CLEAN DEVELOPMENT MECHANISM
PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM-PoA-DD) Version 01

CONTENTS

Annexes

NOTE:

This form is for the submission of a CDM PoA whose CPAs apply a large scale approved methodology.

At the time of requesting registration this form 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).

SECTION A. General description of programme of activities (PoA)

A.1 Title of the programme of activities:

Inti Renewable Energy Program of Activities
Version 03
Date: 19/06/2012

A.2. Description of the programme of activities:

The Inti Renewable Energy Program of Activities ("Inti PoA") aims to develop a series of small hydro power plants in Peru.

1. General operating and implementing framework of PoA

Programme of Activities (PoA) under the CDM often referred, as "Programmatic CDM" is a framework covering similar projects that can be registered as a single CDM project activity. The "Inti Renewable Energy Program of Activities", later on referred as the "Inti PoA", will consist of CDM Programme Activities (CPA) that each represents one or more small hydropower plants built in Peru with an installed capacity of up to 20MW[1] connected to the Peruvian national grid. The Inti PoA is a voluntary action being coordinated and managed by Energía Limpia S.A.C. (hereafter referred as ELSAC), a company registered in Peru.

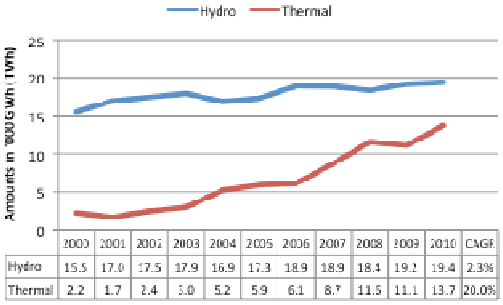
ELSAC is an alliance of Andean Hydro Pty Ltd and Endesa Carbono S. L. Andean Hydro Pty Ltd is a hydropower development and investment company that is looking for hydropower projects in Peru. Its approach is to reduce risk through using its management's experience and knowledge in engineering, financial valuation, socio-ecological project evaluation and understating of the local market in the evaluation and development of hydro power resources. Endesa Carbono S.L. represents Enel-Endesa in the carbon market, as one of the main players in the carbon market, not only does it have preferential access to the carbon market but also, has a successful record in registering projects. Moreover, Endesa Carbono S. L. has the most number of hydropower projects that have been registered in Peru. With this experience, it can standardize the CDM process for small hydropower developers and ensure that CPAs included in this PoA comply with the standards and regulatory framework of the UNFCC and the Peruvian government.

This program aims to support governmental initiatives to diversify the electric sector looking for the sustainable development of the country in a context that renewable energy is losing participation in the national grid. In Peru, the growing demanding electricity for the last 10 years has increasingly been fulfilled by energy generated by fossil-fuel fired power plants thereby decreasing the contribution of hydro power to the Peruvian National Electricity Grid ("SEIN") from 88% in 2000 to 59% in 2010 and strengthening the dependence on fossil fuels for the country electricity requirements.

[1] On this regards, the Peruvian Electricity Concessions Law established in article 25 the Energy Renewable projects below 20 MW do not require environmental impact assessment study. In addition, the European Union legislation regulating the admission of CDM credits (CERs) into the EU's greenhouse gas **Emissions Trading Scheme** (ETS), known as the **Linking Directive**, states that CERs from large hydro projects can only be used in the ETS if the projects meet the standards of the **World Commission on Dams** (WCD). A hydro power plant over 20MW is considered a large-scale project in the linking directive.

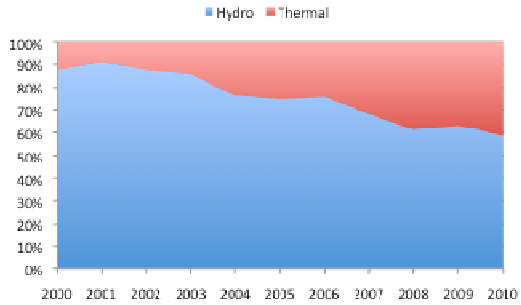
Historical Electricity Production & Contribution to SEIN by Energy Source

Electricity Production



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	CAGR
Hydro	15.5	17.0	17.5	17.9	16.9	17.3	18.9	18.9	18.4	19.2	19.4	2.3%
Thermal	2.2	1.7	2.4	3.0	5.2	5.9	6.1	8.7	11.5	11.1	13.7	20.0%

Electricity Contribution



Source: Evolution of Electricity Market 1995-2010 by the Ministry of Energy and Mines

2. Policy/measure or stated goal of the PoA

The "Inti PoA "aims to encourage the wide scale adoption of small hydro power plants, grid-connected renewable energy projects. The PoA is limited to hydro power plants with an installed capacity of up to 20MW.

The higher-level and long-term goal of this PoA is to strengthen Peru's renewable energy promotion policies by providing a platform that facilitates the transition to a low-carbon economy through generation of additional financial support for renewable energy via international carbon markets. Recently the Peruvian government issued a law for the promotion of the investment for the generation of electricity with the use of renewable energy (hereafter referred to as "RER Law")[2]. The law recognizes that non-conventional renewable energy and hydro power plants under 20 MW capacity have not been developed enough due to barriers and lack of adequate incentives. This law declares non-conventional energy and small hydro power plants of national interest and it is necessary to provide incentives to develop them. The specific incentive launched by the law aims to promote the development of non-conventional renewable energy projects and hydropower plants under 20 MW through the process of tariff auctions.

According to a study of the Word Bank issued in March 2011 about opportunities and challenges of small hydropower plants in Peru, "*A range of financing problems will face developers even if an adequate tariff is provided under the Decree* ("RER Law"), *including unrealistic risk assessments by the commercial banks, high transaction costs, and lack of long-term loans*". The study considers hydro power plants below 20 MW as small-scale projects.[3] The study mentions also that CDM will bring positive effects to the project by bringing them additional revenues that could increase importantly the return of the projects.[4]

[2] Legislative Decree Number 1002."Decreto Legislativo de promoción de la Inversión para la Generación de Electricidad con el Uso de Energías Renovables"

[3] ESMAP "Peru Opportunities and Challenges of Small Hydropower Development". Executive Summary Page XV. World Bank Group. March 2011.

[4] ESMAP "Peru Opportunities and Challenges of Small Hydropower Development". Page 24. World Bank Group. March 2011.

The PoA provides a platform that allows a stronger linkage between incentives provided through a domestic policy for the promotion of renewable energy (namely the "RER Law" and other policies including futures ones) and the incentives provided through the international carbon market, thus helping the implementation of the governmental policies and even expanding the share of renewable hydro small scale power plants in the Peruvian national grid beyond the scope of current policies. In addition, the platform would facilitate access of financing not only because the sum of projects could reach an attractive scale for financing but also because ELSAC management members could invest into the development and realization of the projects.

The goal of the Inti PoA is to develop a platform for supporting the development of small hydropower projects with an installed capacity of up to 20MW in Peru. To reach this goal the coordinating entity will provide the following services across Peru:

✓ Raise awareness among local stakeholders of climate change and renewable energy. To ensure maximum stakeholder involvement CPAs will include local consultation and social investment plants aiming to provide development opportunities and participation to local inhabitants.

✓ Provide standardized and streamlined access to CDM services for small-scale hydropower projects in Peru. To this end ELSAC will coordinate the inclusion of the CPA in the PoA; conduct the registration of the CPA); provide monitoring and verification services to all CPAs; and support the effective commercialization of CERs.

✓ Assist small hydropower project developers in implementing their projects. The management and directors of ELSAC has great experience in developing hydropower projects in Latin America especially in Peru and can provide sound technical advice in improving and/or realizing projects.

