

**VALIDATION OF THE PROJECT:  
SHPS POÇO FUNDO AND PROVIDÊNCIA CDM PROJECT (JUN1133), BRAZIL**

**POÇO FUNDO ENERGIA S.A.  
(BRAZIL)**

**PROVIDÊNCIA ENERGIA S.A.  
(BRAZIL)**

**REPORT NO. CDMVA-13-004-3**

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# VALIDATION REPORT VVS



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## Summary:

ICONTEC performed the validation of the project: SHPs Poço Fundo And Providência CDM Project (Jun1133), Brazil on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

The proposed project activity under validation process is based upon methodology: ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version 15.0, as well as the methodological tool "Tool for the demonstration and assessment of additionality" version 07.0.0 and methodological tool "Tool to calculate the emission factor for an electricity system" version 04.0.

The project involves the development of two hydro power plants the ones take advantage from Preto River water flow. These hydro power plants are named: Poço Fundo SHP (located in Preto River, São José do Vale do Rio Preto, Rio de Janeiro State) featuring an installed capacity of 14.44MW with an estimated power density of 76 W/m<sup>2</sup>, and Providência SHP (located in Preto River Teresópolis, Rio de Janeiro State) featuring an installed capacity of 5.0MW with an estimated power density of 54.00 W/m<sup>2</sup>. The project aims to reduce emissions for a total of 219,212 tCO<sub>2</sub>e within the crediting period.

The main purpose of the project activity is to provide electric power to the National Interconnected System, displacing the thermal generation from fossil fuels present in the system with the generation of renewable energy. Providência facilities are going to be managed by PROVIDÊNCIA ENERGIA S.A. and Poço Fundo facilities are going to be managed by POÇO FUNDO ENERGIA S.A.

The validation process consisted of the three following phases: i) a desk review of the project design documents, ii) follow up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is the ICONTEC opinion that the project SHPs Poço Fundo and Providência CDM Project (JUN1133), Brazil, as described in the latest version of the project design document /58/, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 version 15.0 /2/. Hence, ICONTEC requests the registration of the project as CDM project activity.

Report No:	CDMVA-13-004-3	Subject Group:	1 - Energy Industries (renewable/non-renewable sources)	Indexing terms:
Report title: Validation of the Project: SHPs Poço Fundo and Providência Cdm Project (Jun1133), Brazil				Climate Change; Kyoto Protocol; Validation; Clean Development Mechanism

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This report should not be read without reference to the annex A, Validation Protocol.

## Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CERs	Certified emission reductions
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
GHG	Greenhouse Gases
I	Interview
ICONTEC	Colombian Institute of Technical Standards and Certification (Instituto Colombiano de Normas Técnicas y Certificación)
IPCC	Intergovernmental Panel on Climate Change
MoC	Modalities of Communication
MoV	Means of verification
MP	Monitoring Plan
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
VVS	CDM Validation and Verification Standard
SIN	Integrated National System (from Portuguese – Sistema Interligado Nacional)
CIMGC	Inter-Ministry Commission on Global Climate Change
ONS	National Electric System Operator (from Portuguese Operador Nacional do Sistema Elétrico)
ANEEL	Electricity Regulatory Agency (from Portuguese Agência Nacional de Energia Elétrica)
INEA	Rio de Janeiro state Environmental National Institute (from portuguese: Instituto Estadual do Ambiente)
OPE	Budget Standard Eletrobras (From Portuguese: Orçamento Padrão Eletrobrás)
FSR	Feasibility Study Report
MCTI	Ministry of Science, Technology and Innovation (From Portuguese Ministério da Ciência, Tecnologia e Inovação)
CCEE	Brazilian Electric Energy Commercialization Chamber
IRENA	International Renewable Energy Agency
SHPs	Small Hydropower Plants

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## 1. INTRODUCTION

Poço Fundo Energia S.A. and Providência Energia S.A. commissioned ICONTEC to perform the Validation of SHPs Poço Fundo and Providência CDM Project (Jun1133), Brazil (hereafter called “the project”).

This report summarizes the findings in the validation of the project, which was performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting

According to the documentation of the project activity, the project consists in developing two (2) new hydroelectric power plants, the ones take advantage of the Preto River water flow, this river is going to allow a total installed capacity of 14.44 MW to SHP Poço Fundo and 5.0 MW to SHP Providência. The main purpose of the project activity is to provide electric power to SIN displacing fossil fuel and thermal generation by renewable energy generation.

### 1.1. OBJECTIVE

The purpose of a validation is to secure the opinion of an independent third party in order to assess the project design: the project baseline, the monitoring plan, and compliance with relevant UNFCCC of the project. Host Party’s criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

### 1.2. SCOPE

The validation scope involves an independent and objective review to determine that the project design meets the following criteria:

- UNFCCC criteria: The Kyoto Protocol Article 12 criteria, modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by the CDM Executive Board, and
- Host Party criteria: National CDM requirements, including sustainable development priorities and potential specific requirements contained in, for example, the preliminary approval by the Designated National Authority or project agreements between involved parties.

ICONTEC carries out audits according to its ethics code and internal procedures for carrying out validation, verification and certification audits of CDM project activities, which, in turn, are based on the Validation and Verification Standard (VVS). Likewise, ICONTEC focuses on the identification of significant risks for CER generation, and verification of the mitigation during its audits.

The validation does not intend to provide any consulting for the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

### 1.3. GHG PROJECT DESCRIPTION

The GHG project activity is classified as a CDM project in Sectoral Scope 1: *Energy industries (renewable/non-renewable sources)* according to Sectoral Scopes List given by UNFCCC (available on the website: <http://cdm.unfccc.int/DOE/scopelst.pdf>), as well as verified by ICONTEC through documental review, on-site visitation and as described in the latest version of the PDD /58/.

The project activity consists of the construction of two new Hydropower Plants which their technical characteristics are presented as follows on table 1:

**Table1: Project activity description**

SHP	Installed Capacity (MW)	Water diversion from river	State	Power Density (W/m <sup>2</sup> )	Estimated Reservoir Area (Km <sup>2</sup> )	Assured Energy(MW)	City
<i>Poço Fundo</i>	14.44	Preto	Rio de Janeiro	76.00	0.19	7.2	São José do Vale do Rio Preto
<i>Providência</i>	5.0	Preto	Rio de Janeiro	54.00	0.0926	2.75	Teresópolis

A total of 19.44 MW will be the installed capacity of the project, taking into account the individual installed capacity of the two project sites as previously described.

ICONTEC verified through documental review of the FSRs of Poço Fundo /11/ and Providência /12/ described installed capacity and assured energy of the projects, cross-checking these figures against official documentation issued by ANEEL /7/, /8/, /9/, and /10/. Additionally, consistency of described values was confirmed on the latest version of the PDD /58/.

