (1.1MW, 1.5MW and 1.5MW). The water flow used by Santa Rosa I is almost the same as the water that has been captured by the Santa Rosa derivation channel. Santa Rosa II and III will use less water as they are located downstream and there is more agricultural irrigation outflow in between. These plants work in sequence, i.e. Santa Rosa III will use water already turbinated by Santa Rosa II, and the latter will use water already turbinated by Santa Rosa I.

The project will supply electricity to the *SEIN* by connecting to the 22.9 KV transmission line that belongs to the privately-owned energy distributor for the north of Lima, EDELNOR. Each of the 3 small hydropower plants will use its own 22.9/2.3 KV substation and transmission line for this purpose.

The project contributes to sustainable development by:

a) Assisting the *SEIN* to keep thermal plants shut and use them only as stand-by power generation, therefore, displacing expensive heavy fuel, diesel, coal and gas fired generation and at the same time; reducing CO2 emissions to the atmosphere by generating energy without greenhouse gases ("GHGs") emissions.

b) Employing local labour in construction and plant management.

c) Purifying/cleaning of the water for irrigation.

[3] Which has more than 40 years in operation.
[4] When the 3 small run-of-river hydropower plants are in operation.
[5] Santa Rosa derivation channel.
[6] Which is one of the largest rivers on the Peruvian coast.

d) Facilitating electricity access by serving demand that otherwise would suffer blackouts in the zone, due to failures in the already existing EDELNOR 66 KV transmission line.

e) Influencing population to buy electricity from the grid due to reliable electricity service quality in the zone instead of opting to continue living in the dark or continue using generation sources that emit GHGs.

f) Serving as a small demonstration project for clean renewable electricity generation in the country, functioning as an independent power producer ("IPP").

g) Contributing to Peru's fiscal accounts through the payment of taxes.

h) Helping the country improve the hydrocarbons trade balance through reduction of oil imports to be used for electricity generation.

i) The project's sponsor ("the sponsor") agreed to share part of the CERs income with the community of La Merced and also to provide free electricity to the neighbouring orphanage, which is run by a non-governmental organization named *Asociacion Achalay*.

A.3 Project participants:

(Please list Party(ies) and private and/or public entities involved in the project activity and provide contact information in annex 1 of this document.)

(Please designate one of the above as the official contact for the CDM project activity.)

Electrica Santa Rosa SAC: The project's sponsor

The Community Development Carbon Fund ("The CDCF"): The International Bank for Reconstruction and Development is the Trustee of the CDCF and purchases certified emissions reductions on the behalf of the CDCF' participants.

The Official Contact for the Clean Development Mechanism ("CDM") project activity will be the CDCF.
Official Contact Person:
Senior Financial Specialist Francisco Fernández-Asín

A.4 Technical description of the project activity:

A.4.1 Location of the project activity:

Andean Region, South America, Peru, Lima.

A.4.1.1 Host country Party(ies):

Republic of Peru.

A.4.1.2 Region/State/Province etc.:

Department of Lima/Huara Province/Sayán District.

A.4.1.3 City/Town/Community etc:

Sayán Town.

A.4.1.4 Detailed description of the physical location, including information allowing the unique identification of this project activity *(max one page)*:

The project is located in the Department of Lima in the Santa Rosa irrigation in the Sayán District, approximately 130 km north east of Lima. The access from Lima is reached by following the Panamericana Norte highway until the deviation to Sayán (located approximately 2 hours drive from Lima). Santa Rosa I is located at a relatively short distance from the deviation to Sayán (approximately 20 minutes driving); Santa Rosa II is located 2 km downstream and Santa Rosa III is located 2 km downstream Santa Rosa II.

The Project in the *SEIN*

Source: *SEIN* Map taken from Committee of Economical Operation of the *SEIN* (*"COES")* 2003's Statistics.

A.4.2 Type and category(ies) and technology of project activity

(Please specify the type and category of the project activity using the categorization of appendix B to the simplified M&P for small-scale CDM project activities, hereafter referred to as appendix B. Note that appendix B may be revised over time and that the most recent version will be available on the UNFCCC CDM web site.

In this section you shall justify how the proposed project activity conforms with the project type and category selected (for simplicity, the rest of this document refers to "project category" rather than "project type and category").

If your project activity does not fit any of the project categories in appendix B, you may propose additional project categories for consideration by the Executive Board, in accordance with paragraphs 15 and 16 of the simplified M&P for small-scale CDM project activities. The final SSC-PDD project design document shall, however, only be submitted to the Executive Board for consideration after the Board has amended appendix B as necessary.)

(This section should include a description of how environmentally safe and sound technology and know-how is transferred to the host Party, if such a transfer is part of the project.)

The project falls into:

-Type I: Renewable Energy Projects
-Category D: Renewable electricity generation for a grid.

The project conforms with this category because it is a hydropower plant that will supply electricity to a grid.

The technology to be used is traditional run-of-the-river hydropower plants, low impact water intakes, small canals, and penstocks leading turbines. The project will benefit from the existing irrigation infrastructure, reducing civil works costs. All turbinated water is discharged back to the existing canals in unaltered conditions other than cleaner.

The project has transferred environmentally safe and sound technology and know-how to Peru by:

-Serving as a small demonstrative project for clean renewable electricity generation in the country, functioning as an IPP. This is only possible in Peru after the Electric Concessions Law of 1992 ("ECL"), which separated the electricity business in generation, transmission and distribution. The ECL aimed at breaking the monopolistic conception of the electricity business in Peru and at welcoming private investment. The project constitutes a model that, if successful, can be replicated in other locations of the country.

-Hiring local labour in all of its implementation phases, including the design and execution of civil works. During operation, all the staff working in operation and maintenance of the project will be local people, previously trained if necessary.

A.4.3 Brief statement on how anthropogenic emissions of greenhouse gases (GHGs) by sources are to be reduced by the proposed CDM project activity:

(Please state briefly how anthropogenic greenhouse gas (GHG) emission reductions are to be achieved (detail to be provided in section B.) and provide the estimate of total anticipated reductions in tonnes of CO_2 equivalent as determined in section E. below.)

The project will generate electricity without emitting GHGs and supply it to the *SEIN*, hence the project will displace fossil-fuel based electricity generation that otherwise would be supplied to the *SEIN*. The baseline emissions are deemed to represent emissions that would occur in the absence of the project, and therefore emissions that will be mitigated by the project; given that the project is additional under Attachment A of Appendix B. The question of additionality is analyzed under B.3.

The formulae used to estimate the anthropogenic emissions by sources of GHG's in the baseline, which can be seen under E.1.2, is based on the project's baseline emissions calculation described in methodology AMS-ID, for a system where **not** all generators use exclusively fuel oil and/or diesel fuel. Following baseline methodology AMS-ID, the project is estimated to reduce 340,207 tCO2e during the first 21 years of operation (or 3 first crediting periods), which account for 96,915 estimated ERs for the duration of the initial 7-year crediting period and 17,378 estimated ERs every year thereafter until the 21st year.

A.4.4 Public funding of the project activity:

(Indicate whether public funding from Parties included in Annex I is involved in the proposed project activity. If public funding from one or more Annex I Parties is involved, please provide information on sources of public funding for the project activity in annex 2, including 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 those Parties.)

The project has not received any type of public funding or public financial help. Moreover, the project is wholly owned by the sponsor, a Peruvian private firm.

A.4.5 Confirmation that the small-scale project activity is not a debundled component of a larger project activity:

(Please refer to appendix C to the simplified M&P for the small-scale CDM project activities for guidance on how to determine whether the proposed project activity is not a debundled component of a larger project activity.)

Following Annex C, the project is not deemed to be a debundled component of a large project activity because there is not a registered small-scale CDM project activity or an application to register another small-scale CDM project:

-With the same project participants
-In the same project category and technology/measure;
-Registered within the previous 2 years; **and**
-Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

Hence, the project is eligible as a small-scale CDM project and can use the simplified modalities and procedures for small-scale CDM project activities.

B. Baseline methodology

B.1 Title and reference of the project category applicable to the project activity:

(Please refer to the UNFCCC CDM web site for the most recent list of the small-scale CDM project activity categories contained in appendix B of the simplified M&P for small-scale CDM project activities.)

According to the most recent version of Appendix B, the type and category of the project activity for the project is as follow:

-Type I: Renewable Energy Project
-Category D: Renewable electricity generation for a grid

B.2 Project category applicable to the project activity:

(Justify the choice of the applicable baseline calculation for the project category as provided for in appendix B of the simplified M&P for small-scale CDM project activities.)

The project falls into project category I.D. because it is a hydropower plant that will supply renewable electricity to a grid. Hence, the applicable baseline calculation methodology for the project is AMS-ID, which is provided in Appendix B.

The baseline scenario for a CDM project activity is the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would have occurred in the absence of the project.

The project's baseline calculation takes the option specified in methodology AMS-ID, for a system where **not** all generators use exclusively fuel oil and/or diesel fuel. The baseline formula used is stated under E.1.2.

B.3 Description of how the anthropogenic GHG emissions by sources are reduced below those that would have occurred in the absence of the proposed CDM project activity *(i.e. explanation of how and why this project is additional and therefore not identical with the baseline scenario)*

(Justify that the proposed project activity qualifies to use simplified methodologies and is additional using attachment A to appendix B of the simplified M&P for small-scale CDM project activities.)

(National policies and circumstances relevant to the baseline of the proposed project activity shall be summarized here as well.)

The project is additional because it would not have occurred anyway due to the four barriers listed in Attachment A to Appendix B.

(a) Investment Barrier: There is one financially more viable alternative identified that would have lead to higher emissions: Natural gas-fired simple cycle gas turbines.

The investment barriers the project encountered were:

- The high cost of financing and low sophistication in guarantee instruments in Peru's financial markets impose a barrier to entry to the highly capital-intensive hydropower generation industry; making the gas-fired generation a more reachable alternative.

A hydropower plant investment is needier of financing than a gas-fired power plant because of the much higher up-front investment cost needed for the prior. The table below shows that the turnkey cost[7] per MW of a run-of-river hydropower plant ($975,000) is more than double that of a simple cycle gas power plant ($475,000), on average.

Technology Comparison	Simple Cycle Gas Turbine	River Hydro
Size Range (MW)	0.5 - 450	.02 - 1
Efficiency (%)	21% - 45%	60-70%
Gen Set Cost ($/MW)	300,000 to 600,000	NA
Turnkey Cost-No Heat Recovery ($/MW)	**300,000 to 650,000**	**750,000 to 1,200,000**

Source: Meherwan P. Boyce, Ph.D, P.E (2002); "Gas Turbine Engineering Handbook", p.8

The Project Cost ($)	Santa Rosa I	Santa Rosa II	Santa Rosa III
Size Range (MW)	1.1	1.5	1.5
Civil Works	150,000	430,000	450,000
Equipment Supplies	600,000	620,000	650,000
Installation, Commissioning	100,000	150,000	150,000
Total	850,000	1,200,000	1,250,000
Turnkey Cost ($/MW)	772,727	800,000	833,333

[7]Turnkey meaning the investment needed to put a power plant in operation.

Source: The project's feasibility study.