✓ Facilitate access to financing by combining smaller projects together giving them scale and visibility to local as well as international investors. The management behind ELSAC can provide financial advice as well as invest into the development of viable hydropower projects.

In this way, the proposed PoA will promote the development of renewable energy and facilitate the abatement of greenhouse gas emissions through replacement of fossil fuel based electricity

This PoA shares the Peruvian government's guiding principles for the sustainable development of renewable energy projects through the following criteria:

Environmental Sustainability

- All CPAs included in the Inti PoA are new grid-connected hydro power plants, which will allow the SEIN to acquire 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.
- As the PoA will accept only small-scale projects, the environmental impact will be minimal. As a result, people living at or near the river don't need to be relocated and natural habitats and productive farmlands are not wiped out.

Economic Sustainability

- The Inti PoA will provide standardized and streamlined access to CDM services for the hydro power projects in Peru that otherwise would not be able to generate into CDM revenues on its

own. Therefore, it will reduce the time and uncertainties to achieve additional finance through carbon revenues on future CPAs, making the proposed activity more attractive to others source of capital or equity.

- It will create economic opportunities in the area where the CPAs are located, which will increase local communities' income.

Social Sustainability

- The selected projects (CPAs) will provide to the local inhabitants development opportunities through participatory social development investment plans. The CPAs included in this PoA will be allocating percentage (%) of the CERs issued from its projects towards improving the infrastructure and social services in the communities that are located near the CPA project activities.
- The Inti PoA supports the development of hydropower resources that in many cases are located in remote parts of the host country and may not have access to electricity supplied by the national grid in absence of the PoA

Technical Sustainability

- The Inti PoA supports proven technology and transfer of knowledge from other regions or even other countries through trainings and civil works during the construction and operation phase.
- It generates demand for local products and services when spare parts and/or repairs are needed.

3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity.

The "Inti PoA is a voluntary action being coordinated and managed by Energía Limpia S.A.C. There are no mandatory laws or regulations in place in Peru that require hydropower plants to seek CDM services. Likewise, no mandatory laws or regulations exist requiring the coordinating/managing entity or any other party to develop a PoA for hydropower plants in Peru.

A.3. Coordinating/managing entity and participants of POA:

Energía Limpia S.A.C. will be the Coordinating/Managing Entity for the project activities under the Programme of Activities (PoA) and communicate with the CDM Executive Board.

Name of Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Kindly indicate if the Party wishes to be considered as a project participant
Peru (host)	Energía Limpia S.A.C.	No

A.4. Technical description of the programme of activities:

A.4.1. Location of the programme of activities:

The Programme of Activities will be implemented within the geographical area of Peru.

A.4.1.1. Host Party(ies):

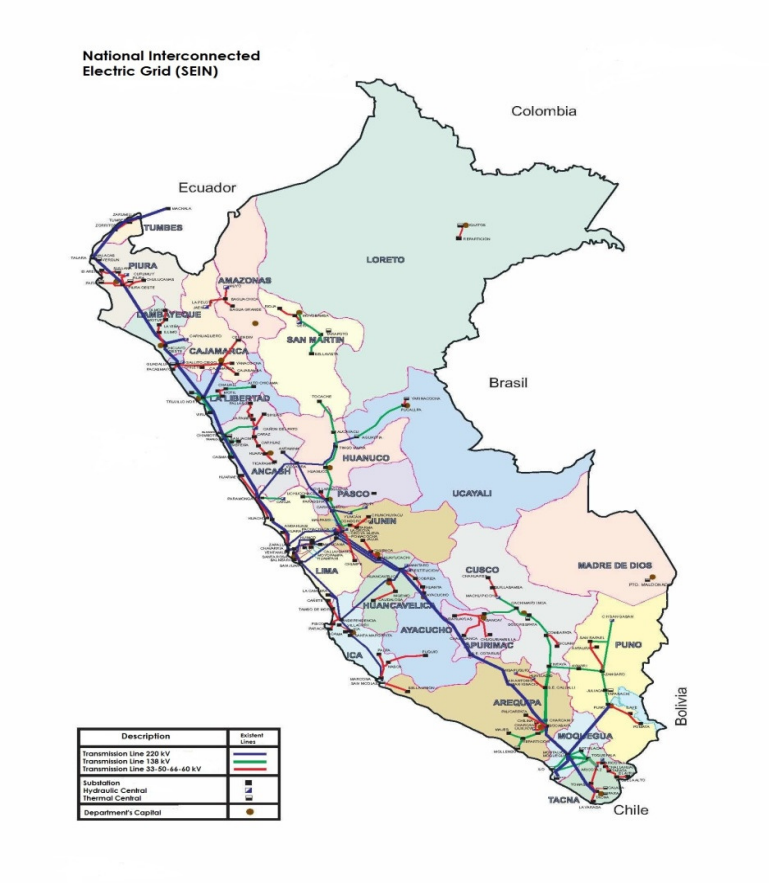
Republic of Peru.

A.4.1.2. Physical/ Geographical boundary:

The PoA will be developed throughout the geographical boundary of the Peruvian National Interconnected Electric Grid (called SEIN) as all project activities to be included in this PoA have to be connected to the national grid.

The map of Peru including SEIN is shown in figure below.

Figure 1. Map of the SEIN



A.4.2. Description of a typical CDM programme activity (CPA):

A typical CPA under the Inti PoA comprises one or more, small hydropower plants with a total installed capacity of up to 20MW. The hydro power plants participating in this PoA are newly constructed and generate electricity from hydropower. As outlined in Section A.4.2.2, a CPA participating in this CPA must not comprise of retrofit or replacement activity in an existing hydro power plant. The detailed

technical characteristics will differ across CPAs and be described in the corresponding CPA-DDs. The electricity generated by under a CPA will be transmitted to the closest grid connection point available in area where the hydropower plants covered by the CPA are located.

The category of the program is:

- Sector: Energy
- Scope Number: 1
- Sectoral Scope: Energy Industries (Renewable Energy-/ non-renewable sources)

A.4.2.1. Technology or measures to be employed by the CPA:

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 hydropower plants projects using already built channels or existing reservoirs could also apply.

In case of Run of River hydropower plants use the natural flow of water from a river to produce electricity. It has no associated large dam or reservoir. It is possible that a small pond or water storage could exist but is limited to the amount required to submerge the intake pipe. In addition, there is no alteration of downstream flows, since all diverted water is returned to the stream below the powerhouse. In Run of River hydroelectric, a portion of the river's flow is diverted to a powerhouse before the water is returned to its natural watercourse. The water reaches the powerhouse through a tunnel or penstock, which drops from the intake. Once the water reaches the powerhouse, it is at a very high pressure and is directed into a turbine before it is fed back into the river. The power generated is connected to the national power grid through a transmission line.

Although detailed technical characteristics will differ, the following general conditions will apply for all CPAs:

- The water is taken from the river, or existing dams, or already built channels with an intake pipe. It is allowed to build a low dam across a stream to raise its level or divert its flow to the intake pipeline.
- If necessary, a forebay is built to trap incoming sediments.
- The water is conducted through channels, tunnels and/or penstock to the power house
- One or more turbines and (a) suitable generator(s) are located in the power house
- A discharge channel or tunnel returns the water to the natural riverbed.
- One or more power transformers will be installed
- The facility supplies electricity to the Peruvian National Electricity Grid and, if applicable, to specific consumers.
- The electric Meter will be implemented according to the dispatch center (COES) requisites[5], 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

[5] Technical Procedure of the Committee of Economic Operation of SINA PR – 20 Verification of Compliance with Requirements for being a member of COES SINAC. Page 20.

A.4.2.2. Eligibility criteria for inclusion of a CPA in the PoA:

A CPA to be included in the proposed PoA shall:

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, Environment 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 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 fulfils the applicability of the methodology ACM0002 as explained in section E.2. of the Inti PoA -DD as the project is: A new 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-	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.

