



VERIFICATION / CERTIFICATION REPORT

POECHOS I PROJECT IN PERU

(UNFCCC Registration Ref. No. 0086)

Verification Period:
01 April 2006 to 31 March 2007

REPORT No. 2007-0927

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DET NORSKE VERITAS



VERIFICATION / CERTIFICATION REPORT

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DET NORSKE VERITAS
CERTIFICATION AS

Veritasveien 1
N-1322 Høvik
Norway
<http://www.dnv.com>

Summary:

Det Norske Veritas Certification AS (DNV) has performed a verification of the emission reductions reported from the "Poechos I Project" in Peru (UNFCCC Registration Ref. No. 0086) for the period of 01 April 2006 to 31 March 2007.

In our opinion, the GHG emission reductions reported for the project in the revised monitoring report version 03 dated 9 October 2007 for the period from 01 April 2006 to 31 March 2007 /1/ are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved monitoring methodology ACM0002 Version 02 /13/ and the monitoring plan and formulas given in the Project Design Document of July 2005 /2/.

Det Norske Veritas Certification AS is able to certify that the emission reductions from the "Poechos I Project" reported during the period from 01 April 2006 to 31 March 2007 amount to 30 612 tonnes of CO₂ equivalent.

Report No.: 2007-0927	Subject Group: Environment	
Report title: Poechos I Project in Peru		
Work carried out by: Alfonso Capuchino, Simon Dawes		
Work verified by: Einar Telnes		
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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 ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DDA-OM	Dispatch Data Analysis Operating Margin Emission Factor
DNV	Det Norske Veritas
DNA	Designated National Authority
ENOSA	Electro Noroeste, S.A. (The project final client)
ERU	Emission Reduction Units(s)
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
NCDMF	Netherlands Clean Development Mechanism Facility
NEC	Net Efficiency Conversion
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
SEIN	Sistema Eléctrico Interconectado Nacional
SINERSA	Sindicato Energético, S.A.
UNFCCC	United Nations Framework Convention for Climate Change
GWP	Global Warming Potential



1 INTRODUCTION

1.1 Objective

The World Bank, on behalf of the Netherlands Clean Development Mechanism Facility (NDCMF), has commissioned Det Norske Veritas Certification AS (DNV) to carry out verification and certification of emission reductions reported for the “Poechos I Project” (the project) for the period 01 April 2006 to 31 March 2007. This report contains the findings from the verification and a certification statement for the certified emission reductions.

1.2 Scope

The verification scope is:

- to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan,
- to evaluate the GHG emission reduction data and express a conclusion with a high level of assurance about whether the reported GHG emission reduction data is free from material misstatement,
- to verify that the reported GHG emission data is sufficiently supported by evidence.
- to verify that findings from the prior verification had been considered and properly closed.

1.3 Description of the Project Activity

Project Parties:	Republic of Peru and the Netherlands;
Title of project activity:	Poechos I Project
UNFCCC registration No:	0086
Project Entity:	SINERSA and Netherlands Clean Development Mechanism Facility (NCDMF). The International Bank for Reconstruction and Development (World Bank) act as the trustee for the Netherlands
Location of the project activity:	Lancones District, Sullana Province, Department of Piura, Republic of Perú
Project's crediting period:	1 April 2004 to 31 March 2011 (renewable)
Verification period:	01 April 2006 to 31 March 2007
Project's actual starting date:	1 April 2004 (Beginning of commercial activities).

The project consists of a 15.2 MW hydroelectric power plant 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 45m³/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. The project is operated by Sindicato Energético, S.A. (SINERSA).

The project's emission reductions are determined by multiplying the amount of net electricity generated by the project with a *ex-post* grid emission coefficient of 0.52942 tCO₂e per MWh for the period of 01 April 2006 to 31 March 2007. According to the validated project design, there are no project emissions and leakage effects associated with the project.