Recently, the Economist Intelligence Unit Limited (February 8, 2005), EIU Riskwire – commented on Peru's financial risk and cost of capital, as follows: "Corporate finance is widely available, but costly, with average commercial interest rates for dollar loans around 10%, and for local currency loans around 15-20%"; It added that "Banks remain wary of lending to small and medium-sized businesses, and will do so until the economy shows strong signs of growth and the bad-debt ratio falls further."

-Debt funding is not available for this type of innovative project activities. The project was considered riskier than a usual investment in generation because it was much smaller than hydropower plants in the *SEIN*[8], it was competing in an economies of scale-known business (generation); it was more exposed to natural phenomena than a gas-fired generation alternative, and the sponsor and other potential equity holders involved in the project were not well-known international companies or institutions. For 2 years the sponsor unsuccessfully looked for any amount and type of debt-financing for the project, at any cost. Several local private banks approached by the sponsors, but did not offer any interest rate and rather refused any lending to the project, unless the sponsor provided liquid monetary guarantees to collateralize 100% of the total project's investment cost.

-Access to international capital markets has been restricted for the sponsor because of the low investment needed for the project relatively to the international financiers' loans' sizes; and the high cost of the due diligence and other transactions required by them, typically. Multilateral agencies and international private equity funds were presented the project but the sponsor did not receive any proposal of funding from these agencies and funds.

In this scenario, only the prospects of carbon finance revenue were capable of lower the barriers investments faced by the project. To illustrate, carbon finance could reduce the hydropower plant overage turnkey cost of US$975,000/MW in 9%[9]. Depending upon the load factor, the impact of carbon finance on the financial viability of the project could be even greater.

(b) Technological barrier: There is one technologically more viable option identified that would have lead to higher emissions: Fossil fuel-fired power plants.

-Santa Rosa is the only small-scale hydropower plant less-than-5MW that has been built in the *SEIN* since 1918.[10] Evidently, small hydropower plants are not a common practice and as a result there is no broad experience to emulate, increasing technological risks due to performance uncertainty. The lack of experience was a strong concern among local financiers and a major contributor to the project's financial risk.

-Regardless of size, fossil fuel-fired plants are a less technological advanced option. Apart from the equipment, they do not need require other major investment and can be placed almost everywhere (as close as necessary to the final client reducing transmission-line investment costs considerably). Given that the particular hydrological and geological conditions and possible design failures only can be fully known ex-post, hydropower plants constitute a much more challenging investment than fossil fuel-fired plants, in terms of technology. Moreover, hydropower plants' are more vulnerable to natural events including earthquakes and droughts, which increase probabilities of technical inconveniences.

(c) Barrier due to prevailing practice: Existing pro-Camisea[11] policies would have led to the implementation of a technology with higher emissions, which is natural gas-fired electricity generation.

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[8] Except for HERCA, which is the only hydropower plant in the SEIN smaller that the project.

[9] Taking a 65% load factor, 1 MW will generate 5,694 MWh, which could reduce 5,694 times 0.57739 (baseline emission factor, which calculation can be seen under E.1.2) , or 3,288 tCO2 (ERs). Considering a price of $3.5 per ER in 21 years, the 1 MW would receive $87,024 in net present value at 12% discount rate. Hence out of an average turnkey cost per MW ($975,000/MW) a 9% turnkey cost reduction will be achieved, approximately.

[10] As of December 2003, only 4 plants out of 59 plants in the *SEIN* are smaller than 5 MW. Only HERCA (1.02 MW), built in 1918, is a renewable energy activity.

[11] "The San Martin and Cashiriari fields, jointly known as Block-88 ("Camisea") are home to one of the most important non-associated natural gas reserves in Latin America. The Camisea reserves are ten times greater than all other existing natural gas reserves in Peru"-Source:

After the exit of Shell, in mid 1998, the Government decided to aggressively promote thermal technology based on natural gas. Beginning that same year, it halted the definitive and temporal concessions for hydropower plants through Law 26980 issued in September 1998, Law 27133 issued in June 1999, and Law 27239 issued in December 1999[12]. No hydropower plants definite concessions were granted in 1999 to 2000[13], showing the clear impact and determination of President Fujimori's laws against hydropower plants developments and in favor of gas-fired electricity generation. This procedure had two main impacts, less new experience with hydropower development in Peru and increased risk in Peru's hydropower generation industry as perceived by foreigners as well as by locals due to biased sectoral political interventions in the market.

Around August 2004th, the date of the Camisea project commissioning, the government released laws DS 019-2004 on June 25th, 2004[14] and DS 041-2004-EM on November 24th, 2004[15]; and DS 107-2004-EF on August 5th, 2004[16]; to promote natural gas based electricity generation and to exempt the selective consumption tax to gas, respectively. These three laws released aimed at making gas an even more competitive option for generation.

Furthermore, the government has recently completed the technical studies of the "Country Gasification Project", which considers the installation of regional natural gas pipelines to transport the Camisea gas to Ayacucho, Cuzco, Ica, and Junin; and announced that the next step would be the selection of investors to build those natural gas pipelines. On promoting investment on gas pipelines, the government gave Supreme Decree 038-2004 on October 21st, 2004, Supreme Decree 016-2004-EM on June 10th, 2004; Supreme Decree 018-2004-EM on June 16th, 2004. These 3 laws clarified gas pipeline installations' security measures and ownership requirements, paving the way for new investments.

The impact of this government-driven project on electricity prices is devastating for hydropower developers who now have to compete not only with a cheaper technology available (combined cycle plants), but also with a much cheaper locally available fuel.

According to *MINEM*[17], the two expected Camisea impact scenarios for Peru's electricity industry are: 1) Hydro-thermal Scenario: At the end of 2027, the *SEIN* will have an installed capacity of 66% thermal and 34% hydro. The current situation of the installed capacity of the *SEIN* is 40% thermal and 60% hydro. 2) Thermal Scenario: If all the additions in electricity generation would be natural gas-fired thermal plants, at the end of 2027 the *SEIN* would have an installed capacity 75% thermal and 25% hydro. In both scenarios, the electric sector would be the main consumer of the Peruvian natural gas industry. In the hydro-thermal scenario the demand would be 800 million cubic feet per day ("MMCFPD") and in the thermal scenario would be 1000 MMCFPD by 2027.

(d) Other barriers: Options for hydropower development are limited in Peru today because almost all the

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www.camisea.com.pe. Camisea was discovered between 1983 and 1987, but the Camisea project only recently became operational, in August 2004. Moreover, the acquisition of the concession rights for the block 56 (Pagoreni), which would enlarge the proven reserves of Natural Gas in Peru has been granted already for exploration and exploitation.

[12](1)September 27th, 1998: Law 26980 – "Law that modified several articles and definitions annexed to ECL". On its third Transitory Disposition mandated the suspension for 9 months in the presentation of requests for temporal and definite concessions for hydropower plants. (2)June 4th, 1999: Law 27133 – "Law of Promotion of the Natural Gas Industry" – On its Unique Complementary Disposition extended the suspension of hydropower plants for 12 additional months from June 1999. (3)December 22nd, 1999: Law 27239 – "Law that modified several articles of the ECL" - On its Unique Complementary Disposition mandated that priorities to admit new temporal and definitive concession in hydropower plants would be determined as a function of the national development.

[13] Source: Last-10-year list of definite concessions granted by Peru's Department Energy and Mines ("*MINEM*").

[14] Indicates that for the next 2 years from June 25th, 2004, the guarantee required by article 66 of the ECL Rules will be reduced to 0.25% (before 1%) of total project budget with a ceiling of 200 UIT("*Unidad Impositiva Tributaria*") (before 500 UIT), when the request for Authorization is for natural gas-based electricity generation.

[15] Supreme Decree that promotes the installation of thermal plants that use natural gas as fuel.

[16] Clarifies that natural gas on its gassy-state will not be comprised in the New Appendix III , which attains Selective Consumption Tax ("ISC") affection only, of the Value Added Tax's *Texto Unico Ordenado* and ISC Law.

[17] *MINEM*-Electricity General Directive, http://www.minem.gob.pe/electricidad/estadisticas/informativo/informativo8.pdf.

best locations have been already given in concession to private firms. Identify geographical appropriate features take longer time nowadays.

In summary, the available information clearly shows that ERs will not be generated in the absence of the proposed project activity because (a) simple cycle natural gas-fired-plants are more financially viable than hydropower plants in Peru (b) fossil-fuel fired plants are a less technologically advanced alternative involving lower risks, (c) national policies, sectoral policies and the particular circumstance created by Camisea fosters fossil-fuel based power-generation technology by using Camisea natural gas and (d) other barriers. Because opting for more viable alternatives than the project would have led to higher emissions the project is additional under Attachment A to Appendix B.

B.4 Description of the project boundary for the project activity:

(Define the project boundary for the project activity using the guidance specified in the applicable project category for small-scale CDM project activities contained in appendix B of the simplified M&P for small-scale CDM project activities.)

According to methodology AMS-ID, the project boundary encompasses the physical, geographical site of the renewable electricity generation source. Hence, the project boundary is the area in the Santa Rosa Irrigation where Santa Rosa I, II and III powerhouses and transmission lines are placed. As the transmission lines reach the *SEIN* by interconnecting to EDELNOR transmission line, the *SEIN* will also be included in the project's boundary.

B.5 Details of the baseline and its development:

B.5.1 Specify the baseline for the proposed project activity using a methodology specified in the applicable project category for small-scale CDM project activities contained in appendix B of the simplified M&P for small-scale CDM project activities:

The project's baseline calculation takes the option specified in methodology AMS-ID, for a system where **not** all generators use exclusively fuel oil and/or diesel fuel. The baseline formula used is detailed under E.1.2

B.5.2 Date of completing the final draft of this baseline section *(DD/MM/YYYY)*:
The final draft of this baseline section was completed on 21/02/2005.

B.5.3 Name of person/entity determining the baseline:
(Please provide contact information and indicate if the person/entity is also a project participant listed in annex 1 of this document.)

Senior Financial Specialist
Francisco Fernández-Asín
The CDCF
Washington, DC, USA,
USA.
The CDCF is also a project participant listed in annex 1 of this document.

C. Duration of the project activity and crediting period

C.1 Duration of the project activity:

C.1.1 Starting date of the project activity:
(For a definition of the term "starting date", please refer to the UNFCCC CDM web site).
01/05/2003 (DD/MM/YYYY).

C.1.2 Expected operational lifetime of the project activity: *(in years and months, e.g. two years and four months would be shown as: 2y-4m.)*
The project operational life-time is 43y-2m.

C.2 Choice of the crediting period and related information: *(Please underline the selected option (C.2.1 or C.2.2) and provide the necessary information for that option.)*
(Note that the crediting period may only start after the date of registration of the proposed activity as a CDM project activity. In exceptional cases, the starting date of the crediting period can be prior to the date of registration of the project activity as provided for in paragraphs 12 and 13 of decision 17/CP.7 and in any guidance by the Executive Board, available on the UNFCCC CDM web site.)

C.2.1 Renewable crediting period *(at most seven (7) years per crediting period)*

C.2.1.1 Starting date of the first crediting period *(DD/MM/YYYY)*:
01/08/2004.