Criteria	Analysis	Documentary Evidence (To demonstrate the eligibility of CPA it could be used one or more of the evidences showed below)
	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.	
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 tbe 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. Inti PoA has established the each CPA has to provide at least 5% of the CER revenues for social investment project to local communities.	Stakeholder consultations report, minutes of the meetings with stakeholders, as well as the agreements established
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	An Environmental Impact Report (or Study) or Environmental Impact Assessment Study that may be required by law to apply for a concession

Criteria	Analysis	Documentary Evidence (To demonstrate the eligibility of CPA it could be used one or more of the evidences showed below)
	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.	
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 20 MW 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 sponsoir 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 existing reservoirs where the power density of the power plant is less than 10 W/m^2.	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 in the increase in existing reservoirs where the power density of the power plant is less than 10 W/m^2.	Feasibility study, Technical report, Study for the connection to the grid, Environmental Impact Report (or Study), Energy concession, quotations or contracts from technological suppliers, map or other documents that could provide information about the power capacity and area of the reservoir.

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

According to the "Procedures for Registration of a Programme of Activities as a Single CDM Project Activity and Issuance of Certified Emissions Reductions for a Programme of Activities" Version 04.1, a PoA is additional if it is a voluntary coordinated action by private of public entity which coordinates an implements any policy/measure or sated goal, which leads to anthropogenic GHG emission reductions that are additional to any that would occur in the absence of the PoA, via an unlimited number of CDM programme activities (CPAs).

This is the case of PoA Inti for the following reasons:

(i) The proposed PoA is a voluntary coordinated action;

The proposed PoA is a voluntary and coordinated action, which will raise public awareness on CDM, renewable energy and climate change in the hydropower sector; coordinate small hydropower plants in Peru to adopt more sustainable practices and seek for carbon finance services; and promote the consultation of local stakeholders in related with CDM. In doing so, the PoA will encourage the deployment of renewable energy electricity generation in the country. There are no mandatory laws or regulations in Peru stipulating to have recourse to CDM to develop hydropower facilities.

The legal framework that regulates hydropower development is ruled by the Electricity Concessions law – ECL (law 25844) released in 1992. This law regulates all activities related to the generation, transmission and distribution of electric energy.

The Law sets forth the norms of operation of the interconnected electric systems, for which an autonomous entity named Committee of Economic Operation of the Electric System (COES) was created. COES is made up of the shareholders of generation companies and of the main transmission system, and the state, the distribution companies or consumers do have any participation. COES is responsible for the coordination of the National Grid (It is called SEIN that is the abbreviation of Sistema Electrico Interconectado Nacional) system operation at minimum cost, guaranteeing the security of the electric power supply and the best use of energy resources. The new regulatory model proposes the free market for investment in power generation.

Several articles of the ECL imply that Hydropower area valid and realistic option and no one of them mention the requirement to seek CDM assistance or to develop PoAs:

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

d) 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.

It is important to mention that a law for the promotion of renewable energy was issued in May 2008[6]. This law allows renewable projects under 20 MW of power capacity built after the issuance of this law, to apply to a special tariff through bidding to get a PPA with the

[6] Legislative Decree Number 1002." Legislative Decree for the promotion of investment for power generation from Renewable Energy Sources"

government. None of its articles enforce to apply to the CDM or POA to apply to the biddings under this law.

Therefore it is demonstrated that the Inti PoA is a voluntary action as there are not any regulation or policy that provide any enforcement or incentives to the implementation of this PoA.

(ii) If the PoA is implementing a voluntary coordinated action, it would reduce anthropogenic GHG emissions that are additional to any that would occur in the absence of the PoA, via an unlimited number of CDM programme activities (CPAs)

As per paragraph 73 of the 47th EB meeting report "*Additionality is to be demonstrated either at the PoA level or at CPA level*". Due to the specificity of every hydropower project, the project participant(s) choose(s) to demonstrate the additionality at CPA level as each power plant may encounter different conditions in the different locations in Peru.

The project proponents of each CPA has the choice to apply investment analysis to address additionality, according to the guidelines of the "Tool for the demonstration and assessment of additionality" (Version 06.0.0) and the sections E.5.1. and E.5.2. of the present PoA-DD. Section E.5.1 "*Assessment and demonstration of additionality for a typical CPA*" presents the guidelines to demonstrate additionality to be followed by each CPA proposed to be registered under this PoA. Section E.5.2. "*Key criteria and data for assessing additionality of a CPA,*" outlines the key criteria to assess the additionality of a CPA under this PoA.

As each CPA has to demonstrate its additionality in the Inti PoA, in the absence of the CDM, none of the implemented CPAs would occur (and therefore the Inti PoA will not lead to any emission reductions), then the Inti PoA is additional[7].

(iii) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced;

Not applicable. The proposed PoA is not implementing a mandatory policy/regulation.

(iv) If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.

Not applicable. No mandatory policies and/or regulations are being enforced.

A.4.4. Operational, management and monitoring plan for the programme of activities:

A.4.4.1. Operational and management plan:

The Inti PoA involves a range of operational activities in order to implement and manage each CPA by the managing entity Energía Limpia S.A.C.and CPA owner within the PoA.

[7] According to the "Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of multiple Methodologies for Programme of activities" (Version 01.0), additionality of the PoA shall be demonstrated by establishing that in the absence of the CDM, none of the implemented CPAs would occur.

Table 1: Responsibilities of Participants

Entity	Management Responsibilities and Arrangements
Energía Limpia S.A.C. ("ELSAC")	• Set a framework for the implementation of the PoA and approve the CDM program activity (CPA) • Obtain letters of approval for the implementation of the PoA from the Peruvian Government and the Annex I Party involved in the PoA. • ELSAC will develop the CPA-DD together with the project owners that will be part of the Inti PoA and maintain relationships with the CPA project owners thereafter • Communicates with the Executive Board on all matters, including submission of the PoA • Making arrangements for the distribution of issued certified emissions reductions (CERs) to the project participants in accordance with the agreements in place between the project participants. • Obtain or calculate the grid emission factor to be used by the CPA developers during the their crediting period
CPA Owner	• Implement the hydro power plant activity according to the registered CPA-DD including the construction timeline and operations and maintenance standards. • Compile and record data according to the monitoring plan and provide required information to the coordinating/managing entity to prepare monitoring reports according to the registered CPA-DD

In addition to the above management tasks, ELSACwill implement the following operational elements to ensure proper management and oversight of the proposed PoA.

(i) *A record keeping system for each CPA under the PoA,*

In order to unambiguously identify hydropower plants participating in the PoA a serial numbering system will be implemented that uniquely identify each hydropower plant through numbers for the CPA and the hydropower facility. This serial numbering system will be used to record baseline and monitoring data on a continuing basis using an Excel database. In this way the PoA coordinating entity will be able to track the emission reduction of each hydropower plant over the full duration of the crediting period.

Each CPA will follow the record keeping and monitoring requirements stipulated in the Approved consolidated baseline and monitoring methodology ACM0002 Version 12.2.0. In summary, ELSAC will record and document CPA detail information as follows:

- Name of CPA
- Name of implementing entity of the CPA
- Contact details of the owner of the CPA including contact person, address, telephone, fax and e-mail
- Location of the CPA
- Installed capacity and other relevant technical specifications of each hydro power plant participating in the CPA
- Verification status and monitoring reports

ELSAC will be responsible for the management of records and data including the periodic collection of monitoring data for all CPAs, preparation of monitoring reports for emission reduction verification, and maintain all monitoring reports of all CPAs in accordance with the record-keeping system identified in the CDM-POA-DD. It will also conduct proper training of the CPAs in data monitoring and make available all monitoring reports requested by a DOE for verification purposes.

