



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

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**NOTE:**

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

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

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



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

### A.1. Title of the CPA:

### (state name of CPA)

Version of CPA-DD: ##

Date: DD/MM/YYYY

### A.2. Description of the CPA:

The purpose of ### (state name of CPA) (hereafter, the Project or the CPA) is to build a hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), with a total installed generating capacity of ### MW and an estimated annual net electricity generation supplied to the national grid of ### MWh/year.

The Project will be located in a section of the ### (state details of the river). It is located in the ### district, ### province, ### department (Republic of Perú).

The energy generated by the Project will be supplied to the Peru's National Interconnected System (*Sistema Eléctrico Interconectado Nacional*, SEIN, hereafter referred to as "SEIN" or the "Grid").

The Project shall be implemented by the company named ###.

It is expected that the CPA will be commissioned by DD/MM/YYYY.

(Add any relevant additional information about the CPA)

### A.3. Entity/individual responsible for CPA:

CPA developer: #####. (hereafter referred to as "CPA Developer").

Contact Details :

##### (State name of key contact person, as stated in Annex 1)

##### (State complete address, as stated in Annex 1)

Phone: #####

Email : #####

Web: #####

### A.4. Technical description of the CPA:

The proposed CPA, (state name of CPA), will have an installed generation capacity of ### MW and an estimated annual net electricity generation supplied to the national grid of ### MWh/year.

The Project consists of ##### (state details of the hydropower plant)

The CPA's design flow is given with ### cubic meters per second (m<sup>3</sup>/s). The intake will be located at the ##### (state name of river). The water shall be led through a ### meter long conduction channel. The penstock of ### meter will carry the water to the powerhouse. The net head is given with ### meter. The water shall be discharged to the (state name of the river).



Below are main technical specifications of the CPA.

<b>HYDROLOGY</b> (Fill table and add/delete information as appropriate)	
Catchment area at diversion site	###
Intake design flood	###
Powerhouse design flood	###
Discharge design flood	###
Intake type	###
No. of spillways	###
Crest elevation	###
<b>INTAKE STRUCTURE</b>	
Crest level	###
No. of intake gates	###
Size of bottom opening	###
Level of intake gate	###
<b>DESANDER<sup>3</sup></b>	
Type	###
No. of basins	###
Size of basins	###
Length of basin	###
Min. particle size to be removed	###
Flushing channel size	###
<b>HEAD RACE PIPE</b>	
No.	###
Length	###
Design discharge	###
Average slope (aprox.)	###
Flow velocity	###
<b>SURGE SHAFT</b>	
Size	###
Maximum surge level	###
Minimum surge level	###
Top level	###
<b>PENSTOCK</b>	
Length	###
Flow velocity (main)	###
<b>POWER HOUSE</b>	
Type	###
Installed capacity	###
No. and capacity of unit	###
Size of machine hall (aprox.)	###
Type of turbine	###
Speed of turbine	###
Gross head	###
Maximum tail water level	###

<sup>3</sup> For calculation purposes the data given for the desander will be used for calculating the reservoir power density.



Normal tail water level	###
Minimum tail water level	###
Net operating head for design discharge of ## m <sup>3</sup> /s	###
<b>POWER POTENTIAL</b>	
Mean annual energy gross	###
Firm capacity	###

Table #: Main technical specifications of the project.

Source: (provide reference document) ###

(State additional technical description as appropriate)

**A.4.1. Identification of the CPA:****A.4.1.1. Host Party:**Republic of Peru (Official name in Spanish: *República del Perú*).**A.4.1.2. Geographic reference of other means of identification allowing the unique identification of the CPA (maximum one page):**

The proposed site for the CPA is a section of the ##### (state name of river).

It will be located in the ### district, ### province, ### department (Republic of Perú).

###

Figure 2: Location of the proposed CPA

(Insert appropriate Map here). Source: (provide reference document)

The CPA coordinates are as follows:

	Longitude	Latitude	Elevation
Powerhouse	###	###	###
Intake	###	###	###

Table #: Location of CPA (provide geographical coordinates)

Source: (provide reference document)

**A.4.2. Duration of the CPA:****A.4.2.1. Starting date of the CPA:**

DD/MM/YYYY (Insert the expected starting state of the CPA)

**A.4.2.2. Expected operational lifetime of the CPA:**

## years

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

7 years x 3 (Renewable crediting period)

**A.4.3.1. Starting date of the crediting period:**

DD/MM/YYYY

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

7 years.

NOTE: Please note that the duration of crediting period of any *CPA* shall be limited to the end date of the *PoA* regardless of when the *CPA* was added.

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

Years	Annual estimation of emission reductions in tonnes of CO <sub>2</sub> e
YYYY	####
YYYY	####
YYYY	####
YYYY	####
YYYY	####
YYYY	####
YYYY	####
<b>Total estimated reductions (tonnes of CO<sub>2</sub>e)</b>	####
Total number of crediting years	7
<b>Annual average over the crediting period of estimated reductions (tonnes of CO<sub>2</sub>e)</b>	####

Table #: Estimated amount of emission reductions over the chosen crediting period.

**A.4.5. Public funding of the CPA:**

The CPA will not make use of any public funding or ODA.

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

The present CPA is not registered as an individual CDM project and is not part of another PoA.

