CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL-SCALE PROJECT ACTIVITIES (SSC-CDM-PDD)
Version 02

CONTENTS

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.

SECTION A. General description of the small-scale project activity

A.1. Title of the small-scale project activity:

Cote small-scale hydropower plant ("the project").
January 17, 2006
Version 03 PDD

A.2. Description of the small-scale project activity:

The proposed project is a small hydropower plant located in Costa Rica, over the limit of the county of Tilarán and Guatuso in the province of Guanacaste and Alajuela, respectively; within the Arenal Conservation Area ("ACA"). The purpose of the project is renewable electricity generation to be supplied to Costa Rica's national electric grid named National Interconnected System ("*NIS")*. The project's installed capacity and projected yearly average generation are 6.786 Megawatts ("MW") and 13.2[1] Gigawatts hours ("GWh"), respectively.

The project is expected to displace 45,017 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 the infrastructure already installed to divert water from the Cote Lake[2] to the Rugama Creek which flows into the *Instituto Costarricense de Electricidad*[3] ("*ICE*") Arenal Reservoir[4]. In particular the project uses the existing water intake structure (a tunnel of 389 meter-length and a damn). The project takes the water from the Cote River and transports it by way of a conducting tunnel and underground pressure pipe until the power house, where the water is turbinated and delivered in unaltered conditions to the Rugama Creek which flows into the Arenal Reservoir[5]. The project has an 87.79 meters ("m") net head; with a nominal water flow of 8.4m^3/s.

The project will supply electricity to the *NIS* through its own 200 meters ("m") - 34.5 Kilovolts ("KV")[6] transmission line which will connect to the closest distribution line that belongs to *ICE*. *ICE* is the distributor of the closest-to-the-project distribution system named Tilarán-Guatuso distribution circuit. Such distribution line owned by *ICE* will transport the electricity generated by the project until the Substation Arenal[7], which belongs to *NIS*. Substation Arenal will transform the energy from 34.5 KV to 120KV and 240KV.

The stated owned energy distributor *Compañía Nacional de Fuerza y Luz* ("*CNFL*")[8] is the project's sponsor ("the sponsor"). The project is in compliance with all Costa Rican regulations for hydropower plants generation activities[9].

The project contributes to sustainable development by:

[1] Taken from the project's feasibility study.
[2] Costa Rica's largest natural lake.
[3] A stated owned vertically integrated utility that manages the power sector being the only power purchaser in the country.
[4] Built in 1982. This infrastructure purpose was to convert the Cote Late into a hydropower plant regulating reservoir, which would be used for the Arenal hydroelectric project.
[5] As the structure built in 1982 did as well.
[6] The project counts with its own substation that transform the project's electricity generated up to 34.5 KV.
[7] Owned by *ICE*.
[8] Largest electricity distributor in Costa Rica and which also has the distribution in San José (the capital), the largest local market. The sponsor has been in operation since 1941.
[9] The project would be primarly operating under Law 7554 (Environmental Organic Law of 1995), Law 449 that legally allocates to *ICE* (98.6% shareholder of the sponsor) the responsibility of the development of electricity generation projects and regulated under Law 7593, which created the regulatory entity named *Autoridad Reguladora de Servicios Públicos* ("*ARESEP"*). The sponsor does not require water concessions, generation permits, etc. required by private projects, as it is a stated owned company.

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

b) Employing local labor in construction and in operation.

c) Facilitating electricity access by serving demand that otherwise would suffer blackouts in the zone, due to failures in already existing *ICE's* distribution line. For this purpose, the sponsor made technical improvements in the distribution line to which the project's transmission line connects.

e) Serving as a small demonstrative project for clean renewable electricity generation in the country, which could also function as an independent power producer ("IPP") if developed by a private company.

f) Contributing to Costa Rica's fiscal accounts through the payment of taxes.

g) Helping the country improve the hydrocarbons trade balance through reduction of oil imports to be used for electricity generation – Costa Rica imports all of its oil[10].

h) The sponsor agreed to develop local environmental[11] and social[12] positive impacts which will be monitored through a Sustainable Development Monitoring Plan ("SDMP")[13].

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host Party):	Private and/or public entity(ies) project participants(*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Costa Rica (host)	Compañía Nacional de Fuerza y Luz ("*CNFL*")	No
Government of Finland	International Bank for Reconstruction and Development (IBRD) as the Trustee of the Prototype Carbon Fund (PCF)	Yes
(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.		
Note: *When the PDD is filled in support of a proposed new methodology (forms CDM-NBM and CDM-NMM),* at least the host Party (ies) and any known project participants (e.g. those proposing a new methodology) shall be identified.		

The Official Contact Person for the Clean Development Mechanism ("CDM") project activity:
Odin Knudsen
Senior Fund Manager
The Prototype Carbon Fund
Washington DC.
USA.

Contact information is listed in Annex 1.

A.4. Technical description of the small-scale project activity:

[10] The steep increase in oil prices since 1999 has hampered the task of reducing inflation.
[11] Related to forest cover and vegetation, water flow, water quality, biodiversity, and ecosystem protection.
[12] Local job creation and improve and help maintaining local access ways and roads.
[13] The SDMP can be seen in the annex section of the project's Monitoring Plan ("MP").

A.4.1. Location of the small-scale project activity:

Costa Rica, Central America.

A.4.1.1. Host Party(ies):

Costa Rica.

A.4.1.2. Region/State/Province etc.:

Guanacaste and Alajuela Provinces.

A.4.1.3. City/Town/Community etc:

Tilarán (in Guanacaste) and Guatuso (in Alajuela) Counties.
Nuevo Arenal (in Tilarán) and Cote (in Guatuso) Districts.

A.4.1.4. Detail of physical location, including information allowing the unique identification of this small-scale project activity(ies):

The project is located over the Guanacaste and Alajuela Provinces, over the Tilarán (in Guanacaste) and the Guatuso (in Alajuela) Counties, over the Nuevo Arenal (in Tilarán) and Cote (in Guatuso) Districts. The transmission line is located in Tilarán County. The project is approximately 3-km away from the closest population composed by the Nuevo Arenal District. The project is located approximately 4.5 hours driving from San José. The water intake is at 647.4 masl, the load chamber at 637.2 masl. and the discharge channel to the Rugama Creek at 539 masl.

The Project Site

Source: The sponsor.

A.4.2. Type and category(ies) and technology of the small-scale project activity:

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 project installed capacity is 6.786 MW and will not increase its capacity beyond 15 MW; complying with the limits for small-scale project activities every year over the 21-year crediting period.

That the small-scale project activity is not a debundled component of a larger project activity is further analyzed under A.4.5.

Aside from using the already built water intake constructed for the Arenal hydroelectric project in 1982 the project's technology contains an open channel, an additional conducting tunnel, an underground 789.35m-1.8m diameter pressure pipe, a fore-bay, a powerhouse containing a 6.786 MW Francis Turbine (of horizontal axis and located at 547 masl), a substation located next to the power house and a sluice leading to the Rugama Creek. The powerhouse and substation will occupy an area of 18.5 ha. on land already highly disturbed and altered as a result of the construction of the Arenal hydroelectric project. The power house is 9.4m wide, 15.4m length, and 7m height. The net head is 87.79m, nominal capacity losses are 3.66m, and the water flow is 8.4m^3/s. All turbinated water is discharged back to the existing Rugama Creek in unaltered conditions.

The project transfers environmentally safe and sound technology and know-how to Costa Rica by:

-Serving as a small demonstrative project for clean renewable electricity generation in the country, which could also function as an IPP if developed by a private owner - this is possible under Costa Rica's Law 7200[14] and Decree 7508[15], which support limited private ownership of renewable energy sources.

-Hiring local labor in all of its implementation phases, including the design and execution of civil works. During operation, almost all staff working in the project site is local people, previously trained when necessary[16].

A.4.3. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed small-scale project activity, including why the emission reductions would not occur in the absence of the proposed small-scale project activity, taking into account national and/or sectoral policies and circumstances:

The project generates electricity without emitting GHGs and supplies it to the *NIS;* thereby it displaces expensive fossil-fuel based electricity generation that otherwise would be supplied to the *NIS*[17].

