



---

# VALIDATION OPINION - CREDITING PERIOD RENEWAL

---

## “POECHOS I PROJECT” IN PERU

(UNFCCC Registration Ref. No. 0086)

REPORT NO. 2011-1386

REVISION NO. 01

DET NORSKE VERITAS




---

 VALIDATION OPINION - CREDITING PERIOD RENEWAL
 

---

Date of first issue: 2010-11-30	ConCert Project No.: PRJC-280986-2010-CCS-NOR
Approved by: Edwin Aalders	Organisational unit: Climate Change & Environmental Services
Client: The World Bank	Client ref.: Claudia Croce

 DNV CLIMATE CHANGE  
SERVICES AS

 Veritasveien 1,  
1322 HØVIK, Norway  
Tel: +47 67 57 99 00  
Fax: +47 67 57 99 11  
http://www.dnv.com  
Org. No: NO 994 774 352 MVA

## Summary:

**Project Name:** "Poechos I Project"**Registration Ref. No.:** 0086**Country:** Peru**Methodology:** ACM0002      **Version:** 12.1.0

Sectoral scope: 01

**GHG reducing Measure/Technology:** Grid connected renewable electricity generation**ER estimate:** 32 850 tCO<sub>2</sub>e per year (average)**Size**☒ Large Scale☐ Small Scale**Validation Phases:**☒ Desk Review☒ Follow up interviews☒ Resolution of outstanding issues**Validation Status**☐ Corrective Actions Requested☐ Clarifications Requested☒ Full Approval and request for renewal☐ Rejected

In summary, it is DNV's opinion that the project activity "Poechos I Project" in Peru, as described in the PDD, version 2 of 24 October 2011, meets all relevant UNFCCC requirements for the renewal of the crediting period. Hence DNV requests the renewal of the crediting period of the project.

Report No.: 2011-1386	Subject Group: Environment
Report title: "Poechos I Project" in Peru	
Work carried out by: Felipe Lacerda Antunes	
Work verified by: Gaurav Srivastava	
Date of this revision: 2012-01-05	Rev. No.: 01
Number of pages: 10	

**Indexing terms**

## Key words

Climate Change

Kyoto Protocol

Validation

Clean Development Mechanism

- ☒ No distribution without permission from the client or responsible organisational unit
- ☐ free distribution within DNV after 3 years
- ☐ Strictly confidential
- ☐ Unrestricted distribution

© 2009 Det Norske Veritas AS

All rights reserved. This publication or parts thereof may not be reproduced or transmitted in any form or by any means, including photocopying or recording, without the prior written consent of Det Norske Veritas AS.



<i><b>Table of Content</b></i>	<i><b>Page</b></i>
1 EXECUTIVE SUMMARY – VALIDATION OPINION.....	1
2 INTRODUCTION.....	2
3 METHODOLOGY.....	2
3.1 Desk review of the project design documentation	2
3.2 Follow-up interviews with project stakeholders	3
3.3 Resolution of outstanding issues	4
3.4 Internal quality control	5
3.5 Validation team	5
4 VALIDATION FINDINGS.....	6
4.1 Participation of project participants	6
4.2 Validity of selected baseline and monitoring methodology	6
4.3 Applicability of selected baseline and monitoring methodology	6
4.4 Validity of baseline	7
4.5 Validity of monitoring plan	8
4.6 Estimation of GHG emissions	9
Appendix A Validation Protocol	
Appendix B Curricula vitae of the validation team members	

**Abbreviations**

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
COES	Committee of Economical Operation of the <i>SEIN</i> ( <i>SEIN</i> Dispatch Center)
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DDA-OM	Dispatch Data Analysis Operating Margin Emission Factor
DNV	DNV Climate Change Services AS
DNA	Designated National Authority
ENOSA	Electro Noroeste, S.A. (The project final client)
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
NCDMF	Netherlands Clean Development Mechanism Facility
NEC	Net Efficiency Conversion
PDD	Project Design Document
SEIN	Sistema Eléctrico Interconectado Nacional / National Interconnected Electric System
SENAMHI	Servicio Nacional de Meteorología y Hidrología del Perú / Peru's National Meteorological and Hydrological Service
SINERSA	Sindicato Energético S.A.
UNFCCC	United Nations Framework Convention for Climate Change



## 1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed an assessment of the request by The World Bank to renew the crediting period of CDM project activity 0086 “Poechos I Project” in Peru. The assessment was performed in accordance with the Procedures for renewal of the crediting period of a registered CDM project activity (version 06.0) and included an assessment of:

- (a) An impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant EB guidance with regard to renewal of the crediting period at the time of requesting renewal of crediting period;
- (b) The correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the validity of the original baseline scenario. The project correctly applies the baseline and monitoring methodology ACM0002, version 12.1.0 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.