2 METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

i) For calculation of the combined margin for the Peruvian grid calculated *ex-post* according to ACM0002:

- Review of COES monthly generation reports of the SEIN's units /3/;
- Variable cost of generation plan /4/ 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 /12/.
- Data from the Integrated Companies effective and installed capacities /5/ and
- Project hourly generation data /7/ to obtain the annual Dispatch Data Analysis Operating Margin Emission Factor (DDA-OM) according to ACM0002.

ii) For verification of the project's real generation:

- Verification of project hourly generation reports /7/ crosschecked with SINERSA receipts of sales to ENOSA (Final Client) /6/ and with ENOSA confirmation letter of energy received /9/.

iii) Compliance of the Sustainable Development Monitoring Plan (SDMP):

- Verification that applied initiatives correspond to the defined ones in the Project Design Document and that selected indicators are close related to the defined initiatives.
- Physically assessed and/or documented demonstrable of all proposed actions carried on during the reporting period and described in the monitoring report.

Verification team

Alfonso Capuchino	DNV Mexico	GHG Verifier / Team Leader
Simon Dawes	DNV Sydney	Sector Expert
Einar Telnes	DNV Norway	Technical Reviewer

Duration of verification

Preparations: *From 09 June to 11 June 2007*

On-site verification: *12-13 June 2007*



Reporting: *20 June 2007 –25 July, 2007 and 10 October 2007 - 21 December 2007*

2.1 Review of Documentation

DNV assessed the monitoring report /1/ (version of 1 June 2007, version of 14 June 2007 and version 3 dated 9 October 2007), COES information that includes SEIN's units monthly generation report /3/; variable cost of generation plants to obtain the merit order /4/; SEIN's integrated companies effective and installed capacities /6/; SINERSA electricity generation invoices /6/; daily generation reports /7/; ENOSA confirmation of received energy /8/ and the Poechos I DDA-OM worksheets /9/. In addition, the project's Project Design Document (PDD) /2/, in particular the monitoring plan contained in the PDD, and the project's previews verification report /10/was reviewed.

The monitoring report of 1 June 2007 was made publicly available on the CDM website in June 2007, prior to the site visit.

During the site visit supporting documents for the DDA-OM and project generation were requested which were correctly delivered and adequately matched with the COES information downloaded from their web page /11/. DNV also verified the source of the NEC reported for 2006 /12/.

2.2 Site Visits

On 12-13 June 2007, DNV carried out a site visit to the "Poechos I Project" site. During this site visit, DNV verified that the actual implementation of the project was as described in the PDD /2/. This included in particular the verification of the actual nameplate capacity of the generation equipment as well as calibration of generation metering.

Evidence for the reported net generation of electricity was verified, i.e. the electricity supplied to the grid minus the electricity consumption (electricity imported from the grid when the turbine was not in operation). Finally, the sustainable development indicators were reviewed.

2.3 Assessment

The verification of reported data was carried out by means of:

- i Assessing of DDA-OM data sheets against COES reports downloaded from COES web page (<http://www.coes.org.pe/coes2/estadistica/anual/2006/anual.htm>), against the COES provided information and SINERSA generation reports in order to confirm period emission factors.
- ii Crosschecking of project generation reports against sales receipts to ENOSA against data described in the monitoring report.
- iii Crosschecking the project generation against ENOSA confirmation letter.
- iii determination of the GHG emissions reductions as defined in the monitoring report by assessment of all received data.
- iv Verifying the effectiveness of the project's data quality assurance and control system.

2.4 Reporting of Findings

The objective of this phase of the verification is to resolve the requests for clarification and any other outstanding issues which needed to be clarified for DNV's positive conclusion on the GHG emission reduction calculation. The clarification requests, raised by DNV were resolved during later communication with the project participants.



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Findings established during the first periodic verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified. Corrective action requests (CAR) are issued, where:

- i) there is a clear deviation concerning the implementation of the project as defined by the PDD;
- ii) requirements set by the MP or qualifications in a validation opinion have not been met; or
- iii) there is a risk that the project would not be able to deliver (high quality) CERs.

Forward action requests (FAR) are issued, where:

- iv) the actual status requires a special focus on this item for the next consecutive verification, or
- v) an adjustment of the MP is recommended.
- vi) additional information is needed to fully clarify an issue.

