CLEAN DEVELOPMENT MECHANISM
PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-CPA-DD)
Version 01

CONTENTS

Annexes

NOTE:

(i) This form is for the submission of CPAs that apply a large scale methodology using provisions of the proposed PoA.

(ii) The coordinating/managing entity shall prepare a CDM Programme Activity Design Document (CDM-CPA-DD)[1,2] that is specified to the proposed PoA by using the provisions stated in the PoA DD. At the time of requesting registration the PoA DD must be accompanied by a CDM-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the PoA must submit a completed CDM-CPA-DD.

[1] The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

[2] At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

SECTION A. General description of CDM programme activity (CPA)

A.1. Title of the CPA:

Title: "*[PLANT NAME] hydropower plant –Inti PoA CPA#[NUMBER OF CPA]*"

Version [VERSION NUMBER].
Date: [DATE OF THE CPA VERSION].

A.2. Description of the CPA:

"*[PLANT NAME] hydropower plant –Inti PoA CPA#[NUMBER OF CPA]* "is being developed as part of "*Inti Renewable Energy Program of Activities*". This Programme of Activities (PoA)aims to encourage the wide scale adoption of small hydro power plants, grid-connected renewable energy projects.

The project is located at *[*NAME OF THE RIVER FLOW*]*, [NAME OF THE DISTRICT] District, Province of [NAME OF THE PROVINCE], and Department of [NAME OF THE DEPARTMENT].

The purpose of the Project is to generate electricity using renewable energy sources to be supplied to Peru's National Interconnected Electric Grid (SEIN). The Project's expected installed capacity is [INSTALLED CAPACITY]MW with an annual average generation of [ANNUAL ENERGY] GWh/yr.

[BRIEF DESCRIPTION OF THE PROJECT]

The Project will generate electricity without emitting GHGs and supply it to the SEIN, hence, displacing fossil-fuel based electricity generation that would otherwise be supplied to the SEIN.The project is estimated to displace [NUMBER OF TONNES] tCO_2e per year, which will add up to [NUMBER OF TONNES] tCO_2e for the first 7-year crediting period.

The spatial extent of the project boundary is the SEIN. The generated electricity will be supplied to the SEIN through a [NUMBER OF kV] kV, [KILOMETERS TO THE SUBSTATION] km transmission line to [NAME OF THE SUBSTATION] Substation and then to the Peru's National Interconnected Electric Grid (SEIN).

Methane and carbon dioxide that may be emitted to the atmosphere as a result of the construction and operation of the Project are negligible. Therefore, there is no need to monitor leakage, and such emissions will not be taken into account when calculating emission reductions (ERs).

The Project contributes to sustainable development of the country by:

- Providing to the national grid energy from cleaner energy sources and either delay the development of new thermal power plants that use fossil fuels and generate greenhouse gases ("GHG") or displace the energy produced by old thermal plants that sit idle when hydro power can satisfy the demand.

- Being a small hydro power project the environmental impact is minimal.

- providing to the local inhabitants development opportunities through participatory social development investment plans. This CPA will allocate a percentage (%) of the CERs issued from its projects towards improving the infrastructure and social services in the communities that are located near to the CPA project activity.

- [OTHERS]

A.3. Entity/individual responsible for CPA:

[CPA ENTITY NAME]is the responsible project implementer of the CPA

A.4. Technical description of the CPA:

A.4.1. Identification of the CPA:

A.4.1.1. Host Party:

Republic of Peru

A.4.1.2.Geographic reference of other means of identification allowing the unique identification of the CPA (maximum one page):

"*[PLANT NAME] hydropower plant –Inti PoA CPA#[NUMBER OF CPA]*"is located in [NAME OF THE DISTRICT] District, Province of [NAME OF THE PROVINCE], and Department of [NAME OF THE DEPARTMENT].

The project's geographical coordinates are shown in the table below:

Table 1: Project Coordinates

Item	Location (Coordinates)
Power house	[IN DECIMAL COORDINATES]
Water intake	[IN DECIMAL COORDINATES]

[COUNTRY MAP WITH CPA LOCATION]

A.4.2. Duration of the CPA:

A.4.2.1.Starting date of the CPA:

[DATE OF THE FIRST "REAL ACTION" OF THE PROJECT]

A.4.2.2. Expected operational lifetime of the CPA:

[EXPECTED OPERATIONAL LIFETIME OF THE PROJECT].

A.4.3. Choice of the crediting period and related information:

Renewable crediting period

A.4.3.1. Starting date of the crediting period:

[THE COMMISSIONING DATE OF THE CPA]

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

7 years, renewable CP

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

Table 2: Estimated amount of emission reductions

Years	Annual estimation of emission reductions in tonnes of CO_2 e
Year 1	XX
Year 2	XX
Year 3	XX
Year 4	XX
Year 5	XX
Year 6	XX
Year 7	XX
Total estimated reductions (tonnes of CO_2 e)	**XX**
Total number of crediting years	**7**
Annual average over the crediting period of estimated reductions (tonnes of CO_2 e)	**XX**

A.4.5. Public funding of the CPA:

The project will not receive public funding that constitutes a diversion of official development assistances

A.4.6. Confirmation that CPA is neither registered as an individual CDM project activity nor is part of another Registered PoA:

By comparing the precise geographical coordinates of the CPA provided in section A.4.1.2 with the database of registered CDM project activities and registered PoAs it has been established that this CPA is neither registered as an individual CDM project nor is part of another registered PoA

SECTION B. Eligibility of CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which CPA is added:

Inti Renewable Energy Program of Activities ("Inti PoA")

B.2. Justification of the why the CPA is eligible to be included in the Registered PoA :

The proposed CPA fulfils all the eligibility criteria set in the PoA as described in Table 3

Table 3: ***Fulfilment of CPA Eligibility Criteria***

Criteria	**Analysis**	**Documentary Evidence** (To demonstrate the eligibility of CPA it could be used one or more of the evidences showed below)
1. Be located inside geographical boundary of the PoA, as defined in section A.4.1.2. of the present PoA – DD. which is the geographical boundary of the Peruvian National Interconnected Electric Grid (called SEIN).	The CPA must be located in Peru and connected the national grid. This should be explained in section A.2. and A.4.1.2. of the CPA -DD	Feasibility study, Technical report, Study for the connection to the grid, Environmental Impact Report or Study, Energy concession, or other documents that explain the connection of the project to the grid
2. Avoid double counting of emission reductions. In section A.4.4.1. (ii) there is a system procedure to avoid double accounting. In addition, each CPA will confirm with a writing statement that: a. It is not registered as a CDM project activity b. It is not included as a CPA under another PoA	The description of the CPA should be compared to the list of project activities that are under validation or registered at the UNFCCC and should not have a coincidence. Moreover , the CPA project sponsor has to confirm in a written statement that it is not registered as a CDM project activity nor included as a CPA under another PoA	Web page of the UNFCCC. Feasibility study, technical report Written statement made by the CPA project sponsor confirming that the project is not registered as a CDM project activity nor included as a CPA under another PoA
3. Be consistent with the technology described in section A.4.2.1. of the present PoA – DD and comply with national standards.	Each CPA will have a power capacity up to 20MW. The CPA could be composed by one or more new small hydro power plants and will be connected to the Peruvian National Electricity Grid (SEIN). The projects will be based on Run of River hydroelectric technology but not limited to it since hydro power plants projects using already built channels or existing reservoirs could also apply. Each CPA should comply with the dispatch centre requisites (COES) and local regulation.	Feasibility study, Technical report, Study for the connection to the grid, Environmental Impact Report (or Study), Energy concession, water permits, quotations or contracts from technological suppliers or other documents that could explain the technology of the project and the compliance of national standards.
4. Have a project starting date after the Global Stakeholder Consultation of the PoA-DD.	The starting date of a CDM project activity is the date on which the implementation or construction or real action of a project activity begins.	The evidence for this could be the signing of the first major contract for the implementation of the project or other documents the give us information about the date on which the implementation or

Criteria	Analysis	Documentary Evidence (To demonstrate the eligibility of CPA it could be used one or more of the evidences showed below)
		construction or real action of a project activity begins.
5. Ensure compliance with applicability and other requirements of the methodology ACM0002 as explained in section E.2. of the present PoA – DD.	The CPA fulfills the applicability of the methodology ACM0002 as explained in section E.2. of the Inti PoA -DD as the project is: Anew grid-connected Greenfield hydro power plant with a run of River reservoir or existing reservoir. Further details are in section A.2. of the CPA-DD. The project does not involve capacity additions, retrofits or replacements. Further details are in section A.2. of the CPA-DD. The project activity results in new (or existing)reservoir and the power density of the power plant, is greater than 10 W/m^2. Further details are in section B.5.2. of the CPA-DD under the title project emissions.	Feasibility study, Technical report, Study for the connection to the grid, Environmental Impact Report or Study, Energy concession, quotations or contracts from technological suppliers or other documents that could explain the characteristics of the project.
6. Demonstrate the compliance with additionality requirements stated on section E.5.1 and E.5.2. of the present PoA DD.	The CPA demonstrates its additionality based in the investment analysis and Common practice analysis. The project is additional if the IRR is lower than the Peruvian benchmark for the electric sector, which is 12% and if the project is not part of the common practice. Further details are in section B.3. of the CPA-DD	Financial analysis, information from the national grid provided by the dispatch center or/and the Ministry of Energy and Mines, feasibility study, technical report, quotations, tariff studies, hydrology study, PPAs if available, etc.
7. Conducted a stakeholder consultation process as described in section D of the PoA –DD.	The CPA has to conduct a stakeholder consultation process according to section D of the PoA-DD. Further details are in section D. of the CPA-DD. The stakeholder consultation report should describe the process by which comments by local stakeholders have been invited and compiled. Also the report has to explain how project participants described the project activity to the stakeholders. The local stakeholder consultations report should include the identification of the stakeholder and a summary of the comments received. Finally, it is necessary to report how due account have been taken of comments received. The report has to include the minutes of the meetings with stakeholders as well as the agreements established.	Stakeholder consultations report, minutes of the meetings with stakeholders as well as the agreements established