C.2.1.2 Length of the first crediting period *(in years and months, e.g. two years and four months would be shown as: 2y-4m.)*:
7y-0m.

C.2.2 Fixed crediting period *(at most ten (10) years)*:

C.2.2.1 Starting date *(DD/MM/YYYY*):
N/A.

C.2.2.2 Length (max 10 years): *(in years and months, e.g. two years and four months would be shown as: 2y-4m.)*
N/A.

D. Monitoring methodology and plan

(The monitoring plan shall incorporate a monitoring methodology specified for the applicable project category for small-scale CDM project activities contained in appendix B of the simplified M&P for small-scale CDM project activities and represent good monitoring practice appropriate to the type of project activity.

The monitoring plan shall also provide information on the collection and archiving of the data specified in appendix B of the simplified M&P for small-scale CDM project activities to:
- Estimate or measure emissions occurring within the project boundary;
- Determine the baseline, as applicable;
- Estimate leakage, where this needs to be considered.

Project participants shall implement the registered monitoring plan and provide data, in accordance with the plan, through their monitoring reports.

Operational entities will verify that the monitoring methodology and plan have been implemented correctly and check the information in accordance with the provisions on verification. This section shall provide a detailed description of the monitoring plan, including an identification of the data to be collected, its quality with regard to accuracy, comparability, completeness and validity, taking into consideration any guidance contained in the methodology, and archiving of the data collected.

Please note that monitoring data required for verification and issuance are to be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

An overall monitoring plan that monitors performance of the constituent project activities on a sample basis may be proposed for bundled project activities. If bundled project activities are registered with an overall monitoring plan, this monitoring plan shall be implemented and each verification/certification of the emission reductions achieved shall cover all of the bundled project activities.)

D.1 Name and reference of approved methodology applied to the project activity:

(Please refer to the UNFCCC CDM web site for the most recent version of the indicative list of small-scale CDM project activities contained in appendix B of the simplified M&P for small-scale CDM project activities.)

(If a national or international monitoring standard has to be applied to monitor certain aspects of the project activity, please identify this standard and provide a reference to the source where a detailed description of the standard can be found.)

The monitoring methodology and plan for the project ("the MP") follows the methodology AMS-ID definition, which states that: "The monitoring shall consist of metering the electricity generated by the renewable energy technology".

The project's baseline calculation follows methodology AMS-ID baseline definition for a system where **not** all generators use exclusively fuel oil and/or diesel fuel. The project will be registered with an overall MP, which will be implemented. Verification and certification of the ERs achieved will cover all of the bundled project activities. Aside from the MP, no national or international monitoring standards have to be applied to the project.

D.2 Justification of the choice of the methodology and why it is applicable to the project activity:

(Justify the choice of the monitoring methodology applicable to the project category as provided for in appendix B.)

The project complies with all the requirements that qualify it for the use of the simplified baseline and simplified monitoring for small-scale project activities. In particular the project:

a) Falls into project category I.D, listed in Appendix B, and uses the baseline methodology calculation AMS-ID.
b) Would otherwise not be implemented due to the existence of one or more of the barriers listed in Attachment A of Appendix B.
c) Is a renewable energy project activity with 4.1MW of installed capacity.[18]
d) Is not a debundled component of a larger project activity, as determined by Annex C.
e) Aims at complying with Annex II of the simplified modalities and procedures for small-scale CDM project activities, which states that "an overall monitoring plan shall apply for the bundled projects, as determined by the designated operational entity ("DOE") at validation to reflect good monitoring practice appropriate to the bundled project activities and to provide for collection and archiving of the data needed to calculate the ERs achieved by the bundled project activities"

The MP created for the project can be found in Annex 5 of this document.

[18] 15 MW is the limit stipulated in paragraphs 6(c) of decision 17/CP.7 – which clears the use of Appendix B for baseline and monitoring.

D.3 Data to be monitored:

(The table below specifies the minimum information to be provided for monitored data. Please complete the table for the monitoring methodology chosen for the proposed project activity from the simplified monitoring methodologies for the applicable small-scale CDM project activity category contained in appendix B of the simplified M&P for small-scale CDM project activities.

Please note that for some project categories it may be necessary to monitor the implementation of the project activity and/or activity levels for the calculation of emission reductions achieved.

Please add rows or columns to the table below, as needed)

ID number	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment
1. EGy	Electricity quantity	Electricity supplied to the grid by the project	KWh	Directly measured	Monthly	100%	Electronic	During the crediting period and two years after	Electricity supplied by the project to the grid. Double check with receipt of sales to final client. Data providers are *COES* or final clients. *COES* is the preferred data provider.

D.4 Name of person/entity determining the monitoring methodology:
(Please provide contact information and indicate if the person/entity is also a project participant listed in annex 1 of this document.)

The Monitoring Methodology and Monitoring Plan were completed on 21/02/2005 by:
Senior Financial Specialist
Francisco Fernández-Asín
The CDCF
Washington, DC, USA,
USA.
The CDCF is a project participant listed in Annex 1.

E. Calculation of GHG emission reductions by sources

E.1 Formulae used:

(In E.1.1 please provide the formula used to calculate the GHG emission reductions by sources in accordance with the applicable project category of small-scale CDM project activities contained in appendix B of the simplified M&P for small-scale CDM project activities.

In case the applicable project category from appendix B does not indicate a specific formula to calculate the GHG emission reductions by sources, please complete E.1.2 below.)

E.1.1 Selected formulae as provided in appendix B:

(Describe the calculation of GHG emission reductions in accordance with the formula specified for the applicable project category of small-scale CDM project activities contained in appendix B of the simplified M&P for small-scale CDM project activities.)

E.1.2 Description of formulae when not provided in appendix B:

E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary: *(for each gas, source, formulae/algorithm, emissions in units of CO_2 equivalent)*

Given that the proposed project is a hydropower plant, the project emissions are zero.

E.1.2.2 Describe the formulae used to estimate leakage due to the project activity, where required, for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities *(for each gas, source, formulae/algorithm, emissions in units of CO_2 equivalent)*

Because the project's existing equipment is neither transferred to another activity nor it comes from another activity, leakage is zero and does not need to be monitored.

E.1.2.3 The sum of E.1.2.1 and E.1.2.2 represents the project activity emissions:

The project emissions and leakage are zero.

E.1.2.4 Describe the formulae used to estimate the anthropogenic emissions by sources of GHG's in the baseline using the baseline methodology for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities: *(for each gas, source, formulea/algorithm, emissions in units of CO_2 equivalent)*

The formulae used to estimate the anthropogenic emissions by sources of GHG's in the baseline is based on the project's baseline calculation described in methodology AMS-ID, for a system where **not** all generators use exclusively fuel oil and/or diesel fuel. Consequently, estimated anthropogenic emissions to be reduced by the project were calculated following a 4-step-process (formulas used were provided for each step):

Step 1 – Calculation of the operating margin ("OM")
Step 2 – Calculation of the build margin ("BM")
Step 3 – Calculation of the combined margin ("CM")
Step 4 – Ex-ante calculation of the project ERs

Step 1 – Calculation of the OM

The OM is the weighted average emissions (in KgCO2e/KWh) of all generating sources serving the system excluding hydro, geothermal, wind, low-cost biomass, nuclear and solar generation.

The following formula to obtain average emissions was used:
OM =? [Gen (KWh) x (APFR (TJ) x C x O x 44/12)] per fuel type / total annual MWh of plants considered

This formula application can be explained as:
The electricity generation of the *SEIN* in 2003[19] was clustered by technology (fuel burned). Each cluster was transformed back to its fuel consumption caloric value by applying the Annual Plant Fuel Requirement ("APFR") Formula:
APFR (TJ) = Gen (KWh) x 3.6 x 10^6 / (NEC x 10^12)
Average NECs ("Net Efficiency Conversion") were calculated per fuel type[20].

The resulting Terajoules ("TJ") per cluster are multiplied by the fuel-corresponding Carbon Content Default Value (tC/TJ) ("C") times the Combustion Efficiency Default value ("O")[21] times 44/12 (being the latter the mass conversion factor).

The total tCO2 per cluster obtained were added up and the result (2,036,788 thousands KgCO2) was divided by the total electricity generation (2,675,365 thousands KWh). Hence, the weighted average emissions obtained was equal to the resulting OM equal to **0.76131 KgCO2/KWh.**

Fuel Used	**2003 (GWh)**	**APFR (TJ per year)**	**C (tC/TJ)**	**O (%)**	**CO2 emission (tCO2)**
Coal	859.4	7468.0	25.8	0.98	692,342
Diesel 2	66.2	726.9	20.2	0.99	53,297
Residual 6	160.1	1518.9	21.1	0.99	116,335
R500	359.7	4181.0	21.1	0.99	320,232
Dry Gas	834.8	10274.6	15.3	0.995	573,525
Pure Methane Gas	395.1	5312.9	14.5	0.995	281,056
Hydro	17,731.9	0.0	0	0	0
Total including low cost / must run plants	20,688.6				2,036,788
Thermal	2,956.6				
Other low cost/must run plants (R-500)	281.3				
Hydro	17,731.9				
Total excluding low cost / must run plants	2,675.365				

OM = 0.76131 KgCO2//KWh

Source: Own production, with *COES* 2003's Statistics[22]
Note that R6, R500, and D2, are nationally defined fuel classifications (given by Petro Peru, stated-owned petroleum company[23]).

Step 2 – Calculation of the BM

The BM is the weighted average emissions of either the 5 most recent or the most recent 20% of power plants built (in generation), whichever group's annual generation is greater. To obtain these 2 samples to (be able to compare them in generation), any increase in installed capacity in the *SEIN* was identified annually and considered only if the increase was made in new units added.

The following list shows the capacity additions (new units') in the *SEIN* from 1988 to 2003, and their 2003's electricity generation[24].

[19] Latest statistics publicly available (2003's *COES* Statistics).
[20] Average NEC per fuel type can be found in Annex 4
[21] C and O use Intergovernmental Panel on Climate Change ("IPCC")-1996 world wide values per fuel type, which are the latest C and O IPCC world-wide values published.
[22] Note that 359.7 GWh R-500 electricity generation in 2003 excludes the electricity generation of Plant ILO1 TV's Cogeneration Process (281.3 GWh)
[23] The features of R6 and R500 can be found in http://www.petroperu.com.pe/Main.asp?T=2995, and those of D2 in http://www.petroperu.com.pe/Main.asp?T=2994.

