CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 02 - in effect as of: 1 July 2004

REVISED MONITORING PLAN FOR POECHOS I PROJECT

Version: 02
Date: 11/04/2012

SECTION D. Application of a monitoring methodology and plan

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

Approved Consolidated Monitoring Methodology (ACM0002): "Consolidated Monitoring Methodology for Zero-Emissions Grid-connected Electricity Generation from Renewable Sources".

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

The Project is a grid-connected zero-emission renewable power generation activity and meets all the following conditions that are stated in the Monitoring Methodology (ACM0002):

- The Project supplies electricity capacity addition from hydropower source; it is a hydropower plant with existing reservoir where the volume of the reservoir is not increased.
- The Project is not an activity that involves switching from fossil fuels to renewable energy at the Project site;
- The electricity grid is clearly identified (as the *SEIN*) and information on the characteristics of the grid is available.

No leakages were identified and hence will not be monitored.

The following variables will be monitored as stipulated by the Monitoring Methodology:

- Electricity generation from the Project (double checking through quality control / assurance procedures).
- The latest *SEIN* grid data supplied by the *COES* is used for the calculation of the DDA-OM, and for the BM. Both margins are to be calculated ex-post annually based on the most recent statistics available as directed in the Monitoring Plan.

D.2. 1. Option 1: Monitoring of the emissions in the project scenario and the baseline scenario

D.2.1.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:								
ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	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)	Comment

As there are no project emissions, no data needs to be collected.

D.2.1.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

As there are no project emissions, no formulae are provided.

D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived :

ID number (Please use numbers to ease cross-referencing to table D.3)	*Data variable*	*Source of data*	*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)*	*Comments*

1	Net electricity supplied to the grid by both Poechos I and Poechos II Plants (E1)	*ENOSA* or *COES* (when the Operator is an active member of *COES*)	MWh	(m)	Hourly measured and monthly recorded	100%	Electronic. Data will be archived during the crediting period and 2 more years after the end of the crediting period.	Official metering data sent monthly by COES.* Invoices to the final buyer have to match official metering data. There is a power meter installed in the Sullana substation. The meter is regularly calibrated.
2	Net Electricity supplied to the grid by Poechos II Hydroelectric Plant (E2)	*ENOSA* or *COES* (when the Operator is an active member of *COES*)	MWh	(m)	Hourly measured and monthly recorded	100%	Electronic. Data will be archived during the crediting period and 2 more years after the end of the crediting period.	Official metering data sent monthly by COES.* Invoices to the final buyer have to match official metering data. There is a power meter installed in Poechos II plant. The meter is regularly calibrated.
3	Net Electricity supplied by the project to the grid (EGy)	*Own production*	MWh	(c)	Monthly	100%	Electronic. Data will be archived during the crediting period and 2 more years after the end of the crediting period.	The net electricity supplied by the project to the grid is calculated based on the difference between the meter readings of E1 and E2. Hence, EGy = E1 – E2*.
4	CO_2 emission factor of the grid (EFy)	Own production	tCO_{2e} / MWh	(c)	Yearly	100%	Electronic	Calculated as a weighted sum of the OM and BM emission factors.
5	CO_2 Operating Margin emission factor of the grid (EFomy)	Own production	tCO_{2e} / MWh	(c)	Yearly	100%	Electronic	Calculated as indicated in the relevant OM baseline method (DDA-OM).
6	CO_2 Building Margin emission factor of the grid (EFbmy)	Own production	tCO_{2e} / MWh	(c)	Yearly	100%	Electronic	Calculated as Sum(Fi,y*COEF)/Sum(Gen m,y) over recently built power plants defined in the baseline methodology (BM2).

7	Amount of each fossil fuel consumed by each power source / plant (Fi,y)	Own production by using COES Net efficiency conversions (NECs) annual data **	TJ	(e)	Monthly	100%	Electronic	Reliably estimated with the Annual Plant Fuel Requirement (APFR) Formula[1]: Gen (KWh)*3.6*10^6/(NEC*10^12) = TJ where Net Efficiency conversions (NECs) are the average real NECs per technology. Real NECs per power plant need to be taken from most recent COES annual statistics. The monitoring of parameter 7 should be done monthly. However, at the end of the year, NECs per technology should be replaced by using the most recent yearly, published NECs information. ** COES monitors fuel consumption by calculating it from the electricity produced and real NECs per power plant. This is the same approach that will be used to monitor Parameter 7 in Project's MP.
8	CO_2 emission coefficient of each fuel type i (COEFi)	Own production	tCO_{2e} / mass or volume unit	(c)	Yearly	100%	Electronic	COEFs need to be updated annually with annual Real NECs data, which are published by COES. Average COEFs per technology will need to be calculated separately by the ERCP Manager by using the average Real NECs per technology, which also are to be calculated separately. The COEF formula to use is the following: COEFs per technology = [3.6 x (44/12) x C x O] / [10^3 x NEC average per technology] – This formula is deducted from APFR Formula.
9	Hourly electricity generation of all units f of the grid (Gen)	COES	MWh	(m)	Hourly measured and monthly recorded	100%	Electronic	Taken from COES.

[1] The APFR Formula has been taken from The Greenhouse Assessment Handbook (September, 1998) – a World Bank document.

10	Identification of power plants for the OM (Plant name)	COES	Text	(e)	Yearly	100% of set plants	Electronic	Identification of plants to calculate OM.
11	Identification of power plants for the BM (Plant name)	COES	Text	(e)	Yearly	100% of set plants	Electronic	Identification of plants (m) to calculate BM.
12	The merit order in which power plants are dispatched by documented evidence	COES	Text	(m)	Weekly	100%	Paper for original documents, else electronic	Required to stack the plants in the dispatch data analysis.
12.a	Electricity imports to the Project's electricity system (GENimports)	COES	KWh	(c)	Yearly	100%	Electronic	Obtained from the latest local statistics. If local statistics are not available, IEA statistics are used to determine imports. Imports are not expected but will be monitored if any.
12.b	CO_2 emission coefficient of fuels used in connected electricity systems (if imports occur) (COEFimports)	COES	tCO_{2e} / mass or unit volume	(c)	Yearly	100%	Electronic	Obtained from the latest local statistics. If local statistics are not available, IPCC default values are used instead.

***** The net electricity to the grid of Poechos I is metered by the energy meter of Sullana substation. However, the project participant implemented a second hydro power plant called Poechos II, delivering electricity to the same Sullana substation. Before Poechos II implementation, the 0.2 class electricity meter at the Sullana substation was measuring the electricity from Poechos I only. After Poechos II implementation and after having installed a separate 0.2 class meter for Poechos II (on March 27th, 2010), the net electricity supplied to the grid from Poechos I is the electricity metered in the meter of Sullana minus the energy metered in the energy meter of Poechos II.

Net Electricity supplied by the project activity to the grid (EGy) = Meter reading at Sullana substation (E1) – Meter reading at Poechos II plant (E2).

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

See Section E.4 for baseline emissions calculations.

D. 2.2. Option 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E).

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

N/A

D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

N/A

D.2.3. Treatment of leakage in the monitoring plan

D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	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)	Comment

N/A

D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

N/A

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

N/A

D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored		
Data (Indicate table and ID number e.g. 3.-1.; 3.2.)	*Uncertainty level of data (High/Medium/Low)*	*Explain QA/QC procedures planned for these data, or why such procedures are not necessary.*
D.3.1. Net electricity supplied to the grid by both Poechos I and Poechos II Plants	Low	There is a power meter installed at Sullana substation. The Serial number of the meter is PL-0305A001-01 The meter is regularly calibrated, at least every three years. Official metering data will be sent monthly by COES. Sales record to the grid (COES) or final client (ENOSA) and other records are used to ensure consistency.
D.3.2. Net Electricity supplied to the grid by Poechos II Hydroelectric Plant	Low	There is a power meter installed at Poechos II plant. The Serial number of the meter is PJ-1004A406-02. The meter is regularly calibrated, at least every three years. Official metering data will be sent monthly by COES. Sales record to the grid (COES) or final client (ENOSA) and other records are used to ensure consistency.
D.3.3 Net Electricity supplied by the project to the grid (EGy)	Low	Calculated based on the readings of meters installed for parameters D3.1 and D3.2.
D.3.4 – D.3.12b Others	Low	IEA statistics (for energy data) are used to check local data.