The total emission reductions from the project are estimated to be on the average 32 850 tCO<sub>2e</sub> per year over the selected 7 year renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring plan provides for the monitoring of the project’s emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is DNV’s opinion that the project participant is able to implement the monitoring plan.

In summary, it is DNV’s opinion that the CDM project activity 0086 “Poechos I Project” in Peru meets all relevant UNFCCC requirements for the renewal of the crediting period. Hence DNV requests the renewal of the crediting period of the project.

Rio de Janeiro and Oslo, 2012-01-05

Felipe Lacerda Antunes  
CDM Validator  
DNV Rio de Janeiro, Brazil

Edwin Aalders  
Approver  
DNV Climate Change Services AS



## 2 INTRODUCTION

DNV Climate Change Services AS (DNV) was commissioned by The World Bank to perform an assessment of the request by The World Bank to renew the crediting period of CDM project activity 0086 “Poechos I Project” in Peru.

The assessment was performed in accordance with the Procedures for renewal of the crediting period of a registered CDM project activity (version 06.0) and included an assessment of:

- (a) An impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant EB guidance with regard to renewal of the crediting period at the time of requesting renewal of crediting period;
- (b) The correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period.

## 3 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

### 3.1 Desk review of the project design documentation

The following tables list the documentation that was reviewed during the validation.

#### 3.1.1 Documentation provided by the project participants

- /1/ The World Bank: Project Design Document for the “Poechos I Project” in Peru Version 1 of 4 August 2010 and final version 2 of 24 October 2011.
- /2/ NCDMF: Project Design Document registered on 14 November 2005.  
web link: <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1123850211.52/view>
- /3/ The World Bank: Grid emission factor calculation spreadsheets:
  - OM-DDA. File named “Poechos DDA-OM - 2blockeado-1(03-10-2011).xls”;
  - BM. File named “Poechos I BM 2009 (3).xls”.
- /4/ SINERSA: Daily generation reports, from April 2009 to March 2010.
- /5/ The World Bank: E-mail message to UNFCCC Secretariat about the intention to renew the project activity crediting period on 22 September 2010 confirmed on 23 September 2010.



### 3.1.2 Letters of approval

- /6/ CONAM (DNA of Peru): *Letter of approval* dated 13 March 2003
- /7/ Ministry of Housing, Spatial Planning and the Environment (DNA of the Netherlands): *Letter of approval* dated 11 November 2004

### 3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

- /8/ CDM Executive Board: *Procedures for renewal of the crediting period of a registered CDM project activity*. Version 06.0.
- /9/ CDM Executive Board: *Validation and Verification Manual*. Version 01.2.
- /10/ CDM Executive Board: ACM0002 – “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”. Version 12.1.0.
- /11/ IPCC: *Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories*. <http://www.ipcc.ch/>
- /12/ CDM-Executive Board: *Methodological Tool “Tool to calculate the emission factor for an electricity system”*, version 02.2.1
- /13/ CDM Executive Board: “Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period”. Version 03.0.0
- /14/ CDM Executive Board: “Guidelines for completing the Project Design Document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM)” Version 07

### 3.1.4 Documentation used by DNV to validate / cross-check the information provided by the project participants

- /15/ COES: SEIN’s units monthly Generation reports, from April 2009 to March 2010.
- /16/ COES: Variable cost of generation plants, from April 2009 to March 2010.
- /17/ COES-SINAC: Integrated Companies effective and Installed capacities Delivered March 2010.
- /18/ COES-SINAC: 2009 Annual Operation Reports. Included in the “Statistical Report 2009” from February 2010. Available at: <http://www.coes.org.pe/Dataweb2/2009/STR/estadistica/anual/anual.htm>
- /19/ COES: NEC “Statistical Report 2009” from February 2010. Available at: <http://www.coes.org.pe/Dataweb2/2009/STR/estadistica/anual/anual.htm>
- /20/ Chira-Piura project webpage, confirming that the project was implemented in an existing reservoir: <http://www.chirapiura.gob.pe/principal.php>, last assessed on 24 February 2011.
- /21/ Ministry of Energy and Mines: Electric Concession Law (Law 25844), released in 1992

## 3.2 Follow-up interviews with project stakeholders

On 12 May 2010 Felipe Lacerda Antunes from DNV visited the project site and performed interviews with project stakeholders.