ICONTEC verified while performing the on-site visit that no civil works have been made, therefore the implementation of the project is focused on acquiring licences. Also, as it was confirmed through the on-site visit and interview, the project complies with the accuracy and completeness of the project description.

The project aims to generate renewable electricity power to be delivered to SIN and, in this way, to displace thermal generation from fossil fuels present in the system with the generation of renewable energy. Renewable electricity power generated will be delivered to SIN as described as follows:

**Table2: Connection of the project to SIN**

SHP	Substation	Distance (Km)
<i>Poço Fundo</i>	Ponte Nova	11
<i>Providência</i>	Ponte Nova	2

As part of the activities carried out during the on-site visit, the audit team visited the Ponte Nova substation, place where SHP Poço Fundo and SHP Providência are going to be connected to the grid. Additionally, the audit team reviewed the Grid Connection documentation /15/ and /16/.

The baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants or by the addition of new generation sources. The baseline of the proposed project activity is further validated in section 3.4 of this report.

It is expected an approximate of 219,212 tCO<sub>2</sub>e emitted to the atmosphere are going to be avoided over a period of 7 years from 01/01/2018 until 31/12/2024. The resulting emission reductions from the project activity are estimated in an average of 31,316 tCO<sub>2</sub>e per year /6/.

Methodology and applicable tools to the project activity under validation process are:

- ACM0002 version 15.0 /2/
- Tool for the demonstration and assessment of additionality version 07.0.0 /3/.
- Tool to calculate the emission factor for an electricity system version 04.0 /4/.

PP involved on the proposed project participants are:

- Poço Fundo Energia S.A. (BRAZIL)
- Providência Energia S.A. (BRAZIL)

Clarifications CL 2 and CL 3 were raised by the audit team in order to ask to PP to provide information enough on PDD /58/ and related to the characteristics of the project. PP correctly addressed these clarifications and added required information, reason why the validation team closed them all.

Finally, During the onsite visit it was verified by the audit team that the two proposed hydro power plants are developed by independent entities as verified through the approved assured energy documentation of SHP Poço Fundo /9/ and SHP Providência /10/.

## **2. METHODOLOGY**

The validation consists of the following three phases:

- i) A desk review of the project design documents
- ii) Follow up interviews with project stakeholders
- iii) Resolution of outstanding issues and the issuance of a final validation report and opinion.

As mentioned in clause 1.2 of this report ICONTEC, based on its ethics code and internal procedures, carries out validation, verification and certification audits of CDM project activities (which, in turn, are based on the validation and verification manual) focused on the identification of significant risks for CER generation and the verification of the contribution to climate change mitigation.

All documentation review during the validation process has been including in chapter 6: references.

The validation protocol resulting from the Validation SHPs Poço Fundo and Providência CDM Project (Jun1133), Brazil is enclosed in Annex A of this report.

Findings established during the validation can be seen as:

- A non-fulfilment of validation protocol criteria, or
- An identified risk to the fulfilment of the project objectives

The findings could take the form of a Corrective Action Request (CAR), Forward Action Request (FAR) or a Clarifications Request (CL).

Corrective action requests (CAR) are issued where:

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

A Forward Action Request is made to highlight issues related to project implementation that will require review during the next verification of the project activity.



A Clarification is required where information is insufficient, or not clear enough to establish whether a requirement is met.

## 2.1. FOLLOWUP INTERVIEWS

ICONTEC performed interviews with project stakeholders to confirm the selected information and to solve issues identified during the desk review. The main topics of the interview are summarized in Table 3.

**Table3: Follow up Interview**

DATE	PLACE	INTERVIEW DELEGATE	ORGANIZATION	INTERVIEW TOPICS
04/07/2013	RIO DE JANEIRO STATE  SÃO JOSÉ DO VALE DO RIO PRETO CITY	SERGIO CORREA PIMENTA	TECHNICAL DIRECTOS POÇO FUNDO PROVIDÊNCIA SHPs	APPROVAL, PARTICIPATION, PROJECT DESCRIPTION, BASELINE SCENARIO AND MONITORING METHODOLOGY, ADDITIONALITY, MONITORING PLAN, SUSTAINABLE DEVELOPMENT, LOCAL STAKEHOLDER CONSULTATION, ENVIRONMENTAL IMPACTS
		ARTHUR MORAES	CARBOTRADER ASSESSORIA E CONSULTORIA EM ENERGIA	
		ROGELIO CAPUSO	AGRICULTURE SECRETARY ( SÃO JOSÉ DO VALE DO RIO PRETO )	
		CARLOS BEZERIL	BIOLOGIST, POÇO FUNDO AND PROVIDÊNCIA SHPs	
		SONIA REGINA	LOCAL INHABITANT (SÃO JOSÉ DO VALE DO RIO PRETO)	LOCAL STAKEHOLDER CONSULTATION
		CECILIA PIRES COSTA	LOCAL INHABITANT (SÃO JOSÉ DO VALE DO RIO PRETO)	

The validation process employed standard auditing techniques and undertook necessary cross-checks and follow-up actions to ascertain the correctness of the information.

## 2.2. RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUESTS

Corrective action requests and clarification requests raised by ICONTEC were presented to the project participants and solved through communication and meetings between PROVIDÊNCIA ENERGIA S.A, POÇO FUNDO ENERGIA S.A. and the validation team.

To guarantee the transparency of the validation process, the concerns raised and the response provided by the project participants are documented in more detail in the validation protocol in Annex A.

Since modifications to the project design document were necessary in order to solve ICONTEC concerns, the client decided to review the PDD and re-submit a corrected version of the PDD /58/. After the period of public consultation (22/06/2013 to 21/07/2013) and after reviewing the latest version of the PDD /58/ ICONTEC issued this validation report and opinion.

## 2.3. INTERNAL QUALITY CONTROL

This report includes the validation findings that underwent a technical review before being submitted to the project participants.

The technical review and the quality control of the process was performed by an internal technical reviewer in accordance with ICONTEC internal procedures for carrying out validation, verification and certification audits of CDM project activities. The technical reviewers are qualified in accordance with ICONTEC professional qualification scheme for CDM validation and verification.

## 2.4. VALIDATION TEAM

The validation team consisted of the following personnel:

**Table 4: Validation Team**

ROLE/QUALIFICATION	LAST NAME	FIRST NAME	COUNTRY
Lead Auditor	Carrizales	Jacobo	Colombia
Technical Expert	Grisales	Cristian	Colombia
Auditor (in training)	N/A	N/A	N/A

The validation team is qualified in accordance with ICONTEC qualification scheme for CDM validation and verification.

## 3. VALIDATION FINDINGS

### 3.1. OVERVIEW

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Annex A.

### 3.2. GENERAL REQUIREMENTS

#### 3.2.1. APPROVAL AND AUTHORIZATION

The project participants of the project are:

- Poço Fundo Energia S.A.
- Providência Energia S.A .