D.4 Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity

No special monitoring equipment is needed. The NCDMF will provide SINERSA with a Monitoring Plan and pre-programmed spreadsheets. The Project sponsor will just need to collect the information as described and apply the formulas as directed in the monitoring Plan. The collection sources of the data will not be in any case the Project own records, but the final client records of hourly production to keep the highest transparency and accuracy. When the Project Operator is an active member of COES, the Project generation data will come from COES. The Project staff will confirm these data with own records, and the latter will be cross-checked with sales receipts.

D.5 Name of person/entity determining the monitoring methodology:

The Monitoring Methodology and Monitoring Plan were completed on 30/11/2004 by:

Francisco Fernandez-Asin
Senior Financial Specialist
NCDMF
Washington DC
USA

The NCDMF is also a Project participant listed in Annex I of this document.

Annex 4

MONITORING PLAN

Monitoring Plan

For

Poechos I

First Crediting Period (2004-2011)

November 2004

GLOSSARY

APFR: Annual Plant Fuel Requirement (TJ)
Baseline Emissions: Product of EFy times EGy
BLS: Latest Baseline Study
BM: Build Margin Emission Factor
CDM: Clean Development Mechanism
CERs: Certified Emission Reductions
CM: Combined Margin Emission Factor
COEF: tCO_2e/MWh
COES: Committee of Economical Operation of the *SEIN* (Dispatch Center)
DDA-OM: Dispatch Data Analysis Operating Margin Emission Factor
EFy: Baseline Emission Factor (tCO_2e/MWh)
EGy: The Project's annual generation (MWh)
ENOSA: Electronoroeste S.A (The Project Final Client)
ERPA: Emissions Reductions Purchase Agreement
ERCP: Emissions Reductions Calculation Procedure
ERs: Green House Gases Emissions Reductions
GHG: Green House Gases
HP: Hydropower plant (s)
Merit Order: Grid Dispatch Weekly Merit Order
Monthly Merit Order: Average of Four Weekly Grid Dispatch Merit Orders
MP: Monitoring Plan
NCDMF: Netherlands Clean Development Mechanism Facility
NEC: Net Efficiency Conversion
OM: Operating Margin Emission Factor
Project Staff: Team or person assigned and trained to perform the ERCP
SEIN: National Electric Grid
The Operator: SINERSA (The Project Operator)
TP: Thermal plant (s) fossil fuel-fired plants

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I. Background Information

The baseline methodology and monitoring methodology for Poechos I, are in accordance with the approved consolidated baseline methodology (ACM0002): Consolidated baseline methodology for zero-emissions grid-connected electricity generation from renewable sources ("The Methodology"). The Methodology was released in September 3rd, 2004 by the Clean Development Mechanism-Executive Board.

Poechos I ("The Project") installed capacity and projected yearly average generation is as follows:

Project name	Installed capacity (MW)	Generation (GWh/yr)
Poechos I	15.2	57.740

Source: The Sponsor

The Project is a hydroelectric power plant located in Peru, in the Northwestern Department of Piura. The Project will displace 31,463 tCO_2e (approx.) per year, which account for 220,241 tCO_2e (approx.) for the first crediting period (7 years). Methane and Carbon Dioxide are negligible. Therefore there is not need to monitor leakage and it will not be taken into account when calculating ERs.

The spatial extent of The Project boundary is the *SEIN*. The Project is connected to the *SEIN* through the Sullana Substation, which belongs to Electronoroeste S.A. (ENOSA). The 57.740 GWh (approx.) of electricity generated per year will be sold to ENOSA, a stated-owned enterprise. Until now, neither electricity exports from the *SEIN* nor electricity imports to the *SEIN* have taken place.

II. Purpose of the Monitoring Plan

This report presents the Monitoring Plan (MP) for The Project, which has been considered by The Netherlands Clean Development Mechanism Facility (NCDMF) 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 Clean Development Mechanism (CDM) of The Kyoto Protocol. The MP is part of the ERPA Document and, after its validation, will be an integral part of the contractual agreement between The NCDMF, The Project Developer and The Project Operator (the Operator). As of today, The Project's Developer is the same enterprise as The Project's Operator: SINERSA. The CDM defines monitoring as the systematic surveillance of a project's performance by measuring and recording performance-related indicators relevant to the project activity. Both the Baseline Study (BLS) 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 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 NCDMF.

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 performance of The Project requires the fulfillment 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 *COES* and; from The Project's final client, ENOSA[70]. Data gathering and processing should be done monthly by the Operator, as follow:

	At the end of each month:
COES **(Data Provider)**	-Report of hourly generation of the *SEIN*'s units (measurement: 15' or 30' [71]) -Report of weekly dispatch merit orders for "hours of maximum demand [72]" -Real NECs per power plant in the *SEIN*.
ENOSA (Data Provider)	-Report of The Project hourly generation purchased by ENOSA.
Operator (Data processor)	-Verification of ENOSA's report of The Project hourly generation – comparison with own records; back up of any claims with receipt of sales -Monthly data filling in all the spreadsheets required, following the ERCP -Monthly report to The NCDMF

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

[70] As long as The Project Operator is not an active member of *COES*; when it is, all data will come from *COES*
[71] Half an hour measurement is still acceptable if total *SEIN* production calculated with it, does not deviate greatly (i.e. less than 1%) from total *SEIN* Production calculated with the 15-minute measured data
[72] (6pm to 11 pm) to set a standard - weekly merit orders for hours of maximum, minimum and medium demand are similar

expected to prevent such errors and the verification audits are expected to uncover any possible errors. The CERs would be granted ex-post verification.

B. Estimated Anthropogenic Emissions for The Project:
The Methodology stipulates that the Baseline of The Project is the Combined Margin Emission Factor, which is the average of the Operating Margin Emission Factor and the Build Margin Emission Factor. Estimated anthropogenic emissions were calculated for The Project following a 4-step-process:

Step 1 – Calculation of the Operating Margin Emission Factor (OM)
Step 2 – Calculation of the Build Margin Emission Factor (BM)
Step 3 – Calculation of the Baseline Emission Factor (CM)
Step 4 – Calculation of The Project's Emissions Reductions Prior to Validation

Step 1 – Calculation of the Operating Margin Emission Factor
Out of four options for the OM, the Dispatch Data Analysis Operating Margin Emission Factor (DDA-OM) was taken; as it constitutes the first methodological choice where data is available, according to The Methodology.

The formula for the DDA-OM used was provided by The Methodology:
EF_OMy Dispatch Data (tCO_2e/MWh)= E_OMy/EGy
E_OMy = Sum of [average tCO_2e/MWh emitted by plants that fall within top 10% of grid system dispatch each hour of the year "times" The Project generation in MWh each hour of the year]
EGy = The Project Generation in the year

For this calculation the BLS used the units' hourly generation of 2003, which was the most recent statistic data available. Because at the time the BLS was completed, The Project hourly generation data for a whole year was inexistent, it was assumed that The Project operated at full capacity and dispatched equally during all hours of the year.

Considering this assumption, the variables were defined as follow:
-EGy: An "approximation" to MWh generated in 2003 by The Project -It was obtained from multiplying Installed Capacity (MWh) of The Project times 8760.
-EGh: An "approximation" to MWh generated in each hour of 2003 -It assumed that The Project produced at its full installed capacity (15.2MWh) each hour.
-Fi,n,h: Electricity output in MWh hourly produced in 2003 by each unit of the *SEIN* that fall within the top 10% of grid dispatch.
-COEFi,n[73]: The tCO_2e/MWh factors assigned to each unit of the *SEIN* according to its technology – For hydropower plants the COEF = 0.

The information of hourly generation of all *SEIN* units and their COEF associated was organized in columns, where the position of the columns was sorted according to a "monthly grid dispatch merit order" calculated[74]. This organization helped to identify the plants that fall within top 10% of grid dispatch each hour of the year.

The BLS's resulting Dispatch Data Analysis Operating Margin Emission Factor was 0.72614 tCO_2e/MWh and was obtained from dividing E_OMy by EGy =96,688/133,152.