(ii) *A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as CDM project activity or as a CPA of another PoA*,

The database described above will be used to perform a double accounting check. Every new CPA will be compared to the already existing database and the list of project activities that are under validation or registered at the UNFCCC. Moreover as shown below, the CPA owners will be made aware of the double accounting principle and will certify that the proposed CPA is registered under the Clean Development Mechanism of the UNFCCC or any voluntary scheme. Should such a case occur then the coordinating entity would not proceed with inclusion of the corresponding CPA in the PoA. ELSAC will also coordinate with the DOE the necessary information and documents for validation and inclusion of CPAs in the PoA and will forward the completed CDM-CPA-DD form to any DOE for consistency checking after ensuring all the requirements determined in the PoA and its specific CDM-CPA-DD are met.

(iii) *The provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA*;

To ensure that those operating the CPA are aware and agree that their activity is being subscribed to the PoA, the CPA owner shall enter into a contractual arrangement with ELSAC including respective provisions that:

a. The CPA Owner is aware that the CPA will be subscribed to the present PoA;
b. The CPA Owner cedes its rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC or any voluntary scheme to the ELSAC of the present PoA
c. The CPA has not been and will not be registered as a single CDM project activity or as a CPA under another PoA.

(iv) *Provisions for meeting training and maintenance needs shall be included in the PoA-DD.*

The Inti PoA is coordinated and managed by Energía Limpia S.A.C. – ELSAC. The personnel of ELSAC will be trained and supported by Endesa Carbono SL, which is specialized in CDM and the Carbon Market.

The support of Endesa Carbono S.L will last all the duration of the project of activities, which is 28 years.

Elsac and Endesa Carbono will review permanently the decisions of the CDM EB and reference documents regarding PoAs in order to maintain valid the operation of Inti PoA.

Special equipment for managing other than computer services and file storage, is required. ELSAC will maintain the computer according to the recommendations of computer technicians and will have a back up information system.

A.4.4.2. Monitoring plan:

(i) Description of the proposed statistically sound sampling method/procedure to be used by DOEs for verification of the amount of reductions of anthropogenic emissions by sources or removals by sinks of greenhouse gases achieved by CPAs under the PoA.

Not applicable

(ii) In case the coordinating/managing entity opts for a verification method that does not use sampling but verifies each CPA (whether in groups or not, with different or identical verification periods) a transparent system is to be defined and described that ensures that no double accounting occurs and that the status of verification can be determined anytime for each CPA;

Monitoring will be carried out by each CPA. For each CPA, all parameters included in section E.7.1 will be monitored by the managing entity of the CPA according to the procedures and monitoring framework established in E.7.2 and will be submitted to the managing entity. The coordinating/managing entity will store the data in an electronic database. The CPA owners will store primary data.

Verification will occur either separately for each CPA or in groups. In any case data shall be verified per CPA and the verification status of each CPA will be recorded by the coordinating/managing entity in the database. The coordinating/managing entity will be in charge of the preparation of the Monitoring Reports and communication with the DOE during verification activities.

The Monitoring Report will compile all required monitoring information for all CPAs (sampled and individually verified) that will be verified by the DOE. This report will unambiguously set out the data on emission reductions generated by each specific CPA during the monitoring period consistent with the requirements of this PoA-DD and the corresponding CPA-DD.

The monitoring plan for parameters included in section E.7.1 will be implemented for each CPA with assistance from the coordinating/managing entity as follows:

- CPA owner will implement each CPA individually and monitor and record all parameters included in section E.7.1.
- The coordinating/managing entity will provide guidance to the CPA owner on how the monitoring should be conducted and data should be collected in regards to emission reductions calculation.
- The CPA owners will provide data on monitored parameters included in section E.7.1 to the coordinating/managing entity.
- The coordinating/managing entity will document and store all parameters included in section E.7.1 provided by CPA owners in an electronic database but primary data will be stored by CPA owner. This data will be kept for at least two years after the end of the last crediting period.
- The coordinating/managing entity reviews the submitted documents, prepares the monitoring report, and provides the monitoring report to the DOE.]

A.4.5. Public funding of the programme of activities:

Neither the PoA nor the CPAs participating in it are receiving or will receive public funding that constitutes a diversion of official development assistances. The coordinating/managing entity, ELSAC, has not received and will not receive public funding of any type for the purpose of developing and/or implementing this PoA.

SECTION B. Duration of the programme of activities

B.1. Starting date of the programme of activities:

19/10/2011. The date of the contract signed between the Coordinating entity and the CPA participant.

B.2. Length of the programme of activities:

28 years

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:

1. Environmental Analysis is done at PoA level ☐
2. 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:

The environmental impact analysis or environmental analysis as required by the Government of Peru will be done at the CPA level.

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):

Due to the specificity, degree of complexity and detail required for each individual CPA may vary depending on installed capacity and local regulations. The coordinating/managing entity will evaluate if a CPAs wishing to be included on the Inti PoA complies with local regulations related to environmental impact assessment.

In accordance to the updated Electricity Concessions Law 25844, for the development of hydro power plants and other renewable energy generation plants of over 500 kW a definite concession is needed (Article 3a & 3d), but generation with renewable sources up to 20MW does not requires the presentation of an Environmental Impact Assessment –EIA (Article 38). As a result, considering that all CPAs part of this PoA will be under this limit; they are not legally required to present an EIA. The completion of an EIA or its approval is not required.

SECTION D. Stakeholders' comments

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

1. Local stakeholder consultation is done at PoA level ☐
2. Local stakeholder consultation is done at CPA level ☒

As each hydropower project included in each CPA has a different geographical location, local stakeholder consultation is done at CPA level.

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 has 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:

Due to the specificity of each project specifically the size, location and the environmental impact of each hydropower project comments are taken at the CPA level.

D.3. Summary of the comments received:

Not applicable

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

Not applicable

SECTION E. Application of a baseline and monitoring methodology

E.1. Title and reference of the approved baseline and monitoring methodology applied to each CPA included in the PoA:

The approved baseline and monitoring methodology is ACM0002, Version 12.2.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"

This methodology also refers to the latest approved versions of the following tools:

- Tool to calculate the emission factor for an electricity system (Version 02.2.1 EB 63)
- Tool for the demonstration and assessment of additionality (Version 06.0.0 EB 65)

E.2. Justification of the choice of the methodology and why it is applicable to each CPA:

The CPAs under this PoA satisfies the applicable conditions of ACM0002 because each CPA represents a new power plant at a site where no renewable power plants were operated prior to the implementation of the Project activity (Greenfield plant). The applicability conditions are described in the table below:

Table 2: 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 historical reference period and the implementation of	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:
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 methodolgy 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 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;	Not applicable • The proposed PoA does not involve switching 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.

Applicability criteria of ACM0002 Version 12.2.0	ACM0002 Version 12.2.0 is applicable to a CPA under the proposed PoA because:
• 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	• 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.

According to the methodology ACM0002 Version 12.2.0, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

> *Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system"* Version 02.2.1.

In the case of Inti PoA the project activities will be connected to an electricity system, which is the national grid, therefore the latest "Tool to calculate the emission factor for an electricity system" Version 02.2.1 is used

The latest version of the "Tool for the demonstration and assessment of additionality" Version 06.0.0 is applied to demonstrate the additionality as it is indicated in the methodology

Provisions regarding the updating of the CPAs in case of held or withdraw of the methodology ACM0002 shall be taken into account.

The provisions have been defined according to the "Procedures for Registration of a Programme of Activities as a Single CDM Project Activity and Issuance of Certified Emissions Reductions for a Programme of Activities" Version 04.1 section F.