Also, the project would displace future generation facilities in the *NIS*, given that the *NIS* Expansion Plan considers a raise in the participation of fossil fuel-fired power plants across future years due to their shorter construction time, lower construction risks, lower turnkey cost and greater reliability to satisfy the growing annual demand, as shown in the table below.

Expected Average Generation in the Recommended Latest Expansion Plan of *ICE* (2005-2015)

[14] Which promotes small-scale exploitation of hydraulic potential and other renewable energy sources to sell energy to the public electricity system: *ICE*. This Law limited the size of the unit to less than 20 MW, the aggregated installed capacity owned by private generators to less than 15% and local ownership to at least 65% of the project's capital structure.

[15] Which modifies Law 7200 by raising the limits for size to less than 50 MW, the aggregated installed capacity owned by private generators to less than 30% and local ownership to at least 35% of the project's capital structure. This decree also required that the concessions for new capacity would be awarded under competitive bidding procedures; and authorized *ICE* to enter into international agreements for electricity transactions with other regional or state-owned utilities.

[16] As of today, 15 people work permanently onsite, 14 out of them are local.

[17] The project generates electricity mostly during hours of high demand, when it is more likely that otherwise fossil fuel-based electricity would have been dispatched. This is due to the environmental limit in the level of Cote Lakes' water monitored by *SETENA* (the minimum and maximum heights of the Cote Lake's water level must be 647.44 masl and 648.50 masl, respectively), which restraints the project's number of hours of operation. This fact allows the project to choose in which hours it operates.

Year	Fossil Fuel (%)	Renewable (%)	Total (GWh)
2005	6%	94%	8,319
2006	7%	93%	8,766
2007	9%	91%	9,233
2008	10%	90%	9,720
2009	9%	91%	10,235
2010	11%	89%	10,776
2011	13%	87%	11,350
2012	11%	89%	11,953
2013	14%	86%	12,580
2014	17%	83%	13,226
2015	19%	81%	13,916

Source: World Bank production based on table 5.2 *ICE*'s Latest Expansion Plan.

The table above shows that the participation of fossil fuel–based generation in the total country's generation will grow from 6% in 2005 to 19% in 2015.

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 45,017 tCO2e for the duration of the initial 7-year crediting period. 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 the project additionality detailed under Attachment A of Appendix B of the Simplified Modalities and Procedures for small-scale CDM Project Activities ("Appendix B")[18].

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

The first crediting period is of 7 years: from 1st April 2003 until March 31th 2010 with the option of renewing the crediting period twice. The crediting period including the two renewed crediting periods is from 1st April 2003 until March 31st 2024.

Following baseline methodology AMS-ID, the project is estimated to reduce 135,051 tCO2e during the first 21 years of operation (or 3 first crediting periods), which account for 45,017 estimated ERs for the duration of the initial 7-year crediting period and 6,431 estimated ERs every year thereafter until the 21st year[19].

Year	Annual estimation of emissions reductions in tonnes of CO_2e
2003	4,823
2004	6,431
2005	6,431
2006	6,431
2007	6,431
2008	6,431
2009	6,431
2010	6,431
2011	6,431

[18] The question of additionality is analyzed under B.3.
[19] These are estimates. For each crediting period, the baseline and emission reductions will be recalculated each year.

2012	6,431
2013	6,431
2014	6,431
2015	6,431
2016	6,431
2017	6,431
2018	6,431
2019	6,431
2020	6,431
2021	6,431
2022	6,431
2023	6,431
2024	1,608
Total estimated reductions (tonnes of CO2e)	135,051
Total number of crediting years	21
Annual average over the crediting period of estimated reductions (tonnes of CO2e)	6,431

Source: World Bank production based on the project's feasibility study estimated annual generation.

A.4.4. Public funding of the small-scale project activity:

No public funding is involved in this project. The project is developed by a Costa Rican public company, the project's initial capital structure was 24%equity and debt 76%, respectively[20], and the loan was taken from the Central American Bank for Economic Integration ("CABEI").

A.4.5. Confirmation that the small-scale 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.

The project is the only CDM application for hydropower plant generation to which the sponsor has applied, as of today.

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.

SECTION B. Application of a baseline methodology:

B.1. Title and reference of the approved baseline methodology applied to the small-scale project activity:

[20] By the time of project commissioning, the capital structure had gone from 76%debt-24%equity to 56%debt-44%equity, maintaining the total financing unchanged at $8,863,005.

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 small-scale project activity:

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 methodology for the project is AMS-ID, which is provided in Appendix B.

The chosen baseline calculation following AMS-ID is the average of the "approximate operating margin" and the "build margin". The baseline calculation chosen was deemed to be superior on its compliance with the Marrakech Accords ("MA")'s baseline definition[21], than the weighted average emissions of the current generation mix for two reasons: a) The project is more likely to mitigate fossil fuel-based electricity generation than hydro electricity generation given the *NIS* dispatch characteristics[22]; this operational fact of the *NIS*, would have been completely ignored if the weighted average emissions (in KgCO2/KWh) of the current generation mix had been considered the project's baseline. However, it is taken into account (with a weight of 50%) in the baseline chosen as the approximate operating margin excludes renewable energy sources[23]; b) The build margin is a more dynamic component for the baseline than the weighted average emissions (in KgCO2/KWh) of the current generation mix, since the build margin focuses on the emission from the most recently-built plants[24]. At the same time, the build margin is also conservative as it is based on weighted average emissions (in KgCO2/KWh) of a generation mix that do not excludes any type of electricity generation technology. In summary, it was deemed that this 50%-50% combination of both margins (approximate operating margin and build margin) explained better what would happen in the absence of the project activity than the weighted average emissions (in KgCO2/KWh) of the current generation mix.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

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

(a) Investment Barrier: The investment barriers identified were two, the high turnkey cost and the low load factor.

-The much higher up-front investment cost need for hydropower plants than for fossil fuel-fired power plants makes fossil fuel power plants a more financially viable alternative than hydropower plants for generation. The table below shows the turnkey cost[25] per MW of different technologies.

[21] The definition for baseline of the Marrakech Accords ("MA"), is: "The baseline for a CDM project activity is the scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity".
[22] Which assigns less dispatch merit order to fossil fuel-based generation than to renewable generating technologies – Merit order of NIS-provided by *ICE*- can be seen in Annex 3.
[23] Except for LFGTE which is not excluded in the approximate average operating margin for the baseline calculation, following AMS-ID.
[24] The latest capacity addition's generation up to 20% of the *NIS* generation takes new units added from July 22th, 1999.
[25] Turnkey meaning the investment needed to put a power plant in operation.

Technology Comparison	Diesel Engine	Simple Cycle Gas Turbine	River Hydro
Size Range (MW)	0.02 - 25	0.5 - 450	.02 - 1
Efficiency (%)	36% - 43%	21% - 45%	60-70%
Gen Set Cost ($/MW)	125,000 to 300,000	300,000 to 600,000	NA
Turnkey Cost-No Heat Recovery ($/MW)	**200,000 to 500,000**	**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 following table shows the final turnkey cost for the project:

Total Cost of The Project ($)	$15,740,590.80
Installed Capacity (MW)	6.786
Turnkey Cost ($/MW)	**$2,319,568**

Source: The sponsor - Financial Department

With such high initial investment cost per MW, the sponsor needed to raise debt to solve its need of capital as well as its need of sharing the risk involved.

-The project's load factor of 22% was very low. Load factors of renewable energy[26] latest capacity addition added to the *NIS* are much higher, as shows the table below.