According to CIMGC: "Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development" /17/

The voluntary participation and contribution to sustainable development was approved through a Letter from the Designated National Authority (CIMGC) after the revision and approval of the Validation Report.

The host country meets all participation requirements, and the Designated National Authority of the host country has approved the project with the letter of approval describing as follows:

**Table5: Approval Letter**

Date of issue:	31 <sup>st</sup> of July 2014
Description:	The president of the Interministerial Commission on Global Climate Change, the Designated Authority for the Clean Development

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	<i>Mechanism of Brazil, under the Kyoto Protocol through of the letter of approval confirmed that the project contributes to the sustainable development of the country.</i>		
Supporting documentation	<i>File name: Carta Aprovação_poco_fundo.pdf File in Portuguese and English.</i>		
Date of ICONTEC reception	16 <sup>th</sup> of August 2014		
Entity that sent the letter to ICONTEC	Project participants	Directly from the DNA	
	X		
Means of validation employed to assess the authenticity	<i>The letter of approval was issued according with the procedures of the Interministerial Commission on Global Climate Change of the Brazilian DNA.</i>		
Additional specification (if it is applicable)		YES	NO
	PDD	X	version number
			3.2
ICONTEC Conclusion	<p><i>All parties involved have approved the project activity. The letters is authentic and valid for the proposed CDM project activity under validation. It confirms and it is unconditional with respect to:</i></p> <p><i>(a) The Party is a Party to the Kyoto Protocol;</i></p> <p><i>(b) Participation is voluntary;</i></p> <p><i>(c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country;</i></p> <p><i>(d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration.</i></p>		

By the time the on-site visit was carried out the approval letter had not been issued yet by Brazilian DNA as described by CAR 4. Nevertheless, the LoA was issued once CIMGC approved the project. In addition PP updated the PDD version from version 3.2 /14/ to version 4 /58/ in order to use the most recent available template; accordingly the audit team verified that the latest version /58/ responds to a template change but, reliable contains same information and project description as version 3.2 /14/.

### 3.2.2. MODALITIES OF COMMUNICATION

According to paragraph 53 of the VVS, the validation team verified the corporate identity of focal points included in the MoC statement /18/. This was verified by carrying out a documental review of the legal constitution documents of Providência /19/ and Poço Fundo /20/ and contrasting signatures in MoC statement against the previous mentioned documentation.

The audit team raised CL 10 since by the time the desk review stage was carried out PP had not issued the MoC Document yet. Nevertheless, PP during on-site visit provided the MoC document properly signed and CL 10 was successfully closed. Besides, CL 12 was raised since version 1 of the PDD /1/, mentioned *Carbotrader Assessoria e Consultoria em Energia Eireli* as a PP; once erroneous information was corrected, the audit team closed the finding.

ICONTEC confirm that, Modalities of Communication Statement (Version 02.1) form, the latest version available /18/ was correctly completed.

### 3.3. PROJECT DESIGN

The project was developed using methodology ACM0002 version 15.0: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources". According to this methodology the project boundary is: "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to" /2/.

The validation team applied standard audit techniques while carrying out the on-site visit in order to determine correctness of the defined boundary. Since the two Hydro Power Plants are going to be connected to SIN /15/ /16/, ICONTEC is able to confirm that, identified boundary on section B.3 in PDD /58/ was correctly determined and is in accordance with methodology /2/.

Additionally, while carrying out the on-site visit the validation team could verify that, selected sources and GHG were correctly determined by PP.

In addition, technology used in the development of the enterprise involves the use of hydraulic potential of the Preto River for electricity generation by the gravitational energy of the water, which is used as well to move the turbine-generator systems, enabling the electricity generation. This is a source of clean and renewable energy that presents low environmental impacts. The total installed capacity will be 19.44 MW.

The project complies with the applicability criteria of the methodology as it was verified by ICONTEC, as follows:

**Table6: Methodology Applicability Conditions Analysis**

<b>Applicability condition</b>		<b>Means of validation</b>
<p><i>This methodology is applicable to grid-connected renewable power generation project activities that:</i></p> <p>a) <i>install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant);</i></p> <p>b) <i>involve a capacity addition;</i></p> <p>c) <i>involve a retrofit of (an) existing plant(s); or,</i></p> <p>d) <i>involve a replacement of (an) existing plant(s).</i></p>		<p><i>While carrying out the on-site visit, the audit team confirmed the project consists of brand new facilities in accordance with option a) of the methodology /2/.</i></p> <p><i>It was verified through review of documents such as feasibility studies /11/ /12/ and legal constitution of the enterprises /19/ /20/ as well as the actual visitation to the different project sites that, the project consist of the development of new power plants.</i></p>
<p><i>In case of hydro power plants:</i></p> <p>• <i>One of the following conditions must Apply</i></p>	<p><i>The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or;</i></p>	<p><i>Not applicable. During the on-site visit at the different project sites, the audit team confirmed that, there is not reservoir. Because of that, the designs of the project include the construction of a reservoir /11/ and /12/.</i></p>
	<p><i>The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir the project activity, as per the definitions given in the Project Emissions section, is greater than 4 W/m<sup>2</sup> after the implementation of the project activity; or</i></p>	<p><i>Not applicable. During the on-site visit at the different project sites, the audit team confirmed that, there is not reservoir. Because of that, the designs of the project include the construction of a reservoir /11/ /12/.</i></p>
	<p><i>The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the project emissions section, is greater than 4 W/m<sup>2</sup>.</i></p>	<p>The validation team verified the feasibility studies of the projects /11/ /12/, where it was established the area of the single reservoirs as follows:</p> <ul style="list-style-type: none"> <li>• Poço Fundo: 0.19 Km<sup>2</sup></li> <li>• Providência: 0.0926 Km<sup>2</sup></li> </ul> <p>Power density was also determined as:</p> <ul style="list-style-type: none"> <li>• Poço Fundo: 76 W/m<sup>2</sup></li> </ul>

- Providência: 54.00 W/m<sup>2</sup>

Since the power density is greater than 4 W/m<sup>2</sup>, applicability condition is met. Additionally the audit team verified information provided on the Environmental Impact Assessment /25/ and /26/. In this sense, since Previous environmental licence was granted for Poço Fundo /22/ and will be issued for Providência /24/ by the local authority (INEA) applicable legislation on the matters of reservoir areas were sorted.

In accordance with the project activity and applicable methodology /2/, emission sources are properly described in the latest version of the PDD /58/ in compliance with Guidelines for completing the project design document form (Version 01.0) and the “F-CDM-PDD - Project Design Document form, version 04.1”.

In the baseline scenario, the main emission source is CO<sub>2</sub> emission from electricity generation in fossil fuel fired power plants that is displaced due to the project activity. In the project activity scenario, there are no different emission sources since the power density of the two SHPs is greater than 10W/m<sup>2</sup> as pointed out on applicable methodology /2/.