**SECTION B. Eligibility of CPA and Estimation of emissions reductions****B.1. Title and reference of the Registered PoA to which CPA is added:**

EN BADEN Large-Scale Hydro PoA in Peru  
Version : ## (Correct as per latest version of PoA-DD)

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

General eligibility criteria for inclusion of a CPA in the PoA	Comments
(a) The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA. The boundary of the PoA is currently the host country Peru.	### (Add a description of the location)
(b) Each CPA involves the construction and operation of one or several new hydro power projects connected to the national/sub-national power grid and with a total n or combined installed capacity not greater than 20MW. The technology and performance specifications fulfil the host country national standards.	### (Add a description to explain the capacity of the CPA)
(c) The CPAs under its PoA are neither registered as an individual CDM project activity nor included in another registered CDM PoA.	### (Add a description to explain that the CPAs are unique)
(d) To avoid double counting of emission reductions each CPA-DD shall be uniquely identified and defined in an unambiguous manner by providing geographic information (e.g. coordinates), a unique CPA identification number, and the exact start date and end date of the crediting period. The following data must be provided to/by the CME prior to inclusion in the PoA in writing: <ul style="list-style-type: none"> <li>• Name of the CPA;</li> <li>• Name of the CPA developer;</li> <li>• Contact details of the CPA developer including contact person, address, telephone and/or email address;</li> <li>• Installed capacity and other relevant technical specifications of each power plant under the CPA;</li> <li>• Location of the each power plant under the CPA (e.g. GPS coordinates);</li> </ul>	### (Add a description to explain that the CPAs are unique)
(e) Start date of the CPA shall be provided through documentary evidence and shall comply with the applicable latest CDM guidelines and standards.	Start date of the CPA: DD/MM/YYYY (Provide name of document)
(f) The CPA needs to sign an inclusion agreement with the CME	### (Add note on inclusion agreement)
(g) Each CPA must be applicable to and need to	The CPA applies version 13.0.0 of ACM0002.



apply the latest version of the CDM baseline and monitoring methodology “ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 13.0.0 as per validation date).

The following applicability conditions apply:

**Applicability conditions in version 13.0.0 of ACM0002**

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)

For hydro power projects, one of the following criteria must apply:

- The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or
- The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than  $4 \text{ W/m}^2$ ; or
- 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  $4 \text{ W/m}^2$ .

In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than  $4 \text{ W/m}^2$  all the following conditions must apply:

- The power density calculated for the entire project activity using equation 5 is greater than  $4 \text{ W/m}^2$ ;
- 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;
- Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity;
- Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4

### (Provide the details on compliance of relevant criteria)



<p>W/m<sup>2</sup>, is lower than 15 MW;</p> <ul style="list-style-type: none"> <li>Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m<sup>2</sup>, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.</li> </ul> <p>The methodology is NOT applicable for hydro projects that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m<sup>2</sup>.</p>	
(h) Only additional projects can be enrolled. Additionality is proven on the CPA level for each CPA separately in accordance with the applicable guidelines established by the UNFCCC.	The project proves additionality by using the investment analysis according to the “Tool for the demonstration and assessment of additionality”.
(i) The CPAs must have undertaken an environmental analysis as per requirements of the CDM modalities and procedures as outlined in Section C and be in accordance with the applicable host country Party environmental laws and/regulations..	### (Add a note on the EIA)
(j) The CPAs must have undertaken a local stakeholder consultation as outlined in Section D.	### (Add a note on the LSC)
(k) The CPAs must provide a written affirmation that funding from Annex I party, if any, does not result in a diversion of official development assistance.	### (Add a note on ODA)

Table #: Definition of eligibility criteria for inclusion of a project activity as a CPA under the PoA

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

As described in the PoA-DD, the additionality of the proposed CPA is demonstrated and assessed by the approved set of methodologies and tools:

**Applied methodology:**

- Version 13.0.0 of ACM0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”

**Related tools:**

- Version 2.2.1 of the “Tool to calculate the emission factor for an electricity system”
- Version 06.0 of the “Tool for the demonstration and assessment of additionality”

**Identification of the baseline scenario**

The baseline scenario for each CPA will be identified among the alternatives described in the methodology, ACM0002 version 13.0.0.





The CPA 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”.*

### **Assessment and demonstration of additionality for the CPA**

According to ACM0002, version 13.0.0., the additionality shall be demonstrated and assessed using the latest version of the “Tool for the demonstration and assessment of additionality” agreed by the Board, which is available on the UNFCCC CDM website. Version 06.0 of the additionality tool includes the following steps:

#### **Step 1: Identification of alternatives to the project activity consistent with current laws and regulations**

##### ***Sub-step 1a: Define alternatives to the project activity***

According to the CDM Validation and Verification Manual (EB 55 – Report – Annex 01 – Version 01.2 - clause 105), “the PDD shall identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required”<sup>4</sup>.

According to methodology ACM0002 version 13.0.0, in cases where the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is defined as follows:

“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”.”

Hence, in accordance with methodology ACM0002, version 13.0.0, and the “Tool to calculate the emission factor for an electricity system”, version 2.1, baseline emissions are equal to power generated by the project activity and delivered to the grid, multiplied by the baseline emission factor. The baseline emission factor is equal to the combined margin (CM): a weighted average of the operating margin (OM) emission factor and the build margin (BM) emission factor. Therefore, no further analysis of the alternatives to the project activity is required.

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

The alternative, electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants, is in compliance with all existing applicable legal and regulatory requirements including Peru’s Electric Concession Law (Law N° 25844, updated March 2009).