[73] COEFs assigned to each unit of the *SEIN* will vary according to the NECs published by COES yearly.
[74] This was done by a simple average of the four weekly Santa Rosa Equivalent Cost Soles/MWh (merit orders) assigned to each unit of the *SEIN*, by *COES*, in a month.

E_OMy:	SUM Egh*EF_DDh	96,688	133,152	:EGy
EOMy/Egy:	Operating Margin	DDA_OM	0.72614	:EF_OMy DD (TCO2/MWh)

Source: Own production with *COES* information.

Step 2 – Calculation of the Build Margin Emission Factor

According to the Methodology, the BM is defined as the generation-weighted average emission factor of either the 5 most recent or the most recent 20% of power plants built (in generation), whichever group's annual generation is greater. Both samples should exclude CDM-Status Plants[75]. Out of the 2 options for the BM, option 2 was selected; this option does not include in-construction plants in the samples and requires an annual ex-post calculation for the first crediting period. The formula to apply to the selected sample is provided by The Methodology:

EF_BMy (tCO_2e/MWh) = [∑I,m Fi,m,y,*COEFi,m] / [∑mGENm,y]
F=Generation of each plant of the selected sample
COEF=tCO_2e/MWh of each plant of the selected sample;
GEN=Generation of each plant of the selected sample

In the BLS, any increase in installed capacity in the *SEIN* was identified and considered only if the increase was made in new units added (No: upgrades, rehabilitations or interconnections of old units). The following list shows the capacity additions (new units') in the *SEIN* from 1988 to 2003, and their annual generation. As The Project did not generate yet, the annual generation of the additions taken was the average of their three most recent year's generations.

[75] As of today, The Project is the only CDM-Status Plant of the *SEIN*

Additions to the *SEIN* (1988-2003)[76]

Years	Techn	Addition Category	Install.Cap. Added (MW)	2001 Gen (GWh)	2002 Gen (GWh)	2003 Gen (GWh)	Annual Generation (GWh)
1988							
C.H. CARHUAQUERO	HYDRO	Newly built	75.1	469.27	479.41	458.78	469.16
CHARCANI (I-V)	HYDRO	Newly built	136.80	842.17	641.80	660.24	714.74
1993							
TG VENTANILLA 2	D2	Newly built	100	2.40	2.45	1.54	2.13
TG VENTANILLA 1	D2	Newly built	100	2.40	2.45	1.54	2.13
1995							
CALANA	R6	Newly built	19.2	33.02	25.72	45.81	34.85
1996							
STA. ROSA WESTING	D2	Newly built	127.7	9.41	5.61	11.60	8.88
1997							
C.H. GALLITO CIEGO	HYDRO	Newly built	34.0	183.53	149.71	121.79	151.68
TG VENTANILLA	D2	Newly built	184.0	4.41	4.51	2.83	3.92
MOLLENDO MIRLESS	R500	Newly built	31.7	10.98	9.53	35.37	18.63
1998							
AGUAYTIA 1	GAS	Newly built	86.3	230.80	412.26	466.80	369.95
AGUAYTIA 2	GAS	Newly built	86.3	216.30	332.89	367.97	305.72
TG MALACAS	PM GAS	Newly built	102.2	206.23	181.35	274.30	220.63
1999							
SAN GABAN II	HYDRO	Newly built	55.0	357.38	376.19	356.34	363.30
CALANA	R6	Newly built	6.4	11.01	8.57	15.27	11.62
MOLLENDO TGM	D2	Newly built	90.0	0.73	0.86	1.43	1.01
2000							
SAN GABAN II	HYDRO	Newly built	58.1	377.51	397.38	376.41	383.76
ILO2 TVC	COAL	Newly built	145.0	338.78	845.93	859.44	681.38
C.H. CHIMAY	HYDRO	Newly built	156.0	724.76	752.96	825.87	767.86
C.H. YANANGO	HYDRO	Newly built	42.3	214.60	239.13	202.28	218.67
2001							
TUMBES	R6	Newly built	18.3	22.38	20.73	27.99	24.36
2002							
C.H. HUANCHOR	HYDRO	Newly built	18.9	-	36.86	144.64	144.64
2003							
YARINACOCHA	R6	Newly Built	25.6	-	-	56.88	144.97

Source: Own production with *COES* information

Out of this list, the 5 most recently built plants up to 2003 were: 1)Yarinacocha, 2) Huanchor, 3)Tumbes, 4)Yanango and 5) Chimay, and their comprised annual generation was 1,300.5 GWh. Since the annual generation of the 20% most recently built was greater, 3,860.08 GWh, the latter group was selected for the BM calculation. The 20% most recently built plants in generation comprises the whole list above except for 1988 capacity additions in the *SEIN*[77].

The selected sample of Newly Built plants was organized (clustered) by type of fuel and each type of fuel annual electricity generation was transformed back to its fuel consumption caloric value through the Annual Plant Fuel Requirement formula[78] and multiplied by C x O[79] x 44/12 (mass conversion factor).

[76] San Gaban appears twice because 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 generation was considered accordingly

[77] Exactly, the selected sample's generation comprised 19.69% (or 20% rounded to the nearest integer) of 2001-2003 average annual generation of the *SEIN*

[78] Fully explained in the ERCP

The total tCO_2e per fuel type that way obtained was summed up and the result was divided by the total generation (MWh) of the selected sample. Hence a weighted average tCO_2e/MWh of the selected sample was obtained.

The BLS' resulting BM2 was 0.36371 tCO_2e/MWh, and was obtained from dividing total tCO_2e emitted by the selected sample "by" total gen. of the selected sample.

Technologies in Selected Sample	Most Recent Year Gen (GWh)	% per technology	APFR	C	O	44/12	CO2 Emissions(tCO2)
Coal	681.38	18%	7,433.28	25.80	0.980	3.67	689,124
d2	18.06	0%	186.12	20.20	0.990	3.67	13,647
r6	215.80	6%	1,807.54	21.10	0.990	3.67	138,445
r500	18.63	0%	204.82	21.10	0.990	3.67	15,688
Dry Gas	675.68	18%	7,484.40	15.30	0.995	3.67	417,776
Pure Methane Gas	220.63	6%	2,443.85	14.50	0.995	3.67	129,282
Dry Gas CC	0.00	0%	0.00	15.30	0.995	3.67	0
Hydro	2,029.91	53%	0.00	0.00	0.000	0.00	0
TOTAL	3,860.08	100%					1,403,961

BM2=	0.36371	tCO2//MWh

Source: Own production with *COES* information.

Step 3 – Calculation of the Baseline Emission Factor

The Baseline Emission Factor was calculated as a combined margin (CM), consisting of the simple average[80] of both the resulting OM and the resulting BM. All margins are expressed in tCO_2e/MWh.

CM = 0.5*OM + 0.5*BM

CM = 0.5*(0.72614) + 0.5*(0.36371) = 0.54493 tCO_2e/MWh

The BLS's resulting Baseline Emission Factor was 0.54493 tCO_2e/MWh.

Step 4 – Calculation of The Project's Emissions Reductions Prior to Validation

Because The Project itself does not produce any emission, no leakages entered into the calculation of estimated ERs, and the baseline emissions were estimated to be equal to The Project ERs.

The estimated ERs per year for The Project were obtained from the following multiplication:

Estimated Baseline Emissions = CM* (Estimated Annual Project Generation in MWh)

Estimated ERs per year = CM* (Estimated Annual Project Generation in MWh)

Estimated ERs per year = 0.54493 tCO_2e/MWh * 57,740 MWh = 31,463 tCO_2e or 31,463 ERs

Assuming the 3 most recent years (data used for the BSL calculations) were average years in hydrological conditions. The ERs per year estimated for the first crediting period are:

Estimated ERs for the first crediting period = 31,463 tCO_2e/yr*7 yrs = 220,241 tCO2e or Estimated ERs[81].