ICONTEC assessed identified boundary and selected GHG sources, finding that were correctly justified in the latest version of the PDD /58/; these sources correctly describe the emission sources existing in the proposed project activity and are not expected to contribute more than 1% of the overall expected average annual emissions reductions.

The audit team raised CAR 1 and CL 1 asking PP to provide completeness and accuracy in information provided on the matters of intrinsic characteristics of the project; these findings were successfully closed once PP provided information as acquired and as complete as requested.

Additionally, the audit team considered necessary to raise CL 5 in order to clarify the actual methodological option used by PP when determining project emissions. Clarification was successfully closed once PP corrected erroneous reference.

ICONTEC concludes that the project description, as included in the latest version of the PDD /58/, is sufficiently complete and accurate as to meet CDM requirements.

### 3.4. BASELINE DETERMINATION

The baseline determination was developed by using methodology ACM0002 /2/. According to this methodology, the baseline is defined as the: “Electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generating sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system” /4/.

Baseline emissions are the product of the total electrical energy generated (EG<sub>BL,y</sub>), expressed as MW/h of electricity produced by the renewable generating unit multiplied by the grid emission factor (EF<sub>grid,CM,y</sub>). Alternatively, the emission factor (EF<sub>grid,CM,y</sub>) is officially calculated by the Brazilian DNA (MCTI and CIMGC) /27/, using the “Tool to calculate the emission factor for an electricity system” /4/, as a combined margin (CM). MCTI currently is calculating the monthly average operating margin emission factor and annually the average build margin emission factor.

The combined Margin integrates the operating margin (OM) and build margin (BM) factors, as indicated on MCTI website /28/ for the year 2012, which is the actual figure used by PP.

According to this information, figures determined for 2012 for  $EF_{grid,CM,y}$ ,  $EF_{grid,OM-DD,y}$  and  $EF_{grid,BM,y}$  /28/ are:

- $EF_{grid,CM,y}$ : 0.3593 tCO<sub>2</sub>e/MWh
- $EF_{grid,OM-DD,y}$ : 0.5176 tCO<sub>2</sub>e/MWh
- $EF_{grid,BM,y}$ : 0.2010 tCO<sub>2</sub>e/MWh

Taking into account the emission factor figures and energy generated by the project, the total baseline emissions in absence of the project activity will be 219,212 tCO<sub>2</sub>e during the 7 years of the crediting period, as indicated in Section B.6.4 of the latest version of the PDD /58/.

ICONTEC found that all information, assumptions and data used in the identification of the baseline scenario are relevant, appropriately justified, correctly quoted and interpreted, supported by evidence and able to be deemed reasonable.

According to the previous description, ICONTEC found that the project participant correctly applied selected methodology /2/ with respect to the baseline identification. The scenario selected reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity. All estimates of the baseline emissions can be replicated using data and parameter values provided in the latest version of the PDD /58/ and CERs calculation file /6/.

### 3.5. ADDITIONALITY

#### 3.5.1. PRIOR CONSIDERATION OF THE CDM

The start date of the project was identified as 01/01/2016, which is the date when PP forecasts the beginning of constructions of the two Hydropower plants. This date was defined by PP as the earliest event in the timeline implementation of the two Hydropower plants that can demonstrate implementation, construction or real action of the project activity. According to this date the project has a start date after 02 August 2008.

By means of raising CL 8 the audit team asked to PP to provide evidences on the matter of the start date of the project activity; this clarification was closed once PP provided the proposed timeline for the project activity /29/ and /30/, and also provided explanations on the latest version of the PDD /58/.

In this framework, ICONTEC verified the PP informed to the UNFCCC secretariat writing of the commencement of the project activity and of their intention to seek CDM status through the standardized form F-CDM-Prior Consideration (form available on the website: [http://cdm.unfccc.int/Reference/PDDs\\_Forms/Registration/reg\\_form05.pdf](http://cdm.unfccc.int/Reference/PDDs_Forms/Registration/reg_form05.pdf)) this communication is described as follows:

- PP notified to UNFCCC Secretariat of their intention to seek CDM status by means of communication of *prior consideration form* dated on 19/04/2013 /32/. On the other hand, PP notified as well UNFCCC through e-mail communication, sent on 19/04/2013 (together with the Form F-CDM-Prior consideration) and had an answer on 23/04/2013 by Mrs Janet Thompson confirming: “*project information has been published to the Prior Consideration of the CDM*” /31/.

In addition, UNFCCC secretariat maintains a publicly available list of notification of the project on the website:



- Prior consideration of the CDM on UN FCC website at:  
[https://cdm.unfccc.int/Projects/PriorCDM/notifications/index\\_html](https://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html)

Finally, the PDD was publically available for global stakeholder consultation:

- PDD version 1 /1/ was published for global stakeholder consultation during the period 22/06/2013 to 21/07/2013. ICONTEC verified on:  
<http://cdm.unfccc.int/Projects/Validation/DB/YQ23AR7H5LV3ADP91BF0JPEAEQFWGK/view.html>

These evidences indicate:

- a) Awareness of the CDM project prior to the project activity start and that benefits were decisive factors in proceeding with the project,
- b) Reliable evidence that indicates that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation, and
- c) CDM project activity complies with the requirements of the latest version of the Guidance on prior consideration of CDM /57/.

Hence, in accordance with the VVS paragraphs 106 and 107 of the VVS, the project activity complies with the requirements of prior consideration of the CDM. ICONTEC verified that, CDM benefits were considered necessary in the decision to undertake the project as a proposed project activity.

## 3.5.2. ADDITIONALITY ANALYSIS

Since methodology ACM0002 /2/ states that: *“The additionality of the project activity 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”*, indicated tool /3/ was used by PP in order to demonstrate the additionality of the project.

In the latest version of the PDD section B.5, PP addressed steps proposed by additionality tool version 07.0.0 /3/ as carefully assessed, verified and cross-checked by the audit team and as described as follows:

### **Step 0: Demonstration whether the proposed project activity is the first-of-its-kind**

On the latest version of the PDD section B.5, did not use this steep since the project activity is not the first of its kind in Brazil. The audit team agreed with this statement since the above mentioned assumption is in accordance with the tool /3/.

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

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

Given that applied methodology /2/ prescribes the baseline scenario, according to Paragraph 122 of the VVS analysis of alternatives is not required. Therefore, the validation team agrees with the

outcome resulting from this sub-step and the latest version of the PDD /58/, the one is in accordance with applicable tool /3/.