	Date	Name	Organization	Topic
/22/	2010-05-12	Redy Riso	SINERSA	➤ Management System




---

 VALIDATION OPINION - CREDITING PERIOD RENEWAL
 

---

/23/	2010-05-12	Branislav Zdravkovic	SINERSA	➤ Environmental Licenses
/24/	2010-05-12	Claudia Croce	The World Bank	➤ Baseline scenario and emission calculations
/25/	2010-05-12	Lorenzo Eguren	ENDESA Carbono	➤ Emission factor calculation
				➤ Monitoring plan

### 3.3 Resolution of outstanding issues

The objective of this phase of the assessment was to resolve any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design.

A corrective action request (CAR) is raised if one of the following occurs:

- (a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- (b) The CDM requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.





### 3.4 Internal quality control

This validation opinion underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

### 3.5 Validation team

<i><b>Role</b></i>	<i><b>Last Name</b></i>	<i><b>First Name</b></i>	<i><b>Country</b></i>	<i><b>Type of involvement</b></i>					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 1.2 competence
Team leader (Validator)	Antunes	Felipe	Brazil	✓	✓	✓	✓		✓
Technical reviewer	Srivastava	Gaurav	India					✓	✓

The qualification of each individual validation team member is detailed in Appendix B to this report.



## 4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The final validation findings relate to the project design as documented and described in the PDD, version 2 dated 24 October 2011 /1/.

### 4.1 Participation of project participants

There is no change with regard to the Parties and project participants participating in the project activity /6//7/.

### 4.2 Validity of selected baseline and monitoring methodology

The project was originally registered based on version 02 of ACM0002 – “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”. The revised CDM-PDD (version 2 dated 24 October 2011) applies version 12.1.0 of ACM0002 – “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” /10/. This is appropriate as version 12.1.0 is the latest version of the applied methodology ACM0002.

### 4.3 Applicability of selected baseline and monitoring methodology

The “Poechos I Project” in Peru is a 15.2 MW hydroelectric power plant with turbines and generators manufactured by Alstom Brazil for generation of electricity by utilization of the Poechos reservoir. The reservoir has 48 m height and a length of approximately 1000 m (with a water discharge of 45 m<sup>3</sup>/s). The project uses a portion of the discharged water from the Poechos Dam, affecting the flow of the Chira River and the Miguel Checa channel. Generated electricity is supplied to the SEIN through the Sullana substation, which belongs to Electronoroeste S.A. (ENOSA), a stated-owned enterprise which is the final customer and consumer of the total generated electricity /1/. The project is operated by Sindicato Energético, S.A. (SINERSA) /4/.

The objective of the project is to generate renewable energy and sell it to the National Interconnected Electric System (SEIN – Sistema Eléctrico Interconectado Nacional), thus, reducing greenhouse gas (GHG) emissions produced by thermal power plants using fossil fuels for electricity generation in Peru.

The project applies the approved baseline methodology ACM0002 - “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, Version 12.1.0 /10/. ACM0002 is applicable to the “Poechos I Project” in Peru as the project consists of two renewable energy generation units of 7.6 MW connected to the Peruvian grid. DNV could confirm from the Chira-Piura project webpage /20/, that the project is a new power plant that was implemented in an existing reservoir with no change in the reservoir volume. DNV could confirm the installed capacity during the site visit by checking the equipment plates.

The estimated amount of GHG emission reductions from the project is 229 950 tCO<sub>2</sub>e during the second crediting period (7 years) from 1 April 2011 to 31 March 2018, resulting in



estimated average annual emission reductions of 32 850 tCO<sub>2</sub>e. For an assessment of the *ex-ante* emission reductions estimates, please refer to chapter 4.6 of this report.

#### 4.4 Validity of baseline

DNV confirms that there have been no changes in the relevant national and/or sectoral regulations since the previous crediting period that could have affected the baseline scenario. In line with ACM0002 requirements, the original baseline scenario /2/ remains valid as 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 as described in the “Tool to calculate the emission factor for an electricity system” version 02.2.1 /12/.