Electricity Generation of Additions to the *SEIN* (1988-2003)[25]

Years/ Plants' names	Technology	New Install.Cap. Added (MW)	Annual Generation 2003 (GWh)
1988			
C.H. CARHUAQUERO	HYDRO	75.1	**458.78**
CHARCANI (I-V)	HYDRO	136.80	**660.24**
1993			
TG VENTANILLA 2	D2	100	**1.54**
TG VENTANILLA 1	D2	100	**1.54**
1995			
CALANA	R6	19.2	**45.81**
1996			
STA. ROSA WESTING	D2	127.7	**11.60**
1997			
C.H. GALLITO CIEGO	HYDRO	34.0	**121.79**
TG VENTANILLA	D2	184.0	**2.83**
MOLLENDO MIRLESS	R500	31.7	**35.37**
1998			
AGUAYTIA 1	DRY GAS	86.3	**466.80**
AGUAYTIA 2	DRY GAS	86.3	**367.97**
TG MALACAS	PM GAS	102.2	**274.30**
1999			
SAN GABAN II	HYDRO	55.0	**356.34**
CALANA	R6	6.4	**15.27**
MOLLENDO TGM	D2	90.0	**1.43**
2000			
SAN GABAN II	HYDRO	58.1	**376.41**
ILO2 TVC	COAL	145.0	**859.44**
C.H. CHIMAY	HYDRO	156.0	**825.87**
C.H. YANANGO	HYDRO	42.3	**202.28**
2001			
TUMBES	R6	18.3	**27.99**
2002			
C.H. HUANCHOR	HYDRO	18.9	**144.64**
2003			
YARINACOCHA	R6	25.6	**144.97**

Source: Own production, with *COES* 1988-2003's Statistics
Note that R6, R500, and D2, are nationally defined fuel classifications (given by Petro Peru, stated-owned petroleum company[26]).

From the above list it is clear that the 5 most recently built plants up to 2003 were Yarinacocha, Huanchor, Tumbes, Yanango and Chimay, with a total generation of 1,346 GWh in 2003. The 20% most recently built plants[27], in generation, comprise the plants listed above from 1998's (inclusive) capacity additions, with a total generation of 4,064 GWh in 2003. Hence, the selected sample for the BM was conformed by the latter group, as its generation output is greater. The following formula applied to the select sample to obtain average emissions was used:

BM =? [Gen (KWh) x (APFR (TJ) x C x O x 44/12)] per fuel type / total annual MWh of the plants that compose the sample.

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[24] Latest statistics publicly available (2003's *COES* Statistics).
[25] In the table, San Gaban appears twice because the increases on its installed capacity were 2 units, the first one was put in operation in 1999 and the second one in 2000 – each unit's generation was considered accordingly. Yarinacocha generation was annualized since 2003 was its first year of operation and there were months in which it did not work.
[26] The features of R6 and R500 can be found in http://www.petroperu.com.pe/Main.asp?T=2995, and those of D2 in http://www.petroperu.com.pe/Main.asp?T=2994.
[27] Exactly, the selected sample's generation comprises 19.64% (or 20% rounding to the nearest integer) of 2003 generation of the *SEIN (*20,689 GWh) – Source: 2003's *COES* Statistics

This formula application can be explained as:
The electricity generation of the *SEIN* in 2003[28] was clustered by technology (fuel burned). Each cluster was transformed back to its fuel consumption caloric value through the following Annual Plant Fuel Requirement ("APFR") Formula:
APFR (TJ) = Gen (KWh) x 3.6 x 10^6 / (NEC x 10^12)
Where, average NECs ("Net Efficiency Conversion") were calculated per fuel type[29].

The Terajoules ("TJ") per cluster obtained are multiplied by the fuel-corresponding Carbon Content Default Value (tC/TJ) ("C") times the Combustion Efficiency Default value ("O")[30] times 44/12 (being the latter the mass conversion factor).

The weighted average emissions of the sample obtained are equal to the BM equal to 0.39346 KgCO2/KWh. This was obtained from dividing 1,598,885 thousands KgCO2 by 4,063,689 thousands KWh. The table below shows the weighted average emissions of the most recent 20% of power plants built in generation (selected sample for the BM):

Technologies in the Selected Sample	2003 Generation	Technology %	APFR TJ	C tC/TJ	O	44/12	CO2 Emissions(tCO2)
Coal	859.44	21%	7,467.98	25.80	0.980	3.67	692,342
d2	1.43	0%	15.67	20.20	0.990	3.67	1,149
r6	188.23	5%	1,785.54	21.10	0.990	3.67	136,760
r500	0.00	0%	0.00	21.10	0.990	3.67	0
Dry Gas	834.78	21%	10,274.16	15.30	0.995	3.67	573,499
Pure Methane Gas	274.30	7%	3,688.70	14.50	0.995	3.67	195,135
Dry Gas CC	0.00	0%	0.00	15.30	0.995	3.67	0
Hydro	1,905.52	47%	0.00	0.00	0.000	0.00	0
Total	4,063.689	100%					1,598,885

BM = 0.39346 KgCO2//KWh

Source: Own production, with *COES* 2003's Statistics
Note that R6, R500, and D2, are nationally defined fuel classifications (given by Petro Peru, stated-owned petroleum company).

Step 3 – Calculation of the CM
The CM was calculated as the simple average of both the resulting OM and the resulting BM. All margins expressed in KgCO2/KWh. The formula used for the CM was:
CM = 0.5 x OM + 0.5 x BM.
CM= 0.5 x (0.76131) + 0.5 x (0.39346) = 0.57739 KgCO2/KWh.
The CM obtained was 0.57739 KgCO2/KWh.

Step 4 – Ex-ante calculation of the project ERs
The estimated ERs per year for the project are equal to the baseline emissions, obtained from the following formula:
Estimated ERs per year = CM x (Estimated EGy).
Estimated ERs per year = 0.57739 KgCO2/KWh x (7,900,000 + 12,000,000 + 10,200,000) = 17,378 tCO2e or 17,378[31] ERs, when all the project activities that compose the project are in operation.

[28] Latest statistics publicly available (2003's *COES* Statistics).
[29] Average NEC per fuel type can be seen in Annex 4
[30] C and O use Intergovernmental Panel on Climate Change ("IPCC")-1996 world wide values per fuel type, which are the latest C and O IPCC world-wide values published.
[31] All margins were rounded to the fifth decimal, but the CERs per year were rounded down to the nearest integer – the rounding down is made independently to the CERs of each component of the bundle.

Since the 3 small hydropower plants that compose the bundle have different dates of commissioning, the ERs per year vary during the first crediting period. The ERs estimated for the first crediting period add up to 96,915 tCO2e. This calculation can be seen in the table below:

First Crediting Period (2004-2011)						
Components' commissioning Dates of CERs delivery		SR I - December 2005 (Thousand KWh)	SR II - August 2004 (Thousand KWh)	SR III - October 2007 (Thousands KWh)	Annual Generation (Thousand KWh)	Total ERs (Thousand KgCO2)
1	1-Aug-05	0	12,000	0	12,000	6,928
2	1-Aug-06	5,267	12,000	0	17,267	9,968
3	1-Aug-07	7,900	12,000	0	19,900	11,489
4	1-Aug-08	7,900	12,000	8,500	28,400	16,396
5	1-Aug-09	7,900	12,000	10,200	30,100	17,378
6	1-Aug-10	7,900	12,000	10,200	30,100	17,378
7	1-Aug-11	7,900	12,000	10,200	30,100	17,378
		44,767	84,000	39,100	167,867	**96,915**

Source: Own production with the projects' feasibility study's annual generation projected data

E.1.2.5 Difference between E.1.2.4 and E.1.2.3 represents the emission reductions due to the project activity during a given period:

The project's ERs are equal to the baseline emissions. The project does not have any emissions or leakages. The ERs estimated for the first crediting period add up to 96,915 tCO2e.

E.2 Table providing values obtained when applying formulae above:

Year	Total baseline emissions (tCO_2e)	Total Project emissions (tCO2e)	ERs(tCO_2e)
2005	6,928	0	6,928
2006	9,968	0	9,968
2007	11,489	0	11,489
2008	16,396	0	16,396
2009	17,378	0	17,378
2010	17,378	0	17,378
2011	17,378	0	17,378
Total	96,915	0	96,915

Source: Own production

F. Environmental impacts

F.1 If required by the host Party, documentation on the analysis of the environmental impacts of the project activity: *(if applicable, please provide a short summary and attach documentation)*

According to the Electric Concession Law of 1992, an Environmental Impact Assessment is not required for hydropower-plant projects under 10 MW. However, an EIA for the project has been completed as part of World Bank due diligence policy. The EIA's[32] conclusions were:

-During operation, the project will cause an overall low negative environmental impact.

-The project shows positive environmental impacts such as ERs – improving air quality; and direct and indirect employment of neighbouring population

[32] CINYDE SAC is the environmental and energy consulting firm that performed the project's EIA. CYNYDE SAC is subscribed in the official administrative registry of firms authorized to perform EIAs by the Environmental Affairs Division of *MINEM*.

-The main activities of the project that could cause environmental impacts are: During operation; use of the water for electric generation purposes, operation and maintenance of the equipment, removal of waste in the water. During construction; motion in the land due to civil works, heavy duty machines in use, residuals production.

-The majority of the negative environmental impacts and risks are concentrated in health and security of the employees and people, as well as the properties, vegetation and animals of the surroundings. In general, these impacts are low; the potential risks are of low probability as well, due to the adequate design of the installations and precautionary measures adopted.

-Adequately management of risk of accidents has been suggested in the EIA, reducing negative impacts on employees.

-The project does not harm in any case the water needs of *Comision de Regantes del Subsector Santa Rosa*[33].

-The project will not be affected by low-scale earthquakes.

-The water that the project uses goes back to the channel from which it comes from, in almost unaltered conditions regarding quality.

-The project mini-landfill needs to be improved to avoid soil contamination.

-Regarding the cultural environment, the project is not inside the limits of a Protected Natural Area or in the vicinity of a Protected Natural Area.

-The noise inside the power houses is louder than the permitted limit for working conditions. Hence, the EIA suggests the obligation to use auricular protection inside the power houses. Outside the power houses and in the neighbouring population, the noise is practically unnoticeable.

-The electro-magnetic levels measured inside the power houses do not go over the permitted limit for working conditions.

-The project will clean the water that passes through for generation purposes, by way of a grating system to be installed in the water reception installation (load chamber). This will benefit the *Comision de Regantes del Subsector Santa Rosa*; who also uses this water for human consumption.

-The most important results of the Public Consultation that formed parted of the EIA ("Public Consultation") have been stated in written agreements. The Public Consultation was done to local stakeholders, which included the *Comision de Regantes del Subsector Santa Rosa*, local authorities and other groups of interests. Local stakeholders had their own suggestions regarding the project. Mutual agreements have satisfied the community, gained their approval and identification with the project as a part of the community.

After all the analysis made in the EIA, CINYDE, i.e. the firm that performed the EIA, recommended the implementation of the project given its low negative environmental impacts and positive impacts in the country and the environment. Furthermore, CYNIDE recommended emulating this type of project in the country, given both a raising energy demand and hydro resources available in Peru.

G. Stakeholders comments

G.1 Brief description of the process by which comments by local stakeholders have been invited and compiled:

The population living in the surroundings of the project, interest groups, and authorities were invited to participate in a Public Consultation meeting. The place, time and date of the meeting was communicated through oral notification because no newspaper is available nor are other means of mass communication in the area.