Criteria	Analysis	Documentary Evidence (To demonstrate the eligibility of CPA it could be used one or more of the evidences showed below)
	Inti PoA has established the each CPA has to provide at least 5% of the CER revenues for social investment project to local communities.	
8. Conducted an environmental impact analysis as described in section C of the PoA–DD.	Due to the highly localized and site-specific environmental impacts of each hydropower project particularly, the geographical location, capacity and construction plan among others, each CPA will have a separate environmental assessment. The environmental analysis for each CPA will be conducted in line with applicable environmental policies that will be identified at the time of the inclusion of each CPA.	Any environmental impact report or study and any declaration required by law.
9. Confirm through a sworn declaration that the project activity is not using any type of official development assistance from Annex I countries.	The CME will investigate the facts in each CPA and in each CPA DD include a confirmation that no Official Development Aid will be involved or diverted.	Sworn declaration that the project activity is not using any type of official development assistance from Annex I countries
10. Comprise one or more newly developed hydro power plant generating a total electricity of up to 20MW using newly built equipment and must not involve retrofitting or replacement of an existing facility for renewable energy generation. Several hydro power plants could be considered part of a CPA if the sum of all of them are up to 20 MW and share significant points in common and are part of the same project (for example if they share some equipments or are undertaken by the same owner on the same river).	It has to be demonstrated that each CPA has a power capacity of up to 20MW using newly built equipment and must not involve retrofitting or replacement of an existing facility for renewable energy generation	Feasibility study, Technical report, Study for the connection to the grid, Environmental Impact Report or Study, Energy concession, quotations or contracts from technological suppliers or other documents that could demonstrate the power capacity of the project.
11. Supply the renewable electricity generated to the Peruvian National Grid (SEIN)	The CPA must be located in Peru and connected the national grid. This should be explained in section A.2. and A.4.1.2. of the CPA -DD	Feasibility study, Technical report, Study for the connection to the grid, Environmental Impact Report or Study, Energy concession, or other documents that explain the connection of the project to the grid
12. Have a cooperation agreement with Energía Limpia S.A.C.to participate in this PoA.	The project sponsor has to sign a cooperation agreement with Energía Limpia S.A.C.to participate in this PoA accepting the conditions of the PoA.	The cooperation agreement between CPA project sponsor and Energía Limpia S.A.C
13. Not result in the construction of new reservoirs where the power density of the power plant is less than 10 W/m^2 or in the increase in	It has to be demonstrated that each CPA Not result in the construction of new reservoirs where the power density of the power plant is less than 10 W/m^2 or	Feasibility study, Technical report, Study for the connection to the grid, Environmental Impact Report or Study, Energy concession, quotations or

Criteria	Analysis	Documentary Evidence (To demonstrate the eligibility of CPA it could be used one or more of the evidences showed below)
existing reservoirs where the power density of the power plant is less than 10 W/m^2.	in the increase in existing reservoirs where the power density of the power plant is less than 10 W/m^2.	contracts from technological suppliers, map or other documents that could provide information about the power capacity and area of the reservoir.

In addition, the proposed CPA fulfils all the applicability criteria of the ACM002 Version 12.2.0 set in the PoA as described in Table 4.

Table 4: Applicability Analysis

Applicability criteria of ACM0002 Version 12.2.0	ACM0002 Version 12.2.0 is applicable to a CPA under the proposed PoA because:
This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	Each CPA under this PoA will consist of a grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) particularly hydro power plants(s)
The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit	Each CPA under this PoA will consist of (a) new hydro power plant/unit(s) (either with a run-of-river reservoir or an accumulation reservoir)
In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 10 of the Approved consolidated baseline and monitoring methodology ACM0002 Version 12.2.0 to calculate the parameter $EG_{PJ,y}$): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum	Each CPA under this PoA will not involve capacity additions, retrofits or replacements

Applicability criteria of ACM0002 Version 12.2.0	ACM0002 Version 12.2.0 is applicable to a CPA under the proposed PoA because:
historical reference period and the implementation of the project activity.	
In case of hydro power plants, one of the following conditions must apply: o The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs; or o The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per definitions given in the Project Emissions section, is greater than 4 W/ m^2; or o The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per definitions given in the Project Emissions section, is greater than 4 W/m^2. In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m^2 all the following conditions must apply: o The power density calculated for the entire project activity using equation 5 of the methodology ACM0002 is greater than 4 W/m^2; o Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project that collectively constitute the generation capacity of the combined power plant; o Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; o Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m^2, is lower than 15MW; o Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m^2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.	For each CPA under this PoA one of the following conditions will apply: (a)The project activity is implemented in single or multiple reservoirs, with no change in the volume of reservoirs; or (b) The project activity is implemented in an existing single or multiple reservoirs, where the total volume of reservoirs is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 10 W/ m^2; or (c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 10 W/ m^2. In case of a CPA using multiple reservoirs, the power density of any of the reservoirs must be bigger than 10 W/m^2
The methodology is not applicable to the following: • Project activities that involve switching from	Not applicable • The proposed PoA does not involve switching

Applicability criteria of ACM0002 Version 12.2.0	ACM0002 Version 12.2.0 is applicable to a CPA under the proposed PoA because:
fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; • Biomass fired power plants; • Hydro power plants that result in new single reservoir or in the increase in existing single reservoir where the power density of the power plant is less than 4 W/m^2	from fossil fuels to renewable energy sources at the site of the project activity. • The proposed PoA is not related to biomass fired power plants. • The power density of each CPA to be included in PoA has a power density greater than 10 W/m^2
In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	Not applicable The proposed PoA does not involve retrofits, replacements, or capacity additions.

B.3. Assessment and demonstration of additionality of the CPA, as per eligibility criteria listed in the Registered PoA:

The following steps from the "Tool for the demonstration and assessment of additionality" Version 06.0.0 are carried out in this section:

Step 1: Identification of alternatives to the project activity consistent with mandatory laws and regulations
Step 2: Investment analysis
Step 3: Barriers analysis (not used)
Step 4: Common practice analysis

Step 1: Identify realistic and credible alternative baseline scenarios for power generation consistent with current laws and regulations

Step 1a: Define alternative scenarios to the proposed CDM project activity

Two realistic and credible alternatives were identified as available to the Project participants, which provide outputs or services comparable with the proposed CDM project activity. These are:

1. The proposed project activity undertaken without being registered as a CDM project activity.

   In the case of the CPAs included in the Inti PoA the hydropower projects would be undertaken without being registered as a CDM project activity.

2. The continuation of the current situation, i.e. to use all power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance. The additional power generated under the project would be generated in existing and new grid-connected power plants in the electricity system.

No other plausible and credible alternatives to the project activities of the CPAs that provide an increase in the power generated at the site, which are technically feasible to implement, are available to project participants

Sub-step 1b: Consistency with mandatory applicable laws and regulations

The identified alternatives are in compliance with all applicable legal and regulatory requirements, including Peru's Electricity Concessions Law of 1992-Law 25844 (ECL)[3]. Several articles of the ECL imply that the alternatives described above are valid and realistic options, including:

a) Article 1: Electricity generating activities can be developed by people or legal entities, whether they are nationals or foreigners. Legal entities, i.e. private companies, should be incorporated under Peruvian laws;

b) Article 3: A concession is required for the development of hydropower plants if their installed capacity is greater than 500 KW;

c) Article 4: An authorization is required to develop fossil fuel-fired power plants with an installed capacity greater than 500 kW;

d) Article 6: The concessions and authorizations can be granted by Peru's Department of Energy and Mines (MINEM*)*;

e) Article 7: Electricity generating activities that do not require a concession or authorization can be developed freely provided they comply with technical standards and adhere to conservation of environmental quality and cultural heritage. The developer of such activities should inform the MINEM of the project activity and its technical characteristics;

f) Article 9: The Peruvian government seeks to preserve the environmental quality and cultural heritage of the country, as well as the rational use of natural resources in the development of activities related to generation, transmission and distribution of electricity.

None of the identified alternatives contradicts any legal or regulatory requirement, or poses a risk to do so in the future. Moreover, none of them breaches technical standards and dispositions of environmental and cultural conservation.

Step 2: Investment analysis

Sub-step 2a – Determine appropriate analysis method

The CDM project activity generates financial and economic benefits other than CDM related income, thus the simple cost analysis does not apply. In order to determine whether the proposed project is economically or financially less attractive than the other alternatives without the revenue from the sale of CERs, Option III – "Apply benchmark analysis", is performed below.