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

On sub-step 1b, section B.5 of the latest version of the PDD /58/, regulatory framework applicable to the project is established. According to PP the project complies with legal requirements since different entities granted licenses to the project activity as described as follows:

- Poço Fundo:
  - State of Pernambuco Board of Trade: Legal constitution certification /20/.
  - ANNEL: Dispatch 1914 dated on 04/05/2011 /33/, Authorizing Resolution 3004 issued on 12/07/2011 /7/ and Ordinance 29 dated on 01/08/2011 /9/ and.
  - INEA: Previous licence issued on 28/01/2011 /22/; Installation license request /23/. Finally, environmental impact assessment /25/.
- Providência:
  - State of Pernambuco Board of Trade: Legal constitution certification /19/.
  - ANNEL: Dispatch 541 dated on 04/02/2011 /8/. Authorizing Resolution has not been issued yet.
  - INEA: Previous license was asked to the environmental entity and has not been issued yet /24/. According to the Resolution CONAMA dated on 23/01/1986 /26/, since Providencia has an installed capacity lower than 10MW does not need to present an EIA

The audit team raised a CAR (CAR 6) related to the environmental licence of Providência; Since the Previous licence has not been issued yet by the environmental authority (INEA), PP provided evidence of requesting the licence /24/, therefore CAR 6 was successfully closed.

Once the documental review was carried out and documents were cross-checks against the original version, the validation team agreed with the outcome resulting from this sub-step and presented on the latest version of the PDD /58/, the one is in accordance with applicable tool /3/. The project complies with mandatory legal requirements.

**Step 2: Investment analysis:**

An investment analysis was performed in order to demonstrate that the project is not economically or financially feasible or attractive without the revenues from CERs.

On sub-step 2a, PP determined *Option III* form additionality tool /3/; since there are not project alternatives to be compared and the project itself generates economic benefits, the audit team agrees with the *Option III* as the option chosen.

On sub-step 2b, PP determined equity Internal Rate of Return (equity IRR) as financial indicator and the cost of equity ( $K_e$ ) as benchmark.

The validation team found these financial indicators to be suitable for the investment analysis and verified that PP applied selected options. Calculation of the cost of Equity is described as follows:

**Cost of Equity (Benchmark) determination:**

The cost of equity, understood as the minimum rate of return that a business organization offers to investors, was calculated as the sum of a Risk free rate ( $R_f$ ) plus and adjustment factor used to



reflect the risk of project ( $\beta$ ) multiplied on the United States risk premium with the Brazilian Equity Risk Premium.

The audit team verified that the cost of equity model used by PP corresponds with the Capital Asset Pricing Model (CAPM) suggested by the Guideline on the Assessment of Investment Analysis /34/. Also, it was verified that the  $K_e$  formula approach used by PP corresponds with the one suggested by Aswath Damodaran when is assumed that a company's exposure to country risk is similar to its exposure to other market risk /40/

According to the cost of equity calculation file /35/, calculation method used is described as follows:

$$K_e = (R_f - I_a) + [\text{Beta} * (\text{US Premium} + \text{Country ERP})]$$

Where:

- $K_e$  = Cost of equity;
- $R_f$  = Risk free rate ( $R_f$ );
- $I_a$  = Inflation Adjustment
- US Premium = United States risk premium;
- Country ERP = Brazilian Equity Risk Premium;
- $\beta$  = adjustment factor to reflect the risk of projects.

The DOE agrees that this methodology of calculation follows the recommendations to the calculation of the Cost of Equity presented in the "Guidelines on the assessment of investment analysis" (EB 62 Annex 5). Variables used for calculation and values are described as follows:

**Table 7: Cost of Equity variables Analysis.**

Variable	Definition	Value	Validation Analysis
$R_f$	Tax Free of Risk	5.64%	<p>The validation team verified figures used to determine the parameter, finding correctness in the period from 2003 and 2012 used to establish the average of return rates of American Bond (TBond) ; this information was verified on the website: <a href="http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histret.html">http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histret.html</a></p> <p>The audit team find reliable the value calculated for the period between 2003 and 2012, being this value: 5,64 %.</p>
$I_a$	Inflation adjustment	2.42%	<p>Figures reported for calculation cost of equity and inflation adjustment included, were verified against official source report of inflation on the websites: <a href="http://www.bcb.gov.br/Pec/metast/TabelaMetaseResultados.pdf">http://www.bcb.gov.br/Pec/metast/TabelaMetaseResultados.pdf</a> (Brazilian Inflation) and <a href="ftp://ftp.bls.gov/pub/special.requests/cpi/cpi.ai">ftp://ftp.bls.gov/pub/special.requests/cpi/cpi.ai</a>. (US inflation).</p> <p>As verified by the audit team the average inflation over the period from 2003 to 2012 is 2.42%, therefore the audit team agrees with figure presented by PP on cost of equity calculation file /35/.</p>
$\beta_i$	Levered $\beta$	2.155	$\beta_i^{\text{Desalavancado}} = \frac{\beta_i^{\text{Alavancado}}}{1 + \frac{D_i}{E_i}(1 - T)}$ <p>Calculation was based upon formula: . Validation team found formula applied and calculation method appropriated according to Aswath Damodaran: <a href="http://www.scielo.org.co/scielo.php?pid=S0121-68052012000200013&amp;script=sci_arttext">http://www.scielo.org.co/scielo.php?pid=S0121-68052012000200013&amp;script=sci_arttext</a></p> <p>In addition PP correctly applied this formula based upon a correct assumption for unlevered beta of 0,849 and a levelled beta of 2,155.</p> <p>The audit team verified that for Beta establishment the PP correctly used the Aswath Damodaran reference available for Brazilian Companies (average Betas from Electric - Generation Industry) by accessing next link: <a href="http://www.stern.nyu.edu/~adamodar/pc/archives/emergcompfirm06.xls">http://www.stern.nyu.edu/~adamodar/pc/archives/emergcompfirm06.xls</a>. By filtering the abovementioned link for Exchange Code: BZ and Industry: Electric</p>

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			<p>– Generation, verified the average value of unlevered beta = 0.849 (average for cells Y145, Y150, Y1517, Y2538 and Y9062).</p> <p>The calculation made was verified in the Cost of Equity file /35/, workbook “Beta SHP” and “Beta”; from this workbooks was extracted a value for beta of 2.155.</p>
<b>US Premium</b>	<b>US Premium</b>	5.8%	<p>The validation team assessed the value presented by PP on cost of equity calculation file /35/ and supported by Damodaran (<a href="http://www.stern.nyu.edu/~adamodar/pc/datasets/ctryprem.xls">http://www.stern.nyu.edu/~adamodar/pc/datasets/ctryprem.xls</a>). The team verified this value cross-checking the figure against information available on the website: <a href="http://www.stern.nyu.edu/~adamodar/pc/datasets/ctryprem.xls">http://www.stern.nyu.edu/~adamodar/pc/datasets/ctryprem.xls</a> and related to the 2012 risk premium report, and finding no differences between the two figures.</p> <p>For the abovementioned, ICONTEC considers reliable the value reported for US Premium as 5.8%.</p>
<b>Country ERP</b>	<b>Country ERP</b>	1.75%	<p>Country ERP value was verified on the website: <a href="http://www.stern.nyu.edu/~adamodar/pc/archives">http://www.stern.nyu.edu/~adamodar/pc/archives</a> file: ctrypremJune2012.xls 02-Jan-2013 11:12 284K</p> <p>Damodaran calculated the risk premium of Brazil for 2012 as 1,75%; this value matches the value applied by PP and therefore the validation team agrees with its application on formula to determine the cost of equity.</p>
<b>K<sub>e</sub></b>	<i>Cost of equity</i>	19.49%	<p>The validation team considered that, the cost of equity of 21.82% is suitable and reasonable as a benchmark to analyze the financial attractiveness of the project. This is based upon a correct calculation procedure and assumptions and formulae have also been correctly applied on calculation file /35/.</p>

The validation team considered that, calculations of Cost of Equity (Benchmark) are based upon methodologies generally accepted.