The objectives of the Public Consultation were as follows: a) to present the project and its environmental impacts as analyzed in the EIA, b) to incorporate in the EIA the community suggestions regarding both improvements in environmental impacts and improvements in the relationship with the neighbouring

[33] Neighbouring accredited persons (registered in the *Padron de Usuarios de Agua de Riego*) who use the water of the Santa Rosa derivation channel for irrigation purposes.

population, c) to become familiarized with the comments of the *Comision de Regantes del Subsector Santa Rosa* regarding the project, and, finally, d) to initiate a communication process between enterprise and neighbouring community.

The Public Consultation was focused on the *Comision de Regantes del Subsector Santa Rosa*, since it was the interest group most directly affected by the project. However other local stakeholders such as the non-governmental organization named *Asociación Achalay* , landowners of the area surrounding the project's site, and The Community of La Merced[34], were consulted about the project independently.

G.2 Summary of the comments received:

Comments and observations from the Public Consultation were focused on a) removal of the waste that falls into the water, b) economic support from the sponsor of the maintenance of the water reception system and of the Santa Rosa derivation channel; c) a call for agreements regarding an adequate coordination of the water needs for agriculture (to water the agricultural plots of lands of the *Comision de Regantes del Subsector Santa Rosa*) and water needs for generation (the project). No other major comments were received from the *Comision de Regantes del Subsector Santa Rosa*.

Asociación de Achalay was interested in accessing electricity at no charge in exchange of providing land to the sponsor. Other landowners asked the sponsor to include his responsibilities with local stakeholders in one of the project component's water rights renewal document.

La Merced was offered a donation of part of the CERs Income at the sponsor's own initiative and as part of the social contribution requirement of the CDCF. Investments requested by La Merced to be financed by the donation were the following:

-Improvements in the Public local school # 20930 *Virgen de la Merced* ("The school") that include: a) a fence that defines the school perimeter, b) a computer laboratory, c) accommodation for school teachers, d) 2 extra classrooms, and e) sports center.

-For the community: a) a civic center (a communal square for La Merced), b) a community library, c) an educational center to train locals for employment, and d) a park and reforestation of the main street of La Merced.

These were stated in an Act signed by the sponsor and La Merced representatives.

G.3 Report on how due account was taken of any comments received:

As a result of the Public Consultation, agreements about responsibilities for both the sponsor and the *Comision de Regantes del Subsector Santa Rosa* were left clearly stated in an Act signed by The Technical Administrator of the Huara Watering District and representatives of The *Comision de Regantes del Subsector Santa Rosa*. This Act was named "Joint Operational Description of the Santa Rosa Hydraulic System for hydroelectric and agricultural purposes" and it includes a description of the joint operational procedure of the hydraulic system for agricultural and generation needs, recommendations regarding the installations and operations, and responsibilities that each party was committed to perform.

Asociacion Achalay was offered free electricity for its orphanage, located in the indirect area of influence, defined in the EIA, in exchange of giving a 99-year concession of part of its territory to the sponsor.

Landowners of the area surrounding the project site were satisfied with the water rights renewed (for the particular Project component) which indeed specified the responsibilities of the sponsor with local stakeholders.

The way in which La Merced comments would be taken into account was stated in an Act. The agreements reached included:

[34] Both *Asociacion Achalay* and La Merced are located in the indirect area of influence of the project, defined in the EIA. La Merced is the closest town to the project's site.

- The social investments needed to be presented by locals in a technical profile that included the cost, description, and budgeting of labour and materials,
- The social investments would be prioritized according to social impact,
- The community would bring labour (voluntarily), at the extent that no other specialized labour was needed.

As of today, the sponsor has prioritized the following outputs. It has built the fence that defines the perimeter of the school, the Civic Center for La Merced, and the computer laboratory for the school. This decision was aligned with the desired priority expressed by La Merced, and with social impact.

Annex 1

CONTACT INFORMATION FOR PARTICIPANTS IN THE PROJECT ACTIVITY

(Please repeat table as needed)

Organization:	Electrica Santa Rosa SAC.
Street/P.O.Box:	Av. La Paz 535 Of. 303 Miraflores
Building:	
City:	Lima
State/Region:	
Postcode/ZIP:	
Country:	Peru
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	General Manager
Salutation:	Mr.
Last Name:	Cox
Middle Name:	
First Name:	Guillermo
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Organization:	The CDCF
Street/P.O.Box:	1818H Street NW
Building:	
City:	Washington
State/Region:	DC
Postcode/ZIP:	20433
Country:	USA
Telephone:	
FAX:	
E-Mail:	
URL:	www.carbonfinance.org
Represented by:	
Title:	Sr. Financial Specialist
Salutation:	Mr.
Last Name:	Fernández-Asín
Middle Name:	
First Name:	Francisco
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

N/A

Annex 3

ABBREVIATIONS

APRF	Annual Plant Fuel Requirement (TJ)
Baseline emissions	CM times EGy
BM	Build Margin Emission Factor as defined in the simplified modalities and procedures for small-scale CDM project activities for project category I.D
C	Carbon Content Default Value (tC/TJ) - 1996 IPCC worldwide values
CDM	Clean Development Mechanism
CERs	Certified Emission Reductions
CM	Average of the BM and OM
COEF	KgCO2/KWh
COES	Committee of Economical Operation of the *SEIN* (*SEIN* Dispatch Center)
DOE	Designated Operational Entity
ECL	Peru's Electric Concessions Law of 1992
EGy	The Project Annual Electricity Generation
EIA	Environmental Impact Assessment
ERs	Greenhouse Gases Emission Reductions
GHGs	Greenhouse Gases
GWh	Gigawatts hours
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
KWh	Kilowatts hours
MINEM	Peru's Department of Energy and Mines
MMCFPD	Million Cubic Feet Per Day
NEC	Net Efficiency Conversion
O	Combustion Efficiency Default value - 1996 IPCC worldwide values
OM	Average Operating Margin Emission Factor, as defined in the simplified modalities and procedures for small-scale CDM project activities for project category I.D
OSINERG	Peru's Energy Investment Supervisory Agency (Regulatory Entity)
PPA	Power Purchase Agreement
SEIN	National Interconnected Electric Grid
tCO2e	Tons of carbon dioxide equivalent
The MP	Simplified monitoring plan as defined in the simplified modalities and procedures for small-scale CDM project activities for project category I.D
The Sponsor	The Project's Sponsor (Electrica Santa Rosa SAC)
UNFCCC	United Nations Framework Convention on Climate Change

Annex 4

ADDITIONAL INFORMATION REGARDING THE BASELINE CALCULATION

NECs AS OF DECEMBER 2003

Unit	Company	Fuel Burned	Efic. conversión (%)
AGUAYTIA TG-1 (GAS)	TERMOSELVA	Gas	29.38%
AGUAYTIA TG-2 (GAS)	TERMOSELVA	Gas	29.13%
MALACAS TGN-4 (GAS)	EEPSA	Gas	31.26%
MALACAS TG-C (GAS)	EEPSA	Gas	23.61%
MALACAS TG-B (GAS)	EEPSA	Gas	23.40%
MALACAS TGN-4 (GAS CON H2O)	EEPSA	Gas	28.83%
ILO2 TV1 Carbón	ENERSUR	Carbon	41.43%
ILO1 TV2	ENERSUR	R500	0.00%
ILO1 TV4	ENERSUR	R500	37.64%
ILO1 TV3	ENERSUR	R500	35.79%
SHOUGESA TV-3	SHOUGESA	R500	30.80%
SHOUGESA TV-1	SHOUGESA	R500	29.01%
SHOUGESA TV-2	SHOUGESA	R500	28.53%
CHILINA TV3	EGASA	R500	22.17%
CHILINA TV2	EGASA	R500	21.43%
TRUPAL TV	EGENOR	R6	19.57%
TUMBES R6	ELECTROPERU	R6	44.16%
CALANA 4	EGESUR	R6	43.86%
CALANA 1,2 Y 3	EGESUR	R6	43.05%
CHILINA (SULZ 1,2)	EGASA	D2	42.11%
MOLLENDO 1, 2, 3	EGASA	R500	42.43%
YARINACOCHA	ELECTROPERU	R6	43.17%
CNP MAN (R6-DS)	CAHUA-CNP	R6	37.65%
CNP SULZER 123-R6	CAHUA-CNP	R6	34.23%
CUMMINS D2	SHOUGESA	D2	40.70%
PIURA 1	EGENOR	D2	40.92%
TINTAYA	SAN GABAN	D2	38.25%
PAITA 1	EGENOR	D2	34.57%
BELLAVISTA (ALCO, DEUTZ)	SAN GABAN	D2	35.90%
DOLORES(GM 1,2,3; ALC 1,2)	EGEMSA	D2	34.52%
BELLAVISTA (MAN1, MAN2)	SAN GABAN	D2	37.21%
CHICLAYO OESTE	EGENOR	D2	36.61%
DOLORES (SZ 1,2)	EGEMSA	D2	34.52%
TAPARACHI	SAN GABAN	D2	35.69%
SULLANA	EGENOR	D2	35.77%
MOQUEGUA 1-2	EGESUR	D2	35.09%
ILO1 CATKATO	ENERSUR	D2	39.16%
PIURA 2	EGENOR	D2	34.68%
PAITA 2	EGENOR	D2	31.23%
CICLO COMBINADO	EGASA	D2	31.10%
VENTANILLA TG-4 (CON H2O)	ETEVENSA	D2	35.93%
VENTANILLA TG-3 (CON H2O)	ETEVENSA	D2	35.80%
WEST. TG-7 (CON H20)	EDEGEL	D2	32.90%
MOLLENDO TG2	EGASA	D2	29.41%
MOLLENDO TG1	EGASA	D2	28.44%
ILO1 TG2	ENERSUR	D2	33.35%
STA ROSA - UTI-6	EDEGEL	D2	29.04%
STA ROSA - UTI-5	EDEGEL	D2	28.31%
ILO1 TG1	ENERSUR	D2	28.83%
CHIMBOTE TG3	EGENOR	D2	25.36%
CHIMBOTE TG1	EGENOR	D2	25.36%
CHIMBOTE TG2	EGENOR	D2	25.36%
TRUJILLO TG	EGENOR	D2	25.15%
PIURA TG	EGENOR	D2	25.73%
MALACAS TG-A (DIESEL)	EEPSA	D2	22.86%

Source: Real NECs per unit (in %) were calculated by *COES* executives with official *COES* data.

Calculation of Low Cost-Must Run sources in the *SEIN:*
In the *SEIN* other-than-hydro low-cost/must-run source, is solely given by the cogeneration plant ILO 1 TV (154 MW of effective installed capacity) in which it is known that:
24 MW come from industrial process (cogeneration with Southern mine).
8 MW come from burning R500 fossil fuel
Must run plant=32MW

The 2003 *SEIN's* electricity cogeneration is estimated to be 281.3 GWh. In 2003, ILO 1 TV installed capacity per hour that dispatched was 61.3 MW on average and its total generation was 538.7 GWh. It is known that out of the 61.3 MW, the first MW that dispatch are the 32 MW cogeneration installed capacity. Hence, the 32 MW prorated generation is 281.3 GWh.