Years	Technology	Added Inst.Cap (MW)	Annual Generation(MWh)	Load Factor(%)
1999				
MOVASA (eólico)	Wind	19	71,396	42%
2000				
ANGOSTURA	Hydro	172	746,616	49%
MIRAVALLES III	Geothermal	30	219,203	85%
LA ESPERANZA	Hydro	6	26,789	56%
2001				
2002				
GARITA 5	Hydro	7	34,364	53%
TEJONA	Wind	20	79,386	46%
PEÑAS BLANCAS	Hydro	38	190,716	58%
2003				
PEÑAS BLANCAS	Hydro	0.4	2,183	58%
COOPELESCA-CHOCOSUELA	Hydro	17	68,481	45%
CNFL	Hydro	7	32,207	50%
2004				
MIRAVALLES V	Geothermal	21	144,410	79%
CACHI	Hydro	8	34,213	49%

Source: World Bank production based on *ICE -Centro Nacional de Control de Energía* (*NIS* Dispatch Center) data.

The lowest load factor of the list above is almost double that of the project. Consequently the debt and equity raised for the project would take longer to be repaid than other renewable energy investments in Costa Rica would.

In this scenario, only the prospects of carbon finance revenue are capable of lower the investments barriers faced by the project.

(b) Technological barrier: The project's technological barriers were the two listed below.

[26] Excluding biomass and landfill-gas-to energy generating activities, whose generation depends on factors other than the renewable energy source availability.

-The project is located in an area with high seismic activity that could generate problems associated with landslides for the project slopes around the infrastructure (*taludes*) as well as damages to the infrastructure.

-Superficial water could increase the weight of the slopes around the infrastructure (*taludes*) and reduce the angle of soil friction increasing the probability of landslides.

These conditions increased the likelihood of potential technical inconveniences and cost increases. In fact, due to construction contingencies the turnkey cost of the project went from an initially forecasted conservative estimate of $1,719,640/MW[27] to $2,319,568/MW[28], all the extra-cost was assumed by the sponsor. These land-instability contingencies not only increased costs (5.6 times the originally planned contingencies, going from $500,000 to $3,285,000), but also extended the project construction period in 1-year; the total project construction period took 3 years and 3 months to be built: From December 2000 to March 2003. The works to reinforce the land stability were performed between October 19th 2001 (date of an unexpected landslide) and November 2002.

Regardless of size, fossil fuel-fired plants are a less technologically advanced option[29] as well as a less technologically risky option[30].

d) Other barriers: Costa Rican fiscal deficit, can seriously affect hydropower-plant development. At the start of the project's construction phase (December 22nd, 2000), Costa Rica's fiscal deficit[31] and the deceleration of the economy[32] started to limit stated-owned enterprises' levels of investment and financial leverage. As the fastest way to decrease fiscal deficit (and thus avoid triggering inflation) is to cut expenses including investments in infrastructure, and as government is still the main investor in energy in Costa Rica[33], energy investments have plunged in recent years as the following table shows:

Years	Technology	Added Inst.Cap (MW)	Additional Annual Clean Energy Capacity (MW)
2000			
ANGOSTURA	Hydro	172	
MIRAVALLES III	Geothermal	30	
LA ESPERANZA	Hydro	6	207
2001			0
2002			
GARITA 5	Hydro	7	
TEJONA	Wind	20	
PEÑAS BLANCAS	Hydro	38	65
2003			
PEÑAS BLANCAS	Hydro	0.4	
MOIN GAS - C.N.F.L.2	Diesel	90	
COOPELESCA-CHOCOSUELA	Hydro	17	
CNFL	Hydro	7	
INGENIO TABOGA S.A.10	Biomass	17	42
2004			
MIRAVALLES V	Geothermal	21	
RIO AZUL	LFGTE	4	
CACHI	Hydro	8	33

[27] $11,669,479/6.786MW.
[28] $15,740,591/6.786MW.
[29] Hydropower plants constitute a much more challenging investment than fossil fuel-fired power plants, in terms of technology.
[30] Given that the particular hydrological and geological conditions and possible design failures can only be fully known ex-post - hydropower plants' are more vulnerable to natural events including earthquakes and droughts, which increase probabilities of technical inconveniences.
[31] Taken from Yahoo Finance "Costa Rica's Background": "Over the past four years the consolidated deficit has been equivalent to 3.5% to 4% of GDP; interest rates in the country are high both in nominal and in real terms and that adds significantly to the deficit problem, as public debt is now 50% of GDP, high interest payments on debt make closing the budget gap doubly difficult".
[32] Taken from Yahoo Finance "Costa Rica's Background": "In particular, the year 2000 saw a dramatic deceleration of the economy with GDP growth down to 1.7% in 2000 from 8.4% in the year 1999. The slowdown continued in 2001 when the economy grew just one percent.
[33] Stated owned enterprises are the main electricity generation investors in the country -*ICE* and *CNFL* were responsible for 77% and 5% of the generation in the country, respectively, during 2004.

Source: World Bank production

Renewable energy developments are an extremely sensitive source to long-term capital sources availability[34] due to their greater turnkey cost per MW installed and capital cost.

Since 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 how the definition of the project boundary related to the baseline methodology selected is applied to the small-scale project activity:

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 18.5-hectare area where the powerhouse, substation and transmission line is placed; and as the transmission line reaches the *NIS*, when connecting to *ICE*'s distribution line, the *NIS* will also be included in the project's boundary.

B.5. Details of the baseline and its development:

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.

The final draft of this baseline section was completed on 16/10/2005 on behalf of The Prototype Carbon Fund by:
Ms. Paola C. Solidoro
Consultant.
World Bank Carbon Finance Business Unit

SECTION C. Duration of the project activity / Crediting period:

C.1. Duration of the small-scale project activity:

C.1.1. Starting date of the small-scale project activity:

22/12/2000 (DD/MM/YYYY).

C.1.2. Expected operational lifetime of the small-scale project activity:

40y

C.2. Choice of crediting period and related information:

C.2.1. Renewable crediting period:

C.2.1.1. Starting date of the first crediting period:

01/04/2003 (DD/MM/YYYY).

C.2.1.2. Length of the first crediting period:

7y-0m.

[34] And also sensitive to macroeconomic factors that shows volatility in the economy - such as high interest rates level and inflation risks – these indicators can be seen in Annex 3.

C.2.2. Fixed crediting period:

N/A.

C.2.2.1. Starting date:

N/A.

C.2.2.2. Length:

N/A.

SECTION D. Application of a monitoring methodology and plan:

D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:

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 MP, which will be implemented. Verification and certification of the ERs achieved will cover all of the bundled project activities. Aside from the MP, the project has certification A-Ecologic Flag, granted by the *MINAE* and is processing to achieve certification AA Ecologic Flag, these certification are monitored.

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

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 6.786MW of installed capacity[35]
d) Is not a debundled component of a larger project activity, as determined by Annex C.

The MP created for the project can be found in Annex 4 of this document.

[35] 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:

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 (*ICE*). The data provider will be *ICE.*

D.4. Qualitative explanation of how quality control (QC) and quality assurance (QA) procedures are undertaken:

ICE's electricity meter will be used to account for ERs and project's own meter will be used to double check accuracy of the project electricity generation registered by *ICE*'s meter. The calibration of this *ICE*'s meter follows standard procedures established for all of ICE's meters across the Costa Rican national territory. The calibration of the project own meter follows *CNFL* standard procedures, as well.

The project generation registered by *ICE*'s meter will be checked monthly against the project generation registered by the project's own meter in order to prevent failures in *ICE*'s meter – this procedure will be performed by the ERCP Manager as directed in the ERCP Quality Control Procedure[36]. If deviation is more than the usual deviation from one meter to another, the ERCP manager will inform *ICE* to repair its meter – after checking that the project's own meter is in good standing. If failure is confirmed by *ICE* then during the failure period, the project's own meter registered generation will be taken to account for ERs, until *ICE*'s meter is repaired. Evidence that *ICE*'s meter underwent repairance should be made available to the verifier (if this case happens).

Every month, the ERCP manager will receive the project's registered generation from two sources: ICE's meter and the project's own meter, and double check accuracy. The ERCP Manager should perform monthly calculation of accounted ERs to be ready for the verifier visit in any time of the year.

[36] Presented under annex section of the project's monitoring plan ("MP"), which can be seen in the annex 4 of this document.