Sub-step 2b – Option III – Apply benchmark analysis

The financial indicator identified for the project is the Internal Rate of Return post tax (IRR). The IRR will be compared to the appropriate benchmark of the electric sector (in accordance with paragraph 12, Annex 5, EB62). The Project IRR is a suitable financial indicator for the Project and is compared to a

[3] Modifications made by the Law 1002 are included in the Peru's Electricity Concessions Law of 1992 -Law 25844 (ECL).

benchmark, which is the discount rate that represents the returns investors or borrowers would normally expect in Peru.

The discount rate of 12% has been selected as a benchmark to evaluate the economic viability of an investment in the electric sector in Peru. This 12% discount rate emerged in several studies, as well as in official governmental decisions related to project investment evaluation. This benchmark has been used since the issuance of the Electricity Concessions Law[4] (1992), this means for more than 20 years, therefore it is expect that this benchmark would last in the long term.

The 12% rate appeared officially for the first time in December 1992 with the issuance of the ECL as the opportunity cost of investment for new additions to the system in order to forecast and determine the regulated tariff in Peru.[5] In addition, there are several other governmental regulations not related to tariffs that use 12% as the rate of the opportunity cost for the evaluation of new investments, reflecting the minimum expected return for investments in Peru's electric sector. In this regard, in 2007 the Ministry of Economy and Finance issued Decree 015-2007,*Terms of reference for feasibility studies for rural electrification in Peru*. In section number 5.2, the Decree stipulates that for private sector investment evaluation a 12% discount rate should be used for rural electrification projects, which include both renewable and non-renewable generation. Prior to this, in May 2005, the Ministry of Economy and Finance had issued *Technical report 085-2005-EF/68.1* regarding the evaluation of projects in the electric sector. This report establishes that the discount rate is 12% for private sector project evaluation. Recently, the Peruvian Ministry of Environment, and MINEM sent letters to the Project Developer confirming that 12% has been used broadly as a benchmark for the government to evaluate the viability of investments in the electric sector in Peru.[6] Even independent studies, such as one performed by the World Bank in 2009[7] and another by the Peruvian Agency for the Promotion of Private Investment (Proinversion) confirm the use of 12% as a benchmark for investment decisions in the sector[8].Recently, the National Fund for the Financing of state Entrepreneurial Activity (FONAFE)[9], which is responsible for the management of the State companies, has confirmed that 12% (after tax) has been used for evaluation of private investments, including those in the electric sector.

Sub-step 2c – Calculation and comparison of financial indicators

Project IRR Calculation: The table below presents the main data used in the IRR calculation of the Project. The calculation was based on conservative assumptions, all of which are listed below in order to maintain a transparent approach.

Table 5: Key Parameter in Benchmark Analysis

No.	Parameter	Value	Sources

[4] *Law Decree N° 25844. Electricity Concessions Law Article 79.* Regarding the issue of tariff applicability, Peru does not have a special tariff for non-renewable or renewable power projects. The 12% discount rate for the electric sector applies to both renewable and non-renewable projects.

[5] *Law Decree N° 25844. Electricity Concessions Law Article 79.* Regarding the issue of tariff applicability, Peru does not have a special tariff for non-renewable or renewable power projects. The 12% discount rate for the electric sector applies to both renewable and non-renewable projects.

[6] The Designated Operational Entity (DOE) has copies of the letters.

[7] 2009, Presentation of a World Bank Study regarding the economic and technical feasibility of hydropower projects in Peru, which used the benchmarks of 12% and 14% to determine the viability of the projects.

[8] The document has been given to the DOE.

[9] National Fund for Financing State Business Activity

I. Technical Parameters			
1	Installed capacity	XXMW	Based on technical specification[SOURCE]
2	Firm capacity	XXMWh	Based on hydrology studies and estimates[SOURCE]
3	Annual energy production	XXMWh/year	Based on hydrology studies and estimates[SOURCE]
4	Technical life time	XXYears	As per evaluation of technical engineering experts[SOURCE]
5	Construction period	XXYears	As per evaluation of technical engineering experts[SOURCE]
II. Revenue Parameters			
1	Energy tariff	XXUS$/kWH	Based on published tariffs and official studies[SOURCE]
2	Capacity tariff	XXUS$/kW-month	Based on published tariffs and official studies[SOURCE]
4	Foreign exchange rates	XXUS$/local currency	Based on published economic data as the one of the Peruvian Central Bank[SOURCE]
III. Investment & Costs Parameters			
1	Investment schedule	XXUS$/year	Capital expenditure schedule of detailed cost estimates.[SOURCE]
2	Development costs	XXUS$	Capitalized pre-operating costs[SOURCE]
3	Operations & maintenance costs	XXUS$/year	Breakdown per operational function either inclusive or exclusive of employee cost breakdown[SOURCE]
4	Regulatory fees	XXUS$/year	Payments to OSINERGMIN, water payments to COES and other fees to government related entities[SOURCE]
5	Contingency costs	XXUS$/year	Based on internal or 3rd party estimations or comparable company information[SOURCE]
6	Insurance fees	XXUS$/year	Based on internal or 3rd party estimations or comparable company information[SOURCE]
7	Other expenses	XXUS$/year	May include legal fees, inventories and other expenses based on internal or 3rd party estimations or comparable company information[SOURCE]
8	Terminal value computation	US$ or X	Estimated value at end of the estimate[SOURCE]
IV. Tax rate and depreciation			
1	Income Tax	XX%	Established by law[SOURCE]
2	Depreciation Rate	XX% or years	Established by law[SOURCE]
V. Benchmark& Results			
1	Benchmark	12 % (after tax)	Hurdle rate for the investment
2	IRR	XX%	Calculation[NAME OF THE SPREADSHEET]

Comparison of Project IRR to benchmark: The project IRR is compared to the benchmark to examine the financial attractiveness of the project. The project IRR is estimated to be [IRR%] which is lower than the benchmark of 12%discussed above. This low IRR compared to the hurdle rate indicates that the Project is not financially attractive without CDM revenues.

Sub-step 2d –Sensitivity Analysis

The following assumptions are established to examine whether the above conclusions regarding the financial attractiveness of the Project are robust:

Project IRR:A sensitivity analysis has been applied to the IRR to explore at what value of each key parameters, the IRR would reach the benchmark. Four key parameters have been chosen for this exercise; namely, investment costs, load factor, energy tariff and total operating & maintenance costs.

The following table shows the sensitivity analysis of the project to the following factors indicated:

Table 6: Sensitivity Analysis Results

	+10%	-10%	Variation needed to reach the benchmark (%)
Investment costs	XX%	XX%	XXX
Load factor	XX%	XX%	XXX
Energy tariff	XX%	XX%	XXX
Total operating & maintenance costs	XX%	XX%	XXX

EXPLAIN THE IMPOSSIBILITY OF REACHING THE IRR THE BENCHMARK ACCORDING TO:

If the sensitivity analysis shows that the post-tax project IRR of the CPA is lower than the benchmark in all cases then the results of the investment analysis are deemed robust. If the post-tax project IRR exceeds the benchmark under one or more scenarios calculated in the sensitivity analysis, the CPA owners shall provide evidence to demonstrate that such a scenario is unlikely to happen. If such demonstration cannot be substantiated with sufficient evidence the CPA will be considered as non-additional.

Therefore, considering the impossibility of reaching the IRR the benchmark, it can be concluded that the Project is not financially attractive for private investors, and therefore requires the assistance of the CDM revenues.

In conclusion, the sensitivity analysis conducted above confirms that the Project is not financially attractive and its successful implementation requires CDM registration. As a result, the Project is considered additional under Step 2.

Step 3: Barrier analysis

This step is not used to demonstrate the additionality of the CPA.

Step 4: Common practice analysis

Sub-step 4a: Analyze other activities similar to the proposed project activity:

The "*Guidelines on Common Practice*"[10] (EB 63 Version 01.1) and the Tool for the demonstration and assessment of additionality Version 06.6.0 propose four steps to determine if the proposed project activity is a common practice.

Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all}. Registered CDM project activities shall not be included in this step.

Table 7: Step 2 Identification of N_{all}

	GENERATING PLANTS[11]	CAPACITY (MW)[12]	CDM status
1	[PLANT NAMES]		[YES/NO]
2	[PLANT NAMES]		[YES/NO]
...	....	...	

N_{all}= XX

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number N_{diff}.

To identify technologies different that the technology applied in the proposed project activity, it is used the criteria from **"***Guidelines on common practice"*[13](EB 63, Version 01.0). The proposed project of this CPA will consider the following criteria which are:

(a) Size of Installation
(b) Energy source/fuel
(c) Investment climate in the date of the investment decision;

Table 8: Step 3 Identification of N_{diff}

[10] Available at: http://cdm.unfccc.int/filestorage/0/B/2/0B2QIUYM6KSETZO34VA8GLCR9WXP7D/eb63_repan12.pdf?t=SWR8bHV0bzVwfDDzDRZT5rvrGDS76IwHxAZo

[11] COES Annual Statistic [YEAR]

[12] COES Annual Statistic [YEAR]

[13] Available at: http://cdm.unfccc.int/filestorage/0/B/2/0B2QIUYM6KSETZO34VA8GLCR9WXP7D/eb63_repan12.pdf?t=SWR8bHV0bzVwfDDzDRZT5rvrGDS76IwHxAZo

	GENERATING[14] PLANTS	CAPACITY[15] (MW)	SIZE OF INSTALLATION	[16]TECHNOLOGY	ENERGY SOURCE/FUEL	DIFFERENT INVESTMENT CLIMATE	COMMENTS
1	[PLANT NAME]	[CAPACITY]	[SIZE]	[TECHNOLOGY]	[FUEL]	[YES/NO]	[EXPLAIN WHY ITS DIFFERENT]
..	....	....	....	....	....	....	