3 VERIFICATION FINDINGS

3.1 Remaining Issues, CARs, FARs from Previous Validation or Verification

The former Verification/Certification Report /10/ included one open forward action request.

Finding No.	Description of the finding	Summary of how findings have been addressed by Project Participant	Assessment of how findings have been addressed
FAR 1	Sustainable Indicators were evaluated but was found that evidence to demonstrate all of the actions done were not accessible in a demonstrable manner. In future verification SINERSA most ensure to have evidence of such indicators in a demonstrable manner	Send clarification respect to the actions done and ensure that in further verifications evidence be available	<p>During the site visit DNV assessed the sustainable indicators from the first and second period. Information was identified as correct.</p> <p>Second Verification period information is provided in an accurate and transparent manner in a way that is feasible to corroborate and confirm.</p> <p>This FAR is considered closed.</p>

3.2 Project Implementation

Generation by the “Poechos I Project” is based on conventional Kaplan turbines (2) and generators (2) each of 9.5 MVA nominal capacity manufactured and installed by Alstom Do Brazil, which was verified to be consistent with the capacity given in the PDD /2/.

The water is discharged into a trail race channel (capacity 45 m³/s) connected to the existing energy dissipater of the bottom outlet and hence is fed back into the irrigation system. The



control building is installed adjacent to the powerhouse. The control room is equipped with a system for automatic and remote control (SCADA).

The project contains a 60 kV open-air switchyard with one main transformer of 29 MVA capacity which supplies electricity to the SEIN through a new 60kV overhead transmission line of 38 km of length to the Sullana Substation, which belongs to Electronoroeste, S.A. (ENOSA).

Project generation is measured by monthly reviews between ENOSA and SINERSA from the SINERSA invoicing meter. Both entities calculate the monthly valorization and send each other data for approval.

The system is running stable as could be confirmed during the site visit. 57 822 MWh were dispatched to the grid during the monitoring period in question according to generation reports from COES and generation receipts from SINERSA.

3.3 Completeness of Monitoring

The validated monitoring plan based on the monitoring methodology ACM0002 includes a description of the data required to present the project generation in a transparent manner. All required data was available.

Merit order calculation was delivered in a clear manner and a calculation procedure is included in the monitoring report.

The monitoring report defines a sustainable development monitoring plan, which includes the following initiatives and related indicators:

- Improvement of soil quality: Number of new trees within the concession area.
- Responsibility: Number of education programs for local population (energy saving).
- Improvement of education standards: Scholarships granted for education of the local population
- Improvement of economic conditions: a) Number of workers hired from the local population; b) Purchases from local suppliers; c) Population has gained access to the electric power system as a result of the project construction activities

With respect to the sustainable development indicators the evidence was provided in a clear and transparent manner. The initiative related to education programs for the local population has not been accomplished, according to information from ENOSA during the initial stage of the new distribution system operation. In order to not cancel this kind of initiatives it is recommended that the project participants identify other means of contribution to the local population as there are other environmental needs in the area.

As a new initiative SINERSA has decided, together with ENOSA, to propose a program of financial support for potential energy users of PSE Sullana. This consists in forming a support fund to be used as a credit for potential local energy users and as such provide conditions for accelerated incorporation. This agreement is under review by the local authorities and will be verified during the next verification.



3.4 Accuracy of Emission Reduction Calculations

The first emission factor spreadsheet delivered for verification contained a mistake related to the project generation, which affected the calculation of the operating margin and consequently the combined margin. Corrections were requested in the form of CAR 1.

Subsequently the project participants' delivered a corrected version of the emission factor calculation, which was assessed against the validated information. This demonstrated that the CO₂ emission reductions were correctly calculated using the net electricity export to the Peruvian grid. The grid CO₂ coefficient was calculated *ex-post* as a combined margin according to the methodology ACM0002 with a value of 0.52942 tCO₂e per MWh for the combined margin, applying the most recent available statistics from COES /11/ and /12/. The COES 2006 statistical report was published only after the submission of the first version of the monitoring report. Nonetheless, the revised monitoring report (version 3) includes an updated determination of the operating margin, build margin emission coefficients using the NECs in the COES 2006 statistical report.