Responsibilities in the ERCP have been established in an ERCP Organizational Structure[37], were a hierarchy is also established. The ERCP Quality Control Procedure[38] establishes steps to be taken in order to minimize errors in the ERCP.

D.5. Please describe briefly the operational and management structure that the project participant(s) will implement in order to monitor emission reductions and any leakage effects generated by the project activity:

No especial monitoring equipment is needed. The sponsor will count with a monitoring plan and pre-programmed spreadsheets so the sponsor will just need to collect the information as described and apply the formulae as directed in the monitoring plan. The collection sources of the data will not be in any case the project's own records but *NIS-dispatch center (registed by ICE meter)* records of hourly production to keep the highest transparency and accuracy of the data. The project staff designated will confirm these data with own records.

D.6. Name of person/entity determining the monitoring methodology:

The Monitoring Methodology and Monitoring Plan were completed on 16/10/2005 on behalf of The Prototype Carbon Fund by:
Ms. Paola C. Solidoro
Consultant
World Bank Carbon Finance Business Unit.
The Prototype Carbon Fund is also a project participant listed in annex 1 of this document.

[37] Presented under annex section of the project's monitoring plan ("MP"), which can be seen in the annex 4 of this document.
[38] Presented under annex section of the project's monitoring plan ("MP"), which can be seen in the annex 4 of this document.

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

E.1.1 Selected formulae as provided in appendix B:

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:

Given that the proposed project is a small 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

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 small-scale 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 GHGs 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:

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. The baseline emission factor was calculated ex-ante in a transparent and conservative manner as the average of the "approximate operating margin" and the "build margin". Consequently, estimated anthropogenic emissions to be reduced by the project were calculated following a 4-step-process (formulae used were provided for each step):

Step 1 – Calculation of the approximate 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 was used to obtain average emissions:
OM =∑[(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 follows:

The electricity generation of the *NIS* in 2004[39] 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[40].

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")[41] times 44/12 (being the latter the mass conversion factor).

The total tCO2 per cluster obtained were added up and the result (64,430 thousands KgCO2) was divided by the total electricity generation (66,480 thousands KWh). Hence, the weighted average emissions obtained was equal to the resulting OM equal to **0.96917 KgCO2/KWh.**

OPERATING MARGIN:

Fuel Used	2004 (MWh)	APFR (TJ per year)	C (tC/TJ)	O (%)	CO2 emission (tCO2)
Residual Fuel Oil ("Bunker")	9,273	118.2	21.10	0.99	9,055
Diesel	57,206	755.2	20.20	0.99	55,376
Hydro	6,514,501	0.0	0.00	0.00	0
Wind	257,538	0.0	0.00	0.00	0
Geothermal	1,205,610	0.0	0.00	0.00	0
Biomass	12,828	0.0	0.00	0.00	0
LFGTE	4,891	0.0	0.00	0.00	0
Total NIS generation (all sources)	8,061,847				64,430
Total exc."hydro, geothermal, wind, low-cost biomass, nuclear, solar and LFGTE gen.	66,480				
OM =	**0.96917**	**KgCO2//KWh**			

Source: World Bank production, with *ICE -Centro Nacional de Control de Energía* (*NIS* Dispatch Center) data.

Note that characteristics of the fuels imported by Costa Rica are given by Refinería Costarricense de Petróleo ("*RECOPE*"), stated-owned petroleum company[42].

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 *NIS* was identified annually and considered only if an additional investment was made to increase installed capacity[43].

The following list shows the capacity additions in the *NIS* from 1996 to 2004, and their 2004's electricity generation[44].

[39] Latest statistics publicly available (2004's *NIS* Statistics).
[40] Average NEC per fuel type can be found in Annex 3.
[41] 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.
[42] The features of Diesel and Residual Fuel Oil ("Bunker") can be found in Annex 3.
[43] Excluding any type of re-expression/re-calculation of the same installed capacity.
[44] Latest statistics publicly available (2004's *NIS* Statistics).

Electricity Generation of Additions to the *NIS* (1996-2004)

***NIS* Capacity Additions for the BM**

Years	Techn	Install.Cap. Added (MW)	Annual Generation 2004 (MWh)
1996			
TORO I	Hydro	12	53,932
TORO II	Hydro	66	273,758
CNFL	Hydro	12	53,653
LOS NEGRITOS	Hydro	0	296
AGUAZARCAS	Hydro	14	92,534
DON PEDRO	Hydro	14	79,996
1997			
CAÑO GRANDE	Hydro	0	2,592
POAS I	Hydro	1	4,540
SAN LORENZO	Hydro	17	91,258
RIO LAJAS	Hydro	11	67,400
EL EMBALSE	Hydro	2	10,849
VOLCAN	Hydro	17	85,688
1998			
RIO SEGUNDO II	Hydro	1	3,546
QUEBRADA AZUL	Hydro	0	783
POAS I, II	Hydro	0	626
MIRAVALLES II	Geothermal	55	428,156
AEROENERGIA	Wind	7	28,838
1999			
COOPELESCA-CHOCOSUELA	Hydro	8	32,103
POAS I - POAS II	Hydro	1	4,176
DOÑA JULIA	Hydro	16	114,639
CAÑO GRANDE TRES	Hydro	3	11,081
TUIS	Hydro	2	11,926
MOVASA (eólico)	Wind	19	71,396
2000			
ANGOSTURA	Hydro	172	746,616
MIRAVALLES III	Geothermal	30	219,203
LA ESPERANZA	Hydro	6	26,789
2001			
2002			
GARITA 5	Hydro	7	34,364
TEJONA	Wind	20	79,386
PEÑAS BLANCAS	Hydro	38	190,716
2003			
PEÑAS BLANCAS	Hydro	0.4	2,183
MOIN GAS - C.N.F.L.2	Diesel	90	13,079
COOPELESCA-CHOCOSUELA	Hydro	17	68,481
CNFL	Hydro	7	32,207
INGENIO TABOGA S.A.10	Biomass	17	12,164
2004			
MIRAVALLES V	Geothermal	21	144,410
RIO AZUL	LFGTE	4	4,891
CACHI	Hydro	8	34,213

Source: *ICE -Centro Nacional de Control de Energía* (*NIS* Dispatch Center).– the only plant built in 1999 that enters the latest 20% added installed capacity (in generation) sample for the BM is MOVASA Eólico, which is commissioned in July 22nd 1999. The capacity addition that enters the BM-chosen sample is highlighted in blue.

The 5 most recently built capacity addition up to 2004 were Rio Azul, Miravalles V, Ingenio Tabogasa, and Chocosuela and Peñas Blancas (commissioned in April 5ht, 2003[45]) with a total generation of 252,105 MWh in 2004. The 20% most recently built capacity addition, in generation, comprise the plants

[45] Oldest from this 5-most recently-built capacity additions sample.

listed above from July 22th 1999[46] this sample comprises a total generation of 1,636,731 MWh[47] in 2004. Hence, the selected sample for the BM was composed by the latter group, as its generation output was greater. The following formula applied to the select sample to obtain average emissions was used:

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

This formula application can be explained as follows:
The electricity generation of the *NIS* in 2004[48] 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[49].

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")[50] 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 0.00753 KgCO2/KWh. This was obtained from dividing 12,659 thousands KgCO2 by 1,680,099 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	2004 Generation (MWh)	Technology %	APFR TJ	C tC/TJ	O	44/12	CO2 Emissions(tCO2)
Residual Fuel Oil ("Bunker")	0	0%	0.00	21.10	0.990	3.67	0
Diesel	13,079	1%	172.64	20.20	0.990	3.67	12,659
Hydro	1,135,570	68%	0.00	0.00	0.000	0.00	0
Wind	150,782	9%	0.00	0.00	0.000	0.00	0
Geothermal	363,613	22%	0.00	0.00	0.000	0.00	0
Biomass	12,164	1%	0.00	0.00	0.000	0.00	0
LFGTE	4,891	0%	0.00	0.00	0.000	0.00	0
Total	1,680,099	100%					12,659
BM =	**0.00753**	**KgCO2//KWh**					

Source: World Bank production, with *ICE -Centro Nacional de Control de Energía* (*NIS* Dispatch Center) data.
-Note that characteristics of the fuels imported by Costa Rica are given by *Refinería Costarricense de Petróleo* ("*RECOPE*"), stated-owned petroleum company[51].
-Note also that geothermal emissions have been considered zero as it is a more conservative choice and given that data to calculate them was not publicly available.
-Note that LFGTE emissions are zero, based on the validated Rio Azul Project Design Document ("PDD"), which considers them zero.