This step will determine whether the proposed project activity is economically and/or financially feasible, or not.

#### **Step 2: Investment analysis**

<sup>4</sup> Source: [http://cdm.unfccc.int/Reference/Manuals/accr\\_man01.pdf](http://cdm.unfccc.int/Reference/Manuals/accr_man01.pdf) (accessed 20/11/2011).



### ***Sub-step 2a: Determine appropriate analysis method***

Three options can be applied for the investment analysis: the simple cost analysis, the investment comparison and the benchmark analysis.

The latest version of the “Tool for the demonstration and assessment of additionality” states:

*If the CDM project activity and the alternatives identified in Step 1 generate no financial or economic benefits other than CDM related income, then apply the simple cost analysis (Option I). Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III).*

The simple cost analysis is not applicable for the proposed project because the project activity will produce economic benefit other than the CDM related income, notably from electricity sale. Instead, the Benchmark Analysis (Option III) will be used. The post tax project internal rate of return (IRR) of total investment is the financial indicator used to analyse the project’s economic viability within the Peruvian context, and it will be compared with a post tax benchmark IRR as explained below.

### ***Sub-step 2b: Option III. Apply benchmark analysis***

In the following, the financial internal return rate of the project (project IRR) is compared to a benchmark. This benchmark represents the minimal required IRR of the project to be economically attractive.

For the purpose of this analysis the Project IRR is compared to a calculated benchmark, a discount rate of 12%<sup>5</sup> that has been selected as a benchmark to evaluate the economic viability of an investment in the electricity sector in Peru. This 12% discount rate is established by the government in the Electric Concession Law<sup>6</sup> as the reference rate to evaluate investments in the power sector. This rate has also emerged in several studies as well as in official governmental decisions related to project investment evaluation.

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. 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 May 2005, the Ministry of Economy and Finance issued the *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. Later on, the Ministry of Economy and Finance issued in 2007 Decree 015-2007, *Terms of reference for feasibility studies for rural electrification in Peru*. The Decree stipulates that for private sector investment evaluation a 12% discount rate should be used for rural electrification projects, which

<sup>5</sup> Source: <http://www2.osinerg.gob.pe/MarcoLegal/pdf/LEYCE-DL25844.pdf> (accessed 15/11/2011).

<sup>6</sup> 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.



include both renewable and non-renewable generation. Even independent studies, such as one performed by the World Bank in 2009<sup>7</sup> confirm the use of 12% as a benchmark for investment decisions in the sector. Recently, the National Fund for the Financing of state Entrepreneurial Activity (FONAFE)<sup>8</sup>, which is responsible for the management of the State companies, has confirmed that 12% has been used for evaluation of private investments, including those in the electric sector.

***Sub-step 2c: Calculation and comparison of financial indicators***

### (Provide a description on calculation and comparison of financial indicators specific for the CPA)

The investment data and financial analysis of the ### CPA is based on the parameters shown in the table below (fill table and add/delete information as appropriate).

Parameter	Unit	Value	Data Source
Generation capacity	MW		
Net electricity generation per year and supplied to the SEIN	MWh		
Firm capacity	MW		
Energy committed	MWh/year		
Energy committed tariff	USD/MWh		
Electricity tariff	USD/MWh		
Capacity tariff	USD/MWh		
Load factor	%		
Transmission losses	%		
CAPEX	USD		
Insurance costs	% CAPEX per year		

<sup>7</sup> Workshop on Framework for the Development of Hydroelectric Projects in Peru (World Bank, 2009).  
Source: [http://siteresources.worldbank.org/INTPERUINSPANISH/Resources/EnriqueCrousillat\\_Sesion2.pdf](http://siteresources.worldbank.org/INTPERUINSPANISH/Resources/EnriqueCrousillat_Sesion2.pdf)

<sup>8</sup> FONAFE is *Fondo Nacional de Financiamiento de la Actividad Empresarial del Estado*.



Overhauling costs every 5 years	USD		
Discount rate	%		
CER price	EUR		
Water Tariff	% of the electricity tariff per year		
Contribution to OSINERGMIN	% of revenues per year		
Contribution to COES	% of revenues per year		
Income Tax	% per year		
Depreciation – Civil Works	% per year		
Depreciation – Machinery & Equipment	% per year		
Distribution of income to workers	% per year		
Exchange Rate	USD/EUR		

Table #: Assumption parameters for the financial analysis.  
(Insert table of main assumption)

Through the economic and financial evaluation of the project activity with and without considering the sale of CERs, the following values of post-tax project IRR are obtained:

Financial Parameter	Project IRR (%)
Without CERs sales	
With CERs sales	

Table #: Financial parameters calculated.

(Add a conclusion of the financial analysis)

According to the Tool for the demonstration and assessment of additionality:

- If Project IRR < Benchmark → Proceed with step 2d: Sensitivity analysis
- If Project IRR > Benchmark → Proceed to step 3: Barrier analysis

(Add a conclusion on whether step 2d or step 3 are applicable)

### **Sub-step 2d: Sensitivity analysis**



The objective of the sensitivity analysis is to quantify the impact of reasonable variations of critical variables in the financial indicator (IRR) of the proposed project activity:

According to the UNFCCC “Guidance on the Assessment of Investment Analysis” (version 3.1)<sup>9</sup> variables that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation.