The following steps from the “Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period” version 03.0.0 /13/ were applied:

##### **Step 1: Assess the validity of the current baseline for the next crediting period**

The “Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period” /13/ approved by the CDM Executive Board requires assessing the impact of new relevant national and/or sectoral policies and circumstances on the baseline. The validity of the current baseline is assessed using the following Sub-steps:

##### **Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies**

During the first crediting period, some articles from the Electric Concession Law (Law 25844) /21/ were revised. However, after reviewing the Electric Concession Law /21/, DNV confirms that these revised articles do not affect the baseline. A summary of these changes are covered in updated PDD.

##### **Step 1.2: Assess the impact of circumstances**

There are no new national/sectoral policies/legislation/circumstances that could affect the baseline scenario during the renewal of the crediting period. Most of the additions to the Peruvian SEIN grid is natural gas based thermal plants /18//19/.

##### **Step 1.3: Assess whether the continuation of the use of current baseline equipment(s) is technically possible or an investment is the most likely scenario for the crediting period for which renewal is requested**

Not applicable, since the baseline is not the continuation of current practice.

##### **Step 1.4: Assessment of the validity of the data and parameters**

The build margin emission factor, that was being monitored *ex-post* during the first crediting period, now is being fixed *ex-ante*, in line with the “Tool to calculate the emission factor for an electricity system” /12/. This parameter is properly described in the following section 4.5.1. Operating margin emission factor and combined margin emission factor, on the other hand, will be updated annually applying the methodology described in the following section 4.6.

##### **Conclusion on step 1**



The current baseline is still valid for the subsequent crediting period; data and parameters needed to be updated considering the latest versions of ACM0002 /10/ and IPCC Guidelines /11/.

## **Step 2: Update the current baseline and the data and parameters**

### **Step 2.1: Update the current baseline**

Not applicable, since the original baseline scenario remains valid.

### **Step 2.2: Update the data and parameters**

The Peruvian SEIN grid emission factor will be updated *ex-post*, as described in chapter 4.6 of this report.

## **4.5 Validity of monitoring plan**

The project applies the approved monitoring methodology ACM0002 (Version 12.1.0) - “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” /10/. The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

### **4.5.1 Parameters determined ex-ante**

The following parameters were determined *ex-ante* and will be kept fixed during the crediting period:

- $EF_{grid,BM,y}$ : Build Margin CO<sub>2</sub> emission factor, as described in the following section 4.6.

### **4.5.2 Parameters monitored ex-post**

The monitoring plan allows for collection and archiving of the following key parameters related to the determination of emission reductions resulting from the project activity:

- $EF_{grid,CM,y}$ : Combined margin CO<sub>2</sub> emission factor – monitored annually;
- $EF_{grid,OM,y}$ : Operating margin CO<sub>2</sub> emission factor – monitored annually;
- $EG_{m,y}$  and  $EG_{n,h}$ : Net electricity generated by the power plant m/n in hour h and year y – raw data recorded each 15 minutes, and consolidated hourly; data obtained from COES;
- $EG_{PJ,h}$ : Electricity displaced by the project activity in hour h – recorded hourly;
- $\eta_{m,y}$ : Average net energy conversion efficiency of power unit m in year y – monitored annually from COES annual statistics;
- $EG_{PJ,y}$ : Quantity of net electricity generation supplied by the project plant/unit to the grid in year y – recorded yearly;
- $EF_{CO2,i,y}$  and  $EF_{CO2,m,i,y}$ : CO<sub>2</sub> emission factor of fossil fuel type i used in power unit m in year y – monitored annually.

Details of data to be collected, frequency of data recording and data recording format are described in the PDD.

All data will be kept for two years after the end of the last crediting period.



### 4.5.3 Management system and quality assurance

Details of data to be collected, frequency of data recording and data recording format are described in the PDD and are in line with ACM0002 requirements.

The electricity meters have an accuracy of 0.2%, and they will be calibrated once every three years. DNV considers this frequency reasonable, since there is no PPA or local or national requirement on this, and in this case the project activity applies the “General Guidelines to SSC CDM methodologies” requirement.

All data will be kept for two years after the end of the last crediting period.

Detailed monitoring procedures, including responsibilities for project management, procedures for QA/QC of monitoring reports and calibration, have been developed in the PDD.

The monitoring plan contains all necessary parameters described in accordance with the monitoring methodology. The monitoring plan, including data management and QA/QC procedures, will give opportunity for real measurements of achieved emission reductions, which can hence be reported *ex post* and verified. The application of the monitoring methodology is transparent and DNV considers the project participants able to implement the monitoring plan.