Step 3 – Calculation of the CM

[46] Commissioning date of MOVASA Eólicos, only plant commissioned in 1999 that enters this sample.
[47] Exactly, the selected sample's generation comprises 20.48% of 2004 generation of the *NIS (*8,061,847 MWh) – Source: 2004's *NIS* Statistics
[48] Latest statistics publicly available (2004's *NIS* Statistics).
[49] Average real NEC per fuel type can be seen in Annex 3 – and was calculated based on *NIS* dispatch center data.
[50] 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.
[51] The features of Diesel and Residual Fuel Oil ("Bunker") can be found in Annex 3.

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 (0.96917) + 0.5 x (0.00753) = 0.48835 KgCO2/KWh.
The CM obtained was 0.48835 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 = 0.48835 KgCO2/KWh x 13,169 = 6,431 tCO2e or 6,431[52] ERs.

The ERs estimated for the first crediting period add up to 45,017 tCO2e. This calculation can be seen in the table below:

First Crediting Period (2003-2010)			
		Annual Generation	Total ERs
Dates of CERs delivery		(Thousand KWh)	(Thousand KgCO2)
1	1-Apr-04	13,169	6,431
2	1-Apr-05	13,169	6,431
3	1-Apr-06	13,169	6,431
4	1-Apr-07	13,169	6,431
5	1-Apr-08	13,169	6,431
6	1-Apr-09	13,169	6,431
7	1-Apr-10	13,169	6,431
			45,017

Source: World Bank production – single parameter of generation was taken from the feasibility study.

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 45,017 tCO2e.

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

Year at Annual CERs delivery	Total baseline emissions (tCO_2e)	Total Project emissions (tCO2e)	ERs(tCO_2e)
2004	6,431	0	6,431
2005	6,431	0	6,431
2006	6,431	0	6,431
2007	6,431	0	6,431
2008	6,431	0	6,431

[52] All margins were rounded to the fifth decimal, but the CERs per year were rounded down to the nearest integer.

2009	6,431	0	6,431
2010	6,431	0	6,431
Total	45,017	0	45,017

Source: World Bank production based on the estimated annual generation taken from the project's feasibility study.

SECTION F.: Environmental impacts:

F.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

The project's Environmental Impact Assessment ("EIA") was approved by the National Environmental Technical Secretariat ("*SETENA*") in May 2000, as required by Law. Water rights approvals are not required for a stated-owned enterprise as the sponsor is[53].

Existing environmental and social conditions found in the EIA can be summarized as follow:

-Geology: The stratigraphic base of the project's area is volcanic rock. The dominant tectonic structures have a northeast-southeast alignment.

-Hydrology: The average rainfall for the area is 4,500 mm/year. Many tributaries feed into the Cote lake, the most important being the Pierna de la Laguna river. The flow at the project site has an average annual from of 1.97 m3/s, ranging from 0.4 m3/s in April to 3.13 m3/s in August. The water from the existing project drains into the Rugama, a tributary to the Arenal lagoon. The Rugama has an average annual flow of 0.21 m3/s, ranging from 0.04 m3/s in April to 0.34 m3/s in August. Maximum flow in the Rugama was calculated through Gumbel distribution, assuming a design flow with a return period of 500 years, the flood flow is 39.0 m3/s.

-Natural Disasters: Aside from flooding (see above), the natural disaster risks in this area are limited to seismic and volcanic activity. These were both considered in the design of the project, again based on a return period of 1 in 500 years.

-Land Use: The Cote watershed (15.3 km^2) mostly consists of forests important for the protection of the flora and fauna, aquifer recharge, genetic reserves and aesthetic beauty. The soil of the watershed Rugama (1.8 km^2) has good drainage, is very steep and has low fertility; its importance is mainly as forest cover. Economic activities in the region are tourism (upper watershed) and agriculture (lower watershed).

-Water Rights: The only river effected by the project, the Rugama, has no known water uses save serving as the major inflow into the Arenal lagoon.

-Terrestrial Flora and Fauna: Intense deforestation in the past altered the weather conditions in the area, increasing the temperature and the wind speed, changing soil humidity, evaporation and the runoff from rivers. Based on Holdridge's classification system, the area is humid and highly humid pre-montane tropical forest. In the areas where the facilities already exist, there is a significant amount of underbrush and aquatic plants at the shore of the lagoon, near the intake. Pines were planted along the tunnel, and

[53] Once approved, *SETENA*, has legal powers in the case of unresolved community conflicts or non-compliance with the terms of the EIA and the Environmental Management Plan ("EMP") that include being able to stop the project (other resources are also available). In addition, the *SETENA* designs one "*Regente Ambiental*" during construction and another during operation. The *Regentes Ambientales* act as watch-guards of what is committed in the EIA and EMP; the *Regentes Ambientales* have civil and judicial responsibility to the validity of what they inform to *SETENA*. In addition to an EIA, the project required forestry permits to be granted by *MINAE*, these were granted on April 2001.

ipil-ipil was planted around the lagoon. Above the canal, there is a secondary forest which is highly mixed and intervened. In the area which the project will intervene, between the tunnel exit and the first canal intake, a high quality forest exists (some primary). The tunnel extension crosses some forested area, but mostly pastureland. The second channel, the antechamber and the beginning of the pressure pipe are in an area with primary forest. This area also suffers from landslides. The majority of the pressure pipe crosses fairly polluted (trash) pastureland. Finally, the machine house and the tailrace canal are in a very intervened zone. Spotted cavies, red coatis, foxes, and squirrels are all common. Monkeys frequent the area, as are birds. Many of the 284 species of birds that have been reported in the area are protected by law to some degree.

-Aquatic Flora and Fauna: The aquatic environment associated with the project is the Cote Lake, the Rugama creek and the Cote River. With the construction of this project, the Rugama creek will return to its natural state (prior to the *ICE* dam built in 1982). The Cote River will remain at its current, diverted (and almost dry) state. The Cote lake water is dark, with low light penetration. There is no evidence of endemic fish in the lake, nor in surrounding rivers. Many frogs and other amphibians are common. Otters have been spotted. The lake is surrounded by some wetlands.

-Local Communities: Two communities are located in the project area of influence, the village of Arenal de Tilarán and the village San Rafael de Guatuso. San Rafael has a population of 6,694, whose main economic activities include grain, vegetable, fruit and dairy production. Arenal has a population of 2,180, and its main economic activity is tourism. The communities have access to education, health services, drinking water, public transportation and electricity. A social assessment was completed during project preparation, and these communities were targeted during project public consultation.

-Cultural Property: Based on information from the National Museum of Costa Rica, no known archeological sites exist in the project area.

The Environmental Management Plan derived from the EIA can be summarized as follows:

Project Activity	Potential Impacts	Corrective Measures taken
Modification of the water intake over the Cote River.	• Removal of the forest.	• Reforestation program for affected area.
	• Noise	• Transportation performed over the Cote Lake • Training to personnel.
	• Hunting risk	• Establishment of limits for walkers. • Allocation of preventive advertisement.