Variables used were validated and cross-checked through references given on table 7, the ones are publicly available and are as standard in the market, as appropriate, given that the project could be developed by an entity other than the project participant.

Also, the validation team confirms data used for benchmark calculations are valid at the investment decision time, 2013, of SHP Poço Fundo and SHP Providência Hydropower plants and also are adjusted to assumptions on cash flow calculation file /37/ /38/. Since the investment decision was taken on 2012, the audit team finds reasonable the identified analysis period of 2003 to 2012 on the calculation of the cost of equity, mainly after carry out a cross-checked of the values and assumptions made by PP.

The audit team considered necessary to raise CAR 5 in order to ask PP to adjust the assessment period for the parameter  $R_f$ , the one was originally assessed between 2002 and 2011. The actual assessment period is 2003 to 2012, therefore CAR 5 was closed. In addition, CL 4 was raised in order to ask PP to provide a steep by steep approach of the cost of equity calculation; CL 4 was closed once PP provided requested information on the latest version of the PDD /58/.

ICONTEC considers that a cost of equity of 19.49% is a suitable and reasonable benchmark to analyze the financial attractive of the CDM project.

### Equity IRR calculations:

The financial indicator, Equity IRR, was calculated by means of the finance model executed in the cash flow spread-sheets of Poço Fundo /37/ and Providência /38/.

Validation of parameters used in the investment analysis of Poço Fundo and Providência (by the time of the investment decision), as described in the latest version of the PDD and cash flow spread-sheets /37/ and /38/, is presented on tables 8 and 9 as follows:

Table8: Poço Fundo Investment Analysis Parameters

PARAMETER	VALUE	UNIT	VALIDATION ANALYSIS																								
Investment	69,564,515.18	R\$ - Real	<p>The audit team verified minutes from the <i>Poço Fundo Energia S.A.</i> held on 18/03/2013 /39/ where the investment value was confirmed and approved by the assembly.</p> <p>On the other hand, the audit team also verified the budget approved by <i>Eletrobras</i> /40/ and described as follows:</p> <table><thead><tr><th>Item</th><th>R\$</th></tr></thead><tbody><tr><td>Land Purchase</td><td>4.686.890,00</td></tr><tr><td>Structures and other improvements</td><td>6.005.059,66</td></tr><tr><td>Reservoir</td><td>23.198.327,50</td></tr><tr><td>Dams and Dykes</td><td>1.630.734,59</td></tr><tr><td>Pipelines</td><td>17.492.819,42</td></tr><tr><td>Turbines and Generators</td><td>10.875.000,00</td></tr><tr><td>Electrical Equipment Accessory</td><td>3.500.000,00</td></tr><tr><td>Miscellaneous Equipment Plant</td><td>1.115.000,00</td></tr><tr><td>Highway, Railway and Bridges</td><td>630.000,00</td></tr><tr><td>Others</td><td>430684,01</td></tr><tr><td><b>Total</b></td><td><b>69.564.515,18</b></td></tr></tbody></table> <p>According to this budget /40/, the actual calculated investment value was: R\$69,564,515.18 as correctly included by the PP in the cash flow calculation file /37/.</p> <p>In addition, the audit team calculated the price per MW installed of <i>Poço Fundo</i> as 4,817.48 R\$/kW (R\$ 69.564.515,18/ kW 14,440), an estimated of U\$ 2,583.1/kW (using an exchange rate of 1.865 as determined by <i>Eletrobras</i> by the time of the budget calculation /40/).</p> <p>The value of U\$ 2,583.1/kW was cross-checked against values reported on “Renewable Power Generation Costs in 2012, An Overview – IRENA-”/45/, page 43 figure 5.4; in this document the actual range of cost goes from 1000 U\$/kW to 3500 and the total investment cost is also within the recognized world range of investment costs reported by IRENA.</p> <p>Taking into account the considerations abovementioned, the audit team deemed reliable and conservative the investment cost reported for the project.</p>	Item	R\$	Land Purchase	4.686.890,00	Structures and other improvements	6.005.059,66	Reservoir	23.198.327,50	Dams and Dykes	1.630.734,59	Pipelines	17.492.819,42	Turbines and Generators	10.875.000,00	Electrical Equipment Accessory	3.500.000,00	Miscellaneous Equipment Plant	1.115.000,00	Highway, Railway and Bridges	630.000,00	Others	430684,01	<b>Total</b>	<b>69.564.515,18</b>
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Highway, Railway and Bridges	630.000,00																										
Others	430684,01																										
<b>Total</b>	<b>69.564.515,18</b>																										
Equity	20,869,354.55	R\$ - Real	<p>The audit team verified that equity value was officially approved by the <i>Poço Fundo Energia S.A</i> assembly; this was verified by reviewing the minutes from the meeting held on 18/03/2013 /39/: this minutes clearly state that: “...In this sense, Mr President informed of the necessity of approval of the investment proposal on R\$69,564,515.18 ... being 70%BNDES and 30% EQUITY the authorized value by the investors present ” (form portuguese: “<i>Nesse sentido o Senhor Presidente informou a necessidade de aprovação da proposta de investimento é previsto em R\$69,564,515.18 ... sendo 70%BNDES e 30% EQUITY o que foi aprovado pelos acionistas presntes</i>”) /39/.</p> <p>Taking into account minutes abovementioned, the audit team agrees with the equity used on cash flow calculation file.</p>																								
Debt	48,695,160.63	R\$ - Real	<p>The audit team verified that equity value was officially approved by the <i>Poço Fundo Energia S.A</i> assembly; this was verified by reviewing the minutes from the meeting held on 18/03/2013 /39/: this minutes clearly state that: “...In this sense, Mr President informed of the necessity of approval of the investment proposal on R\$69,564,515.18 ... being 70%BNDES and 30% EQUITY the authorized value by the investors present ” (form portuguese: “<i>Nesse sentido o Senhor Presidente informou a necessidade de aprovação da proposta de</i></p>																								