## 4.6 Estimation of GHG emissions

The various algorithm/formulae for calculating baseline and project emissions have been transparently documented /3/ in line with the requirements of ACM0002 Version 12.1.0 and the “Tool to calculate the emission factor of an electricity system” (version 02.2.1) /12/.

Emission reductions are calculated as the product between the net electricity supplied to the Peruvian grid and the Peruvian grid emission factor, which will be updated annually. For the *ex-ante* estimation of emission reductions, the net electricity generated by Poechos I is expected to be 57 740 MWh per year, which corresponds to the same 43.36% expected plant load factor applied in the original PDD for the first crediting period /2/.

For the combined margin of the Peruvian grid emission factor calculation, the following documents were assessed by DNV:

- Review of COES monthly generation reports of the SEIN’s units /15/;
- Variable cost of generation plan /16/ in order to obtain dispatch merit order;
- Review of updated information with respect to Net Efficiency Conversions (NEC) from the most recent annual statistics by COES /19/.
- Data from the Integrated Companies effective and installed capacities /17/, and;
- Project hourly generation data /4/ to obtain the annual Dispatch Data Analysis Operating Margin Emission Factor (DDA-OM) according to ACM0002.

The grid emission factor of 2009, which was the most recent one at the time of the validation start, is considered. Operating margin emission factor will be calculated applying the dispatch data analysis, and is estimated to be 0.75579 tCO<sub>2</sub>/MWh. Build margin emission factor was calculated *ex-ante* to be 0.50665 tCO<sub>2</sub>/MWh. The grid emission factor coefficients were estimated as a combined margin applying the weights of 0.25 for OM and 0.75 for BM



according to the methodology ACM0002 with a value of 0.56893 tCO<sub>2</sub>e/MWh for the second crediting period, applying the most recent available statistics from COES /18/ and using the NECs from COES statistical reports /19/. DNV assessed the grid emission factor calculation /3/ and found it to be correct. Fuel emission factors were sourced from IPCC 2006 /11/ considering the lower 95% confidence interval. The emission reductions were correctly calculated using the net electricity export to the Peruvian grid.

Project emissions are not considered since the project activity is a new power plant that was implemented in an existing reservoir with no change in the reservoir volume /20/.

As per ACM0002 requirements leakage does not need to be considered.

The estimated amount of GHG emission reductions from the project is calculated to be 229 950 tCO<sub>2</sub>e over a 7 years crediting period, resulting in estimated average annual emission reductions of 32 850 tCO<sub>2</sub>e.

The emission reduction calculation were provided in a spreadsheet /3/, and it can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration. The data sources mentioned have been verified by DNV.

In summary, the GHG calculations are complete and transparent, and their accuracy has been verified. No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been found.

- o0o -

## APPENDIX A

---

### CDM VALIDATION PROTOCOL

**Table 1 Resolution of corrective action requests and clarification requests**

Corrective action and/ or clarification requests	Response by project participants	Validation conclusion
<b>CAR 1</b> The project proponent is requested to update the PDD to the latest methodology version at the start of the validation of the crediting period renewal.	The PDD has been updated.	The revised PDD /1/ correctly applies ACM0002 version 12.1.0.  Therefore this CAR is closed.
<b>CAR 2</b> Regarding the EF calculation: <ul style="list-style-type: none"> <li>- DNV requests the spreadsheet with OM calculation, as well as supporting data;</li> <li>- DNV requests the supporting data for BM calculation;</li> <li>- The PDD in page 12 says that six steps are applied for the EF calculation, but in fact those are seven steps;</li> <li>- The formula presented in PDD page 35 for <math>EF_{EL,m,y}</math> is not in line with the one presented in ACM0002.</li> </ul>	<p>The spreadsheet with the OM calculations is in document DDA-OM Poechos I 2009. The dispatch raw data of all power plants from the grid has been gotten from the web page of COES <a href="http://www.coes.org.pe/valorizacion/index.aspx?anio=2009">http://www.coes.org.pe/valorizacion/index.aspx?anio=2009</a>. Once there, select a month and click in “0 Valorizacion”. The data of that month is inside of the links “Medidores”. The dispatch data is recorded every 15 minutes by COES. For OM calculation project participant process data to become it in hourly basis. The method is by calculating the simple average of the four 15 minutes included in on hour.</p> <p>The NEC or net conversion efficiency of power plants connected to the grid has been gotten for the last annual statistics of COES which is year 2009. The values appeared in chart number 4.7 in column “Eficiencia Térmica”. The information is attached in document “Chart 4.7 Annual statistics</p>	For the combined margin of the Peruvian grid emission factor calculation, the following documents were assessed by DNV: <ul style="list-style-type: none"> <li>- Review of COES monthly generation reports of the SEIN’s units /15/;</li> <li>- Variable cost of generation plan /16/ in order to obtain dispatch merit order;</li> <li>- Review of updated information with respect to Net Efficiency Conversions (NEC) from the most recent annual statistics by COES /19/.</li> <li>- Data from the Integrated Companies effective and installed capacities /17/, and;</li> <li>- Project hourly generation data /4/ to obtain the annual Dispatch Data Analysis Operating Margin</li> </ul>