Project Activity	Potential Impacts	Corrective Measures taken
Conducting-tunnel construction	• Removal of the forest	• Reforestation program for affected area
	• Noise • Habitat fragmentation • Personnel security.	• Stability reinforcement of the channels and access roads. • Water control. • Reforestation with species that favor land stability. • Change from an open channel to an underground channel structure. • Control of hours of labor and rest. • Allocation of advertisement in risky zones.
Excavation of new tunnel and new structures	• Change in humidity. • Debris generation. • Archeological impact.	• Control of excavation. • Elaboration of an archeological evaluation.
Construction of the load chamber	• Removal of forest.	• Reforestation program for affected area.
Construction of Pressure Pipe	• Removal of forest. • Reproductive barrier. • Visual impact.	• Reforestation program for affected area. • Monitoring of the biodiversity. • Reforestation by using native species.
Construction of power house and turbo-generator.	• Removal of forest • Noise	• Reforestation by using native species.
Final phase of construction	• Noise. • CO2 emissions. • Contamination risk for oil spills. • Traffic. • Debris emissions.	• Training. • Ears protection equipment made available. • Machinery inspection. • Careful management of oil by using deposits. • Distribution of

Project Activity	Potential Impacts	Corrective Measures taken
		hours of work. • Vehicle speed regulation established.
Camping and offices	• Interaction with the community. • Contamination risk for solid residues.	• Environmental training. • Drainage structures for chemicals to avoid spills. • Medical services made available. • Transportation of solid residues to a landfill. • Allocation of advertisement regarding solid residues management.

SECTION G. Stakeholders' comments:

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

The two affected populations, San Rafael de Guatuso and Nuevo Arenal have been involved in extensive consultations with project proponents (i.e. The Arenal Municipality conferred construction permissions to the project on April 2001 after a public presentation of the project). These populations have been invited to participate in several Public Consultation meetings through oral notification and notes posted on churches and schools which indicated the place, time and date of the meetings[54].

The objectives of the Public Consultations have been as follow: a) to present the project and its environmental impacts as analyzed in the EIA and solve any doubt raised by the community, b) to improve the relationship with the neighboring population, c) to become familiarized with the comments of the local stakeholders regarding the project, and, finally, d) to initiate a communication process between enterprise and neighboring community.

No downstream water users will be affected, since there are no water users along the stretch of Rugama creek with future reduced flow.

Local landowners who are affected by the project have also signed agreements to sell the required land to the project. The process of land purchase from private owners was completed on March 2001. Similarly, the permission conferred by *ICE* to used *ICE*-owned lands for project was granted on April 2001.

G.2. Summary of the comments received:

Comments, concerns and/or observations from the Public Consultation have been positive and negative. The positive have been focused on:
-Source of work.
-Better electricity access.

[54] Neither newspaper nor any other means of mass communication is available in the area.

-Improvement in roads.
-Economic benefits for the local population

The negative were focused on:
-Negative effects on the ecology.
-Negative effects on the lake level.
-Negative effect on downstream aquatic vegetation.

No other major comments have been received.

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

The very mission of the sponsor, which is to contribute to the social and economic development of the country, is interpreted internally to include social support to the communities surrounding its projects. The sponsor has well-developed community participation programs, which they have also applied in the case of the project. In part at least due to these programs, the sponsor is perceived as a responsible "good guy" by the greater Costa Rican society, including those segments of the society that live in the areas of influence of its electrical generation projects.

As a result of the public consultations meetings performed and also at the sponsor's own initiative, the sponsor agreed to the following:
-Hire local labor[55].
-Build small infrastructure improvements (i.e. performed improvements in the illumination of Sports Park of Nuevo Arenal, performed a slight road improvement).
-Establishment of a community feedback mechanism[56] - 16 persons of Nuevo Arenal and 12 persons of Guatuso volunteer to be part of this mechanism, these persons would kept aware of the project advancement, and would be given the responsibility to spread any information given by the sponsor in the community. This mechanism was to be in existence during the whole pre-operative period.
-Improve local electricity access and electricity quality (constant blackouts) by improving *ICE*'s distribution line to which the project connects.
-Teach educational classes at local schools regarding the importance of protecting the environment and local natural resources.
-The plant committed to acquired certification A of Ecological Flag, provided by MINAE, and the project's actual target is achieving AA in the short term[57].

[55] Information about available local labor was raised through polls performed as of December 12th, 2000. During construction the project hired 435 neighbors.
[56] As of the end of 2003 there have been 16 meetings carried out with this feedback mechanism.
[57] These certifications would take due account on the negative comments received listed under G.2.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Compañía Nacional de Fuerza y Luz ("*CNFL*").
Street/P.O.Box:	5th Avenue, 1st Street
Building:	
City:	San José de Costa Rica
State/Region:	
Postcode/ZIP:	
Country:	Costa Rica
Telephone:	506-295-5720
FAX:	506-296-3950
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	Engineer
Last Name:	Mora
Middle Name:	
First Name:	Dennis
Department:	Electricity Generation Projects
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	mailto:wdelgado@cnfl.go.cr

Organization:	The Prototype Carbon Fund
Street/P.O.Box:	
Building:	1818H Street
City:	Washington DC
State/Region:	Washington DC
Postcode/ZIP:	20433
Country:	Unites States of America
Telephone:	
FAX:	
E-Mail:	oknudsen@worldbank.org
URL:	
Represented by:	
Title:	
Salutation:	Senior Fund Manager
Last Name:	Knudsen
Middle Name:	
First Name:	Odin
Department:	World Bank Carbon Finance Business Unit
Mobile:	
Direct FAX:	

Direct tel:	
Personal E-Mail:	

Organization:	Ministry of Foreign Affairs, Department for Development Policy
Street/P.O.Box:	P.O Box 176 , FIN-00161
Building:	
City:	Helsinki
State/Region:	
Postfix/ZIP:	
Country:	Finland
Telephone:	358 91605410
FAX:	358 916056428
E-Mail:	
URL:	
Represented by:	Head of Unit
Title:	
Salutation:	Mr.
Last Name:	Puustinen
Middle Name:	
First Name:	Pekka
Department:	Unit for Sectoral Policy
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	Keo-12@frmin.fl

Annex 2
INFORMATION REGARDING PUBLIC FUNDING

No public funding is involved in this project.

Annex 3
ADDITIONAL INFORMATION REGARDING THE BASELINE CALCULATION
ICE-historical Real NECs calculated

		MEDIAN	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Diesel	SAN ANTONIO GAS [6]	24.71%	28.32%	26.17%	18.57%	24.82%	24.82%	25.13%	24.89%	24.60%	24.51%	24.33%	25.06%	22.73%	25.09%	24.44%	24.52%	22.88%
Diesel	BARRANCA GAS [7]	23.49%	20.95%	23.41%	20.89%	23.61%	23.61%	24.36%	24.47%	24.81%	24.93%	22.43%	22.22%	23.05%	23.23%	20.38%	23.66%	23.56%
Bunker	MOIN PISTON	20.71%	0.00%	0.00%	0.00%	0.00%	0.00%	20.19%	20.93%	20.79%	21.18%	21.35%	21.68%	21.24%	14.81%	21.41%	20.88%	20.63%
Bunker	COLIMA	35.78%	0.00%	63.73%	34.79%	35.87%	35.87%	48.81%	35.31%	38.07%	37.39%	35.68%	35.62%	36.08%	34.41%	35.92%	35.23%	35.02%
Diesel	MOIN GAS [8]	30.45%	45.13%	39.10%	31.17%	17.67%	17.67%	16.13%	30.58%	37.39%	30.78%	30.32%	28.69%	29.99%	32.15%	32.81%	28.92%	29.62%
Diesel	MOIN GAS - C.N.F.L.[2]	30.45%	45.13%	39.10%	31.17%	17.67%	17.67%	16.13%	30.58%	37.39%	30.78%	30.32%	28.69%	29.99%	32.15%	32.81%	28.92%	29.62%

Source: World Bank production[58], based on latest *ICE* real NECs calculations available.

Average Net Efficiency Conversion ("NEC") per fossil fuel-technology used in the APFR formula

Average Diesel	**27.27%**
Average Residual Fuel Oil ("Bunker")	**28.24%**

Source: World Bank production based on *ICE*'s NECs calculations

Characteristics of the Diesel and Residual Fuel Oil ("Bunker") imported in Costa Rica by RECOPE

Diesel:	10201 Kcal/Kg	0.84 gr/cm3
Residual Fuel Oil ("Bunker"):	10239 Kcal/Kg	0.97 gr/cm3

Source: *ICE -Centro Nacional de Control de Energía* (*NIS* Dispatch Center).