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			<p><i>investimento é previsto em R\$69,564,515.18 ... sendo 70%BNDDES e 30% EQUITY o que foi aprovado pelos acionistas presntes") [41].</i></p> <p>Taking into account minutes abovementioned, the audit team agrees with the equity used on cash flow calculation file.</p>
<b>Debt Interest</b>	8.50%	%	<p>The audit team verified inputs included in the Debt Interest Calculation as follows:</p> <p>TJLP = 5.50% (for 2012). Information cross-checked on the website: <a href="http://www.ceicdata.com/en/blog/brazil-foreign-investors-substitute-bonds-equities">http://www.ceicdata.com/en/blog/brazil-foreign-investors-substitute-bonds-equities</a></p> <p>BNDDES Fee for Generation + Risk Fee = 3% (0.9%: - Information cross-checked on the website: <a href="http://www.bndes.gov.br/SiteBNDDES/bndes/bndes_pt/Institucional/Apoio_Financieiro/Produtos/FINEM/energia_eletrica_geracao.html">www.bndes.gov.br/SiteBNDDES/bndes/bndes_pt/Institucional/Apoio_Financieiro/Produtos/FINEM/energia_eletrica_geracao.html</a> + 2.1% information verified on files /50/</p> <p>For the all abovementioned, The audit team deemed reliable and conservative the debt interest reported for the project.</p>
<b>Assured Energy</b>	7.20	MW/ h average	<p>The audit team verified FSR /11/ where it was determined the assured energy as 7.20 MW hourly average. Additionally, the audit team verified the ANEEL order N°29 /9/ where was authorized by ANEEL the value of 7.2 MW as the assured energy.</p> <p>Taking into account the abovementioned, the audit team deemed reliable and conservative the assured energy reported by PP on cash flow calculation file /37/.</p>
<b>Installed power</b>	14.44	MW	<p>The audit team verified this figure on ANEEL Resolution N° 3004 /7/. PP correctly used this value on cash flow file /37/.</p>
<b>Net Generated electricity per year</b>	63,072.0	MWh/ year	<p>The validation team verified calculation of the Annual Net Electricity Generation per year, being the result of assured energy calculated 7.20 MW multiplied by the 8,760 hours in a year:</p> <p>Net Generated Electricity per year = 7.20 MW x 8,760 hours/year Net Generated Electricity per year = 63,072 MWh/year.</p> <p>The validation team deemed the value reliable.</p>
<b>Energy Price</b>	135.00	R\$/MWh	<p>The validation team verified the value presented by PP cross-checking it against minutes from the meeting held on 18/03/2013 /39/. Additionally verified the energy price of other registered CDM projects, in Brazil as resumed as follows:</p> <ul style="list-style-type: none"> <li>• Jirau Hydro Power Plant: 134.00 R\$/MW (available on the website: <a href="http://cdm.unfccc.int/filestorage/4/v/6R4O8MVS92JU1AZDXFNB05YEGCP7I3.pdf/PDD%20Jirau%20V03.pdf?t=M3B8bXlXMGllfDA94nFyEWZqZpKWUysP7iNn">http://cdm.unfccc.int/filestorage/4/v/6R4O8MVS92JU1AZDXFNB05YEGCP7I3.pdf/PDD%20Jirau%20V03.pdf?t=M3B8bXlXMGllfDA94nFyEWZqZpKWUysP7iNn</a>)</li> <li>• Small Hydro Power Plants Santa Gabriela and Planalto: 133.00 R\$/MW (available on the website: <a href="http://cdm.unfccc.int/filestorage/u/c/K7BWIARXJ9DVMQP6GESTH0O2LF35ZN.pdf/9042%20PDD.pdf?t=Ukd8bXlXMGxgDC8nxl4sUiYsZA_YhL8XRr">http://cdm.unfccc.int/filestorage/u/c/K7BWIARXJ9DVMQP6GESTH0O2LF35ZN.pdf/9042%20PDD.pdf?t=Ukd8bXlXMGxgDC8nxl4sUiYsZA_YhL8XRr</a>)</li> <li>• Small Hydro Power Plants Quartel I, II and III CDM Project: 139.00 R\$/MW (available on the website: <a href="http://cdm.unfccc.int/filestorage/d/h/9X537UJIC8BSFNMZHK4TD2Q6R0VWPY.pdf/7685-20121227-PDD.pdf?t=b0F8bXlXMHdxDCV7FjFu5DRlqi8x68wMmjZ">http://cdm.unfccc.int/filestorage/d/h/9X537UJIC8BSFNMZHK4TD2Q6R0VWPY.pdf/7685-20121227-PDD.pdf?t=b0F8bXlXMHdxDCV7FjFu5DRlqi8x68wMmjZ</a>)</li> </ul> <p>The audit team, taking into account the abovementioned facts agrees with the Energy price used in the cash flow analysis /37/.</p>
<b>Cash Flow Period Considered</b>	20	years	<p>The audit team verified that PP correctly applied the "Clarification Applicability of the "Guidelines on the assessment of investment analysis" (available on the website: <a href="https://cdm.unfccc.int/filestorage/i/4/YZ9W23QKHPJTDECIX84GO7FUV10SNL.pdf/eb73_repan08.pdf?t=NWZ8bXlXMW92fDCCnjjjQKfWQ0AFdBLyxj1l">https://cdm.unfccc.int/filestorage/i/4/YZ9W23QKHPJTDECIX84GO7FUV10SNL.pdf/eb73_repan08.pdf?t=NWZ8bXlXMW92fDCCnjjjQKfWQ0AFdBLyxj1l</a>"); therefore agrees with the time span of the analysis.</p>