N_{diff}= XX

Note about the Investment climate in the date of the investment decision

Although the traditional energy source in Peru has been hydropower, the recent and on-going exploitation of the natural gas deposits of Camisea has started a new chapter in the Peruvian energy sector. Natural gas has become the most economic resource for power generation over these years.

The table below shows the new additions to the SEIN since 2004, the year in which the Camisea natural gas project was commissioned:

Table 9: Additions to the SEIN from 2004 to 2010

Enterprise	Power plant	Unit	Type	Effective installed Capacity (MW)	Date of Commissioning	Comments
EDEGEL	Santa Rosa Westinghouse	TG7	Turbo Gas	121.30	01/06/2005	Natural Gas from Camisea
EDEGEL	Santa Rosa UTI 5 & 6	UTI 5, UTI 6	Turbo Gas	109.00	01/06/2006 - 01/08/2006	Natural Gas from Camisea
ENERSUR	Chilca TG1	TG1	Turbo Gas	175.96	01/12/2006	Natural Gas from Camisea
KALLPA GENERACION	Kallpa TG1	TG1	Turbo Gas	184.00	24/07/2007	Natural Gas from Camisea
ENERSUR	Chilca TG2	TG2	Turbo Gas	175.96	07/08/2007	Natural Gas from Camisea
SDF ENERGIA	Oquendo		Turbo Gas	29.38	19/01/2009	Natural Gas from Camisea
KALLPA GENERACION	Kallpa TG2	TG2	Turbo Gas	193.52	19/06/2009	Natural Gas from Camisea
ELECTROPERU	Trujillo Norte		Diesel 2	62.13	28/06/2009	Diesel
ENERSUR	Chilca TG31	TG31	Turbo Gas	194.19	22/07/2009	Natural Gas from Camisea
EDEGEL	Santa Rosa TG8	TG8	Turbo Gas	199.83	01/08/2009	Natural Gas from Camisea
AGRO INDUSTRIAL PARAMONGA	CT Paramonga		Cogeneration	23.00	01/12/2009	Cogeneration Bagase/Diesel

[14] COES Annual Statistic [YEAR]

[15] COES Annual Statistic [YEAR]

[16] COES Annual Statistic [YEAR]

KALLPA GENERACION	Kallpa TG3	TG3	Turbo Gas	233.00	01/02/2010	Natural Gas from Camisea
DUKE ENERGY	CT Las Flores	TG1	Turbo Gas	192.5	01/04/2010	Natural Gas from Camisea
MAJA ENERGIA	C.H. Roncador	U1 & U2	Hydro	3.80	01/04/2010	Hydro
EGASA	CT Pisco	TG1,TG 2	Turbo Gas	73.20	01/08/2010	Natural Gas from Camisea
EGESUR	CT Independencia		Turbo Gas	22.93	01/09/2010	Natural Gas

Therefore, projects developed after 2004 face a different investment climate decision due to cheap availability of natural gas.

Step 4: Calculate factor $F=1-N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.

$F = 1 - (N_{diff}/N_{all})$	$N_{all} - N_{diff}$
X	X

The proposed project activity is a common practice within a sector in the applicable geographical area if the factor F is greater than 0.2 and N_{all}-N_{diff} is greater than 3.

Sub-step 4b. Discuss any similar options that are occurring:

Discuss the following:

If more than 3 similar project activities occur, then it is necessary to demonstrate why the existence of the activities does not contradict the claim that the proposed project activity is financially/economically unattractive.

If the final result is that no comparable activities occur without incentives, the project cannot be considered common practice and, therefore, it is not a business as usual type scenario. And it is clear that, in the absence of the incentive created by the CDM this project would not be the most attractive scenario.

Based on these circumstances, the Project is not common practice, but rather, an exception that would likely not have materialized without CDM revenues. Thus, the Project is additional

B.4.Description of the sources and gases included in the project boundary and proof that the CPA is located within the geographical boundary of the registered PoA.

The spatial extent of the CPA boundary includes the CPA power plant and all power plants connected physically to the Peruvian National Grid (SEIN), which the CDM-CPA power plant is connected to.

The greenhouse gases and emission sources included in or excluded from the CPA boundary are shown in table below.

Table 10: Sources and Gases Included in the Project Boundary

Source		Gas	Included ?	Justification / Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
Project Activity	For hydro power plants, emissions of CH_4 from the reservoir	CO_2	No	Minor emission source
		CH_4	No	CPAs under Inti PoA have not substantialreservoir and therefore CH4 emissions are negligible
		N_2O	No	Minor emission source

The project is located within the boundaries of the Republic of Peru as stated in Section A.4.1.2.

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

As all CPAs to be included in this PoA have a power density higher than 10W/m^2, the parameters GWP_{CH4} and EF_{Res} are not used. However, parameters $\boldsymbol{Cap_{BLand}}$ $\boldsymbol{A_{BL}}$ are necessary to asses in each CPA the fulfilment of the condition to has a power density over 10W/m^2.

The following parameters are to be reported in CDM-CPA-DD form

Data / Parameter:	CAP_{BL}
Data unit:	W
Description:	Installed capacity of the hydro power plant before the implementation of the project activity.
Source of data:	PoA-DD
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied:	For new hydropower plants, this value is zero
Any comment:	-

Data / Parameter:	A_{BL}
Data unit:	m^2
Description:	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero
Source of data:	Project site
Value applied:	XX m^2
Justification of the choice of data or description of measurement methods and procedures actually applied:	Measured from topographical surveys, maps, satellite pictures, etc.
Any comment:	-

Data / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	BM CO_2 emission factor in year *y* (tCO_2/MWh)
Source of data used:	PoA-DD
Value applied:	0.56921 tCO_2/MWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the Tool to Calculate the Emission Factor for an Electricity System (Version 02.2.1), in terms of vintage of data, project participants have chosen option 1: For the first crediting period, the BM emission factor is calculated ex-ante based on the most recent information available on units already built for sample group, m, at the time of PoA-DD submission to the DOE for Validation. This option does not require monitoring of the emission factor during the crediting period.
Any comment:	Fixed for crediting period.

Data / Parameter:	$EG_{m,y}$
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by power plant / unit *m* in year *y*
Source of data used:	PoA-DD
Value applied:	According to the *Tool to Calculate the Emission Factor for an Electricity System* (Version 02.2.1),, in terms of vintage of data, project participants have chosen option 1: For the first crediting period, the BM emission factor is calculated *ex-ante* based on the most recent information available on units already built for sample group *m*, at the time of PoA-DD submission to the DOE for Validation.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Monitoring frequency: BM: For the first crediting period only once *ex-ante*.
Any comment:	MWh

B.5.2. Ex-ante calculation of emission reductions:

Project Emissions

The Project does not lead to any GHG emissions. Hydropower plants without substantial reservoirs are classified as zero emission projects, for which there are no associated emissions in the Project boundary.

The proposed CDM project activity has an installed capacity of [CAPACITY] W, and an hourly regulation reservoir of [AREA]m^2. The resulting power density of the reservoir is[POWER DENSITY]W/m^2([CAPACITY]W/[AREA]m^2). This power density significantly exceeds the 10 W/m^2 minimum thresholds required to consider Project emissions from the reservoir negligible.

Baseline emissions

The baseline emission factor was calculated prior validation in a transparent and conservative manner as a combined margin (CM) consisting of the average of the operating margin (OM) and the build margin (BM), according to the procedures prescribed in the Tool to calculate the emission factor for an electricity system, Version 02.2.1.

Since the Project itself does not lead to any GHG emissions and no leakage[17] was factored into the calculation of estimated ERs, the baseline emissions were estimated to be equal to the Project ERs.

Combined Margin Calculation

Step 1: Identify the relevant electricity systems

The Project will supply electricity to the SEIN connected through a [TENSION] kV, [KILOMETERS] km transmission line to the [NAME OF THE SUBSTATION] substation.

Electricity imports from other grids have been XXXX MWh. For the purpose of determining the OM emission factor, the assumed emission factor for net electricity imports is 0.

Electricity exports from other grids have reported by the SEIN dispatch center; therefore, exports should not be subtracted from electricity generation data used in calculating and monitoring the electricity emission factors.

Electricity exports to other grid has been reported in year [YEAR] by the dispatch center. The amount has been [ENERGY]GWh and was exported to XXXX

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

Project participants may choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included in the calculation..

[17] Since the energy generating equipment is new and is not replacing any existing facility, the Project does not produce leakage.

[24]Source COES, Annual Statistics 2010. Page 73

Since project participants considered only grid power plants for the calculation of the operating margin and build margin emission factor, Option one is selected.