Costa Rican Macroeconomic Indicators
Costa Rica's Inflation Rate

Date	2000	2001	2002	2003	2004	2005
January 1st	9%	10%	9%	9%	9%	12%

Source: Costa Rica's Central Bank

Average Interest Rate for Loans in Local Currency

Date	2000	2001	2002	2003	2004	2005
January 1st	29%	28%	26%	27%	24%	23%

Source: Costa Rica's Central Bank

Average Interest Rate for Loans in US Dollars

Date	2000	2001	2002	2003	2004	2005
January 1st	13%	12%	11%	10%	10%	9%

Source: Costa Rica's Central Bank

[58] MOIN GAS *CNFL* – was assumed to have the same NEC as MOIN GAS, since it is the same technology and by December 2002 the prior was not yet commissioned.

<u>*NIS* Merit Order allocated by *ICE* -Centro Nacional de Control de Energía (*NIS* Dispatch Center)</u>

1		Geothermal	Miravalles 1
2		Geothermal	Miravalles 2
3		Geothermal	Miravalles 3
4		Geothermal	Miravalles 5
5		Geothermal	Boca Pozo
6		Renewable	Private Companies
7		Renewable	Municipal Companies
8		Hydro	CNFL
9		Hydro	Peñas Blancas
10		Hydro	Echandi
11		Hydro	Garita
12		Hydro	V. Garita
13		Hydro	Río Macho
14		Hydro	TORO 1
15		Hydro	TORO 2
16		Hydro	Angostura
17		Hydro	Cachí
18		Hydro	Arenal
19		Hydro	Corobicí
20		Hydro	Sandillal
21	Bunker C	Fossil fuel	Colima
22	Diesel	Fossil fuel	Moín CNFL
23	Diesel	Fossil fuel	San Antonio
24	Diesel	Fossil fuel	Barranca
25	Bunker C	Fossil fuel	Moín Piston
26	Diesel	Fossil fuel	Moín-Gas

Source: *ICE -Centro Nacional de Control de Energía* (*NIS* Dispatch Center).

Justification of the usage of *NIS*-dispatch center information system data for baseline calculation: The only official data available about generation in the country is *ICE's* data; all generation (private and municipal as well) is reported to *ICE's Centro de Control de Energía (NIS Dispatch Center)*, as long as a contract of energy purchase exists between the electricity producer and *ICE*. According to *ICE* Planning Department, the electricity not registered by *ICE* is irrelevant (very small).

Annex 4
THE MONITORING PLAN

TABLE OF CONTENTS

I. Background Information

The baseline methodology and monitoring methodology for 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 installed capacity and estimated yearly average generation is as follows:

Project name	Installed capacity (MW)	Expected Annual Generation (MWh/year)
Cote	6.786	13,169

Source: The project's feasibility study

The proposed project is a small hydropower plant located in Costa Rica, over the limit of the county of Tilarán and Guatuso in the province of Guanacaste and Alajuela, respectively; within the Arenal Conservation Area ("ACA"). The purpose of the project is renewable electricity generation to be supplied to Costa Rica's national electric grid named National Interconnected System ("*NIS")*. The project's installed capacity and projected yearly average generation are 6.786 Megawatts ("MW") and 13.2 Gigawatts hours ("GWh"), respectively.

The project is expected to displace 45,017 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 the infrastructure already installed to divert water from the Cote Lake[59] to the Rugama Creek which flows into the *Instituto Costarricense de Electricidad*[60] ("*ICE*") Arenal Reservoir[61]. In particular the project uses the existing water intake structure (a tunnel of 389 meter-length and a damn). The project takes the water from the Cote River and transports it by way of a conducting tunnel and underground pressure pipe until the power house, where the water is turbinated and delivered in unaltered conditions to the Rugama Creek which flows into the Arenal Reservoir[62]. The project has an 87.79 meters ("m") net head; with a nominal water flow of 8.4m^3/s.

The project will supply electricity to the *NIS* through its own 200 meters ("m") - 34.5 Kilovolts ("KV")[63] transmission line which will connect to the closest distribution line that belongs to *ICE*. *ICE* is the distributor of the closest-to-the-project distribution system named Tilarán-Guatuso distribution circuit. Such distribution line owned by *ICE* will transport the electricity generated by the project until the Substation Arenal[64], which belongs to *NIS*. Substation Arenal will transform the energy from 34.5 KV to 120KV and 240KV.

The stated owned energy distributor *Compañía Nacional de Fuerza y Luz* ("*CNFL*")[65] is the project's sponsor ("the sponsor"). The project is in compliance with all Costa Rican regulations for hydropower plants generation activities[66].

[59] Costa Rica's largest natural lake.
[60] A stated owned vertically integrated utility that manages the power sector being the only power purchaser in the country.
[61] Built in 1982. This infrastructure purpose was to convert the Cote Late into a hydropower plant regulating reservoir, which would be used for the Arenal hydroelectric project.
[62] As the structure built in 1982 did as well.
[63] The project counts with its own substation that transform the project's electricity generated up to 34.5 KV.
[64] Owned by *ICE*.
[65] Largest electricity distributor in Costa Rica and which also has the distribution in San José (the capital), the largest local market. The sponsor has been in operation since 1941.
[66] The project would be primarily operating under Law 7554 (Environmental Organic Law of 1995), Law 449 that legally allocates to *ICE* (98.6% shareholder of the sponsor) the responsibility of the development of electricity generation projects and regulated under Law 7593, which created the regulatory entity named *Autoridad Reguladora de Servicios Públicos* ("*ARESEP"*). The sponsor does not require water concessions, generation permits, etc. required by private projects, as it is a stated owned company.

II. Purpose of the Monitoring Plan

This report presents the Monitoring Plan ("the MP") for the project, which has been considered by The Prototype Carbon Fund ("PCF") for ERs purchases in Costa Rica. 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 PCF, 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 PCF.

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 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 the project's performance in terms of ERs achievement requires the fulfillment of operational data collection and processing obligations from the operator. The operator has the primary obligation to calculate the project ERs based on the most recent available information, following the ERs Calculation Procedure ("ERCP") presented in this MP and to abide to the ERCP Organizational Structure and the ERCP Quality Control Procedure presented in the annex section of this MP. Both the ERCP Organizational Structure and the ERCP Quality Control can be seen in annex.

The ERCP Organizational Structure aims at showing that the ERCP Manager will be responsible for performing the ERCP (monthly), and the MP Steering Committee will be responsible for supervising the ERCP Manager monitoring work (monthly). The ERCP Manager will report to the MP Steering

Committee (monthly); and both the ERCP Manager and MP Steering Committee co-ordinately will report to the verifier (when the verification takes place), allowing for a successful verification of the project's accounted ERs.

The ERCP Quality Control aims at providing guidance on how to handle monitoring data as to ensure that sufficient and accurate information is made available to the verifier, allowing for a successful verification of accounted ERs. It is responsibility of the operator to enter into agreements with both sorts of data-sources (*NIS*) to ensure that data is made available monthly to the ERCP Manager. To avoid conflict of interests, all data required for the MP will come from *ICE* through e-mail or CD.

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 between monitored and verified ERs, especially errors in the data monitoring and processing 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 post-verification.

Monthly Data Collection – parties involved and monitoring responsibilities

I. *ICE* – (Data Provider)	- Shall provide the operator with written proof of the project's monthly generation registered by ICE's meter (through e-mail) Frequency: Monthly
II. The operator (Data Processor)	- Shall keep receipt of sales. - Shall perform monthly calculation of ERs following the ERCP. - Shall perform the annual report of ERs achieved to the verifier. - Shall establish the necessary agreements with *ICE* to assure that ICE provides (monthly) the project's hourly generation registered by its meter

Source: World Bank production

B. Emissions Reductions Calculation Procedure and Required Spreadsheets

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 *ICE* meter, 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 ICE *meter* reports. 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. The file is named Cote 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. This will allow saving old versions on disk and keeping 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 Cote 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 Cote ERs at "yearly period in question".xls.