Four main variables are considered in the following sensitivity analysis:

1. CAPEX
2. OPEX
3. Plant load factor
4. Electricity Sales Prices

The financial analysis was performed by modifying each of the parameters by up to +/-10%, and assessing the impact on the ### IRR (without considering revenues from selling CERs), as requested in the aforementioned guidance on the assessment of investment analysis.

Results are presented in the following table:

	OPEX				
	-10%	-5%	0%	5%	10%
<b>Project IRR</b>	##.# %	##.# %	##.# %	##.# %	##.# %
	CAPEX				
	-10%	-5%	0%	5%	10%
<b>Project IRR</b>	##.# %	##.# %	##.# %	##.# %	##.# %
	Electricity Sales Price				
	-10%	-5%	0%	5%	10%
<b>Project IRR</b>	##.# %	##.# %	##.# %	##.# %	##.# %
	Plant load factor				
	-10%	-5%	0%	5%	10%
<b>Project IRR</b>	##.# %	##.# %	##.# %	##.# %	##.# %

Table #: Results of the sensitivity analysis.

Under all sensitivity analysis scenarios, the CPA’s project IRR does not increase beyond ## % without CDM revenues and thus the profitability is still below the benchmark.

From a conservative point of view, an analysis of the required values of these parameters to surpass the benchmark has also been carried out.

CAPEX	Electricity Sales Price	Plant load factor
##.# %	##.# %	##.# %

Table #: Results of the analysis of the required values to surpass the benchmark.

<sup>9</sup> Source: [http://cdm.unfccc.int/Reference/Guidclarif/reg/reg\\_guid03.pdf](http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf) (accessed 20/11/2011)



(Include an explanation on why the benchmark cannot be met by the project under existing circumstances)

(Include an explanation on why the benchmark cannot be met by changing the feed-in tariff under existing circumstances).

(Include an explanation on why the new PLF cannot be met by the project under existing circumstances)

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

### **Step 3: Barrier Analysis**

As the ### IRR is lower than the benchmark, a barrier analysis is not required.

### **Step 4. Common Practice Analysis**

This test is a credibility check to complement the investment analysis (Step 2).

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

The designed generating capacity of the CPA is ###.## MW, hence **applicable range is ## MW to ## MW**.

**Step 2:** In the applicable geographical area (Republic of Peru), 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;

	List of Power Plants	Capacity (MW)	Fuel	CDM Project	Year of commercial operation start
1					
2					
3					
4					
5					

Table #: Power plants delivering an output (MW) within the applicable range which have started commercial operation before the start date of the project.

(provide the details of the power plants as appropriate to the start date of the project and (Indicate if any of the above projects are CDM projects)

Hence,  $N_{all} = \#$

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

(Provide an explanation for Step 3), hence,  $N_{diff} = \#$



**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. A proposed project activity is common practice within a sector in the applicable geographical area if the factor  $F$  is greater than 0.2 and  $N_{all} - N_{diff}$  is greater than 3. In this case:

- $F = 1 - (N_{diff}/N_{all}) = 1 - (\#/\#) = \# < 0.2$
- $N_{all} - N_{diff} = \# - \# = \# < 3$

Therefore, the **project is not a common practice** in the Republic of Peru.

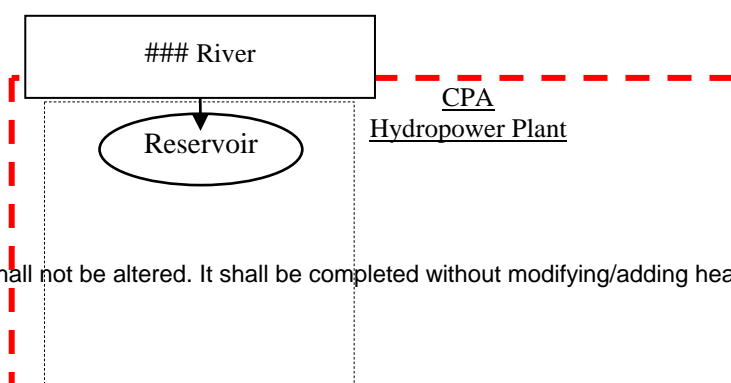
**B.4. Description of the sources and gases included in the project boundary and proof that the CPA is located within the geographical boundary of the registered PoA.**

According to version 13.0.0 of ACM0002, the spatial extent of the project boundary includes the project activity and all power plants connected physically to the same grid to which the proposed projects (CPAs) are also connected. The energy generated by the Project will be supplied to the Peru's National Interconnected System, SEIN, which spans all across the country.



Figure #: National Interconnected System, Peru. *Source: COES SINAC, 2011.*

The flow diagram of the project boundary is shown in the following figure.



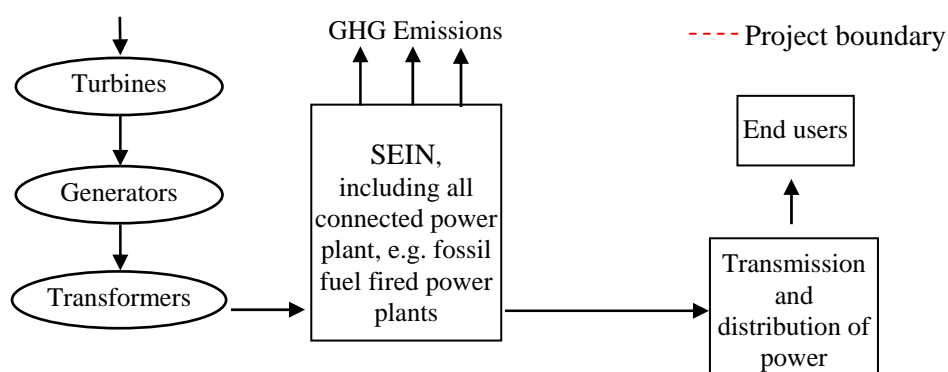


Figure #: Project boundary of the CPA

The GHGs and emission sources included in the project boundary are shown in the following table.