C. Emissions Reductions Calculation Procedure and Required Spreadsheets

The Emissions Reductions Calculation Procedure (ERCP) is the basic instrument for gathering, recording and processing information that will result in the measured ERs. The Operator shall keep The Project ERCP as a manual. The ERCP should contain: i) data gathered from The Project final client: ENOSA[82], ii) data gathered from *COES* information system, and iii) data processed by the Operator. All data processing should be done in Excel. The ERCP is designed for monthly calculation, based on final

[79] C and O use IPCC-1996 world wide values per fuel type
[80] The default weights (50%,50%) were kept
[81] All margins were rounded to the fifth decimal, but the CERs per year was rounded down to the nearest integer. The exact generation herewith considered is 57,739.5 MWh/yr, this generation does not need to be rounded down to the nearest integer.
[82] When the Project Operator becomes an active member of *COES*, all data will come from *COES*

monthly *COES* reports and the final client monthly recording. Although it will only be possible to know the ERs at the end of each year (March 31st for The Project), 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 are only 2 required spreadsheets to update with new data: Poechos DDA-OM.xls and Poechos BM2.xls.** The names of these files should be kept but should also reflect the date for which the latest adjustment is made.

DDA-OM Spreadsheet:
This excel file contains all data and formulas necessary to calculate the Dispatch Data Analysis Operating Margin. The data's year is the year of project generation (April1st-March31st). 14 worksheets compose the DDA-OM Spreadsheet:
-Worksheet #1: COEFs (tCO_2e/MWh) to assign to each unit of the *SEIN* along the first crediting period[83].
-Worksheet #2: Calculation of monthly grid dispatch merit order for all thermal units of the *SEIN*.
-Worksheet #3 to Worksheet #14: One worksheet per month of the year; they contain the *SEIN* units hourly generation.

Worksheet #1

Table # 1: COEF by Technology[84]

Current Technologies in the *SEIN*

Type of Fuel	COEF(tCO2/MWh)
Coal	1.01
Oil based	0.80
Diesel 2	0.76
Residual 6	0.64
R500	0.84
Gas	0.61
Dry	0.62
Pure Methane	0.59
Hydro	0.00
Residual 6 and Diesel 2	0.66
Pure Methane or Diesel 2	DEPENDS
ILO TV2 Cogeneration Plant	0.34

Future Technologies in the *SEIN*

Type of Fuel	COEF (tCO2/MWh)
MIX	weigthed average of fuel COEFs
Change fuel type	each month (first week of the month)
Diesel CC	0.48
Residual CC	0.50
Gas Dry CC	0.37
Gas PM CC	0.35
Coal CC	0.61
Diesel Cogeneration	0.33
Residual Cogeneration	0.34
Gas Dry Cogeneration	0.25
Gas PM Cogeneration	0.24
Coal Cogeneration	0.42

Source: Own production.

Table#1'COEFs will be updated yearly according to real NECs published in COES Statistics. The formula to use to calculate the COEFs per technology for Table 1 is:
COEFs per technology = [3.6 x (44/12) x C x O] / [10^3 x NEC average per technology]. Future technologies in the SEIN should be updated as well with real NECs data of the future.

The following table relates each unit of the *SEIN* to a COEF, according to the technology the unit uses. The assignation of COEFs, shown in Table #2, is to be taken from Table 1.

Table#2: Name Plant / Technology/Assigned COEF

Table #2, holds up to 100 units (no more than 34 HPs and 66 TPs), 81 that operated in 2003 (27 HPs and 54 TPs) and 19 future units (7 HPs and 12 TPs) that are set aside a space. Future units' data should be filled as the arrows in Table#2 indicate, as they enter the *SEIN*. Units that did not dispatch in any hour of the year in question should not be considered for the DDA-OM Calculation at all, so that they do not occupy extra-space, unnecessarily.
Table#2 below shows the technical name of the *SEIN* unit (the way *COES* has it registered), complete name of the plant, technology and assigned COEF.

[83] COEF will vary according to yearly published NECs per plant. Annual real NECs average per technology will have to be considered for the COEFs per technology calculation.
[84] CC: Combined cycle technology

Table #2 COEFs that show "DEPENDS" indicate that the plant changes the fuel it burns in several weeks of the year. For this plant the fuel that is burned in the first week of the month should be taken as an assumption for the plant's fuel burned for the month, and the COEF related to that type of fuel should be taken for the month.

ag_tg1	AGUAYTIA 1 (2)	Dry	0.62
ag_tg2	AGUAYTIA 2 (2)	Dry	0.62
arcata	Arcata	Hydro	0.00
aricota	CH ARICOTA	Hydro	0.00
bvista1	BELL MAN 1,2	Diesel 2	0.76
bvista2	BELL MAN 1,2	Diesel 2	0.76
cahua	Cahua	Hydro	0.00
calana123	CALANA 123	Residual 6	0.64
calana4	CALANA 4	Residual 6	0.64
call	CH Callahuanca	Hydro	0.00
ccomb	C. COMBINADO	Diesel 2	0.48
charill	CH CHARCANI	Hydro	0.00
charlv	CH CHARCANI	Hydro	0.00
charv	CH CHARCANI	Hydro	0.00
charvl	CH CHARCANI	Hydro	0.00
chl_slz12	SULZER CHILINA	Diesel 2	0.76
chlcl_o	DG CHICLAYO OESTE-D	Diesel 2	0.76
chiltv1	chiltv1	R500	0.84
chiltv2	TV2 CHILINA	R500	0.84
chiltv3	TV3 CHILINA	R500	0.84
chimay	CH Chimay	Hydro	0.00
chimb	TG1 CHIMBOTE	Diesel 2	0.76
cnp_mann	DG PACAS-MAN	Residual 6 and Diesel 2	0.66
cnp_slz	DG PACAS-SULZER	Residual 6	0.64
cpato	CH Cañón del Pato	Hydro	0.00
cqro	CH Carhuaquero	Hydro	0
dolores1	DOL ALCO 1-2 GM 1-2-3	Diesel 2	0.76
dolores2	DOL ALCO 1-2 GM 1-2-3	Diesel 2	0.76
gciego	CH Gallito Ciego	Hydro	0
herc	CH HERCA	Hydro	0
hp1	HP1	Hydro	0
hp2	HP2	Hydro	0
hp3	HP3	Hydro	0
hp4	HP4	Hydro	0
hp5	HP5	Hydro	0
hp6	HP6	Hydro	0
hp7	HP7	Hydro	0
hpnl	CH Huampani	Hydro	0
huanchor	CH Huanchor	Hydro	0
hulin	CH Hulnco	Hydro	0
ilo1catk	KATCATO (ENERSUR)	Diesel 2	0.76
ilo1tg1	TG1 ILO	Diesel 2	0.76
ilo1tg2	TG2 ILO	Diesel 2	0.76
ilo1tv1	ILO TV1	R500	0.84
ilo1tv2	ILO TV2	R500	0.34
ilo1tv3	ILO TV3	R500	0.84
ilo1tv4	ILO TV4	R500	0.84
ilo2_carb	TV CARBON ILO II	Coal	1.01
machup	CH MACHUPICCHU	Hydro	0
mal_tg1	TG1	Pure Methane or Diesel 2	DEPENDS
mal_tg2	TG2	Pure Methane or Diesel 2	DEPENDS
mal_tg3	TG3	Pure Methane or Diesel 2	DEPENDS
mal_tg4	TGN4	Pure Methane	0.59
malp	CH Malpaso	Hydro	0
man	CH MANTARO	Hydro	0
mat	CH Matucana	Hydro	0
moll123	MOLLENDO 1,2,3	R500	0.84
mollTg1	TGM1 MOLLENDO	Diesel 2	0.76
mollTg2	TGM2 MOLLENDO	Diesel 2	0.76
moq12	MOQUEGUA	Diesel 2	0.76
moy	CH Moyopampa	Hydro	0
oro_p	CH Oroya-Pachac.	Hydro	0
paita1	DG PAITA1	Diesel 2	0.76
paita2	DG PAITA2	Diesel 2	0.76
pariac	Pariac	Hydro	0
piura1	DG PIURA1	Diesel 2	0.76
piura2	DG PIURA2	Diesel 2	0.76
ron	CH RESTITUCION	Hydro	0
sgab2	CH SAN GABAN	Hydro	0
shcummins	CUMMINS	Diesel 2	0.76
shou_tv1	TV1 SHOUGESA	R500	0.84
shou_tv2	TV2 SHOUGESA	R500	0.84
shou_tv3	TV3 SHOUGESA	R500	0.84
sullana	DG SULLANA	Diesel 2	0.76
taparachi	TAPARACHI	Diesel 2	0.76
tg_piu	TG PIURA	Diesel 2	0.76
tintaya	TINTAYA	Diesel 2	0.76
tp55	TP55	Unknown	0
tp56	TP56	Unknown	0
tp57	TP57	Unknown	0
tp58	TP58	Unknown	0
tp59	TP59	Unknown	0
tp60	TP60	Unknown	0
tp61	TP61	Unknown	0
tp62	TP62	Unknown	0
tp63	TP63	Unknown	0
tp64	TP64	Unknown	0
tp65	TP65	Unknown	0
tp66	TP66	Unknown	0
truji	TG TRUJILLO	Diesel 2	0.76
trupal	TRUPAL	Residual 6	0.64
tumbes	TUMBES	Residual 6	0.64
utl_5	TG S.ROSA UTI5	Diesel 2	0.76
utl_6	TG S.ROSA UTI6	Diesel 2	0.76
vent3	TG VENTANILLA-3	Diesel 2	0.76
vent4	TG VENTANILLA-4	Diesel 2	0.76
westin	TG WESTINGHOUSE	Diesel 2	0.76
yanan	CH Yanango	Hydro	0
yarinac	Yarinacocha (5)	Residual 6	0.64
yaupi	CH Yaupi	Hydro	0