3.5 Quality of Evidence to Determine Emission Reductions

After the delivery of a correct version of the emission factor calculation the project participants demonstrated that emission reductions were calculated in an accurate and transparent manner.

During the period of 01 April 2006 to 31 March 2007 the net amount of electricity was of 57 822 MWh. thus the claimed emission reductions of 30 612 tCO₂e reported for the period 01 April 2006 to 31 March 2007 was verified by reviewing and crosschecking all delivered information.

3.6 Management System and Quality Assurance

Data was collected according to well defined data collection procedures:

- i) Data of electricity exported is automatically registered on a daily basis;
- ii) The "Poehos I Project" responsible on charge analyses (daily) the amount of electricity exported.
- iii) On the first week of every month, SINERSA and ENOSA download metering logs, and both parties review and approve the generation logs.
- iv) Sales receipts are issued using the approved generation log records.

As the monitoring and reporting of electricity data is in accordance with well established operational procedures, no documented instructions were requested and reviewed. The site visit at the Poehos I Project confirmed that monitoring and reporting is carried out consistently and records are kept in a secure and consistent manner.

Finally, evidence for the reported net generation of electricity was verified, i.e. the electricity supplied to the grid minus the electricity consumption. The metering used record all generated electricity and all consumed electricity from the grid (bidirectional). The electricity meter is locked to guarantee the integrity of the instrument. DNV was assessed that monthly generation described in the monitoring report includes deductions from grid consumption for Poehos own needs.

4 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments	Error/Discounted Uncertainty Tonnes
		Baseline Emissions	Project Emissions	Calculated Emission Reductions		
Completeness	<ul style="list-style-type: none"> Source coverage/ boundary definition 	✓	✓	✓	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.	None
Accuracy	<ul style="list-style-type: none"> Physical Measurement and Analysis 	✓	✓	✓	Metering initial calibration was performed in May 2003 but calibration periodicity defined by manufacturer is of 5 years. The instrument is working properly.	None
	<ul style="list-style-type: none"> Data calculations 	✓	CAR 1	✓	Project Participants delivers a clear spreadsheet but during data assessment was identified that Operating Margin and then after Combined Margin does not matches values described in the Monitoring Report. Reason was identified as an incorrect consideration of project generation that in some months does not include all generation hours and in other months included generation data does not matches at all.	None
	<ul style="list-style-type: none"> Data management & reporting 	✓	✓	✓	<ul style="list-style-type: none"> SINERSA monthly generation reports are consistent with the figures indicated in the monitoring report. ENOSA delivers a Generation confirmation letter which states received generation and this matches SINERSA generation records. Sustainable Indicators were assessed and found to be in compliance. Evidence demonstrates all action done. 	None
Consistency	<ul style="list-style-type: none"> Changes in the project 	✓	✓	✓	No changes in the project as defined in the PDD were identified.	None

4.1 Summary of periodic verification findings

Finding No.	Description of the finding	Summary of how findings have been addressed by Project Participant	Assessment of how findings have been addressed
<p>CAR 1</p>	<p>Project participants delivered a spreadsheet which includes Combined Margin calculations which does not matches the values declared in the Monitoring Report:</p> <p>Operating Margin: 0.68571 in report vs. 0.69213 in the approved and verified calculations; Combined Margin 0.51768 vs. 0.52089 this based in an incorrect project generation data application (not all hours of generation are included or incorrect generation data was included in calculations).</p>	<p>Providing Verifier with a correct Spreadsheet and a new Monitoring Report which includes a revision of the Project generation application.</p>	<p>The spreadsheet supplied was verified and concludes that generation data are included as reported by customer reports and meters readings.</p> <p>This CAR is considered closed.</p>



5 VERIFICATION STATEMENT

Introduction

Det Norske Veritas Certification AS (DNV) has been engaged by World Bank, on behalf of the Netherlands CDM Facility (NDCMF), to examine the greenhouse gas (GHG) emission reductions reported from the “Poechos I Project” (0086) for the period 01 April 2006 to 31 March 2007, equating to 30 612 tonnes of CO₂ equivalents.