Source		Gas	Included?	Justification / Explanation
Baseline	CO <sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO <sub>2</sub>	Yes	Main emission source
		CH <sub>4</sub>	No	Minor emission source
		N <sub>2</sub> O	No	Minor emission source
CPA	For hydro power plants, emissions of CH <sub>4</sub> from the reservoir	CO <sub>2</sub>	No	Minor emission source.
		CH <sub>4</sub>	Yes	Main emission source. However, the project activity is a run-of-river hydro power implemented in an existing natural reservoir, with no change in the volume of reservoir. Hence, no CH <sub>4</sub> emissions from the reservoir are considered.
		N <sub>2</sub> O	No	Minor emission source.

Table #: Sources and gases included in or excluded from the project boundary

## B.5. Emission reductions:

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

Data / Parameter:	LE <sub>v</sub> Leakage emissions
Data unit:	tCO <sub>2</sub> /yr
Description:	GHG emissions produced by leakage of the project activity
Source of data used:	N/A (as suggested in the Methodology)
Value applied:	0
Justification of the choice of data or description of measurement methods	According to the Baseline Methodology, project participants do not need to consider leakage.





and procedures actually applied :	
Any comment:	

<b>Data / Parameter:</b>	$Cap_{BL}$
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:	#
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	-

<b>Data / Parameter:</b>	$A_{BL}$
Data unit:	$m^2$
Description:	Area of single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full.
Source of data used:	Project site (as suggested in the Methodology)
Value applied:	#
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	-

<b>Data / Parameter:</b>	$A_{PJ}$
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 applied:	#
Justification of the choice of data or description of measurement methods and procedures actually applied :	Measured from topographical surveys, maps, satellite pictures, etc.
Any comment:	Monitoring frequency: yearly

<b>Data / Parameter:</b>	$EF_{grid,BM,y}$
Data unit:	tCO <sub>2</sub> /MWh
Description:	BM CO <sub>2</sub> emission factor in year y (tCO <sub>2</sub> /MWh)



Source of data used:	COES annual statistics.
Value applied:	#### tCO <sub>2</sub> /MWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	According to the <i>Tool to Calculate the Emission Factor for an Electricity System (Version 02.2.1)</i> , in terms of vintage of data, project participants have chosen option 1. For the first crediting period, the BM emission factor is calculated <i>ex-ante</i> based on the most recent information available on units already built for sample group, <i>m</i> , at the time of CPA-DD submission to the DOE for Validation. For the second crediting period, the BM emission factor will be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the BM emission factor calculated for the second crediting period will be used. This option does not require monitoring of the emission factor during the crediting period.
Any comment:	-

<b>Data / Parameter:</b>	<b>EF<sub>Res</sub></b>
Data unit:	kgCO <sub>2</sub> e/MWh
Description:	Default emission factor for emissions from reservoirs
Source of data used:	Decision by EB23
Value applied:	90 kgCO <sub>2</sub> e/MWh
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

For the OM emission factor calculation of the interconnected system of Peru, (mention the option and its applicability). Therefore, all parameters for the OM calculation are monitored and listed in section B.6.1.

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

The emissions reductions are calculated in accordance with the approved consolidated baseline methodology version 13.0.0 of ACM0002 along with the “Tool to calculate the emission factor for an electricity system” (version 02.2.1), as follows:

#### **Project emissions (PE<sub>y</sub>)**

According to ACM0002 (Version 13.0.0):

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

Where:

- PE<sub>y</sub> = Project emissions in year y (tCO<sub>2</sub>e/yr)
- PE<sub>FF,y</sub> = Project emissions from fossil fuel consumption in year y (tCO<sub>2</sub>e/yr)
- PE<sub>GP,y</sub> = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO<sub>2</sub>e/yr)
- PE<sub>HP,y</sub> = Project emissions from water reservoirs of hydro power plants in year y (tCO<sub>2</sub>e/yr)



For El Carmen CPA:  $PE_{FF,y} = 0$  and  $PE_{GP,y} = 0$ .

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

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

(a) If the power density of the project activity (PD) is greater than  $4 \text{ W/m}^2$  and less than or equal to  $10 \text{ W/m}^2$ :

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

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 ( $kgCO_2e/MWh$ ).  $90 \text{ kgCO}_2e/MWh$ , as per EB 23 decision<sup>10</sup>.  
 $TEG_y$  = 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  $10 \text{ W/m}^2$ :

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

(provide details as appropriate to estimate the power density)

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 reservoir 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 reservoir 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

The CPA has an installed capacity of ##### W and an hourly regulation reservoir of ###  $m^2$ .

$$\text{Hence } PD = \frac{Cap_{PJ} \text{ ##### } W}{A_{PJ} \text{ ##### } m^2} = \frac{\text{##### } W}{m^2} = \text{#####}$$

<sup>10</sup> Eb23, Annex 5, page 1: [http://cdm.unfccc.int/EB/023/eb23\\_repan5.pdf](http://cdm.unfccc.int/EB/023/eb23_repan5.pdf)



The resulting power density is ##### than  $10 \text{ W/m}^2$  and thus, project emissions from the reservoir  $PE_{HP,y} = ##$ .