Is the approved methodology is put on hold of withdrawn, for any reason other than for the purpose of inclusion in a consolidated methodology, no new CPAs shall be included to the PoA, in accordance with timelines indicated in the latest of the "Procedures for the revision of an approved baseline and monitoring methodology by the executive Board"

If the methodology, subsequent to being placed on hold or withdrawn, is revised or replaced by inclusion in a consolidated methodology, the PoA shall be revised accordingly. The changes shall be subsequently document in a new version of PoA, validated by a DOE and approved by the Board. The Board`s approval defines a new version of the PoA and the generic CDM-CPA-DD. Such revision to the PoA is not required in cases where a methodology is revised without being placed on hold or withdrawn.

Once changes have been approved by the Board, the inclusion of all new CPAs shall follow the latest version of generic CDM-CPA-DD

CPA s that were included before the methodology was put on hold, shall apply the latest version of the PoA generic CDM-CPA-DD at the time of the renewal of the crediting period.

E.3. Description of the sources and gases included in the CPA boundary

According to the methodology ACM0002 (Version 12.2.0) the spatial extent of the CPA boundary includes the CPA power plant and all power plants connected physically to the electricity system[8] that 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 3: Emissions sources included in or excluded from 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 substantial reservoir and therefore CH4 emissions are negligible
		N_2O	No	Minor emission source

E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

With reference to the description of the approved baseline methodology ACM0002 (Version 12.2.0), since the project activity in each CPA under this PoA involves the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system" Version 02.2.1 .

Moreover, in accordance with the tool, the CO_2 emission factor for the displacement of electricity generated by power plants in an electricity system can be determined by calculating the "combined

[8] Referring to the latest approved version of the "Tool to calculate the emission factor for an electricity system" for definition of an electricity system.

margin" emission factor (CM) of the electricity system measured in tCO_2e/MWh when calculating baseline emissions for a project activity that substitutes grid electricity (i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid).

The CPAs under the Inti PoA will supply electricity to the Peruvian National Interconnected Grid.

The Peruvian Electricity sector is regulated by the Electricity Concessions Law No. 25844 ("ECL"), which was enacted on December 5, 1992, according to what is indicated in Article 195 of the Political Constitution of Peru of 1979 and the Supreme Decree No.009-93-EM, Regulation of the Electricity Concessions Law ("RECL"). The law established that any natural person or corporation, local or foreign, without discrimination might invest in electricity, with limits established regarding monopolistic conditions, and cross investing. The electrical sector is vertically integrated, and separated into three distinct functions: Generation, Transmission and Distribution. Also large customers were allowed to negotiate directly with generation and distribution companies.

The ECL also establishes the governance of the system through a series of entities, which were created with distinct and separate functions. The principal entities are: The Ministry of Energy and Mines ("MINEM") issues concessions and sets technical operational standards. The Supervisory Agency for Energy and Mining Investment ("OSINERGMIN") is responsible for the supervision of investments in the energy sector. The Energy Tariff Commission ("CTE") sets the energy tariffs and regulates the transport of liquid hydrocarbons and the transport and distribution of natural gas in Peru. The CTE was absorbed by the OSINERGMIN. The Committee for Economic Operation of the System ("COES") is responsible for the Peruvian National Interconnected Grid's ("SEIN") operation at minimum cost, guaranteeing the security of the electric power supply and the best use of energy resources.

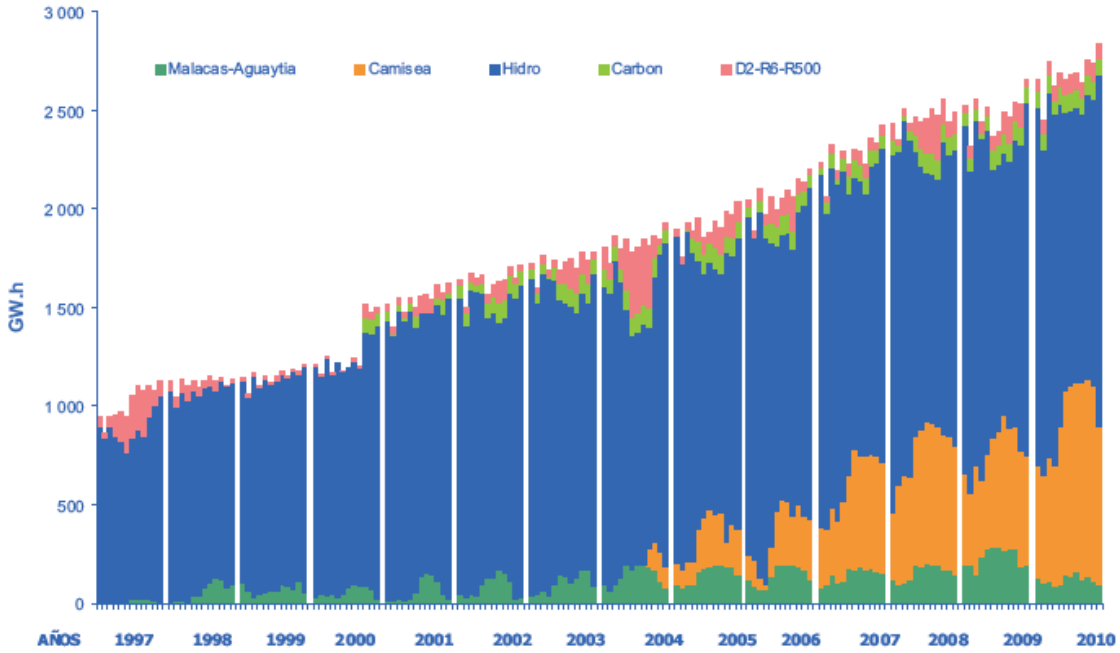
At the end of 2010, the total installed capacity for total electricity was 8,612.6MW where the installed capacity of hydro power plants was 3,437.6MW or 39.9% and the installed capacity of fuel-fired plants were 5,174.3MW or 60.1%[9]. In addition, the total power generated in the SEIN for the year was 32,426.83Wh of which 18,964.56GWh or 58.5% of the total generation was from hydroelectric power and 13,462.27GWh or 41.5% was from thermal generation[10].

Traditionally, Peru has been sourcing its power from hydropower however, since the exploitation of the Camisea gas field in 2004, the country has been provided with a cheap domestic source of energy. Consequently, there has been an increase in the use of thermoelectric power generation in recent years.

Figure 2. Evolution of Energy Generation in the SEIN in GWh

[9] Base data from the presentation on the Evolution of Electricity Market Indicators (1995-2010) by the Ministry of Energy and Mines.

[10] Operating Statistics 2010, COES SINAC.



Source: COES – Operational Statistics Graphic No.2.6 A (orange section represents the energy production from the Camisea gas field)

E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the CPA being included as registered PoA (assessment and demonstration of additionality of CPA): >>

E.5.1. Assessment and demonstration of additionality for a typical CPA:

Additionality shall be demonstrated for each CPA under this PoA following the steps outlined in the last Version of the "Tool for the demonstration and assessment of additionality" Version 06.0.0 as directed by ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources --- Version 12.2.0.

As per the paragraph 73 of the 47th EB meeting report, *"additionality is to be demonstrated either at the PoA level or CPA level"*. In the case of the *"Inti Renewable Energy Program of Activities"*, the additionality will be assessed at the CPA level through the steps of the "Tool for the demonstration and assessment of additionality" Version 06.0.0: identification of alternatives, investment analysis and common practice analysis as presented below. Barrier analysis would be not used.

The following steps from the "Tools 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: Identification of alternatives to the project activity consistent with mandatory laws and regulations

Sub-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)[11]. 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.