Step 3: Select a method to determine the operating margin (OM)

Out of the four options for the OM, the Dispatch Data Analysis OM (OM-DD) was selected. The Simple OM method cannot be used since low cost, must-run resources constitute more than 50% of total grid generation in Peru. Also, it was not necessary to use either the Simple Adjusted OM approach or the Average OM approach because detailed dispatch data is available.

Step 4: Calculate the operating margin emission factor according to the selected method

For this calculation, the hourly generation in [YEAR]was used, which was the most recent data available. At the time the Project's Baseline Study was completed, the hourly generation data did not yet exist for one entire year. Therefore, it was assumed that the Project operated at [LOAD FACTOR]% of its maximum capacity ([CAPACITY] MW), during all hours of the year. Considering this assumption, the variables were defined as follows:

- $EG_{PJ,y}$: Total electricity displaced by the project activity in year y (MWh) It was estimated at [CAPACITY]MWh in year [YEAR].
- $EG_{PJ,h}$: Electricity displaced by the project activity in hour h of year y (MWh). It was assumed the Project generated at [LOAD FACTOR]% of its full maximum installed capacity of [CAPACITY]MW in each hour.

The following chart shows the $EF_{EL,m,y}$ of all thermal units in the SEIN. Each emission factor has been calculated as per the guidance for the simple OM, using option A2.

Table 11: $EF_{EL,n,y}$ of all thermal units in the SEIN

Thermal Plants (1)	Thermal Plants (2)	Technology (3)	Fuel (3)	ηm,y Real NECs (4)	$EFCO_2KgCO_2/Tj$ (5)	CO_2 Emissions Factor (tCO_2/MWh)
[PLANT NAME]	[PLANT NAME]					

(1) Source: COES. Annual Statisctic [YEAR]. Chart No [NUMBER].

(2) Source: COES. Hourly Dispatch [YEAR]. Webpage www.coes.org.pe

(3) Source: COES. Annual Statisctic [YEAR].Chart No [NUMBER]. Technology

(4) Source: COES. Annual Statisctic [YEAR].Chart No [NUMBER]. Net Efficient %

(5) See table bellow

Type of Fuel	D2	Residual	Natural Gas	Coal
EFco2 (Kg/Tj)	72,600	75,500	54,300	87,300

Source: IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories

Information on the hourly generation of all plants in the SEIN[18]and their associated emission factors was entered using Excel software and organized in columns where the position of the columns was determined by the grid dispatch merit order[19]. This process enabled identification of the plants that fall within the top x% of grid dispatch each hour of the year. In the *ex-ante* calculations, the quantity of electricity displaced by the project activity during hour, *h,* divided by the total electricity generation in the grid during that hour, *h* is smaller than 10%; therefore, 10% is used to determine the plants that fall within the top x % of grid dispatch each hour of the year.

The resulting DDA-OM emission factor was calculated as follows:

$$EF_{grid,OM\text{-}DD,y} = \sum_h EG_{PJ,h} * EF_{EL,DD,h} / EG_{PJ,y} = XX / XX = [\ TONNES]\ tCO_2/MWh$$

Step 5: Calculate the built margin (BM) emission factor

In terms of vintage of data, project participants have chosen Option 1. For the first crediting period, calculate the build margin emission factor prior to validation based on the most recent information available on units already built for sample group m at the time of PoA-DD submission to the DOE for validation. Any additions to installed capacity in the SEIN were identified and considered. The table below shows the capacity additions to the SEIN and their annual generation. The annual generation of the additions included in this table for prior validation calculations is from 2010, which is the latest year information was publicly available.

Capacity additions from retrofits of power plants should not be included in the calculation of the build margin emission factor.

Table 12: Capacity Additions in the SEIN (2006-2010)

Plant	Date	Technology	Installed Capacity Added (MW)	2010 Gen (MWh) of the new addition
CT INDEPENDENCIA	sep-10	Diesel Generator/Natural Gas	22.93	5,270
CT PISCO (TG1,TG2)	aug-10	Gas Turbine Natural Gas	73.20	13,800
C.H. Roncador	apr-10	Hydro	3.80	7,650
CT LAS FLORES	apr-10	Gas Turbine Natural Gas	192.50	13,080
KALLPA (TG3)	feb-10	Gas Turbine Natural Gas	233.00	1,078,300
CT PARAMONGA	dec-09	Cogeneration Bagase/Diesel	23.00	77,480
SANTA ROSA TG8	aug-09	Gas Turbine Natural Gas	193.18	763,860
CHILCA 1 (TG3)	jul-09	Gas Turbine Natural Gas	199.80	930,460
KALLPA (TG2)	jun-09	Gas Turbine Natural Gas	216.00	1,252,340
EMERG_NORTE (EMERG)	jun-09	Diesel 2	64.00	120,970
CT OQUENDO	jan-09	Gas Turbine Natural Gas	31.00	203,600
CHILCA 1 (TG2)	jul-07	Gas Turbine Natural Gas	180.00	406,190
KALLPA (TG1)	jul-07	Gas Turbine Natural Gas	180.00	880,430
CHILCA 1 (TG1)	dec-06	Gas Turbine Natural Gas	174.28	1,092,950
VENTANILLA (TG3, TG4, TV)	oct-06	Combined Cycle	457.00	3,214,640
SANTA ROSA (UTI5,6)	aug-06	Gas Turbine Natural Gas	109.80	56,560

[18] Data provided by COES, the dispatch center.
[19] This was done by the merit orders assigned to each unit of the SEIN, as published by COES in its annual statistics.

In Table below, it can be seen that the 5 most recently built($SET_{5\text{-units}}$) plants up to year 2010 were the thermal plants of: (1) CT Independencia, (2) CT Pisco, (3) C.H. Roncador (4), CT Las Flores (5) CT Kallpa; with their total annual generation being 1,118,100 MWh ($AEG_{SET\text{-}5\text{-}units}$).

On the other hand, the total annual generation of the most recently built plants ($SET_{\geq 20\%}$)accounting for 20 % of the grid was higher 6,846,380 MWh($AEG_{SET\geq 20\%}$),therefore, the most recently built plants accounting for 20 % of the grid was selected for the BM calculation.

Table 13:Selection of SET_{sample} power plants

Year	Plant Name	Plant Type	Most recent year generation, 2010 (MWh)	Filter most recent 20%	AEGSET-≥20%, (MWh)	Filter 5 most recent units	AEGSET-5-units MWh
sep-10	CT INDEPENDENCIA	Diesel Generator/Natural Gas	5,270	1	5,270	1	5,270
aug-10	CT PISCO (TG1,TG2)	Gas Turbine Natural Gas	13,800	1	13,800	1	13,800
apr-10	C.H. Roncador	Hydro	7,650	1	7,650	1	7,650
apr-10	CT LAS FLORES	Gas Turbine Natural Gas	13,080	1	13,080	1	13,080
feb-10	KALLPA (TG3)	Gas Turbine Natural Gas	1,078,300	1	1,078,300	1	1,078,300
dec-09	CT PARAMONGA	Cogeneration Bagase/Diesel	77,480	1	77,480		
aug-09	SANTA ROSA TG8	Gas Turbine Natural Gas	763,860	1	763,860		
jul-09	CHILCA 1 (TG3)	Gas Turbine Natural Gas	930,460	1	930,460		
jun-09	KALLPA (TG2)	Gas Turbine Natural Gas	1,252,340	1	1,252,340		
jun-09	EMERG_NORTE (EMERG)	Diesel 2	120,970	1	120,970		
jan-09	CT OQUENDO	Gas Turbine Natural Gas	203,600	1	203,600		
jul-07	CHILCA 1 (TG2)	Gas Turbine Natural Gas	406,190	1	406,190		
jul-07	KALLPA (TG1)	Gas Turbine Natural Gas	880,430	1	880,430		
dec-06	CHILCA 1 (TG1)	Gas Turbine Natural Gas	1,092,950	1	1,092,950		
oct-06	VENTANILLA (TG3, TG4, T	Combined Cycle	3,214,640		-		
aug-06	SANTA ROSA (UTI5,6)	Gas Turbine Natural Gas	56,560		-		
Total			10,117,580	14	6,846,380	5	1,118,100
					21.73%		
				AEGtotal=	31,510,890		
				AEGSET-≥20%, n	6,302,178		

AEGSET-≥20%, MWh		AEGSET-5-units MWh
6,846,380	>	1,118,100

In Table below, the selected sample of most recently built plants was organized by their annual electricity generation output, their weights with respect to the total generation of the selected sample, and their emission factors. By multiplying the emission factor per plant with its assigned weight and then summing up the results, the weighted average of the selected sample was obtained. The resulting **BM**equals**0.56921 tCO_2/MWh** for the year 2010.