Therefore, project emissions are:  $PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y} = ##$

### **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 ( $tCO_2e/yr$ )
- $EG_{PJ,y}$  = 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 $EG_{PJ,y}$**

The calculation of  $EG_{PJ,y}$  is different for (a) greenfield plants, (b) retrofits and replacements, and (c) capacity additions. Since the CPA 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, the methodology (a) is used.

#### **(a) Greenfield renewable energy power plants**

$EG_{PJ,y}$  is calculated as follows:

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

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 net electricity generation that is produced and fed into the grid as a result of the CPA is estimated to be:  $EG_{PJ,y} = EG_{facility,y} = ##### \text{ MWh/yr}$ .

### **Calculation of $EF_{grid,CM,y}$**

According to the “Tool to calculate the emission factor for an electricity system” (version 02.2.1) the baseline emission factor ( $EF_{grid,CM,y}$ ) is calculated as combined margin (CM), consisting of the combination of the operating margin (OM) and the build margin (BM) factors.

Application of procedures provided in “Tool to calculate the emission factor for an electricity system” (version 02.2.1) for determining the grid emission factor are as follows:



- 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 energy generated by the Project will be supplied to the Peru's National Interconnected System (*Sistema Eléctrico Interconectado Nacional, SEIN*). (Provide a description of the transmission system) (Provide a brief description of the status of electricity imports and exports by SEIN.)

***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.

For the CPA, (provide the chosen Option).

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

The aforementioned Tool to calculate the EF for an electricity system, provides four methods to calculate the operating margin emission factor ( $EF_{grid,OM,y}$ ):

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

For the emission factor calculation of the interconnected system of Peru Option, (provide the chosen Option) has been chosen.

(provide the reasons for non-selection of other Options)

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

(provide the detailed explanation as regards the application and estimation of selected Option for calculating the operating margin)

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

In terms of data vintage, there are two options according to "Tool to calculate the emission factor for an electricity system" (version 02.2.1). Option 1 has been chosen.

(provide the detailed explanation as regards the application and estimation of selected Option for calculating the build margin)

**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;
- (b) Simplified CM;

For the CPA, the (mention the selected Option here) is used. Therefore, the combined margin emissions factor is calculated as follows:

(provide the detailed calculation for estimating the combined margin emissions factor based on the selected Option above)

Hence, the resulting Baseline Emission Factor is  $EF_{grid,CM,y} = ##### \times ## + ##### \times ## = ##### \text{ tCO}_2/\text{MWh}$

**Leakage ( $LE_y$ )**

As it is stated in ACM0002 version 13.0.0, no leakage emissions are considered.

**Emissions reduction ( $ER_y$ )**

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

- $ER_y$  = Emission reductions in year y (t CO<sub>2</sub>e/yr)
- $BE_y$  = Baseline emissions in year y (t CO<sub>2</sub>e/yr)
- $PE_y$  = Project emissions in year y (t CO<sub>2</sub>/yr)

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

Year	Estimation of project activity emissions (tonnes CO <sub>2</sub> e)	Estimation of baseline emissions (tonnes CO <sub>2</sub> e)	Estimation of leakage (tonnes CO <sub>2</sub> e)	Estimation of overall emission reductions (tonnes CO <sub>2</sub> e)
YYYY	0	####	0	####
YYYY	0	####	0	####
YYYY	0	####	0	####
YYYY	0	####	0	####
YYYY	0	####	0	####
YYYY	0	####	0	####
YYYY	0	####	0	####
<b>Total</b> (tonnes of CO <sub>2</sub> e)	<b>0</b>	<b>####</b>	<b>0</b>	<b>####</b>

**B.6. Application of the monitoring methodology and description of the monitoring plan:****B.6.1. Description of the monitoring plan:**

The purpose of the monitoring plan will be to measure and record the net electricity delivered to the electrical grid.

**1. Management structure and responsibilities**

Monitoring will be carried out by the CPA. The main measure for CPA is the net electricity supplied to the grid and assuring the correct operation and maintenance of the measuring equipment.

**Data collection**

For the CPA, the following data has been recorded:

Name of the CPA	####			
Project developer of the CPA	####			
Contact details of the developer including contact person, address, telephone and email address	Address: #### Contact information: Phone: #### Email: ####			
Installed capacity and other relevant technical specifications of each CPA	## MW (# turbines of ## MW each)			
Location of the CPA (e.g. GPS coordinates)		Longitude (##)	Latitude (##)	Elevation
	Power-house	####	####	####
	Intake	####	####	####
Verification status and monitoring reports of each CPA	(mention the CDM status of the CPA and the status of monitoring reports)			

Table ##: Information on the CPA contained in the database maintained by the CME.

The net energy generation data will be monitored directly at the CPA project site. The CME will provide guidance to the 'CPA developer' on how the monitoring should be conducted and data should be collected with regards to emission reduction calculations. The start and end dates of each monitoring period for the CPA, together with the emission reductions attributable to that monitoring period will be recorded in the database of the operated by the CME.