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

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

To conduct the investment analysis, use the following Sub-steps

Sub-step 2a – Determine appropriate analysis method

Project activities proposed under CPAs that are eligible for inclusion in the Inti PoA will generate financial and economic benefits other than CER revenues, so the simple cost analysis (Option I) is not applicable. Moreover, since the only clear options from the PoA level is undertaking the CPA project without CDM (including a delayed implementation) and not implementing the project, benchmark analysis (Option III) will be used in assessing additionality of a CPA as instructed in ACM0002 Version 12.2.0

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 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 electricity concessions law[12] (1992), this means for more than 20 years, therefore it is expect that this benchmark would last in the long term. If the Electricity Concessions Law updates this value, then the benckmark used in the Inti PoA for the inclusion of CPAs would be updated accordingly.

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.[13] 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

[12] *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.

[13] *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.

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.[14] Even independent studies, such as one performed by the World Bank in 2009[15] 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[16]. Recently, the National Fund for the Financing of state Entrepreneurial Activity (FONAFE)[17], 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

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

[15] 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.

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

[17] National Fund for Financing State Business Activity

Table 4: Key parameters for calculation of Project IRR

No.	Parameter	Unit	Comment
I. Technical Parameters			
1	Installed capacity	MW	Based on technical specification
2	Firm capacity	MWh	Based on hydrology studies and estimates
3	Annual energy production	MWh/year	Based on hydrology studies and estimates
4	Technical life time	Years	As per evaluation of technical engineering experts
5	Construction period	Years	As per evaluation of technical engineering experts
II. Revenue Parameters			
1	Energy tariff	US$/kWH	Based on published tariffs and official studies
2	Capacity tariff	US$/kW-month	Based on published tariffs and official studies
4	Foreign exchange rates	US$/local currency	Based on published economic data as the one of the Peruvian Central Bank
III. Investment & Costs Parameters			
1	Investment schedule	US$/year	Capital expenditure schedule of detailed cost estimates.
2	Development costs	US$	Capitalized pre-operating costs
3	Operations & maintenance costs	US$/year	Breakdown per operational function either inclusive or exclusive of employee cost breakdown
4	Regulatory fees	US$/year	Payments to OSINERGMIN, water payments to COES and other fees to government related entities
5	Contingency costs	US$/year	Based on internal or 3rd party estimations or comparable company information
6	Insurance fees	US$/year	Based on internal or 3rd party estimations or comparable company information
7	Other expenses	US$/year	May include legal fees, inventories and other expenses based on internal or 3rd party estimations or comparable company information
8	Terminal value computation	US$	Estimated value at end of the estimate
IV. Tax rate and depreciation			
1	Income Tax	%	Established by law
2	Depreciation Rate	%	Established by law
V. Benchmark& Results			
1	Benchmark	12 % (after tax)	Hurdle rate for the investment
2	IRR	%	Calculation

Comparison of Project IRR to benchmark: The project IRR is compared to the benchmark to examine the financial attractiveness of the project.

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 5: Sensitivity Analysis Template

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

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.

Step 3: Barrier analysis

Not applicable. Additionality will be demonstrated through the investment analysis (step 2).

Step 4: Common practice analysis

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

The "*Guidelines on Common Practice*" (EB 63 Version 01.1) and the Tool for the demonstration and assessment of additionality Version 06.0.0 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

The range capacity for each CPA under this PoA shall be calculated.

Step 2: In the applicable geographical area[18], 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.

[18] The Peruvian national grid.

Using the dispatch center (COES) Annual Statistics identify all the plants with the same output capacity within the output range calculated in Step 1.

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed CPA. 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"* (EB 63, Version 01.0) and paragraph 9 of the Tool for the demonstration and assessment of additionality Version 06.0.0.

Each CPA under this PoA will consider the following criteria, which are:

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

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

The proposed project activity is a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled:

(a) the factor F is greater than 0.2, and

(b) $N_{all}-N_{diff}$ is greater than 3.

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

If any similar project activity (ies) occurs, 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.

E.5.2. Key criteria and data for assessing additionality of a CPA:

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.

Therefore the key criteria and data for assessing additionality of a CPA are:

- the Project IRR is less than the 12% benchmark discussed in Step 2 of section E.5.1.
- the Project is not a common practice based on Step 4 of section E.5.1.

The financial indicator to be used by the CPA 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 the Guidelines on the Assessment of Investment Analysis). 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. The IRR post tax of each CPA will be compared this benchmark and if it is lower, then the project activity will be additional. This benchmark has been used since its publication the Electricity Concessions Law19 (1992), this means for more than 20 years, therefore it is expect that this benchmark would last in the long term. If the Electricity Concessions Law updates this value, then the benchmark used in the Inti PoA for the inclusion of CPAs would change accordingly.

In the other hand, The "*Guidelines on Common Practice*" (EB 63 Version 01.1) and the Tool for the demonstration and assessment of additionality Version 06.0.0 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

The range capacity for each CPA under this PoA shall be calculated.

Step 2: In the Peruvian national grid, identify all plants that deliver the same capacity using the dispatch center (COES) Annual Statistics, 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.

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed CPA. 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"* (EB 63, Version 01.0) and paragraph 9 of the Tool for the demonstration and assessment of additionality Version 06.0.0.

Each CPA under this PoA will consider the following criteria, which are:

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

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

[19] *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.

The proposed project activity is not a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled:

(a) the factor F is 0.2 or lower, and

(b) N_{all}-N_{diff} is 3 or lower.

E.6. Estimation of Emission reductions of a CPA:

E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical CPA:

The CPAs will use the last "*Tool to calculate the emission factor for an electricity system* Version 02.2.1 as indicated in the approved consolidated baseline methodology ACM0002 v12.2.0 to calculate the emission reduction from the implementation of the project. The emissions reduction (ER_y), baseline emissions (BE_y) and project emissions (PE_y) are computed as follows:

The emission reduction (ER_y) for the Project:

According to methodology ACM0002 (Version 12.2.0), the emission reduction ER_y by the project activity during a given year *y* is calculated as follows:

$ER_y = BE_y – PE_y$

Where:

ER_y = Emission reductions in year *y* (t CO_2e/yr)
BE_y = Baseline emissions in year *y* (t CO_2e/yr)
PE_y = Project emissions in year *y* (t CO_2e/yr)

Project Emissions (PE_y)

According to ACM0002 (Version 12.2.0),

$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$

Where:

PE_y = Project emissions in year *y* (tCO_2e/yr)
$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year *y* (tCO_2e/yr)
$PE_{GP,y}$ = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year *y* (tCO_2e/yr)
$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year *y* (tCO_2e/yr)

For the hydropower project activity, the value of $PE_{FF,y}$ and $PE_{GP,y}$ are zero.

E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a CPA:

The emission reduction (ER_y) for the Project:

According to methodology ACM0002 (Version 12.2.0), the emission reduction ER_y by the project activity during a given year *y* is calculated as follows:

$ER_y = BE_y – PE_y$

Where:

ER_y	=	Emission reductions in year *y* (t CO_2e/yr)
BE_y	=	Baseline emissions in year *y* (t CO_2e/yr)
PE_y	=	Project emissions in year *y* (t CO_2e/yr)

Project Emissions (PE_y)

According to ACM0002 (Version 12.2.0),

$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$

Where:

PE_y	= Project emissions in year *y* (tCO_2e/yr)
$PE_{FF,y}$	= Project emissions from fossil fuel consumption in year *y* (tCO_2e/yr)
$PE_{GP,y}$	= Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year *y* (tCO_2e/yr)
$PE_{HP,y}$	= Project emissions from water reservoirs of hydro power plants in year *y* (tCO_2e/yr)

For the hydropower project activity, the value of $PE_{FF,y}$ and $PE_{GP,y}$ are zero.