Table 14: BM Calculation

Plant Name	Most Recent Year Gen (MWh)	CO2 emission Factor tCO_2/MWh
CT INDEPENDENCIA	5,270	0.50123
CT PISCO (TG1,TG2)	13,800	0.72400
C.H. Roncador	7,650	0.00000
CT LAS FLORES	13,080	0.57494
KALLPA (TG3)	1,078,300	0.57494
CT PARAMONGA	77,480	0.00000
SANTA ROSA TG8	763,860	0.55851
CHILCA 1 (TG3)	930,460	0.59236
KALLPA (TG2)	1,252,340	0.57494
EMERG_NORTE (EMERG)	120,970	0.68779
CT OQUENDO	203,600	0.57494
CHILCA 1 (TG2)	406,190	0.55851
KALLPA (TG1)	880,430	0.59236
CHILCA 1 (TG1)	1,092,950	0.55851
Total	**6,846,380**	
$EF_{grid,BM,y}$	**0.56921**	**tCO_2//MWh**

Step 6: Calculate the combined margin (CM) emissions factor

The Baseline Emission Factor was calculated as a CM, which is the simple average[20] of the OM and the BM. All margins are expressed in tCO_2/MWh.

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times 0.5 + EF_{grid,BM,y} \times 0.5$$

$$EF_{grid,CM,y} = [\text{NUMBER}]\ tCO_2/MWh$$

The resulting Baseline Emission Factor is [FACTOR] tCO_2/MWh.

Calculation of the Project's Emission Reductions Prior to Validation

The estimated annual ERs for the Project were calculated as follows:

$ERy = BEy - PEy$

Where:

ER_y = Emission reductions in year *y* (t CO_2/yr)
BE_y = Baseline emissions in year *y* (t CO_2/yr)
PE_y = Project emissions in year *y* (t CO_2/yr)

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$$

BEy = [ENERGY]MWh * [FACTOR]tCO_2/MWh = [TONNES]tCO_2

[20] The default weights of 50%-50% were kept....

PEy = Zero

Estimated Emission Reductions:

ERy = BEy – PEy = [TONNES]tCO_2 – 0 = [TONNES]tCO_2

B.5.3. Summary of the ex-ante estimation of emission reductions:

Year	Estimation of project activity emissions (tonnes of CO_2 e)	Estimation of baseline emissions(tonnes of CO_2 e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of overall emission reductions (tonnes of CO_2 e)
Year 1	0	[TONNES]	0	[TONNES]
Year 2	0	[TONNES]	0	[TONNES]
Year 3	0	[TONNES]	0	[TONNES]
Year 4	0	[TONNES]	0	[TONNES]
Year 5	0	[TONNES]	0	[TONNES]
Year 6	0	[TONNES]	0	[TONNES]
Year 7	0	[TONNES]	0	[TONNES]
Total (tonnes of CO_2 e)	0	[TONNES]	0	[TONNES]

B.6. Application of the monitoring methodology and description of the monitoring plan:

B.6.1. Description of the monitoring plan:

ELSAC will provide to all the CPAs with a Monitoring Plan and pre-programmed spreadsheets such that the [NAME OF THE COMPANY]will only need to collect the information as described and apply the formulas as instructed in the Monitoring Plan. COES, the dispatch center, will be the only data provider for the annual *ex-post* calculation of the Project's ERs. The designated project staff will confirm these data with their own records, which they will cross check with sales receipts or COES sell records. Further details of the MP are available in Annex 4.

SECTION C. Environmental analysis

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

☐ Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form.

Environmental Analysis is done at CPA level. Due to the highly localized and site-specific environmental impacts of each hydropower project particularly, the geographical location, capacity and construction plan among others, each CPA will have a separate environmental assessment. The environmental analysis for each CPA will be conducted in line with applicable environmental policies that will be identified at the time of the inclusion of each CPA.

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

Due to the magnitude and technology of the project activity, the impacts are considered not significant. In spite of this, an Environmental Impact Report was undertaken voluntarily by the Project Developer as part of its commitment to the sustainable development of the area, and in order to establish an Environmental Management Plan (EMP) to mitigate any potential negative impacts from the Project.

(Note: modify this section in case the project conditions are different or if there is important information that shall be mentioned)

C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA),:

The updated Electricity Concessions Law 25844 state that for the development of hydropower plants of over 500kW a concession is needed but, generation from renewable sources of up to 20MW do not require the presentation of an Environmental Impact Assessment.

(Note: modify this section in case the project conditions are different or if there is important information that shall be mentioned)

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

☐ Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form.

The local stakeholder consultations report shall describe the process by which comments by local stakeholders have been invited and compiled. An invitation for comments by local stakeholders shall be

made in an open and transparent manner, in a way that facilities comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted. In this regard, project participants shall describe a project activity in a manner, which allows the local stakeholders to understand the project activity. The local stakeholder consultations report should include the identification of the stakeholder and a summary of the comments received. Finally, it is necessary to report how due account have been taken of comments received. The report has to include the minutes of the meetings with stakeholders as well as the agreements established.

Inti PoA has established the each CPA have to provide at least 5% of the CER revenues for social investment project to local communities.

D.2.	**Brief description how comments by local stakeholders have been invited and compiled:**

>>

D.3.	**Summary of the comments received:**

>>

D.4.	**Report on how due account was taken of any comments received:**

>>

Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE CPA

Organization:	
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postfix/ZIP:	
Country:	
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The Project has not received any type of public funding or public financial help.

Annex 3

BASELINE INFORMATION

Table A3-1 below shows EF_{EL}s calculations with actual [YEAR] NECs ($\eta_{m,y}$ Average net energy conversion efficiency of power unit ,m in year, y) from the *Annual Statistics* published by COES. In the monitoring, EF_{EL}s should be updated using the latest *Annual Statistics*.

Table A3-1: EF_{EL} calculations [YEAR]

Thermal Plants (1)	Thermal Plants (2)	Technology (3)	Fuel (3)	ηm,y Real NECs (4)	$EFCO_2tCO_2$/Gj (5)	CO_2 Emissions Factor (tCO_2/MWh)
[PLANT NAME]	[PLANT NAME]					

(1) Source: COES. Annual Statistics [YEAR]
(2) Source: COES. Hourly Dispatch [YEAR]. Webpage www.coes.org.pe
(3) Source: COES. Annual Statistics [YEAR].Technology
(4) Source: COES. Annual Statistics [YEAR]Net Efficient %

(5) See table 2 below

Type of Fuel	D2	Residual	Natural Gas	Coal
EFco2 (Kg/Tj)				

Source: IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories

Table A3-1 above has the emission factor formulas inserted in it. Actual NECs(Average net energy conversion efficiency of power unit m in year y = $\eta_{m,y}$), as well as data on technology and fuel were obtained from COES. All this data was publicly available at the COES website in its annual statistics. The specific information source is the chart entitled "Costos Variables de las Centrales Termoeléctricas del SINAC", which appeared in the COES Annual Statistics (*Estadística Anual de Operaciones*) for the year [YEAR] as chart number [NUMBER].

Justification of the usage of COES information system data for baseline calculation:

In the baseline calculation, data that is not registered by COES has been disregarded and only COES data is considered to be the best approximation of total SEIN data, for both generation and installed capacity additions. Moreover, COES data is deemed to allow for good monitoring practices because:

1. There is no better quality data of the SEIN production than what is collected by COES. The information of plants connected to the SEIN but not registered in COES regarding generation and

installed capacity additions is provided by the plants' management periodically to the MINEM. However, this data does not pass through a verification or validation process, nor is it required to comply with technical standards as rigorously as COES requires from their power plant members;

2. The limitation of MINEM's final annual reports and data availability, such as the lack of hourly dispatch data, would not allow for good monitoring practice;

3. The generation of these other plants connected to the SEIN but not registered by COES, is irrelevant as it comprised only X% of total SEIN electricity generation in year xxxx, as Table A-3 below shows.

Table A3-2: Generation in SEIN and COES

	SEIN (GWh)	COES (GWh)	COES/SEIN	Not recorded by COES
…….	……..	……	……..	……..
2010	33,326	32,427	0.97	0.03
2009	30,493	29,807	0.98	0.02
2008	30,104	29 559	0.98	0.02
2007	27,806	27,255	0.98	0.02
2006	25,251	24,762	0.98	0.02
2005	23,434	23,001	0.98	0.02
2004	22,288	21,903	0.98	0.02
2003	20,999	20,689	0.99	0.01
2002	20,018	19,658	0.98	0.02
2001	18,755	18,463	0.98	0.02

Source: *Anuario Estadístico MINEM,* 2001 – 20xx*and Estadística de Operaciones,* COES, 2001 – 20xx.

Annex 4

MONITORING INFORMATION
TABLE OF CONTENTS

I. Background Information

The baseline methodology and monitoring methodology for the Project are in accordance with the approved consolidated baseline methodology (ACM0002. Version 12.2.0): "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"(The Baseline Methodology).

II. Purpose of the Monitoring Plan

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. This report presents the Monitoring Plan (MP) for the Project. 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.

III. Use of the Monitoring Plan by the Project Operator

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 in the monitoring period. Adherence to the instructions in the MP is necessary for the Project Operator to successfully measure and track the impact of the Project, and to prepare all data required for the periodic audit and verification process that must be undertaken to confirm the attainment of the corresponding ERs.

IV. Organizational, Operational and Monitoring Obligations

A. Obligations of the Operator

Monitoring performance of the Project requires the fulfilment of operational data collection and processing obligations by the project operator (the Operator) throughout the crediting period of the Project. The Operator is obligated to ensure that sufficient and accurate information is available to calculate ERs in a transparent manner, and that adequate information is collected and maintained to facilitate successful verification of accounted ERs.