**Data recording**

The net generation of the CPA,  $EG_{\text{facility},y}$ , will be monitored by the and recorded electronically. The CPA developer will provide data on the monitored parameter to the CME. The CME will document and store all data related to the parameter in an PoA Monitoring database, while primary data will be stored by the CPA developer.

**Parameters to be monitored**

Data / Parameter:	<b>EF<sub>grid,CM,y</sub></b>
Data unit:	tCO <sub>2</sub> /MWh
Description:	Combined margin CO <sub>2</sub> 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”
Source of data to be used:	As per the “Tool to calculate the emission factor for an electricity system”
Value of data applied for the purpose of calculating expected emission reductions in section B.6.3	#### tCO <sub>2</sub> per MWh for year YYYY
Description of measurement methods and procedures to be applied:	Ex-post emission factor will be calculated as per the “Tool to calculate the emission factor for an electricity system”
QA/QC procedures to be applied:	As per the “Tool to calculate the emission factor for an electricity system”
Any comment:	The parameters defined in the tool have been included in this section of the CPA-DD.

Data / Parameter:	<b>EG<sub>facility,y</sub> (EG<sub>pl,y</sub>)</b>
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data to be used:	Information provided by COES based in electricity meters.
Value of data applied for the purpose of calculating expected emission reductions in section B.6.3	#### MWh/y
Description of measurement methods and procedures to be applied:	Continuous monitoring, hourly measurement and monthly recording. Measurements are undertaken using energy meters.
QA/QC procedures to be applied:	Cross check measurement results with records for sold electricity and information from COES
Any comment:	As the transformer and transmission line will be shared by other power plants not included in the CPA, the quantity of net electricity generation supplied by the project plant/unit to the grid in year y will be extracted from the following measurements: <ul style="list-style-type: none"> <li>Information provided by COES based in common electricity meters;</li> <li>Measurement of the electricity of each plant immediately</li> </ul>





	<p>before the transformer and transmission line.</p> <p>This will guaranty that all projects connected to a common transformer and transmission line at the same conditions consider the same transformer and transmission line losses. (The procedure to be followed is explained after the parameters to be monitored tables).</p>
--	--

Data / Parameter:	<b>EG<sub>m,y</sub> and EG<sub>n,h</sub></b>
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by power plant / unit <i>m</i> , or <i>n</i> in year, <i>y</i> or hour, <i>h</i>
Source of data to be used:	COES
Value of data applied for the purpose of calculating expected emission reductions in section B.6.3	COES data from YYYY. (Data available in the internet: <a href="http://www.coes.org.pe">http://www.coes.org.pe</a> )
Description of measurement methods and procedures to be applied:	For the <i>ex-ante</i> calculation, the latest publicly available information is used, which is the COES annual statistics of 2010. 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 100.00% and the data will be archived electronically.
QA/QC procedures to be applied:	-
Any comment:	<p>Monitoring frequency:</p> <ul style="list-style-type: none"> <li>○ Dispatch data OM: hourly</li> <li>○ BM: For the first crediting period <i>ex-ante</i>. For the second and third crediting period, only once <i>ex-ante</i> at the start of the second crediting period.</li> </ul>

Data / Parameter:	<b>EG<sub>P,j,h</sub></b>
Data unit:	MWh
Description:	Electricity displaced by the project activity in hour <i>h</i> of year <i>y</i>
Source of data to be used:	COES (Data available in the internet: <a href="http://www.coes.org.pe">http://www.coes.org.pe</a> )
Value of data applied for the purpose of calculating expected emission reductions in section B.6.3	#### MWh
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. The electric meter will be implemented according to the dispatch center (COES) requisites. <sup>11</sup>
QA/QC procedures to be applied:	Sales records to the SEIN or to the final client, as well as other records

<sup>11</sup> See: Technical Procedure of the Committee of Economic Operation of SINAC PR – 20 – Verification of Compliance with requirements for being a member of COES SINAC, p.20; in the internet: [http://www.coes.org.pe/coes/Procedimientos/procedimiento\\_n20.pdf](http://www.coes.org.pe/coes/Procedimientos/procedimiento_n20.pdf). (accessed 15/11/2011)



	are used to ensure consistency. Electricity supplied by the project activity to the grid. The metering system will be calibrated according to the manufacturer specifications and at least every 3 years.
Any comment:	-

<b>Data / parameter:</b>	$\eta_{m,y}$
Data unit:	-
Description:	Average net energy conversion efficiency of power unit , <i>m</i> in year, <i>y</i>
Source of data to be used:	Data from the dispatch center, COES Annual statistics (Data available in the internet: <a href="http://www.coes.org.pe">http://www.coes.org.pe</a> )
Value of data applied for the purpose of calculating expected emission reductions in section B.6.3	Net Energy Conversion Efficiencies (NEC) for all thermal plants are available in the annual statistics of COES. For the <i>ex-ante</i> calculation, the latest publicly available information is used, which is the COES annual statistics of YYYY.
Description of measurement methods and procedures to be applied:	In the first monitoring report will be used the last available annual report of COES.
QA/QC procedures to be applied:	<p>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.<sup>12</sup> This procedure established that the efficiency of the plants have to be calculated according to international standards. For diesel engines ISO-3046-1 or its updated versions, for gas turbines: section 8 of ISO 2314: 1989 or its updated versions, for steam turbines: DIN1943, Sections 6 a 8, February 1975, or it updated version etc.</p> <p>These calculations and measurements will be performed with a COES accredited consultants and the result are reviewed and supervised by COES experts.</p>
Any comment	This information will be monitored once for the crediting period.