Total plants that burn R-500 in the *SEIN*	**Gen 2003 (GWh)**	**Inst Cap ILO TV (MW)**	
San Nicolás TV1	20.0		
San Nicolás TV2	4.4		
San Nicolás TV3	27.2		
Chilina r500	15.2		
Mollendo Mirrlees	35.4		
ILO TV1	51.5		22
ILO TV2	92.5		22
ILO TV3	153.2		58
ILO TV4	241.5		58
Total R-500 production (GWh)	640.9	*Nominal MW*	*160*
Cogeneration (GWh)	**281.3**	*Effective MW*	*154*
R-500 Production excluding Cog. (GWh)	**359.7**		

Source: Own production, with *COES* 2003's Statistics

Net Efficiency Conversions ("NECs"):
NECs used in the APFR formula are the following (averages per technology):

Real NECs	
Dry Gas	29.25%
Pure Methane Gas	26.77%
Coal	41.43%
R500	30.97%
R6	37.95%
D2	32.81%

Source: Real NECs per unit (in %) were calculated by *COES* executives with official *COES* data. The averages per technology is own production.

Justification of the usage of *COES* information system data for baseline calculation:
The baseline calculation disregarded the data that is not registered by *COES* and deemed *COES* data to be the best approximation of total *SEIN* data about both generation and installed capacity additions, and also the best data to allow a good monitoring practice because of three reasons:
- There is not as good quality data of the *SEIN* production as what *COES* registers. The information of plants connected to the *SEIN* but not registered in *COES* regarding generation and installed capacity additions is provided by the plants' management periodically to the *MINEM*, but this data does not pass through a verification or validation process or is required to comply with technical standards as rigorously as COES requires from their plants members.
- Limitation on *MINEM* final annual reports and data availability is also an issue.
- The generation of these other plants connected to the *SEIN* but not registered by *COES*, is irrelevant, only 1% of total *SEIN* electricity generation in 2003, as the table bellows shows.

	SEIN (GWh)	COES (GWh)	COES/SEIN	Not recorded by COES
2003	20,999	20,689	0.99	0.01
2002	20,018	19,658	0.98	0.02
2001	18,755	18,463	0.98	0.02
Anuario Estadistico MINEM (2001-03) and Estadistico de Operaciones COES (2001-03)				

Annex 5

THE MONITORING PLAN

TABLE OF CONTENTS

I. Background Information

The baseline methodology and monitoring methodology for Santa Rosa I, II and III ("the project") are in accordance with the approved small scale methodology AMS-I.D, which is applicable to renewable electricity generation for a grid. The project's baseline methodology and monitoring methodology use the most recent version approved by the CDM EB18, latest amendments to the applicable methodology as of today were done on February 25th, 2005.

The project's installed capacity and estimated yearly average generation is as follows:

Project name	**Installed capacity (MW)**	**Generation (GWh/yr)**
Santa Rosa	4.1	30,100[35]

Source: The project's feasibility study

The project is a bundle of 3 small run-of-river hydropower plants, located in Lima-Peru, in the Santa Rosa Irrigation[36] in the Sayán District. The Purpose of the project is renewable electricity generation to be supplied to the National Interconnected Electric Grid ("*SEIN*"). The project will displace 17,378 tCO2 approx. per year[37]. GHG Emissions Reductions ("ERs") for the first crediting period (7 years) account for 96,915 tCO2 or ERs. Because the existing Project equipment is neither transferred to another activity nor it comes from another activity, there is not need to monitor leakages. Leakage for the project is zero.

The project boundary is the area in the Santa Rosa Irrigation where Santa Rosa I, II and III powerhouses and transmission lines are placed; and as the transmission lines reach the *SEIN* by interconnecting to EDELNOR transmission line, the *SEIN* will also be included in the project boundary.

II. Purpose of the Monitoring Plan

This report presents the Monitoring Plan ("the MP") for the project, which has been considered by the Community Development Carbon Fund (CDCF) for ERs purchases in Peru. The MP defines a standard against which the performance in terms of the project's ERs will be monitored and verified, in conformance with all relevant requirements of the CDM of The Kyoto Protocol. The MP is part of the Emissions Reductions Purchase Agreement (ERPA) document and, after its validation, will be an integral part of the contractual agreement between the CDCF, and the project' sponsor ("the sponsor"). For the MP, the sponsor will be treated as it were the project's operator ("the operator"), and solely responsible for the ERs delivery. Both the project's baseline and the MP are subject to verification procedures.

III. Use of the Monitoring Plan by the operator

This report, the MP, identifies key performance indicators of the project and sets out the procedures for metering, monitoring, calculating and verifying the ERs generated by the project, annually. Adherence to the instructions in the MP is necessary for the operator to successfully measure and track the impact of the project on the environment and prepare all data required for the periodic audit and verification process that must be undertaken to confirm the achievement of the corresponding ERs. The MP is thus the basis for the production of ERs and delivery of ERs to the CDCF.

The MP assists the operator in establishing a credible, transparent, and adequate data measurement, collection, recording and management system to successfully develop and maintain the proper information; required for an audit and for the verification and certification of the achieved ERs and other Project outcomes. Specifically, the MP provides the requirements and instructions for: (i) establishing and maintaining the appropriate monitoring system including spreadsheets for the calculation of ERs, (ii) checking whether the project meets key sustainable development indicators, (iii) implementing the necessary

[35] When all the project components are operational
[36] The Santa Rosa irrigation has more than 40 years in operation.
[37] When all the project's components are operational

measurement and management operations, and (iv) preparing for the requirements of independent third party verifications and audits.

The MP ensures environmental integrity and accuracy of crediting ERs by only allowing actual ERs to be accounted for after they have been achieved. The MP must therefore be used throughout the period in which the project has committed to or desires to sell/track ERs. It must be adopted as a key input into the detailed planning of the project, and included as one of the operational manuals of the project.

The MP can be updated and adjusted to meet operational requirements. The verifier approves such modifications during the process of initial or periodic verification. In particular, any shifts in the baseline scenario may lead to such amendments, which may be mandated by the verifier. Amendments may also be necessary as a consequence of new circumstances that affect the ability to monitor ERs as described here or to accommodate new or modified CDM rules.

I.V. Organizational, Operational and Monitoring Obligations

A. Obligations of The Operator

Monitoring performance of the project requires the fulfilment of operational data collection and processing obligations from the operator. The operator has the primary obligation of ensuring that sufficient and accurate information is available to calculate ERs in a transparent manner and of allowing for a successful verification of accounted ERs.

The operator must gather and process information needed to monitor ERs. It is required that the operator calculate its ERs based on most recent available information, following the ERs Calculation Procedure ("ERCP") presented in this report.

All data required for the MP will come from final clients or *COES* information system, being the latter the preferred data provider. Data gathering and processing should be done monthly by the operator, as follows:

Monthly Data Collection

Electricity distributor final client (Data Provider)	- Report of the project hourly generation purchased by final clients
COES – for activities in which the project has made association with an active member of *COES* to be able to sell the project's electricity in the spot market (Data Provider)	- *COES* Statistics for the year[38] of the project's generation will be the source of hourly project generation
The operator (Data Processor)	- Keep receipt of sales - Perform monthly calculation of ERs following the ERCP - Perform annual report of ERs achieved to the verifier

Source: Own production

The operator should calculate ERs on the basis of this MP (following the ERCP) for the purpose of claiming ERs credits. It is believed that the MP approach presented here will result in an accurate, yet conservative calculation of ERs. However some uncertainties may lead to a deviation of monitored ERs and the verified ERs, especially errors in the data monitoring and processed system. The operator is expected to prevent such errors and the verification audits are expected to uncover any possible errors. The Certified Emissions Reductions ("CERs") would be granted ex-post verification.

B. Emissions Reductions Calculation Procedure and Required Spreadsheets

[38] The year for the project will run from August 1st to July 31st.

The ERCP is the basic instrument for gathering, recording and processing information that will result in the measured ERs. The operator shall consider the project's ERCP as a manual. The ERCP should contain: i) data gathered from the project final clients or *COES* information system, being the latter the preferred data provider, and ii) data processed by the operator. All data processing should be done in Excel. The ERCP is designed for monthly and yearly calculation, based on final monthly *COES* reports and the final client monthly recording. Filling data monthly in the required spreadsheets will provide time to review formulas, minimize errors and have data readily available for the verifier in any period of the year. There will be in only 1 spreadsheet to be reviewed by the verifier named Santa Rosa ERs at "yearly period in question".xls**.** However, as the verifier could require preliminary calculations, The ERCP responsible ("ERCP manager") should keep the name of the file and follow by the date at which the latest adjustment is made, every time he works on the file. Doing so will allow to save old versions in disk and keep them as a record to show to the verifier, if required.

When the ERs calculation for the month is completed, the file should be named Santa Rosa ERs at "month in question".xls, to allow differentiating scratch versions from the final monthly calculation. Likewise, after the calculation of the ERS of the last month of the year, the file should change its name to Santa Rosa ERs at "yearly period in question".xls.

The year for the MP will run from August 1st to July 31st. This monthly-filled file will be composed by 3 worksheets:

1. Worksheet # 1: Original Data from *COES*
2. Worksheet # 2: Original Data from final clients- data that is not registered by *COES.*
3. Worksheet # 3: Organized Data, Processed Data and Result

1. Worksheet #1: Should contain data as it was handed in, by *COES*, through a CD or email, regardless of how it comes i.e. arranged in hours or every 15 minutes. The ERCP manager should not manipulate this data other than copy and paste it from the file it was handed in. The CD or e-mail through which data comes from provider should be kept as proof for the verifier.

2. Worksheet # 2: The same procedure as Worksheet#1, but from data coming from final clients and that is not registered by *COES.*

3. Worksheet # 3: The ERCP manager should put in columns (3 columns per month) the hourly generation or quarter-of-hour generation of the month of the project's components and sum it up to obtain the monthly Project's components' generation (adding up must be done to each project component, which will occupy one column each). In this same Worksheet, the ERCP manager should calculate monthly ERs (measured in tCO2) by multiplying the generation in KWh (or MWh) times 0.57739 in KgCO2/MWh (or tCO2/MWh), which is the baseline emission factor for the project and will be used for the first crediting period (7 years). No rounding needs to be made per month when calculating monthly ERs -as this is only done to measure progress. However, resulting yearly ERs must be rounded down to the nearest integer per project component. At the end of the year[39], the ERCP manager should sum the resulting yearly ERs of each project component (already rounded down to the nearest integer per project component per year) to obtain the yearly project' ERs ready for verification. Once the yearly ERs calculation is completed in the Santa Rosa ERs at July.xls (July is the last month of the year, for the MP), this file should become Santa Rosa ERs at "yearly period in question".xls.

Worksheet # 3 also allows the ERCP manager to calculate the cumulative generation and cumulative ERs along the year and be aware of the project's environmental benefits progresses regarding ERs.

The ERCP Quality Control and Organizational Structure can be seen in the annex section of this MP.

V. Sustainable Development Monitoring Plan ("SDMP"):

[39] For MP purposes: July 31st

Being a CDM activity, the project must meet the requirements of The Kyoto Protocol Article 12 for CDM Projects, which states that the CDM activity must assist the host country in achieving sustainable development. The Government of Peru has endorsed the project as a CDM-eligible activity. This part of the MP explains why it can be taken for granted that the project will contribute to environmental sustainability as well as development in Peru over its lifetime. The sustainable development objective applies also to projects, where not only positive but also negative environmental and social effects are conceivable. The MP for the project specifies sustainable development indicators and targets, which must be monitored and met by the operator and the area to which these indicators and targets will be applied.