Our opinion relates to the project’s GHG emissions and resulting GHG emissions reductions reported for the Period 01 April 2006 to 31 March 2007 and related to the validated and registered project baseline, and its associated documents. We express no opinion on the baseline methodology of the project nor on the Project Design Document nor on any projections regarding GHG emission performance. We express no opinion on applied emission factors published by the official and recognised sources in Peru.

Responsibilities of the “Poechos I Project” management and DNV Certification

The management of the “Poechos I Project” is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Monitoring and Verification Plan dated July 2005. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the “Poechos I Project”.

It is DNV’s responsibility to express an independent verification statement on the reported GHG emissions reductions from the project for the period 01 April 2006 to 31 March 2007 based on the reported emission reductions for the period 01 April 2006 to 31 March 2007 compared with the validated and approved baseline for the same period.

Basis of GHG verification opinion

Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, as well as those defined by the CDM Executive board.

Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Our examination includes assessment, on a test basis, of evidence relevant to the amounts and disclosures in relation to the project’s GHG emissions for the period 01 April 2006 to 31 March 2007.

We planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that the amount of calculated GHG emission reductions for the Period 01 April 2006 to 31 March 2007, prepared on the basis of the Monitoring and Verification Plan from July 2005, are fairly stated.

We conducted our verification having regard to the Project Design Document including the “Poechos I Project”’s Monitoring and Verification Plan from July 2005 and the applied baseline as registered for the project. This assessment included:

- *collection of evidence supporting the reported data*



- *checking whether the provisions of the Monitoring and Verification Plan from July 2005, were consistently and appropriately applied.*

We have verified whether the information included in the monitoring report dated 9 October, 2007 is correct and that the emissions reductions achieved have been determined correctly.

Opinion

In our opinion, GHG emissions reductions reported for the “Poechos I Project” for the period 01 April 2006 to 31 March 2007 in the monitoring report dated 9 October, 2007, are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the Project Design Document and the “Poechos I Project”’s Monitoring and Verification Plan. Det Norske Veritas Certification AS is able to certify that the emission reductions from the “Poechos I Project” for the period 01 April 2004 to 31 March 2006 amount to 30 612 tonnes CO₂ equivalent.

Mexico City and Oslo, 21 December 2007

Alfonso Capuchino
CDM Verifier
DNV Mexico City, Mexico

Michael Lehmann
Technical Director
DNV Oslo, Norway



REFERENCES

Documents provided by the Project Participants that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the periodic verification conclusions, and are usually further checked through interviews with key personnel.

- /1/ Poechos I Project: *Project Monitoring Report: 01 April 2006 to 31 March 2007* version of 01 June 2007, version of 14 June 2007 and version 3 dated 9 October 2007
- /2/ Project Design Document of the Poechos I Project. July 2005
- /3/ COES SEIN's units monthly Generation reports April 2006- March 2007
- /4/ COES Variable cost of generation plants April-December 2006; January-February 2007 and March 2007.
- /5/ COES-SINAC 2004 Integrated Companies effective and Installed capacities Delivered 22 March 2007
- /6/ SINERSA electricity generation invoices April 2006- March 2007
- /7/ SINERSA daily generation reports April 2006- March 2007
- /8/ ENOSA Confirmation letter of energy received May 2007
- /9/ Poechos DDA-OM worksheets version initial, version dated 17 April, 2007 and final version dated 09 October, 2007
- /10/ DNV Verification/Certification Report 2006-1637 dated 22 December, 2006.
- /11/ COES-SINAC 2006 Annual Operation Report April, 2007
- /12/ COES NEC 2006

Background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents have been used to cross-check project assumptions and confirm the validity of information given in the Category 1 documents and in verification interviews.

- /13/ ACM0002 Ver.2 Consolidated methodology for grid-connected electricity generation from renewable sources
- /14/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): Validation and Verification Manual. <http://www.vvmanual.info>

Persons interviewed during the verification, or persons contributed with other information that are not included in the documents listed above.

- /15/ Redy Riso – SINERSA
- /16/ Branislav Zdravkovic- SINERSA