← Start filling from HP7 to HP1. COEFs remain 0 for the seven HPs.

← Start filling from TP55 to TP66. COEFs remain 0 for yet to exist TPs.

Source: Own production with COES data of plants and type of fuel.

Worksheet #2: Monthly Merit order Calculation

The 52 weekly merit orders[85] for **"hours of maximum demand"** should be averaged in this Worksheet #2:

April - 1st Week most recent year	
Unit Name	Sta Rosa Eq-C (S/KWh)
Sorted by name	x

April-most recent year	
Unit Name	Sta Rosa EC (S/KWh)
Sorted by name	Monthly Average Merit Order

April-most recent year	
Unit Name	Sta Rosa EC (S/KWh)
Name	Sorted by Monthly Average Merit Order

April - 2nd Week most recent year	
Unit Name	Sta Rosa Eq-C (S/KWh)
Sorted by name	x

Visible Average Function

April - 3rd Week most recent year	
Unit Name	Sta Rosa Eq-C (S/KWh)
Sorted by name	x

April - 4rd Week most recent year	
Unit Name	Sta Rosa Eq-C (S/KWh)
Sorted by name	x

….. 12 monthly merit orders need to be obtained from April through March.

Worksheet #3 to Worksheet #14: Hourly Generation of the *SEIN* Units

12 monthly worksheets that contain the *SEIN* units' hourly production in each month of the most recent year (April-March) should be identical in # of columns, formulas, "general organization" but not in data. Worksheets #3' – Worksheet #14' columns C to CY should be organized as follow:

COEFs:	0	0	0	0	0	0.34	0.76	0	0
TECHNOLOGY:	hydro	hydro	hydro	hydro	hydro	r-500	diesel	unknown	unknown
Hours of the month	HP 1…	…HP7	CH Mantaro	…	Canhon del Pato	ILO T2 Cog	Dolores	TP55	T66
1									
.	Future HPs			Existing HPs		Existing TPs		Future TPs	
.	◄----------				----------	----------			----------►
.	There is an unchangeable pre-defined order for existing					Existing TPs should be placed according to			
744	and future HPs - for all the crediting period					grid dispatch merit order, future TPs are placed last			

Source: Own production

Hydropower plants' (existent and future) hourly generation should occupy the **D to AK columns only. Thermal plants'** (existent and future), the **AL to CY** columns only. The predefined order for HPs is shown below (Where the "-1 position" =D column and "27th position" =AK column). This order should hold for the first crediting period. TPs should be sorted according to their grid dispatch monthly merit order calculated. As future HPs (max.7) are kept a space (columns) in the left extreme of columns D to AK; future TPs (max. 12) should be kept a space (columns) in the right extreme of columns AL to CY (like they were occupying the least monthly merit order of grid system dispatch). Finally, the *SEIN* units' associated COEFs should be placed in the first row of the corresponding unit's column. For yet-to-exist plants COEF=0.

[85] The merit order is given by the Santa Rosa Equivalent Cost (Soles/MWh) assigned to a unit, according to its efficiency.

Predefined order from left to right (D to AK) for all HPs[86]

-7 hp1	HP1
-6 hp2	HP2
-5 hp3	HP3
-4 hp4	HP4
-3 hp5	HP5
-2 hp6	HP6
-1 hp7	HP7
1 Hydro	CH MANTARO
2 Hydro	CH RESTITUCION
3 Hydro	CH Huinco
4 Hydro	CH Matucana
5 Hydro	CH Yaupi
6 Hydro	CH Oroya-Pachac.
7 Hydro	CH Malpaso
8 Hydro	Cahua
9 Hydro	Pariac
10 Hydro	Arcata
11 Hydro	CH Gallito Ciego
12 Hydro	CH Callahuanca
13 Hydro	CH Moyopampa
14 Hydro	CH Huampaní
15 Hydro	CH Chimay
16 Hydro	CH Yanango
17 Hydro	CH Huanchor
18 Hydro	CH Carhuaquero
19 Hydro	CH ARICOTA
20 Hydro	CH CHARCANI
21 Hydro	CH CHARCANI
22 Hydro	CH CHARCANI
23 Hydro	CH MACHUPICCHU
24 Hydro	CH HERCA
25 Hydro	CH SAN GABAN
26 Hydro	CH CHARCANI
27 Hydro	CH Cañón del Pato

Source: Own production

The formula component of each monthly worksheet (W#3–W#14) is given by columns CZ to FD (not shown in this report). Formulas will use data entered in columns D to CY and will bring a resulting DDA-OM. The **only data column in this set is EE which should be filled with The Project hourly generation**. The resulting DDA-OM will show up at the low end of column EE in W# January.

The BM2 Spreadsheet:
This excel file, composed by four worksheets, contains all the calculations necessary to update the BM2. The data's year is the year of The Project generation.
-Worksheet #15: *SEIN* Installed Capacity (March 31st 2004 to March 31st 2011)
-Worksheet #16: New units built' annual generation in the year of The Project generation.
-Worksheet #17: The BM2 Calculation in the year of The Project generation.
-Worksheet #18: The Baseline Emission Factor and ERs in the year of The Project generation.

[86] The only difference between negative and positive positions is that negatives' are for inexistent plants until the moment (up to March 2004). Even when they start to exist they should keep that position. Note that Future HPs are kept a space (column) on the left extreme of Worksheet #3-Worksheet #14.

Worksheet #15: 2004-2011 *SEIN* Installed Capacity

PLANT	SEIN Installed Capacity March 2004 INSTALLED CAPACITY (MW)	3/2005 SEIN Installed Capacity	...	3/2011 SEIN Installed Capacity
TERMOSELVA				
AGUAYTIA 1	86.294			
AGUAYTIA 2	86.294			
CAHUA S.A.				
CAHUA	43.600			
PARIAC	5.216			
E. PACASMAYO				
PACASMAYO	24.617			
GALLITO CIEGO	38.147			
ARCATA	6.088			
EDEGEL				
HUINCO	258.400			
MATUCANA	128.578			
CALLAHUANCA	75.059			
MOYOPAMPA	89.250			
HUAMPANI	31.360			
YANANGO	42.300			
CHIMAY	156.000			
HUANCHOR	18.660			
SANTA ROSA WTG	127.700			
SANTA ROSA UTI	109.600			
EEPSA				
MALACAS	173.2			
EGENOR				
CAÑON DEL PATO	260.730			
CARHUAQUERO	95.020			
CHIMBOTE	63.833			
TG PIURA	24.300			
TRUJILLO	22.800			
PIURA	27.850			
CHICLAYO OESTE	26.610			
PAITA	11.112			
SULLANA	12.500			
TRUPAL	15.000			
ELECTROANDES				
YAUPI	108.000			
OROYA	9.000			
PACHACHACA	12.282			
MALPASO	54.400			
ELECTROPERU				
COMPLEJO MANTARO - MANTARO	798.000			
COMPLEJO MANTARO-RESTITUCION	210.400			
TUMBES	18.244			
YARINACOCHA	26.600			
ETEVENSA				
VENTANILLA	384			
SHOUGESA				
SAN NICOLAS TV 1-2-3	63.588			
SAN NICOLAS CUMNIS	1.26			
EGASA				
CHARCANI	176.890			
MOLLENDO MIRLESS	31.710			
MOLLENDO TGM	90.000			
CHILINA TV	18.000			
CHILINA C.C	20.000			
CHILINA SULZER	10.400			
EGEMSA				
HERCA	1.020			
MACHUPICCHU	92.250			
DOLORESPATA	15.620			
SAN GABAN				
SAN GABAN II	113.098			
TINTAYA	17.960			
BELLAVISTA	8.600			
TAPARACHI	8.800			
EGESUR				
ARICOTA	35.7			
CALANA	25.6			
MOQUEGUA	1			
ENERSUR				
ILO 1 TV	154.000			
ILO 1 TG	81.690			
ILO 1 CATKATO	3.300			
ILO 2 TVC1	145.000			
TOTAL SEIN Inst Capacity	4784.928			

Source: *COES* data.