Key responsibilities: The steering committee will approve the monitoring reports. ERCP Management will be in charge of emission reduction calculation and will report to the steering committee. This organizational structure for this activity is included in the monitoring plan in the "Emissions Reductions Calculation Procedure (ERCP) Organizational Structure".

Training of monitoring personnel: The team established in the ERCP Organizational structure, and composed of the MP Steering Committee and the ERCP Management, will be trained by ELSAC in one day workshop on a comprehensive set of tools and knowledge required to implement the monitoring plan. The training on the MP and associated responsibilities will build the capability of the MP Steering Committee and the ERCP Management to replicate, on an *ex-post* basis, an equivalent process that has been demonstrated in this PoA-DD for an *ex-ante* emissions avoidance calculation as if the plant were in operation in [YEAR]. All relevant personnel will be trained by ELSAC in a one day workshop on a comprehensive set of tools and knowledge required to implement the monitoring plan, including: (a) accurate monitoring of the performance and output characteristics of the plant to record and keep accurate data; (b) collection and integration of utility data for the

current year; (c) incorporation of these data sets into spread sheets pre-prepared by ELSAC, and (d) consistently calculating verifiable CERs as a function of measured plant output against a current-year emission factor that serves as a recognized proxy for emissions displaced from the grid.

Equipment Required: Adequate computer services and file storage are required, and maintenance of computers and data contained therein are described under the following section. Adequate metering and logging equipment will be procured for measuring electricity generation by the plant, and net levels of electricity dispatched for sale to the grid. The electric Meter will be implemented according to the dispatch center (COES) requisites[21] which includes that the meter should be at least Class 0.2 compliant metering accuracy. Procedures for maintenance and installation of equipment, as well as calibration, will be performed according to manufacturer specifications of equipment. The periodic calibration would be performed at least every 3 years. All measurements, data gathering, record keeping, and procedures for dealing with possible monitoring data adjustments will be performed in specific consideration of the data gathering requirements of the MP and as determined as adequate for meeting the baseline and monitoring requirements described in baseline methodology ACM0002 Version 12.2.0 and the Tool to Calculate the Emission Factor for an Electricity System (Version 02.2.1).

In addition, the dispatch center, COES, occasionally performs a similar quality control check. The accuracy of the electricity meters is a demand not only from COES but also from final customers in regard to their energy purchase contracts.

Data Collection and Integration: It is required that the Operator calculate the Project's ERs based on most recent available information, following the ERCP presented in this report. The Operator must gather and process information needed to monitor ERs. All data required for calculating the emission margin will come from the COES information system and the operator. Electricity production by the plant and any internal usage will be metered continuously to account for the net level of electricity sold to the grid, which itself will contain a record of the plant output, along with all other plants in the SEIN.

Data gathering and processing should be done by the Operator, as follows:

Table A4-1: Data Collection

COES (Data Provider)	Report hourly generation of plants in the SEIN (measurement: 15'), available monthly. Report dispatch merit orders. As the project will be an active member of COES all data will come from COES. Use real NECs per power plant in the SEIN. Available once a year in the Annual Statistic of COES. This information will be monitored once for the crediting period.

[21] Technical Procedure of the Committee of Economic Operation of SINAC PR – 20 – Verification of Compliance with requirements for being a member of COES SINAC. Page 20.
http://www.coes.org.pe/coes/Procedimientos/procedimiento_n20.pdf

Operator (Data processor)	Substantiate all ER claims with COES report data and /or final clients. Fill in monthly data in all required spreadsheets, following the ERCP Report hourly net generation of *"[PLANT NAME] hydropower plant –Inti PoA CPA#[NUMBER OF CPA]"* in the SEIN (measurement: 15') and/or final clients, available monthly.

Procedures for review of reported results data and internal audits: quality control is established in the ERCP to ensure monitoring accuracy. Such procedures will include, but will not be limited to, the following:

- spreadsheets will be reviewed during yearly consolidation of monthly calculations;
- corrective actions will be taken in the case of malfunction or breakdowns, or simply for more accurate monitoring and reporting;
- an internal audit will be performed by the ERCP Steering Committee each monitoring period to see if the MP has been performed according the guidelines established in the PoA-DD; and,

Independent verification of monitoring results and achievement of the ERs as calculated in the PoA-DD is a critical outcome for all CDM projects. The ERCP Management should work closely with the DOE to assure a dependable and transparent outcome; and to that end, they will follow the procedures below for project performance reviews and corrective actions:

- keep efficient contact with the DOE who verifies the Project's ERs;
- provide all necessary monitoring information about the ERs to facilitate the verification work;
- during the crediting period, always take into account requests by the CDM Executive Board and conduct preparatory work for the Verification to obtain high quality results and efficiency;
- ensure review of the monitoring report by the ERCP Steering Committee before verification;
- cooperate to answer all questions raised by DOE during the Verification process; and,
- archive all data for a period of 2 years from the end of the crediting period.

Upon detecting a problem or being informed of a discrepancy, ERCP Management will take immediate action to rectify it. Should COES fail to provide adequate information; the ERCP Steering Committee will file a claim with COES to obtain the information.[22] If a major investment is required, the ERCP Management will notify the ERCP Steering Committee to ask the management of [COMPANY OWNER OF THE CPA-DD]to invest in the monitoring personnel or/and equipment.

Data and parameters to be monitored

Data / Parameter:	$EG_{facility,y}(EG_{pj,y})$
Data unit:	MWh/yr

[22] As a member of COES, the Project Developer has the right to seek get information from COES.

Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data to be used:	Directly measured by electricity meter(s) at the site(s) of each CPA
Value of data applied for the purpose of calculating expected emission reductions in section B.5.2	This value is calculated at CPA level.
Description of measurement methods and procedures to be applied:	Electricity supplied by the project activity to the grid will be measured using an electric meter at a switchyard near the powerhouse. The electricity supplied will be recorded continuously at least every hour. Net electricity supplied is computed by subtracting the electricity used by the CPA from the electricity it supplies to the SEIN
QA/QC procedures to be applied:	The meter readings will be crosschecked with sales records/electricity invoices to the grid or the final client. Meters will be calibrated according to national standards. The calibration period will be less or equal to three years.
Any comment:	The hourly measurement will be processed into reports monthly. Data will be kept the CPA owner for 2 years after the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2/MWh
Description:	Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the "Tool to calculate the emission factor for an electricity system" Version 02.2.1.
Source of data to be used:	Official data provided by Committee for Economic Operation of the System ("COES"), the administrator of the grid. Calculated according to the"Tool to calculate the emission factor for an electricity system" Version 02.2.1.
Value of data applied for the purpose of calculating expected emission reductions in section B.5.2	This value is calculated at CPA level.
Description of measurement methods and procedures to be applied:	The baseline emission factor is calculated as combined margin emissions factor consisting of the build margin ($EF_{grid,BM,y}$), the operating margin ($EF_{grid,OM,y}$) and their respective weights depending on the crediting period. The computations follow the last "Tool to calculate the emission factor for an electricity system"Version 02.2.1..
QA/QC procedures to be applied:	A DOE will validate the computation of baseline emission factors for the application and in the succeeding crediting periods. It will be calculated using data monitored by COES.
Any comment:	This is monitored every monitored period

Data / Parameter:	$\eta_{m,y}$
Data unit:	-

Description:	Average net energy conversion efficiency of power unit *m* in year *y*
Source of data to be used:	Data from the dispatch center, COES Annual statistics http://www.coes.org.pe
Value of data applied for the purpose of calculating expected emission reductions in section B.5.2	Net Energy Conversion Efficiencies (NEC) for all thermal plants are available in the annual statistics of COES. For the ex-ante calculation, the latest publicly available information is used, which is the COES annual statistics of [YEAR].
Description of measurement methods and procedures to be applied:	In the first monitoring report, the latest publicly available annual report of COES will be used. This information will be monitored once during the crediting period.
QA/QC procedures to be applied:	The data from COES is reliable since efficiency is calculated according to the COES procedure Number 17 for the determination of effective power and efficiency of thermal power plants. (http://www.coes.org.pe/coes/Procedimientos/procedimiento_n17.pdf). This procedure established that the efficiency of the plants have to be calculated according to international standards. For diesel engines ISO-3046-1 or its updated versions, for gas turbines: section 8 of ISO 2314: 1989 or its updated versions, for steam turbines: DIN1943, Sections 6 a 8, February 1975, or its updated version, etc. These calculations and measurements will be performed with COES accredited consultants and the results reviewed and supervised by COES experts
Any comment:	-

Data / Parameter:	$EG_{n,h}$
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by power plant / unit *n* in hour *h*
Source of data to be used:	COES
Value of data applied for the purpose of calculating expected emission reductions in section B.5.2	Information is available to the DOE in Excel spreadsheets based on information provided by COES. COES data from [YEAR]. http://www.coes.org.pe
Description of measurement methods and procedures to be applied:	Directly measured based on the information provided by COES. This data will be measured every 15 minutes and recorded hourly. The proportion of data to be monitored is 100% and the data will be archived electronically.
QA/QC procedures to be applied:	-
Any comment:	○ Monitoring frequency: Hourly