Emissions from water reservoirs of hydro power plants ($PE_{HP,y}$)

For hydro power project activities that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, project proponents shall account for CH_4 and CO_2 emissions from the reservoirs, estimated as follows:

(a) If the power density of the single or multiple (PD) is greater than 4 W/m^2 and less than or equal to 10 W/m^2:

$$PE_{HP,y} = \frac{EF_{Res} \cdot TEG_y}{1000}$$

Where:

$PE_{HP,y}$	=	Project emissions from water reservoirs (tCO_2e/yr)
EF_{Res}	=	Default emission factor for emissions from reservoirs of hydro power plants in year *y* ($kgCO_2e$/MWh)
TEG_y	=	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year *y* (MWh)

(b) If the power density of the project activity (PD) is greater than 10 W/m^2:

$$PE_{HP,y} = 0$$

The power density of the project activity (PD) is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

PD = Power density of the project activity (W/m^2)
Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)
Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero
A_{PJ} = 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 (m^2)
A_{BL} = 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

Since as eligibility criteria of this PoA, all projects have to have a power density over 10 W/m^2, project emission are considered Zero, therefore for this PoA $PE_{HP,y} = 0$

Baseline emissions (BE_y)

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

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

Where:

BE_y = Baseline emissions in year *y* (tCO_2/yr)
$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr)
$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2/MWh)

Calculation of $EG_{PJ,y}$

If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr)

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh/yr)

The Baseline emission factor is calculated as a combined margin ($EF_{grid,CM,y}$), following the guidance in the Tool to calculate the emission factor for an electricity system, Version 02.2.1 According to the tool, the baseline emission factor is calculated as the weighted average of the Operating Margin emission factor ($EF_{grid,OM,y}$) and the Build Margin emission factor ($EF_{grid,BM,y}$) where the weights w_{OM} and w_{BM}, by default, are 50% (i.e., $w_{OM} = w_{BM} = 0.5$). This is presented below:

Estimated anthropogenic emissions were calculated for the Project following a 6-step-process:

Step 1: Identify the relevant electricity systems.

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

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

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

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

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

Step 1: Identify the relevant electricity systems

The Project will supply electricity to the SEIN.

Electricity imports from other grids have not been reported, neither by the SEIN dispatch center nor MINEM. Even if there were imports, for the purpose of determining the OM emission factor, the assumed emission factor for net electricity imports is 0.

Electricity exports to other grids have been 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.

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.

Since project participants considered only grid power plants for the calculation of the operating margin and build margin emission factor, Option 1 is selected.

Step 3: Select a method to determine the Operating Margin (OM)

The calculation of the Operating Margin emission factor(s) ($EF_{grid,OM,y}$) is calculated based on one of the following methods:

1. Simple OM,
2. Simple adjusted OM,
3. Dispatch Data Analysis OM, or
4. Average OM.

Out of four options for the OM, the Dispatch Data Analysis OM 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

The formula for the OM-DD emission factor ($EF_{grid,OM-DD,y}$) used was provided by the tool as follows:

$$EF_{grid,OM-DD,y} = \frac{\sum_{h} EG_{PJ,h} * EF_{EL,DD,h}}{EG_{PJ,y}}$$

Where,

$EF_{grid,OM-DD,y}$ = Dispatch data analysis operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EG_{PJ,h}$ = Electricity displaced by the project activity in hour *h* of year *y* (MWh)
$EF_{EL,DD,h}$ = CO_2 emission factor for grid power units in the top of the dispatch order in hour *h* in year *y* (tCO_2/MWh)
$EG_{PJ,y}$ = Total electricity displaced by the project activity in year *y* (MWh)
h = Hours in year *y* in which the project activity is displacing grid electricity
y = Year in which the project activity is displacing grid electricity

Since hourly fuel consumption data are not available, the hourly emissions factor is determined based on the energy efficiency of the grid power unit and the fuel type used, as follows

$$EF_{EL,DD,h} = \frac{\sum_{m} EG_{m,h} * EF_{EL,m,y}}{\sum_{m} EG_{m,h}}$$

Where:

$EF_{EL,DD,h}$ = CO_2 emission factor for grid power units in the top of the dispatch order in hour *h* in year *y* (tCO_2/MWh)
$EG_{n,h}$ = Net quantity of electricity generated and delivered to the grid by grid power unit n in hour *h* (MWh)

$EF_{EL,n,y}$ = CO_2 emission factor of grid power unit *n* in year *y* (tCO_2/MWh)

n = Grid Power units in the top of the dispatch.
At each hour, *h*, stack each grid power unit's generation using the merit order. The group of power units n in the dispatch margin includes the units in the top x% of total electricity dispatched in the hour h, where x% is equal to the greater of either:
(a) 10%; or
(b) The quantity of electricity displaced by the project activity during hour h divided by the total electricity generation by the grid power plants during that hour *h*.

h = Hours in year y in which the project activity is displacing grid electricity

The $EF_{EL,n,y}$ is calculated as per the guidance for the simple OM, using the option A2.

$$EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} * 3.6}{\eta_{m,y}}$$

Where:

$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year*y* (tCO_2/MWh)

$EF_{CO2,m,i,y}$ = Average CO_2 emission factor of fuel type *i* used in power unit *m* in year *y* (t CO_2/GJ)

$\eta_{m,y}$ = Average net energy conversion efficiency of power unit *m* in year *y* (%)

m = All power units serving the grid in year y except low-cost/must-run power Units

y = Applicable year during monitoring (*ex-post* option)

Where several fuel types are used in the power unit, use the fuel type with the lowest CO_2 emission factor for $EF_{CO2,m,i,y.}$

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 validation (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 the emission factor during the crediting period.

According to the tool, the sample group of power units *m* used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

(a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently (SET5-units) and determine their annual electricity generation ($AEG_{SET-5-units}$, in MWh);

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 buildmargin emission factor.

Table 11: 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

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 ($AEG_{SET\text{-}5\text{-}units}$).

Table 12: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

(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}, in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20.00% of AEG_{total} (if 20.00% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ($SET_{\geq 20\%}$) and determine their annual electricity generation ($AEG_{SET-\geq 20\%}$, in MWh);

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.

(c) From $SET_{5\text{-units}}$ and $SET_{\geq 20\%}$ select the set of power units that comprises the larger annual electricity generation (SET_{sample});

Identify the date when the power units in SET_{sample} started to supply electricity to the grid. If none of the power units in SET_{sample} started to supply electricity to the grid more than 10 years ago, then use SET_{sample} to calculate the build margin. Ignore steps (d), (e) and (f).

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 13: 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**

Otherwise:

(d) Exclude from SET_{sample} the power units, which started to supply electricity to the grid more than 10 years ago. Include in that set the power units registered as CDM project activity, starting with power units

that started to supply electricity to the grid most recently, until the electricity generation of the new set comprises 20.00% of the annual electricity generation of the project electricity system (if 20.00% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) to the extent is possible. Determine for the resulting set ($SET_{sample\text{-}CDM}$) the annual electricity generation ($AEG_{SET\text{-}sample\text{-}CDM}$, in MWh);

If the annual electricity generation of that set is comprises at least 20.00% of the annual electricity generation of the project electricity system (i.e. $AEG_{SET\text{-}sample\text{-}CDM} \geq 0.2 \times AEG_{total}$), then use the sample group $SET_{sample\text{-}CDM}$ to calculate the build margin. Ignore steps (e) and (f).

Otherwise:

(e) Include in the sample group $SET_{sample\text{-}CDM}$ the power units that started to supply electricity to the grid more than 10 years ago until the electricity generation of the new set comprises 20.00% of the annual electricity generation of the project electricity system (if 20.00% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation);

(f) The sample group of power units m used to calculate the build margin is the resulting set ($SET_{sample\text{-}CDM}$->10yrs).