The Project staff should classify *SEIN's* yearly capacity additions as follow:

Classification of SEIN Addition in Installed Capacity (MW)

Newly Built =	Only when new units are added - interconnection of units less than 5 years old are included
Interconnection =	Old unit that gets interconnected to SEIN
Rehabilitation =	Reconstruction of a plant that was broken down
Upgrade =	Same unit that increases its installed capacity by technological improvements or adjustments

Source: Own production.

Worksheet #16: Capacity Additions from 1988-2003[87]

Years	Techn	Addition Category	Install.Cap. (MW)	2001 Gen (GWh)	2002 Gen (GWh)	2003 Gen (GWh)	2004 Gen (GWh)	2011 Gen ...(GWh)	Most Recent Year Generation (GWh)
				% Inst Cap*TGen					
1988									
C.H. CARHUAQUERO	HYDRO	Newly built	75.1	469.27	479.41	458.78			
CHARCANI (I-V)	HYDRO	Newly built	136.80	842.17	641.80	660.24			
1993									
TG VENTANILLA 2	D2	Newly built	100	2.40	2.45	1.54			
TG VENTANILLA 1	D2	Newly built	100	2.40	2.45	1.54			
1995									
CALANA	R6	Newly built	19.2	33.02	25.72	45.81			
1996									
STA. ROSA WESTING	D2	Newly built	127.7	9.41	5.61	11.60			
1997									
C.H. GALLITO CIEGO	HYDRO	Newly built	34.0	183.53	149.71	121.79			
TG VENTANILLA	D2	Newly built	184.0	4.41	4.51	2.83			
MOLLENDO MIRLESS	R500	Newly built	31.7	10.98	9.53	35.37			
1998									
AGUAYTIA 1	GAS	Newly built	86.3	230.80	412.26	466.80			
AGUAYTIA 2	GAS	Newly built	86.3	216.30	332.89	367.97			
TG MALACAS	PM GAS	Newly built	102.2	206.23	181.35	274.30			
1999									
SAN GABAN II	HYDRO	Newly built	55.0	357.38	376.19	356.34			
CALANA	R6	Newly built	6.4	11.01	8.57	15.27			
MOLLENDO TGM	D2	Newly built	90.0	0.73	0.86	1.43			
2000									
SAN GABAN II	HYDRO	Newly built	58.1	377.51	397.38	376.41			
ILO2 TVC	COAL	Newly built	145.0	338.78	845.93	859.44			
C.H. CHIMAY	HYDRO	Newly built	156.0	724.76	752.96	825.87			
C.H. YANANGO	HYDRO	Newly built	42.3	214.60	239.13	202.28			
2001									
TUMBES	R6	Newly built	18.3	22.38	20.73	27.99			
2002									
C.H. HUANCHOR	HYDRO	Newly built	18.9	-	36.86	144.64			
2003									
YARINACOCHA	R6	Newly Built	25.6	-	-	56.88			
2004									
New Plants 2004				-	-	-			
2005									
New Plants 2005				-	-	-			
2006									
New Plants 2006				-	-	-			
2007									
New Plants 2007				-	-	-			
2008									
New Plants 2008				-	-	-			
2009									
New Plants 2009				-	-	-			
2010				-	-	-			
New Plants 2010				-	-	-			
2011				-	-	-			
New Plants 2011				-	-	-			

[87] Only the plants that fall in the Newly Built Classification should be considered "Capacity Addition" for the BM2 calculation

Source: Own production with *COES* data.

Only columns and rows highlighted in blue (empty low rows, empty right columns) should be updated. The year of annual generation of the capacity addition is the year of The Project generation[88]. Information of the capacity additions (MW and Technology) from 1988 through 2003 should not be recalculated but taken from Worksheet #16 (rows filled). It will be necessary to know the yearly installed capacity of the plant the unit added belongs in order to obtain the unit added participation in the total generation produced by the plant.

Worksheet #17: Build Margin 2 Calculation

Table#1: Selection of the sample group

Year	Plant Name	Plant Type	Most recent year generation(GWh)	Filter most recent 20%	Most recent 20% units generation	Filter 5 most recent units	5 Most recent units generation
2003	YARINACOCHA	r6					
2002	C.H. HUANCHOR	Hydro					
2001	TUMBES	r6					
2000	C.H. YANANGO	Hydro					
2000	C.H. CHIMAY	Hydro					
2000	ILO2 TVC	Coal					
2000	SAN GABAN II	Hydro					
1999	MOLLENDO TGM	d2					
1999	CALANA	r6					
1999	SAN GABAN II	Hydro					
1998	TG MALACAS	gas					
1998	AGUAYTIA 1	gas					
1998	AGUAYTIA 2	gas					
1997	C.H. GALLITO CIEGO	Hydro					
1997	TG VENTANILLA	d2					
1997	MOLLENDO MIRLESS	r500					
1996	TG STA. ROSA WESTINGHOUSE	d2					
1995	CALANA	r6					
1993	TG VENTANILLA 2	d2					
1993	TG VENTANILLA 1	d2					
1988	C.H. CARHUAQUERO	Hydro					
1988	CHARCANI (I-V)	Hydro					
T/.						5	
				First sample comprises:		of SEIN generation	
				SEIN Annual Gen=			
The sample list would be composed by .... as it represented greater gen. addition				20% of SEIN Gen=			
			>				

Source: Own production.

Any new unit recorded in Worsheet#16 will origin an additional row in Worksheet #17's. In Worksheet #17, empty cells/columns highlighted in blue should be updated. New units (rows) are to be incorporated as the arrow above indicates. The first filter (5th column composed by 1s and 0s) helps keeps track that the sample's annual generation comprises the most recent 20% in generation added to the *SEIN*. The second filter (7th column) counts up to 5 most recent plants. One automatic check is included in this table; it checks whether the 5 most recent plants built's generation is greater than first sample's generation (latest 20% in generation added) and indicates which sample should be selected for the BM2 calculation.

[88] In case the addition was not an entire plant but rather a unit of an existent plant, only this new unit added to the *SEIN* should be considered in the sample. If not publicly available, its generation should be estimated by the % that this unit capacity represents in the total plant capacity times the annual generation of the plant it belongs.

Table # 2: BM2 Calculation

Clusters the generation of the selected sample by technology, and gets a tCO_2e/MWh weighted average.

Technologies in Selected Sample	Most Recent Year Gen (GWh)	% per technology	APFR	C	O	44/12	CO2 Emissions(tCO2)
Coal							
d2							
r6							
r500							
Dry Gas							
Pure Methane Gas							
Dry Gas CC							
Hydro							
Total							

BM2= tCO2//MWh

Source: Own production.

APFR=Annual Plant Fuel Requirement (TJ) = Gen (KWh)*3.6*10^6/(NEC*10^12); C= Carbon Content (tC/TJ); O=Oxidation Factor; 44/12= Mass Conversion (tCO_2/tC). The NECs to use in the APFR formula, and the C and O factors should be extracted accordingly from Table #3, of this Worksheet #17.

Empty columns and cells highlighted in blue should be updated. The arrow above indicate insertion of new technologies (new rows) that enter the *SEIN*.