The SDMP can be seen in the annex section of this MP.

A. Environmental Sustainability: Impact on Local Pollution

In addition to mitigate emission of CO2, the project will reduce emissions of local pollutants (particularly SO_2, NOx and particulates).

The sustainable development contribution of the project is considered fulfilled as long as the project is operating. In the project's EIA no major impacts were identified. Construction impacts will be well managed through proper environmental practices.

The project does not cross or negatively affects any populated or cultivated areas, nor areas with cultural heritage sites. The area is not a migratory bird habitat, and no impact is expected on the local bird population.

The project will operate using the current and future water requirements for irrigation, potable water and ecological flow. The total flow is determined by the local Agricultural Authority of the region, not by the project's sponsor. The water concession is based upon the use of the flow required for agricultural needs.

B. Socio-Economic Sustainability

No negative social impacts are predicted as a consequence of the project. The direct area of influence of the project, including its ancillary infrastructure, is not in or near an indigenous reserve or populated area. Water user rights will be respected, as energy generation receives a lower priority than agricultural use. During operation, the project will hire local labour for operation and maintenance. The sponsor will donate part of the CER's income to La Merced, which is the town closest to the project site. A broader contribution by the project to Socio-Economic Sustainability is contemplated in the SDMP, shown in the annex section of this MP.

VI. Management and Operational Systems Monitoring Plan

A. Purpose

It is the responsibility of the operator to develop and implement a management and operational system that meets the requirements of the project and of the MP. Equally, it is the operator's responsibility to enter into appropriate agreements with local institutions (i.e. *COES*) and final clients, to secure an adequate data gathering, processing and recording. The operational and management system shall include, among others Data Handling.

B. Data Handling:

-The establishment of a transparent system for the collection, computation and storage of data, including adequate record keeping and data monitoring systems is required. The operator must develop and implement a protocol that provides for these critical functions and processes, which must be ready for independent auditing.

-For electronic-based and paper-based data entry and recording systems, there must be clarity in terms of the procedures and protocols for collection and entry of data, usage of the spreadsheets and any assumptions made, so that compliance with requirements can be assessed by a third party. Stand-by

processes and systems, e.g. paper-based systems, must be outlined and used in the event of, and to provide for, the possibility of systems failures.

C. Quality Assurance:

-Well-defined protocols and routine procedures, with good, professional data entry, extraction and reporting procedures will reduce costs and time while making it considerably easier for the auditor and verifier to do their work - the more organized and transparent the organization, the easier will be to track, monitor, audit and verify.

-The operator must keep proper management processes and systems records, as the auditors will request copies of such records to check compliance with the required management systems. Auditors will accept only one set of official information, and any discrepancies between the official, signed records and on-site records will be questioned.

D. Reporting:

-The operator will report regularly to The CDCF as well as to Peruvian authorities as required.

-The operator will prepare reports, as needed for audit and verification purposes.

E. Training:

-It is the operator´ responsibility to ensure that the required capacity and internal training is made available to the ERCP manager to enable him to undertake the tasks required by this MP. The CDCF will train the ERCP manager on the tasks needed to observe the present MP.

F. Preparation for Operation:

-The management and operational systems and the capacity to implement this MP must be put in place before the project can start generating ERs or by the end of the first year of the first crediting period. This will be verified before any project can start to generate ERs that are accepted by the CDCF.

VII. Auditing and Verification Procedures

A. Audit and Verification Objectives

Periodic auditing and verification of the project's results is a mandatory component for all CDM projects and a CDCF requirement. The chief objective of the audit is to independently verify that the project has achieved the ERs reported by the operator. Audits are an integral part of the verification process and are undertaken in conjunction with verification and by the same firm.

This section of the MP outlines the auditing and verification procedures and prerequisites. It provides instructions on how the monitoring work undertaken by the operator is in line with the MP; as well as project performance and compliance with CDM requirements that need to be verified. The CDCF will select and contract the verifier.

B. The CDCF Audit and Verification Regime

The CDCF submits the project to third party validation and verification, which is conducted by independent firms specializing in environmental auditing services (Auditors, Validator, Verifiers, and Certifiers). The CDCF expects that its Auditors will seek accreditation under The Kyoto Protocol regime for providing these services. The CDCF verification system for CDM consists of four activities:

Validation of Project Design: The validator undergoes validation of the project's design, the project's baseline calculation and the MP against CDM requirements and modalities and is complemented by validation of the project. Validation is a CDM requirement. The CDCF will not sign contract with the project unless a validator has confirmed that the project's design is in compliance with all relevant CDM requirements. The validated MP for a project must be followed by the operator and any other involved partner. This MP can be adjusted or amended, if necessary, in order to improve consistency with its objectives, general concepts and project circumstances, but such adjustments are subject to approval by the project's verifier. A renewal of validation is not necessary in this case.

Initial Audit and Verification of Project Readiness: The CDCF requires that the project successfully complete an initial audit and verification process before the CDCF commissions the project and accept emissions reductions delivered by it. While initial verification is not a CDM requirement, The CDCF regards it as essential and final step in The CDCF project preparation and implementation cycle. In the case of small scale activities, as the project is, it can be the same firm and individuals that provide both validation and verification. Initial verification provides an opportunity for verifiers to become familiar with the project, its context, the operator and its management.

The purpose of the initial audit and verification process is threefold:

1. Ensure that the project has been implemented as planned, that the monitoring system is in place and that the project is ready to generate and record ERs.
2. Ensure that the correct meters and registers are installed and tested.
3. Approve adjustments and amendments to the MP that may have become necessary during the detailed design and construction of the project.
4. Assist meeting The CDCF supervision obligations and clear the way for project commissioning and generation of high quality ERs.

During initial verification, Auditors are expected to do the following. They will:

1. Familiarize themselves with the project and the project's circumstances,
2. Introduce the ERCP manager to the audit and verification process,
3. Check whether the project has been implemented as planned,
4. Check whether the meters and registers have been installed and tested correctly and are in operation.
5. Check whether assumptions that have an impact on the monitoring and verification processes and its outcomes are still reasonable, in particular assumptions for the baseline calculation.
6. Confirm system readiness: that the MP has been implemented in the project's management and operational procedures and that all necessary monitoring elements are in place to ensure generation of verifiable ERs.

Periodic verification of ERs: All CDCF Projects must undergo periodic audits and verification of ERs. This is a CDM requirement and the basis for issuance of Certified Emissions Reductions (CER) and for their value in the market place. Verification is arranged by The CDCF and conducted at annual or longer intervals as appropriate for the project.

The purpose of periodic audits and verification is to confirm that:

1. The project has achieved the ERs claim for the verification period in compliance with the methodology laid down in this MP.
2. The claimed ERs are real and additional to any that would have occurred in the baseline scenario as interpreted and developed in the projects' baseline calculation and this MP.
3. The operation of the project continues to be in compliance with all Kyoto Protocol, CDCF and host country requirements and modalities for CDM project.
4. The project maintains high quality monitoring systems consistent with the MP.

As part of the periodic audit and verification process Auditors are expected to:

1. Review and audit relevant monitoring records and reports.
2. Verify that the required measurements and observations made for all data inputs necessary for the calculation of ER, are available.
3. Check that meters and recorders are operating correctly.
4. Check whether the MP methodology has been applied correctly and consistently.
5. Check whether achieved ERs have been computed correctly using the provided spreadsheets, and, if necessary, recalculate achieved ERs.
6. Verify that all relevant MP and the project's baseline calculation assumptions are still valid.
7. Verify that the management and monitoring system, including data handling, recording and reporting, are in place and remain adequate.

8. Verify that the social and environmental targets in the MP have been met and that the project assists the host country in achieving sustainable development.

9. Consult with the operator and other project partners on the continued adequacy of the monitoring system and approve any modifications that need to be made to ensure a high quality monitoring operation.

10. Undertake any other activities required by this MP, by The Kyoto Protocol requirements and modalities for the CDM, by the appropriate host country authorities and/or by professional auditing and verification standards and practice.

Verification concludes with a formal verification report. The report may include a statement that may permit the renewal of the project's crediting period in line with applicable CDM rules and modalities.

Certification of ERs: A successfully completed verification process and related verification report provide the basis for the issuance by the verifier of an emissions reductions certificate. The certificate is a legally binding statement, which confirms the (successful) verification report's conclusion that the project has achieved the stated quantity of ERs in compliance with all relevant criteria and requirements. The verifier's certificate constitutes sufficient confirmation for the CDCF as to the project's ERs performance.
The verifier for the project is the only one that can issue the certificate but it does not constitute or creates CERs in the sense of Article 12 of The Kyoto Protocol. However, the verifier's certificate may be used by the CDCF and/or Peruvian authorities or authorized entities in the process of issuance and registration of CERs by the competent authority in line with applicable CDM and Kyoto Protocol modalities and procedures.

C. Auditing Criteria and Needs

Verification includes an audit of the project's output information, and data and management systems on the basis of the following established criteria:

1. Completeness.
2. Accuracy.
3. Coverage.
4. Risk Management Controls.

Auditors and verifiers will request information (in the form of records and documentation) from the operator to determine if key performance indicators meet the objectives of the project as set out in this document. The operator is required to record all such indicators, and provide satisfactory documentation and an audit trail for verification purposes (for instance, generation and sales records, etc.). The information that will be needed includes:

1. Records on reported ERs including the electronic worksheets and supporting documentation (assumptions, data estimations, measurement methods, etc).
2. Records on reported social and environmental performance as measured by indicators and targets laid down in the MP.
3. Records on project management, including monitoring, data collection and management systems.

The audit process followed, as with other management systems, is interactive, iterative and participatory. The auditors will determine the credibility and accuracy of the reported performance through spot checks of data measurement and collection systems and interviews with the key project participants. It is necessary for all involved in an audit to understand the audit process and verification requirements.

D. Audit and Verification Process

Audits procedures used to verify CDM projects are similar to audits of other environmental management systems (ISO 14000, EMS) and should complement these established processes. Principle audit tools are spot check of documents and interviews with participating organizations and individuals. Auditors/verifiers are generally free to apply any method that represents good auditing practice and internationally accepted standards. Auditors typically conduct risk-based spot checks, which are checks of the key parameters and

systems with the highest risks for data measurement and collection problems. The planning and scheduling of audits and the verification process is covered in this section.

Audit Preparation and Requests for Information: The auditor will familiarize himself with the project documentation, project reports, project requirements and expected project performance. The auditor will use this MP to prepare the audit process. He will make telephone contact with the operator, and if necessary, will request additional information. Two weeks should be allowed for the receipt of this information.

Development and Delivery of an Audit Checklist: The auditor will develop checklists to guide the audit process. The checklists will cover the key points of the audit. The appropriate checklist will be sent to the operator accompanied by explanatory materials prior to a site visit. Two weeks should be allowed for review, comments and preparation by the auditee.