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year y for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} * EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year *y* (tCO_2/MWh)
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit m in year *y* (MWh)
$EF_{EL,m,y}$	=	CO_2 emission factor of power unit m in year *y* (tCO_2/MWh)
m	=	Power units included in the build margin
y	=	Most recent historical year for which power generation data is available

The CO_2 emission factor of each power unit *m* ($EF_{EL,m,y}$) should be determined as per the guidance in Step 4 (a) for the simple OM, using option A2, using for *y* the most recent historical year for which power generation data is available, and using for *m* the power units included in the build margin.

If the power units included in the build margin *m* correspond to the sample group $SET_{sample\text{-}CDM\text{->}10yrs}$, then, as a conservative approach, only option A2 from guidance in Step 4 (a) can be used and the default values provided in Annex 1 of the Tool to Calculate the Emission Factor for an Electricity System shall be used to determine the parameter $\eta_{m,y}$.

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

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

(a) Weighted average CM; or
(b) Simplified CM.

The weighted average CM method (Option a) is used.

(a) Weighted average CM

The combined margin emissions factor is calculated as follows:

$$\mathbf{EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2/MWh)

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year *y* (tCO_2/MWh)

W_{OM} = Weighting of operating margin emissions factor (%)

W_{BM} = Weighting of build margin emissions factor (%)

The following default values should be used for W_{OM} and W_{BM}:

W_{OM} = 0.5 and W_{BM} = 0.5 for the first crediting period.

Estimation of emissions reductions prior to validation

Project participants should prepare as part of the CDM-CPA an estimate of likely emission reductions for the proposed crediting period. This estimate should, in principle, employ the same methodology as selected above. Where the grid emission factor ($EF_{CM,grid,y}$) is determined *ex post* during monitoring, project participants may use models or other tools to estimate the emission reductions prior to validation.

Changes required for methodology implementation in 2nd and 3rd crediting periods

At the start of the second and third crediting period project proponents have to address two issues:

- Assess the continued validity of the baseline; and
- Update the baseline.

In assessing the continued validity of the baseline, a change in the relevant national and/or sectoral regulations between two crediting periods has to be examined at the start of the new crediting period. If at the start of the project activity, the project activity was not mandated by regulations, but at the start of the second or third crediting period regulations are in place that enforce the practice or norms or technologies that are used by the project activity, the new regulation (formulated after the registration of the project activity) has to be examined to determine if it applies to existing plants or not. If the new regulation applies to existing CDM project activities, the baseline has to be reviewed and, if the

regulation is binding, the baseline for the project activity should take this into account. This assessment will be undertaken by the verifying DOE.

For updating the baseline at the start of the second and third crediting period, new data available will be used to revise the baseline scenario and emissions. Project participants shall assess and incorporate the impact of new regulations on baseline emissions.

Fixed values

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 used:	Project site (as suggested in the Methodology)
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied :	For new hydro power plants, this value is zero
Any comment:	-

Data / Parameter:	$\mathbf{EF_{grid,BM,y}}$
Data unit:	tCO_2/MWh
Description:	BM CO_2 emission factor in year *y* (tCO_2/MWh)
Source of data used:	COES annual statistics. By comparing annual statistics, new additions were identified. The last annual statistics of COES was for 2010.
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:	$\mathbf{EG_{m,y}}$
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by power plant / unit *m* in year *y*
Source of data used:	COES last year annual statistics (year 2010)
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.

Any comment:	Monitoring frequency: BM: For the first crediting period only once *ex-ante*.

E.6.3. Data and parameters that are to be reported in CDM-CPA-DD form:

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

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

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).
Source of data:	Project site
Value applied:	To be specified by each CPA
Justification of the choice of data or description of measurement methods and procedures actually applied:	Measured from topographical surveys, maps, satellite pictures, etc. For new reservoirs, this value is zero
Any comment:	-

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

Data / Parameter:	$\mathbf{EF_{grid,BM,y}}$
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:	$\mathbf{EG_{m,y}}$
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
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.
Any comment:	Monitoring frequency: BM: For the first crediting period only once *ex-ante*.

E.7. Application of the monitoring methodology and description of the monitoring plan:

E.7.1. Data and parameters to be monitored by each CPA:

Data / Parameter:	$EG_{facility,y}$ ($EG_{pj,y}$)
Data unit:	MWh
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
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 latest version of 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 last "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:	$\mathbf{EG_{n,h}}$
Data unit:	MWh
Description:	Net electricity generated 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.6.3	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:	-
Any comment:	Monitoring frequency: Hourly

Data / Parameter:	$EG_{PJ,h}$
Data unit:	MWh
Description:	Electricity displaced by the project activity in hour h of year y
Source of data to be used:	Directly measured by electricity meter
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:	The readings of the electricity meters will be continuously measured and recorded hourly. 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. Electricity supplied by the project activity to the grid. The electric meter will be implemented according to the dispatch center (COES) requisites[20], which includes that the meter should be at least Class 0,2 compliant in 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.

[20] Technical Procedure of the Committee of Economic Operation of SINA PR – 20, Verification of Compliance with Requirements for being a member of COES SINAC. Page 20.

QA/QC procedures to be applied:	-
Any comment:	The plants should be stacked in the dispatch data analysis.

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 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:	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.	
QA/QC procedures to be applied:	-	
Any comment:	-	

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.6.3	Net Energy Conversion Efficiencies for all thermal plants are available in the annual statistics of COES.
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 to 8, February 1975, or it

	updated version. Etc. These calculations and measurements will be performed by COES accredited consultants and the result are reviewed and supervised by COES experts.
Any comment	-

E.7.2. Description of the monitoring plan for a CPA:

ELSAC will provide to all the CPAs with a Monitoring Plan and pre-programmed spreadsheets such that the Project Developer 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.

E.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

The baseline study and monitoring methodology was completed by Andean Hydro Pty. Ltd. and Endesa Carbono S.L. on 18/11/2011.

Endesa Carbono S.L. is not a project participant

Andean Hydro Pty. Ltd is not a project participant

Annex 1

CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and PARTICIPANTS IN THE PROGRAMME of ACTIVITIES

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Represented by:	Richard L.A. Marohn
Title:	General Manager
Salutation:	Mr.
Last Name:	Marohn
Middle Name:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The “Inti PoA” has not received any type of public funding or public financial help.

Annex 3

BASELINE INFORMATION

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 fulfillment of operational data collection and processing obligations by the project operator of each CPA (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 of the Operator 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 the CPA for an *ex-ante* emissions avoidance calculation as if the plant were in operation in the year of CPA application to the POA. 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 last Tool to Calculate the Emission Factor for an Electricity System.

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.
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 the Power Plant in the SEIN (measurement: 15') and/or final clients, available monthly.

[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.

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 Project Sponsor to invest in the monitoring personnel or/and equipment.

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: [CPA Name] DDA-OM and BM.xls 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. .

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

18 worksheets compose the DDA-OM and BM Spreadsheet:

- Worksheet #0: EF_{EL}s (tCO_2/MWh) calculation for each plant in the SEIN. The EF_{ELS} 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 EFELs 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.

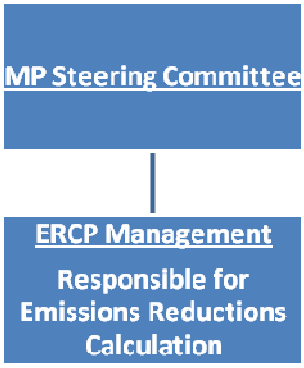
- Worksheet #17: It shows the Baseline Emission Factor and ERs calculated in the monitoring period of the Project's generation.

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.