Corrective action and/ or clarification requests	Response by project participants	Validation conclusion
	<p>COES 2009” and available in the web page of COES</p> <p><a href="http://www.coes.org.pe/wcoes/coes/estadistica/estadannual.aspx">http://www.coes.org.pe/wcoes/coes/estadistica/estadannual.aspx</a></p> <p>The merit order is public available in the annual statistics of COES. For year 2009, the variable cost of thermal plants from the SEIN in effect at 2009 is used. This data is represented in the annual statistics also in chart number 4.7 in the last column.</p> <p>The calculation of the BM is in the spread sheet Poechos I BM2 December 2009. In this spread sheet is included all the sources of information from where the data was taken. This data comes from the annual statistics of COES. The last one was issued in year 2010 and corresponds to the annual statistics of year 2009. The value of the BM emission factor has been changed slightly since the emission factors of the plants were wrong. They have reviewed and checked according the emission factors calculated in workbook 0 of the spread sheet “DDA-OM Poechos I 2009”</p> <p>The PDD has been corrected. Now says 7 steps</p>	<p>Emission Factor (DDA-OM) according to ACM0002.</p> <p>The emission reductions were correctly calculated using the net electricity export to the Peruvian grid. The grid emission factor coefficients were estimated as a combined margin according to the methodology ACM0002 with a value of 0.56893 tCO<sub>2</sub>e/MWh for the second crediting period, applying the most recent available statistics from COES /18/ and using the NECs from COES statistical reports /19/. DNV assessed the grid emission factor calculation /3/ and found it to be correct.</p>

Corrective action and/ or clarification requests	Response by project participants	Validation conclusion
	The formula presented in PDD page 35 for EFEL,m,y has been corrected accordingly to the latest's approved version of the Tool to calculate the emission factor for an electricity system which is number 2 .	
<b>CL 1</b> In line with the Guidelines for Completing PDD, section A.2 should describe the view of the project participants on the contribution of the project activity to sustainable development.	Now, it is included in the PDD in section A.2.	The revised PDD /1/ correctly complies with the Guidelines for Completing PDD /14/.  Therefore this CL is closed.
<b>CL 2</b> DNV requests evidence that the project activity was implemented in an existing reservoir and that its volume was not increased, as well as the reservoir area.	The reservoir was built as part of a large irrigation project, called Irrigation project Chira Piura. The reservoir construction was started in year 1971 and was commissioned in year 1976. The irrigation project construction continued in two phases more, but no one them changed the initial characteristics of the Poechos reservoir. Moreover, as sediments have been accumulated since the commissioning of the reservoir, the capacity of reservoir has been decreased. The project started operation in year 2004; therefore it was implemented in an existing reservoir built 28 years before. The evidence of this is in the web page of the entity in charge of the investment management of the irrigation project Chira – Piura. The name of the	The Chira-Piura project webpage /20/, confirms that the project was implemented in an existing reservoir.  Therefore this CL is closed.