<b>Data / Parameter:</b>	<b>Merit Order</b>
Data unit:	Text
Description:	The merit order in which power plants are dispatched by documented evidence
Source of data to be used:	COES (Data available in the internet: <a href="http://www.coes.org.pe">http://www.coes.org.pe</a> )
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Information is available to the DOE in Excel spreadsheets 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.
QA/QC procedures to be applied:	

<sup>12</sup> See in the internet: [http://www.coes.org.pe/coes/Procedimientos/procedimiento\\_n17.pdf](http://www.coes.org.pe/coes/Procedimientos/procedimiento_n17.pdf), (accessed 17/11/2011).



Any comment:	The plants should be stacked in the dispatch data analysis.
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<b>Data / Parameter:</b>	<b>Cap<sub>PJ</sub></b>
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.6.3	####
Description of measurement methods and procedures to be applied:	Determine the installed capacity based on recognized standards. The monitoring frequency would be yearly.
QA/QC procedures to be applied:	-
Any comment:	-

<b>Data / Parameter:</b>	<b>A<sub>pi</sub></b>
Data unit:	m <sup>2</sup>
Description:	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full
Source of data used:	Project sponsor
Value of data applied for the purpose of calculating expected emission reductions in section B.6.3	The area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full will be ### m <sup>2</sup> .
Description of measurement methods and procedures to be applied:	The area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full will be monitoring with as built plan of the reservoir.
QA/QC procedures to be applied:	-
Any comment:	-

<b>Data / Parameter:</b>	<b>EF<sub>CO<sub>2</sub>,i,y</sub> and EF<sub>CO<sub>2</sub>,m,i,y</sub></b>	
Data unit:	tCO <sub>2</sub> /GJ	
Description:	CO <sub>2</sub> emission factor of fossil fuel type i in year y	
Source of data used:	The following data sources may be used if the relevant conditions apply:	
	<b>Data source</b>	<b>Conditions for using data source</b>
	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 95.00% confidence interval as provided in table 1.4 of	



	Chapter1 of Vol. 02 (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.6.3:	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; BM: For the first crediting period <i>ex ante</i> . For the second and third crediting period, only once <i>ex ante</i> at the start of the second crediting period	
QA/QC procedures to be applied:	-	
Any comment:	-	

<b>Data/Parameter:</b>	TEG <sub>y</sub>
Data unit:	MWh/yr
Description:	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y
Source of data:	Project activity site
Measurement procedures (if any):	Electricity meters
Monitoring frequency:	Continuous measurement and at least monthly recording
QA/QC procedures:	-
Any comment:	Applicable to hydro power project activities with a power density of the project activity (PD) greater than 4 W/m <sup>2</sup> and less than or equal to 10 W/m <sup>2</sup>

**Metering of net generation**

(provide the details of the metering of net generation and a diagram)

**Data calibration**

Data calibration will be done considering the calibration frequency as per manufacturer's requirements. The CME will store all the data in an electronic database. Primary data will be stored by the CPA owner.

**Data reporting**

The CME will be responsible for the preparation of the monitoring report and communication with the DOE during verification activities. The monitoring report will compile all required monitoring information in order to allow the DOE to verify the emission reductions for each monitoring period of the CPA. The monitoring report will unambiguously set out the data on emission reductions generated by the CPA during the monitoring period consistent with the requirements of the PoA-DD and the CPA-DD. Record keeping procedures undertaken by the CME will ensure that the data attributed to a monitoring period can be clearly attributed to the CPA and will furthermore prevent double counting of emission reduction data.

**Data archiving**

The CME will be responsible for the management of records and data associated with the CPA and all records will be stored for a period of two years after the end of the relevant crediting period.

**2. Data quality control**

The data on  $EG_{\text{facility},y}$  and reports provided by the CPA owner to the CME will be checked internally to ensure the accuracy and completeness of data. In case of mistakes, corrective action will be applied to avoid future similar mistakes.

**3. Training and monitoring personnel**

The CME will ensure that all persons that participate in the monitoring process will be suitably qualified and trained in the operation and maintenance of the CPA project activity. These persons will also receive training on the application of the monitoring plan.

**SECTION C. Environmental analysis**

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

☐ Please tick if this information is provided at the PoA level. In this case sections C.2. and C.3. need not be completed in this form.

The PoA consists of individual hydropower activities of different type and size, potentially implemented in different geographical regions throughout the boundary of the PoA. Hence it is deemed inappropriate to conduct an environmental impact assessment at the PoA level.

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

(provide the details of the analysis of environmental impacts)

**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):**

(provide the applicability of EIA and the status of the environmental certificate according to the Peruvian Laws related to EIA (N° 27446) and Electric Concessions (N° 25844))

**SECTION D. Stakeholders' comments**

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

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

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

The LSC was held at the ##### (provide the location, address where the LSC was undertaken) at HH:MM Peru Time (PET) on DD/MM/YYYY and conducted by ##### (Name of the agency)

(Add additional description as appropriate)

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

(Add additional description as appropriate)

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

(Add additional description as appropriate)

Annex 1**CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE CPA**

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



**Annex 2**

**INFORMATION REGARDING PUBLIC FUNDING**

The CPA will not make use of any public funding or ODA.





**Annex 3**

**BASELINE INFORMATION**

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**Annex 4**

**MONITORING INFORMATION**