The year for the MP will run from April 1st to March 31st. This monthly-filled file will be composed by 2 worksheets:

-Worksheet # 1: Original Data from ICE -(ICE's meter)
-Worksheet # 2: Organized Data, Processed Data and Result

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

3. Worksheet # 2: The ERCP manager should put in one column, the hourly generation or quarter-of-hour generation of the month of the project and sum it up to obtain the monthly project generation. In this same Worksheet, the ERCP manager should calculate monthly ERs (measured in tCO2) by multiplying the generation in KWh (or MWh) times 0.48835 in KgCO2/KWh (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. At the end of the year[67], the ERCP manager should sum the resulting yearly ERs of the project to obtain the yearly project' ERs ready for verification. Once the yearly ERs calculation is completed in the Cote ERs at March.xls, this file should become Cote ERs at "yearly period in question".xls.

Worksheet # 2 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"):

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 Costa Rica has endorsed the project as a CDM-eligible activity. It can be taken for granted that the project will contribute to environmental sustainability as well as development in Costa Rica 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 specific SDMP built for the project 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 stratigraphic base of the project's area is volcanic rock. The Cote River will remain at its current, diverted (and almost dry) state. The Cote lake water is dark, with low light penetration. There is no evidence of endemic fish in the lake, nor in surrounding rivers. Many frogs and other amphibians are common. Otters have been spotted. The lake is surrounded by some wetlands.

The project contribution to environmental sustainability is contemplated in the SDMP, shown in the annex section of this MP.

[67] For MP purposes: March 31st

B. Socio-Economic Sustainability

No negative social impacts are predicted as a consequence of the project, two communities are located in the project area of influence, the village of Arenal de Tilarán and the village San Rafael de Guatuso. A social assessment was completed during project preparation, and these communities were targeted during project public consultation[68].

Based on information from the National Museum of Costa Rica, no known archeological sites exist in the project area.

The project contribution to socio-economic sustainability is contemplated in the SDMP, shown in the annex section of this MP.

[68] San Rafael has a population of 6,694 habitants, whose main economic activities include grain, vegetable, fruit and dairy production. Arenal has a population of 2,180 habitants, and its main economic activity is tourism. The communities have access to education, health services, drinking water, public transportation and electricity.

VI. Annexes

Sustainable Development Monitoring Plan ("SDMP")

The SDMP will cover the project's direct and indirect area of influence[69] 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[70] by the verifier to check compliance with targets. The targets will be progresses[71] registered by the indicators. The following indicators have been established:

SDMP Indicators and Targets Framework

Goal 1: Environmental Sustainability		
Initiative	**Indicator[72]**	**Target**
Land Quality	Reforestated area as % of the total area de-forested	The same or improved[73]
Land Quality	Minimum ecological flow	The same or improved[74]
Water Quality	Water Quality	The same or improved[75]
Biodiversity	Number of key bioindicator species, frequency of sightings	The same or improved[76]
Biodiversity	Payment for environmental services to protect watershed forests	$36,000[77]
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[78]

Goal 2: Socio-Economic Sustainability		
Initiative	**Indicator[79]**	**Target**
Economic standards	Number of permanent jobs created by the project	Positive[80]
	Quality of access ways and roads maintained – m^2 improved	Positive[81]
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[82]

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.

[69] Defined in the EIA.
[70] The year for the MP runs from April 1st to March 31st.
[71] Progresses meaning positive results of the indicators.
[72] Yearly flow or yearly change.
[73] During the first 4 years of operation.
[74] During the project's operating life.
[75] During the project's operating life.
[76] During the project's operating life.
[77] During the first 10 years of operation.
[78] Target will be set when indicator is created and also needs to be approved by the verifier.
[79] Yearly flow or yearly change.
[80] During the project's operating life.
[81] During the project's operating life.
[82] Target will be set when indicator is created and also needs to be approved by the verifier.

(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 the project's "*Regente Ambiental*" during the project operation: Ms. Ángela González[83].

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 year - to be prepared by the sponsor (*CNFL*) - 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
- Review progresses, identify stoppages and suggest solutions regarding listed indicators, to *CNFL*, represented by Mr. Dennis Mora, who will be present at the meeting.

[83] Professional biologist.

Annual Compliance Committee Meeting - Compliance Form

Goal 1: Environmental Sustainability		
Initiative	**Indicator[84]**	**Annual Cumulative Progress**
Land Quality	Reforestated area as % of the total area de-forested[85]	As of March 31st =
Land Quality	Minimum ecological flow[86]	As of March 31st =
Water Quality	Water Quality[87]	As of March 31st =
Biodiversity	Number of key bioindicator species, frequency of sightings[88]	As of March 31st =
Biodiversity	Payment for environmental services to protect watershed forests[89]	As of March 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[90]

Goal 2: Socio-Economic Sustainability		
Initiative	**Indicator[91]**	**Annual Cumulative Progress**
Economic standards	Number of permanent jobs created by the project[92]	As of March 31st =
	Quality of access ways and roads maintained – m^2 improved[93]	As of March 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[94]

Identified stoppages, suggested solutions and other observations brought up in the meeting: _____

_____

_____

_____

[84] Yearly flow or yearly change.
[85] During the first 4 years of operation.
[86] During the project's operating life.
[87] During the project's operating life.
[88] During the project's operating life.
[89] During the first 10 years of operation.
[90] Target will be set when indicator is created and also needs to be approved by the verifier.
[91] Yearly flow or yearly change.
[92] During the project's operating life.
[93] During the project's operating life.
[94] Target will be set when indicator is created and also needs to be approved by the verifier.

_____
_____

_____ (Annex extra-paper if necessary).

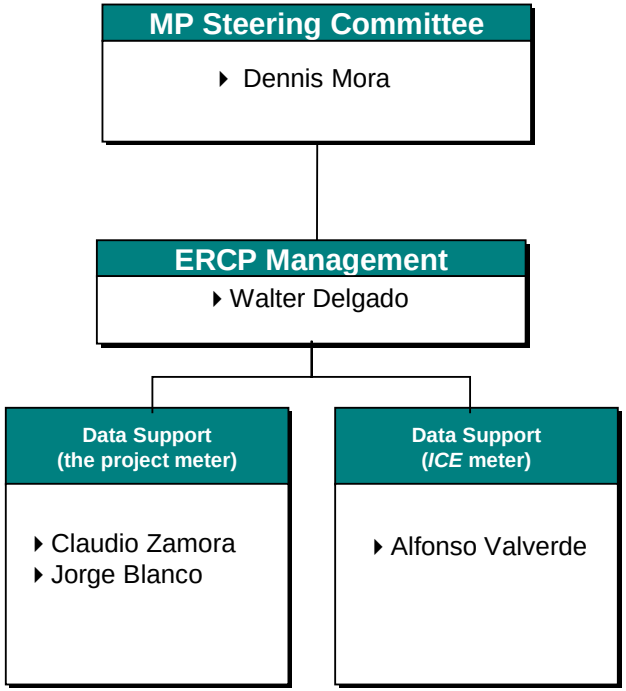
_____ _____
Direct area of influence representative Indirect area of influence representative

_____
The sponsor

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

Monitoring Plan (MP) – Emissions Reductions Calculation Procedure

ERCP Organizational Structure



Source: World Bank production

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

	ICE Meter		The Project Meter
		• *Monthly recording* • *Check calibration of electricity meters, periodically* • *Make coordination with ICE to be able to implement this document* • *Only one person will be responsible for the ERCP: Mr. Walter Delgado*	
Data	• The project hourly generation that is registered by *ICE meter*		• The project hourly generation that is registered by the project meter
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 *ICE* meter • To whom does it comes? Mr. Walter Delgado		• 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 the project meter • To whom does it comes? Mr. Walter Delgado
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	• No processing needs to be made with this data, Except for when ICE meter fails.
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 all calculations made (all steps of Data Processing) by showing all preliminary versions of spreadsheets saved in disk • Double check if deviation from both meters is unusual and inform ICE to repair/recalibrate its meter – after the project own meter has been confirmed/checked to be in good conditions.		

Source: World Bank production