Table # 3: NECs & IPCC 1996 values

COEF(tCO2/MWh)	Open Cycle					
Type of Fuel	D2	R6	R500	Gas Dry	Gas PM	Coal
NEC	34.93%	42.98%	32.74%	32.50%	32.50%	33.00%
C Content	20.20	21.10	21.10	15.30	14.50	25.80
Oxidation Factor	0.99	0.99	0.99	0.995	0.995	0.98
COEF(tCO2/MWh)	**0.76**	**0.64**	**0.84**	**0.62**	**0.59**	**1.01**

COEF(tCO2/MWh)	Combined Cycle				
Type of Fuel	D2	R	Gas Dry	Gas PM	Coal
NEC	55.00%	55.00%	54.00%	55.00%	55.00%
C Content	20.20	21.10	15.30	14.50	25.80
Oxidation Factor	0.990	0.990	0.995	0.995	0.980
COEF(tCO2/MWh)	**0.48**	**0.50**	**0.37**	**0.35**	**0.61**

COEF(tCO2/MWh)	Cogeneration				
Type of Fuel	D2	R	Gas Dry	Gas PM	Coal
NEC	80%	80%	80%	80%	80%
C Content	20.20	21.10	15.30	14.50	25.80
Oxidation Factor	0.990	0.990	0.995	0.995	0.980
COEF(tCO2/MWh)	**0.33**	**0.34**	**0.25**	**0.24**	**0.42**

Source: Own production with *COES* data.

Average real NECs per technology need to be calculated separately every year; Table #3, of this Worksheet #17 will show updated NECs per technology calculated with yearly real data from COES. This will allow the most accurate TJ-estimation consumed per technology. COEFs will be updated automatically as NECs are updated; both rows are linked by the following COEFs formula:
COEFs per technology = [3.6 x (44/12) x C x O] / [10^3 x NEC average per technology][89].

[89] COEFs per technology of Worksheet#1-Table#1, should be the same as COEFs gotten in this Worksheet#17-Table#3, as both use the latest information publicly available from *COES*.

Worksheet #18: Combined Margin and ERs of the year

Worksheet #18 shows the ERs of the year calculated with the 2 spreadsheets' results for DDA-OM and BM2. Empty cells highlighted in blue should be updated at the end of the year (March 31st)[90].

Project	MWh in the year
Poechos I	

Ers of the Year (DDA-OM - BM2):

Project	MWH in the year*Combined Margin
Poechos I	

DDA-OM=
BM2=
CM=

Source: Own production

V. Sustainable Development Monitoring Plan:

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. Therefore, the MP for The Project specifies sustainable development indicators and targets, which must be monitored and met by the Operator.

A. Environmental Sustainability: Impact on Local Pollution

In addition to mitigate emission of CO_2, The Project will reduce emissions of local pollutants (particularly SO2, NOx and particulates).

The sustainable development contribution of The Project is considered fulfilled as long as The Project is operating. Numerous environmental assessment documents were completed during the preparation phase of The Project. An EIA was completed for the hydropower project specifically, which analyzed the construction and operation phase impacts. In part due to the highly intervened surroundings, no major impacts were identified. Construction impacts were well managed through proper environmental practices, as enumerated in the Environmental Management Plan. Consideration of an ecological flow is not required, given the discussion above. A separate EIA was completed for the transmission lines, with, again, no major impacts identified.

Approximately 38 km of transmission lines that were built as part of The Project go through desert landscape with scarce vegetation. The impact of the transmission lines was thoroughly studied in a separate EIA. The EIA concluded that the line follows an existing right-of-way; it does not cross or negatively affect any populated or cultivated areas, nor areas with cultural heritage sites. As required by National Law, an architect was part of the EIA team, and the National Institute of Culture certified the EIA. The area is not a migratory bird habitat, and no impact is expected on the local bird population.

[90] Margins are rounded to the 5th decimal but the ERs of the year are rounded down to the nearest integer. The Project's generation does not need to be rounded down to the nearest integer.

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, and not by The Project sponsor. The water concession is based upon the use of the flow required for agricultural needs downstream of the dam. The Project sponsors have no direct control over the flows emitted to either the Chira River or to the irrigation canal.

B. Socio-Economic Sustainability

No negative social impacts are predicted due to the remote location of The Project, and the requirement of existing water usage rights. The area of influence of The Project, including its ancillary infrastructure, is not in or near an indigenous reserve or populated area. The only population near the site is the guards of the national police that guard the dam security. No other people live near The Project site or under the transmission line. As discussed above, all water user rights will be respected, as energy generation receives a lower priority than agricultural use.

The area is extremely poor. The population downstream of the plant is small landowner farmers. The main crops are rice, plantains, vegetables and coconuts. The plant utilizes the existing access road for the dam, which passes through many of the small villages. Social impacts of construction were minimized by good construction practices such as traffic control, noise reduction, and proper waste disposal. Many jobs were created during construction and now during operation.

A broader social program involves providing the local communities with access to electricity, something most of the nearby communities live without. The new transmission line has opened up the possibility of electrification in the area. The distribution of electricity is the sole right and responsibility of the Department of Energy and Mines; the sponsor is not allowed to undertake a social electrification program itself. However, the sponsor is working with the Department of Energy and Mines to promote this program in the area. So far, The Project has installed a keys yard of 22.9 Kv to feed 3 small isolated systems: the Lancones system, the Chira system, and the third one goes into a small population located close to the Ecuadorian border. These three small populations' consumptions will be partly "subsidized" by the Peruvian Government according to The Department of Energy and Mines overall initiative regarding social development and rural electrification: *FOSE*[91] and Rural Electrification Plan, respectively.

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 (ENOSA), 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

[91] *Fondo de Compensacion Social Electrica* – was created by Law 27510 in 2001. Currently FOSE's life is set until December 2006. The FOSE was created to favor electricity access and permanency of it to all clients that consume less than 1000 KWh, by providing them discounts.

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 NCDMF 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 assigned The Project Staff, to enable them to undertake the tasks required by this MP. NCDMF will train the Project Staff 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 NCDMF.

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 NCDMF 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 14CDM requirements that need to be verified. The NCDMF will select and contract the Verifier.

B. The Netherlands Carbon Facility Audit and Verification Regime
The NCDMF 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 NCDMF expects that its auditors will seek accreditation under The Kyoto Protocol regime for providing these services. The NCDMF verification system for CDM consists of four activities:

Validation of project design: the Validator undergoes validation of The Project's design, the BLS and the MP against CDM requirements and modalities and is complemented by validation of The Project. Validation is a CDM requirement. The NCDMF will not sign contract with The Project unless a Validator has confirmed that The Project 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 Verifier. A renewal of validation is not necessary in this case.

Initial audit and verification of project readiness: The NCDMF requires that The Project successfully complete an initial audit and verification process before The NCDMF commissions The Project and accept emissions reductions delivered by it. While initial verification is not a CDM requirement, The NCDMF regards it as essential and final step in The NCDMF project preparation and implementation cycle. To prevent conflicts of interest, the same firm and individuals that have provided validation services for The Project must not conduct verification. But the initial auditor / verifier may also provide subsequent verification services to The Project. 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 GHG emissions reductions.
2. Ensure 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 NCDMF 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:
5. Familiarize themselves with The Project and The Project circumstances,
6. Introduce The Project Staff to the audit and verification process,
7. Check whether The Project has been implemented as planned,
8. Check whether the meters and registers have been installed and tested correctly and are in operation.
9. Check whether assumptions that have an impact on the monitoring and verification processes and its outcomes are still reasonable, in particular assumptions for the BL.
10. 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 emissions reductions.

Periodic verification of ERs: All NCDMF 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 NCDMF 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 BLS and this MP.
3. The operation of The Project continues to be in compliance with all Kyoto Protocol, NCDMF 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 BLS 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 NCDMF as to The Project's emissions reductions performance.
The Verifier for The Project is the only one that can issue the certificate but it does not constitute or creates Certified Emissions Reductions (CER) in the sense of Article 12 of The Kyoto Protocol. However, the Verifier's certificate may be used by The NCDMF 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 GHG emissions reductions 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 Project 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 Project 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 interview 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 NCDMF 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 NCDMF, 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 NCDMF 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 participants as follows:

The NCDMF:

1. The NCDMF will make arrangements for the audit and select a third party auditor/verifier in accordance with CDM modalities and NCDMF requirements and selection criteria and in consultation with the relevant the host country CDM authority.
2. It is The NCDMF'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 NCDMF requires details of the experts to be used on the audit/verification team.
3. The NCDMF will facilitate the audit work and verification process and will work with The Project 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 their best interest to fully cooperate with auditors and verifiers, since only successful verification will enable the delivery of ER to The NCDMF in fulfillment of the Operator' contracts with The NCDMF.