Data / Parameter:	$EG_{PJ,h}$

Data unit:	MWh
Description:	Electricity displaced by the project activity in hour h
Source of data to be used:	COES http://www.coes.org.pe
Value of data applied for the purpose of calculating expected emission reductions in section B.5.2	Data is presented in the accompanying spreadsheet for the Grid Emission Factor calculation of each CPA
Description of measurement methods and procedures to be applied:	Directly measured based on the information provided by COES. This data will be measured every 15 minutes and recorded hourly. The proportion of data to be monitored is 100% and the data will be archived electronically.
QA/QC procedures to be applied:	Sales records to the SEIN or to the final client, as well as other records are used to ensure consistency of electricity supplied by the project activity to the grid. The electric Meter will be implemented according to the dispatch center (COES) requisites[23],which includes that the meter should be at least Class 0.2 compliant metering accuracy. The metering system will be calibrated according to the manufacturer specifications and at least every 3 years.
Any comment:	-

Data / Parameter:	**Merit Order**
Data unit:	Text
Description:	The merit order in which power plants are dispatched by documented evidence
Source of data to be used:	COES http://www.coes.org.pe
Value of data applied for the purpose of calculating expected emission reductions in section B.5.2	Information is available to the DOE in Excel spreadsheets of each CPA based on information provided by COES.
Description of measurement methods and procedures to be applied:	The merit order is publicly available in the annual statistics of COES. For each year, it displays the variable cost of thermal plants from the SEIN in effect at December. The proportion of data to be monitored is 100% of all plants in the merit order. The data will be archived electronically and in paper for original documents. The merit order will be based on most recent available information in each monitoring period.
QA/QC procedures to be applied:	-
Any comment:	The plants should be stacked in the dispatch data analysis.

[23]Technical Procedure of the Comitte of Economic Operation of SINA PR – 20 Verification of Compliance with Requirements for being a member of COES SINAC. Page 20. http://www.coes.org.pe/coes/Procedimientos/procedimiento_n20.pdf

Data / Parameter:	**Cap $_{PJ}$**
Data unit:	W
Description:	Installed capacity of the hydropower plant after the implementation of the project activity.
Source of data to be used:	Project site.
Value of data applied for the purpose of calculating expected emission reductions in section B.5.2	To be determined in each CPA
Description of measurement methods and procedures to be applied:	As indicated on the manufacturer´s name plate, or determine the installed capacity based on recognized standards or official data.. The monitoring frequency would be yearly.
QA/QC procedures to be applied:	-
Any comment:	-

Data / Parameter:	**A_{pi}**
Data unit:	m^2
Description:	Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full
Source of data used:	Project sponsor
Value of data applied for the purpose of calculating expected emission reductions in section B.5.2	To be determined in each CPA
Description of measurement methods and procedures to be applied:	Measured from topographical surveys, maps, satellite pictures, etc
QA/QC procedures to be applied:	Monitoring frequency: yearly
Any comment:	-

Data / Parameter:	**$EF_{CO2,i,y}$ and $EF_{CO2,m,i,y}$**
Data unit:	tCO_2/GJ
Description:	CO_2 emission factor of fossil fuel type *i* used in power unit *m*in year *y*
Source of data used:	The following data sources may be used if the relevant conditions apply:

Data source	Conditions for using the data source
Values provided by the fuel supplier of the power plants in invoices	If data is collected from power plant operators (e.g. utilities)
Regional or national average default Values	If values are reliable and documented in regional or national energy statistics / energy balances

	IPCC default values at the lower limit of the uncertainty at a 95%confidence interval as provided in table 1.4 of Chapter1 of Vol. 2(Energy) of the 2006 IPCC Guidelines on National GHG Inventories	
Value of data applied for the purpose of calculating expected emission reductions in section B.5.2	IPCC default values: Diesel Oil = 72,600 Residual Fuel Oil = 75,500 Natural Gas = 54,300 Coal = 87,300	
Description of measurement methods and procedures to be applied:	Dispatch data OM: Annually for the year *y* in which the project activity is displacing grid electricity or, if available, hourly. Further guidance can be found in Step 3 of the Tool to calculate the emission factor for an electricity system Version 02.2.1; BM: For the first crediting period, *only once ex –ante* following the guidance included in Step 5 of the Tool to calculate the emission factor for an electricity system Version 02.2.1. For the second and third crediting period, only once *ex ante* at the start of the second crediting period	
QA/QC procedures to be applied:	-	
Any comment:	-	

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 keep the ERCP as a reference manual. The ERCP should contain: (i) data gathered from COES, and (ii) data processed by the operator. All data processing should be done in Excel. The ERCP is designed for monthly calculation, based on final monthly COES 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 is only 1 required spreadsheet to update with new data: [NAME OF THE FILE]. The names of this file should be kept but should also reflect the date for which the latest adjustment is made.

DDA-OM and BM Spreadsheet:

This Excel file contains all data and formulas necessary to calculate the Combined Emission Factor for the monitoring period. .

18worksheets compose the DDA-OM and BM Spreadsheet:

- Worksheet #0: EF_{EL}s (tCO_2/MWh) calculation for each plant in the SEIN. The EF_{EL}s will be calculated *ex- post* along the monitoring period, according to the information published by COES each year.

  It contains pre-established formulas to calculate the emission factors. Data of technology and fuel has to be updated each year. New thermal plants have to be included in the year they appear. All

these variables should be updated yearly according to the information in the Annual Statistics publicly available on the COES website, therefore, the emission factors of each year depends on the latest Annual Statistics published on the COES website.

- Worksheet #1: EF_{EL}s (tCO_2/MWh) to assign to each plant in the SEIN, according to the EF_{EL}s established in Worksheet #0. It holds up to 100 plants, of which 34 are hydropower plants and 66 are thermal plants. Data on future plants should be filled as the arrows in the table indicate, as they enter to the SEIN. Plants 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.
- Worksheet #2: Grid dispatch merit order for all thermal plants in the SEIN. Merit order is public available in the annual statistics of COES
- Worksheet #3 to Worksheet #14: One worksheet per month in the monitoring period. These worksheets contain the hourly generation of the plants in the SEIN. The number of worksheet will depend on the number of months in the monitoring period.

  Columns C to CY should be organized as follows:

COEFs:	0.00	0.00	0.00	0.00	0.00	0.56	0.67 ……..	Unknown	Unknown
TECHNOLOGY:	Hydro	Hydro	Hydro	Hydro	Hydro	Gas Turbine Natural Gas	Gas Turbine Natural Gas ……..	Unknown	Unknown
Hours of the month	HP1……..	……..HP6	CH Yuncan	……..	Cañon del Pato	TG1 CHILCA	AGUAYTIA 2 (2) ……..	TP56……..	……..TP70
1									
	Future HPs		Existing HPs						
	←						→		
	There is an unchangeable pre-defined order for exisiting and future HPs - for all the crediting period					Existing TPs should be placed according to grid dispatch merit order as well as future TPs			
744									

Hourly generation of hydropower plants (both existing and future) should occupy columns D to AK only. Hourly generation of thermal plants (both existing and future) should occupy columns AL to CY only.

The plants should be sorted according to their merit order in the grid dispatch. Plants with higher dispatch merit order will be ordered from right to left.

The associated EF_{EL}s of SEIN plants should be entered in the first row of the corresponding plant's column. For future plants $EF_{EL} = 0$.

To calculate the ex ante BM:

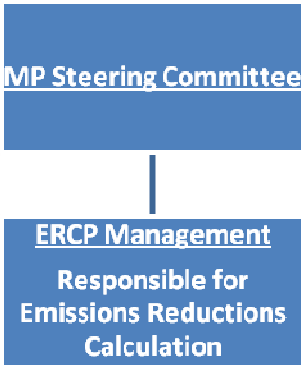
- Worksheet #15: Additions to the SEIN according to COES, fixed in the first monitoring period.
- Worksheet #16: The BM calculation ex ante. Fixed in the first monitoring period.
- Worksheet #17: It shows the Baseline Emission Factor and ERs calculated in the monitoring period of the Project's generation.

V. Annexes

The ERCP Organizational Structure and Quality Assurance and Control Procedure

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

ERCP Organizational Structure



Monitoring Plan –Emissions Reductions Calculation Procedure

ERCP Quality Control

Operating Margin Calculation

Steering Committee

- Cross-checking
- Corrective actions
- Check calibration of electricity meters

ERCP Management	**Data**	1. The Project hourly generation data 2. SEIN units hourly generation data 3. COES public merit order 4. Real NECs
ERCP Management	**Quality of Data Collection**	✓Which data comes? All of the above ✓By what means does it come? By E-mail/CD/Webpage ✓How does it come? In Excel ✓How frequently does it come? Monthly (1 and 2), yearly (3) and Once in the crediting period (4) ✓From whom does it come? From COES ✓To whom does it come? ERCP Manager.
ERCP Management	**Quality of data Processing**	✓ Original Data ✓ Organized Data ✓ Entered Data ✓ Processed Data ✓ Result ✓ Monthly calculation ✓ Follow ERCP ✓ Monitoring Period consolidation
Steering Committee	**Quality of Data Storage**	✓ Keep all data for 2 years after the first crediting period. ✓ Save the document with the last date in which an alteration was made.
Steering Committee	**Quality of data Delivery**	✓Provide to the verifier e-mails/cd/web page trough which the data provider (COES delivered the original data ✓Provide to the verifier report from COES or clients. ✓Provide to the verifier all calculations made.