Corrective action and/ or clarification requests	Response by project participants	Validation conclusion
	<p>entity is “Proyecto Especial Chira Piura”. . The web page is <a href="http://www.chirapiura.gob.pe/principal.php">http://www.chirapiura.gob.pe/principal.php</a> , Click in “Nuestra Empresa” and then click in “Nuestra Historia” to see the details of the development of the project.</p>	
<p><b>CL 3</b> DNV requests an evidence that confirms that changes in the Electric Concession Law did not affect the baseline.</p>	<p>The Electric Concession Law still rules all activities relating to the generation, transmission and distribution of electric energy. This Law appears in the web Page of the Ministry of Energy and Mines as the first law for the general regulatory framework for the electric sector in Peru. <a href="http://www.minem.gob.pe/descripcion.php?idSector=6&amp;idTitular=440&amp;idMenu=sub114&amp;idCateg=274">http://www.minem.gob.pe/descripcion.php?idSector=6&amp;idTitular=440&amp;idMenu=sub114&amp;idCateg=274</a>.</p> <p>The Changes in the law have been few and has not affected the baseline. As it described in the PDD, the changes would not prevent any of the alternatives. The most important changes are for the need of EIA. Now projects over 20 MW need EIA to get electric concession, before it was over 10MW. The impact is that now is a little easier apply for a concession for both, thermal and hydro plants.</p> <p>Moreover, the grid system including the market conditions as well as the dispatch system remains the same; therefore, the</p>	<p>DNV could confirm that the changes in the Electric Concession Law /21/ did not affect the baseline.</p> <p>Therefore this CL is closed.</p>

Corrective action and/ or clarification requests	Response by project participants	Validation conclusion
	<p>application conditions in Peru for applying to ACM0002 remains the same. The evidence is the original Concession Law versus the latest version of the Law. In document “Electric Concession Law Original.doc” appears the original concession Law and its changes until year 2007. In document “Electric Concession Law updated to May 2010” appears the last version of the Law.</p> <p>A comparative description of the changes made in the articles of the Electric Concession Law are provided as part of the analysis in section B.4. of the PDD, under step 1.1 of the Application of the Tool to assess the validity of the original/current baseline</p>	
<b>CL 4</b> Since the parameters $EF_{CO2,i,y}$ and $EF_{CO2,m,i,y}$ will be monitored, they should not be described in PDD section B.6.2.	Ok, now it has been deleted from section B.6.2 of the PDD and has been added to section B.7.1, which is to be monitored.	The revised PDD /1/ correctly describes the parameters monitored and the ones that are fixed <i>ex-ante</i> .  Therefore this CL is closed.
<b>CL 5</b> The project proponent is requested to present in the PDD a single line diagram of the power plant showing the position of the meter(s).	Ok. It was included in the PDD in Annex 4.	The revised PDD /1/ presents the diagram showing the meters position.  Therefore this CL is closed.
<b>CL 6</b> The project proponent is requested to present an	Email to the UNFCCC Secretariat has been forwarded to DNV.	DNV could confirm that UNFCCC Secretariat was informed on 22 September 2010 about the intention to renew the



Corrective action and/ or clarification requests	Response by project participants	Validation conclusion
evidence that the UNFCCC secretariat was notified on its intention to renew the project activity crediting period.		project activity crediting period /5/, therefore more than 6 months on the first crediting period end date.  Therefore this CL is closed.

**Table 3 Forward action requests**

Forward action request	Response by project participants
<i>No FAR was issued.</i>	

- o0o -

## **APPENDIX B**

---

### **CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS**

## ***Felipe Lacerda Antunes***

**Felipe Lacerda Antunes** holds a Master's Degree in Production Engineering (Quality) and a Post Graduate Diploma in Environmental Management and Industrial Waste Management and Treatment. Possesses an International experience of more than 10 years in the field of quality and environmental auditing, working two years as the responsible of the QMS of Rede Metrológica RS and since 1999 as a QMS and EMS auditor in DNV.

He has experience of more than 4 years in validation and verification of numerous CDM projects in DNV, both in South America and abroad. He has also been actively involved in Management System Audits such as ISO 9001, ISO 14001 and OHSAS 18001 standards in various industrial sectors for more than 10 years in DNV.

His qualification and experience in CDM demonstrate him sufficient sectoral competence in energy generation from renewable energy sources, waste handling and disposal, and animal waste management.

## ***Gaurav Srivastava***

CDM Validator/Verifier, DNV Bangalore, India holds a Master's Degree in Energy Systems. His educational qualification covers the fields of sustainable development, power plant technology, renewable energy technology, performance of thermal & electrical utilities and project financing. He has completed ISO 14001:2004 - Environmental Management System Auditor / Lead Auditor Program, certified by IRCA.

He has experience of around 4 years in validation and verification of numerous CDM projects in DNV, both in India & abroad. His qualification, training and experience in CDM demonstrate his sufficient sectoral competence in energy generation from renewable energy sources.