The Auditor / Verifier:

1. The auditors/verifiers must be must operational entities accredited in accordance with CDM modalities. They must be a professional organization 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 NCDMF 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[92] and indirect[93] area of influence and their habitants. A Sustainable Development Indicators & Targets framework will facilitate the measurement of progress towards sustainability. The indicators will be revised annually[94] by the Verifier to check compliance with targets. The Targets will be progresses[95] registered by the indicators. The following indicators have been established:

Goal 1: Environmental Sustainability		
Initiative	**Indicator[96]**	**Target**
Land Quality improvement	Number of trees sowed	Positive
Awareness	Number of environmental educational programs for local population[97] (i.e. energy savings, water savings, etc.)	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[98]

Goal 2: Socio-Economic Sustainability		
Initiative	**Indicator[99]**	**Target**
Education standards improvement	Grants provided for education of local population	Positive
Economic standards improvement	Number of employees hired from local population	Positive
	Purchases from local suppliers	Positive
	[Population that accesses electricity due to The Project's action or cooperation] Divided by [viable opportunities[100] on rural electrification proposed to The Project by third parties or identified by The Project management]	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[101]

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

[92] Approximately 3.5 hectares (defined by the *MINEM* concession granted).
[93] Approximately 6 hectares (defined in the EIA).
[94] The year for the MP runs from April 1st to March 31st.
[95] Progresses meaning positive results of the indicators.
[96] Yearly flow or yearly change.
[97] Local meaning people who are living in the direct or indirect area of influence for reasons other than The Project occurrence.
[98] Target will be set when indicator is created and also needs to be approved by the Verifier.
[99] Yearly flow or yearly change.
[100] Viable opportunities meaning positive Net Present Value projects.
[101] 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 bi-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:
- Universidad-de-Piura: PhD. Ignacio Benavente, who is a member of the faculty; and
- The area of Influence: Isais Vazquez Moran, Sullana City Mayor

The Compliance Committee will meet bi-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 Project Sponsor (SINERSA) - 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 SINERSA, legally represented by Mr. Branislav Zdravkovic, who will be present at the meeting.

Bi-annual Compliance Committee Meeting - Compliance Form

Goal 1: Environmental Sustainability		
Initiative	**Indicator**[102]	**Annual Cumulative Progress**
Land Quality improvement	Number of trees sowed	Of 1rst Semester = Of 2nd Semester =_____ **As of March 31st =**
Awareness	Number of environmental educational programs for local population[103] (i.e. energy savings, water savings, etc.)	Of 1rst Semester = Of 2nd Semester =_____ **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[104]

Goal 2: Socio-Economic Sustainability		
Initiative	**Indicator**[105]	**Annual Cumulative Progress**
Education standards improvement	Grants provided for education of local population	Of 1rst Semester = Of 2nd Semester =_____ **As of March 31st =**
Economic standards improvement	Number of employees hired from local population	Of 1rst Semester = Of 2nd Semester =_____ **As of March 31st =**
	Purchases from local suppliers	Of 1rst Semester = Of 2nd Semester =_____ **As of March 31st =**
	[Population that accesses electricity due to The Project's action or cooperation] Divided by [viable opportunities[106] on rural electrification proposed to The Project by third parties or identified by The Project management]	Of 1rst Semester = Of 2nd Semester =_____ **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[107]

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

_____

_____

_____(Annex extra-paper if necessary).

_____ _____

Universidad de Piura Representative The Project's Area of Influence Representative

_____

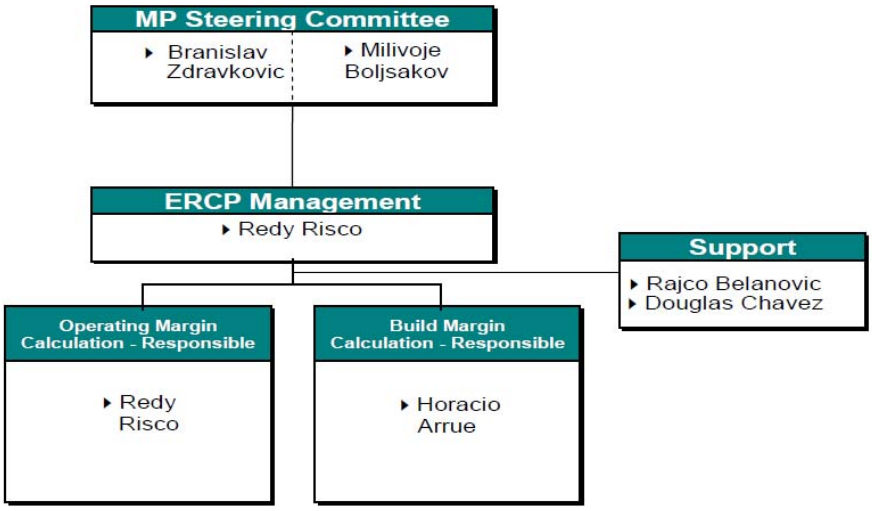
The Sponsor

Date of the Compliance Committee Meeting:

[102] Yearly flow or yearly change.
[103] Local meaning people who are living in the direct or indirect area of influence for reasons other than The Project occurrence.
[104] Target will be set when indicator is created and also needs to be approved by the Verifier.
[105] Yearly flow or yearly change.
[106] Viable opportunities meaning positive Net Present Value projects.
[107] 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 Organizational Structure



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

	Operating Margin Calculation		Build Margin Calculation
		▸ *Quarterly Cross-checking* ▸ *Quarterly Corrective actions* ▸ *Check calibration of electricity meters, periodically* ▸ *Make coordination with ENOSA and COES to be able to implement this document*	
Data	▸ The Project hourly generation data: "A" ▸ *SEIN* units hourly generation data: "B" ▸ Weekly Merit order for hours of maximum demand: "C" ▸ Real NEC per power plant of the *SEIN*		▸ *COES* most recent year operations statistics (Tables: 2.6, 4.3, 12.1): "D" ▸ New units that enter the SEIN from Jan 1st to March 31st: "E" ▸ Real NEC per power plant of the *SEIN*
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? A from *ENOSA;* B-C *COES(Programacion Semanal)* ▸ To whom does it comes? Ing. Risco & Ing. Arrue		▸ 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? Yearly ▸ From who does it come? From *COES* (EE. Economicos) ▸ To whom does it comes? Ing. Risco & Ing. Arrue
Quality of Data Processing	▸ Original Data ▸ Organized Data ▸ Entered Data ▸ Processed Data ▸ Result	• Monthly calculation involves 5 steps • Follow ERCP • Beware of alerts – presented in training • Quarterly cross-check by BM responsible • Yearly consolidation of C.Margin	▸ Original Data ▸ Organized Data ▸ Entered Data ▸ Processed Data ▸ Result	• Yearly calculation involves 5 steps • Follow ERCP • Beware of alerts – presented in training • Yearly c-check by OM responsible • Yearly consolidation of C.Margin
Quality of Data Storage	▸ Prevent Excel versioning problem, by keeping "a new" Excel software package every year in PCs used for the OM and BM calculations ▸ Keep all data for 2 years after the first crediting period (9 years) –Each responsible should assign a password to his excel spreadsheets ▸ Save the document with the last date in which an alteration was made, i.e. "OM at xx", so that old versions are kept in disk ▸ Keep all written documentation in a folder per Margin/Responsible		
Quality of Data Delivery	▸ Provide to the Verifier e-mails /CD through which Data Providers (COES and ENOSA) delivered the original data ▸ Provide to the Verifier receipt of sales of ENOSA ▸ Provide to the Verifier all calculations made (all steps of Data Processing) by showing all preliminary versions of spreadsheets saved in disk		