The Audit: A visit will be made to the site to undertake the audit. The length of the audit visit is to be agreed between the auditor and CDCF and depends on the complexity of the monitoring system and on previous performance based on experience. Audits on each site do normally not require more than two days. The audit time will be spent checking records and undertaking interviews with staff and other individual, which will allow the auditor to complete the audit checklist. These activities are the basis for completing the verification process and for preparing the verification report.

Audit and Draft Verification Reports: The auditor will produce an audit report and a draft verification report for the project, which summarizes the audit findings. The draft verification report will state the number of ERs achieved by the project and will point to areas of possible non-compliance if warranted. The report will also include conclusions on data quality, the monitoring and management and operational system, and other areas where corrective action may be required to come into compliance, improve performance or mitigate risks. The draft report will be submitted to The CDCF, and a copy will be sent to the operator. The project will have the opportunity to come into compliance, if necessary, by submitting the appropriate evidence or by taking corrective action.

Final Verification Report: The auditor will revise the draft report taking into consideration reviewers' comments and further findings and issue the final verification report, if possible within two weeks of receiving all comments. If justified, the final verification report will conclude and explain that, within the verification period, the project has generated the stated quantity of ERs in compliance with all applicable CDM and other requirements. The final verification report is the basis for the issuance of a certificate by the verifier, which will state and confirm the conclusions of the report.

Non-Compliance and Dispute Settlement: In the event of non-compliance findings, the non-complying auditee will be given sufficient time to demonstrate compliance. An eight week period from the issuance of the draft report is recommended for the auditee to address identified deficiencies and come into compliance. It is the responsibility of the verifier to ensure that dispute over any non-compliance issue is communicated clearly and that any attempt is made to resolve it. The verifier will have final decision over the process. The verifier will also provide guidance as appropriate on how identified deficiencies can be met so that the operator can come into compliance in the following period.

Audit and Verification Schedule: Audits and verification of the project will be conducted annually at first, then at intervals over the life of the project. The CDCF in consultation with auditors and the operator will determine the audit schedule. Audit intervals will depend on audit outcomes and experience with the project performance and compliance with the MP, the quality of its monitoring management and operational systems, and the type and number of corrective actions required by the verifier.

E. Roles and Responsibilities

Audit responsibilities are allocated between the project's participants as follows:

The CDCF:

1. The CDCF will make arrangements for the audit and select a third party auditor/verifier in accordance with CDM modalities and CDCF requirements and selection criteria and in consultation with the relevant the host country CDM authority.
2. It is the CDCF's obligation to ensure that the audit process is fair, that the auditor/verifier is fully independent of the operator and that and all possible conflicts of interests are avoided. The CDCF requires details of the experts to be used on the audit/verification team.
3. The CDCF will facilitate the audit work and verification process and will work with the project's participants to ensure co-operation.

The Operator:

1. Will prepare for the audit and verification process to the best of its abilities.
2. Will facilitate the audit through providing Auditors with all the required information, before, during and, in the event of queries, after the audit.
3. Will fully cooperate with the auditors and instruct staff and management to be available for interviews and respond honestly to all audit questions.
4. It is the contractual obligation of the operator and in its best interest to fully cooperate with auditors and verifiers, since only successful verification will enable the delivery of ER to The CDCF in fulfilment of the operator' contracts with the CDCF.

The Auditor / Verifier:

1. The auditors/verifiers must be operational entities accredited in accordance with CDM modalities. They must be professional organizations with a proven track record in environmental auditing and verification, experience with CDM project and work in developing countries. The audit firm must guarantee professional work and assure the quality of the audit and verification team.

2. The auditors / verifiers must undertake the audit to the best of their professional abilities. The auditor's responsibilities include to (a) provide the checklists and request for information in good time, (b) allow adequate time for sufficient review and preparation, (c) provide publishable reports in the agreed format, (d) work with the operator, host country authorities and CDCF as appropriate, (e) report on lessons learnt during the course of the project.

VIII. Annexes

Sustainable Development Monitoring Plan ("SDMP")

The SDMP will cover the project's direct and indirect area of influence[40] and their habitants. The following sustainable development indicators and targets framework will facilitate the measurement of progress towards sustainability. The indicators will be revised annually[41] by the verifier to check compliance with targets. The targets will be progresses[42] registered by the indicators. The following indicators have been established:

SDMP Indicators and Targets Framework

Goal 1: Environmental Sustainability		
Initiative	**Indicator[43]**	**Target**
Water Quality	M^3 of solid residue removed from the water	Positive
New Initiative	In case the sponsor desires to incorporate a new initiative to this environmental-sustainability-initiative list, it will have to be approved by the verifier	N/A[44]

Goal 2: Socio-Economic Sustainability		
Initiative	**Indicator[45]**	**Target**
Economic standards	Number of employees hired from local population	Positive
	Purchases from local suppliers	Positive
	Donations to La Merced[46]	Positive
New Initiative	In case the sponsor desires to incorporate a new initiative to this socio-economic-sustainability-initiative list, it will have to be approved by the verifier	N/A[47]

To provide evidence of listed indicators' progresses, the project should provide the verifier the following:
(a) Receipts of expenses incurred for the socially and environmentally responsible action.
(b) Documents related to socially and environmentally responsible action.
(c) The compliance form signed annually by all members of the compliance committee (described below).

The Compliance Committee:
The compliance committee will be formed to enforce further the SDMP.

The compliance committee will be composed by a representative from:
- The project's direct area of influence: President of the *Junta de Regantes del Subsector Santa Rosa*, Mr. Manuel Perez - León Jarrín.
- The project's indirect area of influence: Secretary of La Merced, Mr. Fernando Jimenez.

The compliance committee will meet annually to:
- After reviewing evidence [(a) and (b) described above], reviewing a written summary of the environmentally and socially responsible actions taken in the semester - to be prepared by the sponsor (ELECTRICA SAC) - and being left convinced by this evidence about the indicators' progresses' accuracy claimed by the project, sign the attached form annexed below ("compliance form"); and

[40] Defined in the EIA.
[41] The year for the MP runs from August 1st to July 31st.
[42] Progresses meaning positive results of the indicators.
[43] Yearly flow or yearly change.
[44] Target will be set when indicator is created and also needs to be approved by the verifier.
[45] Yearly flow or yearly change.
[46] Until complying with social works committed with La Merced - according to the Act signed by La Merced and the sponsor, as of December 16th, 2004
[47] Target will be set when indicator is created and also needs to be approved by the verifier.

- Review progresses, identify stoppages and suggest solutions regarding listed indicators, to Electrica Santa Rosa SAC, legally represented by Mr. Guillermo Cox Harman, who will be present at the meeting.

Annual Compliance Committee Meeting - Compliance Form

Goal 1: Environmental Sustainability		
Initiative	**Indicator[48]**	**Annual Cumulative Progress**
Land Quality	M^3 of solid residue removed from the water	**As of July 31st =**
New Initiative	In case the sponsor desires to incorporate a new initiative to this environmental-sustainability-initiative list, it will have to be approved by the verifier	N/A[49]

Goal 2: Socio-Economic Sustainability		
Initiative	**Indicator[50]**	**Annual Cumulative Progress**
Economic standards	Number of employees hired from local population	**As of July 31st =**
	Purchases from local suppliers	**As of July 31st =**
	Donations to La Merced[51]	**As of July 31st =**
New Initiative	In case the sponsor desires to incorporate a new initiative to this socio-economic-sustainability-initiative list, it will have to be approved by the verifier	N/A[52]

Identified stoppages, suggested solutions and other observations brought up in the meeting: _____
_____
_____
_____
_____ (Annex extra-paper if necessary).

_____ _____

Direct area of influence representative Indirect area of influence representative

_____

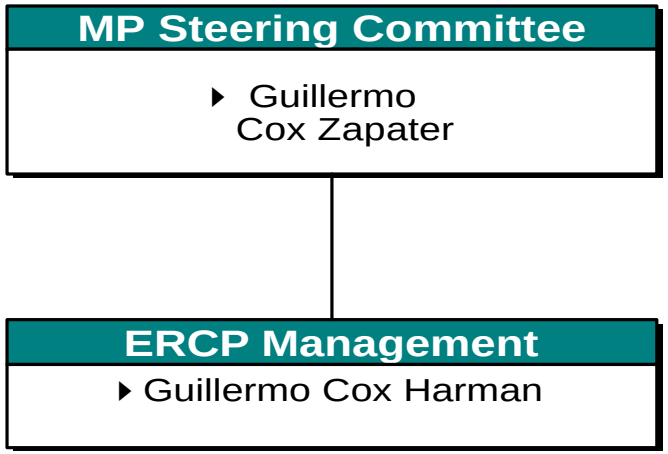
The sponsor

Date of the Compliance Committee Meeting:
Period of the year monitored:

[48] Yearly flow or yearly change.
[49] Target will be set when indicator is created and also needs to be approved by the verifier.
[50] Yearly flow or yearly change.
[51] Until complying with social works committed with La Merced - according to the Act signed by La Merced and the sponsor, as of December 16th, 2004
[52] Target will be set when indicator is created and also needs to be approved by the verifier.

Monitoring Plan (MP) – Emissions Reductions Calculation Procedure (ERCP)

ERCP Organizational Structure



Monitoring Plan (MP) – Emissions Reductions Calculation Procedure (ERCP)

ERCP Quality Control

- *Monthly recording*
- *Check calibration of electricity meters, periodically*
- *Make coordination with final clients and COES to be able to implement this document*
- *Only one person will be responsible for the ERCP: Mr. Guillermo Cox Harman (ERCP Manager)*

	COES	Final clients
Data	The Project hourly generation that is registered by *COES*	The Project hourly generation sold to final clients connected to the grid, and that is not registered by *COES*
Quality of Data Collection	Which data comes? All of the above By what means does it come? By E-mail/ CD How does it come? In Excel How frequently does it come? Monthly From whom does it come? From *COES* To whom does it comes? Mr. Guillermo Cox Harman	Which data comes? All of the above By what means does it come? By E-mail/ CD How does it come? In Excel How frequently does it come? Monthly From who does it come? From final clients To whom does it comes? Mr. Guillermo Cox Harman
Quality of Data Processing	Original Data Organized Data Entered Data Processed Data Result • Monthly calculation involves 5 steps • All of it must be done in excel and documented with receipt of sales • Yearly consolidation of monthly calculation	Original Data Organized Data Entered Data Processed Data Result • Monthly calculation involves 5 steps • All of it must be done in excel & documented with receipt of sales • Yearly consolidation of monthly calculation
Quality of Data Storage	Prevent Excel versioning problem, by keeping “a new” Excel software package every year in PCs used for the ERs calculations Keep all data for 2 years after the first crediting period (9 years) – assign a password to excel spreadsheets used for the ERCP Save the document with the last date in which an alteration was made, so that old versions are kept in disk Keep all written documentation in a folder that will be provided to the verifier together with the data in excel collected	
Quality of Data Delivery	Provide to the Verifier e-mails /CD through which Data Providers delivered the original data Provide to the Verifier receipt of sales Provide to the Verifier all calculations made (all steps of Data Processing) by showing all preliminary versions of spreadsheets saved in disk	