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			<p>Clarification states: "If project participants choose a renewable crediting period and if the technical lifetime of the CDM project activity is more than 20 years, the investment analysis shall be conducted for 20 years and include the fair value of the project activity assets at the end of the assessment period"</p> <p>The audit team deemed that the PP correctly applied the requested clarification.</p>
Amortization	16	years	<p>The audit team verified the established value by comparing it against information provided on the BNDES (National Bank of development), on table Total period (from Portuguese <i>Prazo Total</i>), on the website: <a href="http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoi_o_Financeiro/Produtos/FINEM/energia_eletrica_geracao.html">http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoi_o_Financeiro/Produtos/FINEM/energia_eletrica_geracao.html</a></p>
PIS - Social Contribution Program	0.65%	on gross revenue	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/PisPasepCofins/Reglncidencia.htm#Regime de incidência não-cumulativa">http://www.receita.fazenda.gov.br/PessoaJuridica/PisPasepCofins/Reglncidencia.htm#Regime de incidência não-cumulativa</a></p>
COFINS - Social Security Financing Transfers	3.00%	on gross revenue	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/PisPasepCofins/Reglncidencia.htm#Regime de incidência não-cumulativa">http://www.receita.fazenda.gov.br/PessoaJuridica/PisPasepCofins/Reglncidencia.htm#Regime de incidência não-cumulativa</a></p>
Base Value for the IR calculation	8.00%	on gross revenue	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/pessoajuridica/dipj/2000/orientacoes/determinacaolucropresumido.htm">http://www.receita.fazenda.gov.br/pessoajuridica/dipj/2000/orientacoes/determinacaolucropresumido.htm</a></p>
Base Value for the Social Contribution calculation	12.00%	on gross revenue	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/aliquotas/ContribCsl/ApuracaAnualIREcMensBascalcEst.htm">http://www.receita.fazenda.gov.br/aliquotas/ContribCsl/ApuracaAnualIREcMensBascalcEst.htm</a></p>
IR - Income Taxes	15%	on base value	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2000/Orientacoes/Determinacao2.htm#AI%C3%ADquota">http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2000/Orientacoes/Determinacao2.htm#AI%C3%ADquota</a></p>
CSLL - Social Contribution on Net Profit	9.00%	on base value	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr617a633.htm">http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr617a633.htm</a>, note 619.</p>
Additional IR	10%	on base value	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2000/Orientacoes/Determinacao2.htm#AI%C3%ADquota">http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2000/Orientacoes/Determinacao2.htm#AI%C3%ADquota</a></p>
Annual O&M, Insurance, Adm, Environm.	913,294	R\$	<p>The validation team cross-checked the estimated value reported by PP against the one suggested by IRENA (page 44, section 5.3 /45/), where is established that: "Annual O&amp;M costs are often quoted as a percentage of the investment cost per kW per year. The IEA assumes 2.2% to 3% for smaller projects".</p> <p>The validation team calculated the O&amp;M cost percentage over the total investment cost of <i>Poço Fundo</i>, obtaining a percentage of 1.31% (913,294 / 69,564,515.18) which is lower than reported by IRENA.</p> <p>Taking into account the abovementioned, the validation team deemed reliable and conservative the O&amp;M cost reported by PP.</p>
ANEEL - Fiscalization fee	27,967.97	R\$ / year	<p>The audit team verified correctness on application of the "Technical Note N° 11/2013-SRE/ANEEL" /43/ where is set the way to calculate the fiscalization fee. In this document is the reported formula (1) :</p> <p>TF ape/pie = 0,4% x (BETU x P) Where:</p> <ul style="list-style-type: none"> <li>- <b>TF ape/pie</b> = Annual value of fiscalization tax expressed in R\$;</li> <li>- <b>BETU</b> = Typical average value of annual benefit arising from the operation of power generation activity, applicable to mixers and Independent Power Producers, expressed in U.S. \$ / kW;</li> </ul>



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			<p>- <math>P</math> = Nominal power installed in commercial operation by December 31 of the previous year, pro rata, in kW;</p> <p>TF ape/pie = <math>0,4\% \cdot 484.21 \cdot 14,440</math>  TF ape/pie = 27,967.97</p> <p>The audit team found calculation procedure in accordance with applicable regulations and, therefore, agrees with figure used by PP on cash flow calculation file /37/.</p>
Distribution Use of System Charge - TUSD	2.92	R\$/KW	<p>The audit team verified this value by reviewing the table "V" (page 5) of the Annex I issued by ANEEL (available on the website: <a href="http://www.aneel.gov.br/cedoc/areh20131414_2.pdf">http://www.aneel.gov.br/cedoc/areh20131414_2.pdf</a>). This document states that the actual value of use of the system – TSDU, is 5.83 R\$/kW. Additionally, this value has to be 50% for Small Hydropower Plants, in accordance with ANEEL (information verified on the website: <a href="http://www.aneel.gov.br/aplicacoes/audiencia/arquivo/2011/039/documeto/documento_matriz_desconto_tust_tusd_v1.0.pdf">http://www.aneel.gov.br/aplicacoes/audiencia/arquivo/2011/039/documeto/documento_matriz_desconto_tust_tusd_v1.0.pdf</a>, page 1 paragraph 2)</p> <p>The audit team verified the calculation procedure findings correctness in its application, therefore agrees with figure used in the cash flow calculations /37/.</p>
MRE fee - Mecanismo de Realocação de Energia	8.75	R\$/MWh	<p>The audit team verified that reported value as the average value of the power plants enrolled in MRE since 2005 to 2008.</p> <ul style="list-style-type: none"> <li>- 2008: R\$ 7.77 <a href="http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/relatorio_anual_2008.pdf">http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/relatorio_anual_2008.pdf</a></li> <li>- 2009: R\$ 8.18 <a href="http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/relatorio_anual_2009_2.pdf">http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/relatorio_anual_2009_2.pdf</a></li> <li>- 2010: R\$ 9.245 <a href="http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/Relatorio_anual_2010_REV5.pdf">http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/Relatorio_anual_2010_REV5.pdf</a></li> <li>- 2011: R\$ 8.99 <a href="http://www.em.com.br/app/noticia/economia/2011/12/13/internas_economia,267232/aneel-reajusta-tarifa-atualizada-de-referencia.shtml">http://www.em.com.br/app/noticia/economia/2011/12/13/internas_economia,267232/aneel-reajusta-tarifa-atualizada-de-referencia.shtml</a></li> <li>- 2012: R\$ 9.58 <a href="http://www.em.com.br/app/noticia/economia/2011/12/13/internas_economia,267232/aneel-reajusta-tarifa-atualizada-de-referencia.shtml">http://www.em.com.br/app/noticia/economia/2011/12/13/internas_economia,267232/aneel-reajusta-tarifa-atualizada-de-referencia.shtml</a></li> </ul> <p>Average = R\$ 8.753</p> <p>Taking into account this values, the audit team agrees with the value determined by PP</p>
Comercialization Fee	2%	on gross revenue	<p>The audit team verified the applied value on the minute form meeting held on 18/03/2013 /39/, finding this assumption reasonable according to PP experience in commercialization of energy.</p>
Residual	60%	on total asset	<p>ICONTEC verified from the study "Lifetime and Depreciation Study for Turbines and Generators"/44/, volume 2, page 249. This document states that, for generators the average lifetime is 30 years; and taking into account a depreciation rate of 2% per year, for 20 years of analysis, the asset will get a residual value of 60% over its total cost.</p> <p>ICONTEC deemed reliable and conservative the reported residual value for the Project.</p>

**Table9: Providência Investment Analysis Parameters**

Parameter	Value	Unit	Validation Analysis
Investment	28.823.950,00	R\$ - Real	The audit team verified minutes from the <i>Providência Energia S.A.</i> held on 18/03/2013 /41/ where the investment value was confirmed and approved by the assembly.

			<p>On the other hand, the audit team also verified the budget approved by <i>Eletrobras /42/</i> and described as follows:</p> <table><thead><tr><th>Item</th><th>R\$</th></tr></thead><tbody><tr><td>Land Purchase</td><td>3,466,050.00</td></tr><tr><td>Structures and other improvements</td><td>1,745,460.00</td></tr><tr><td>Reservoir</td><td>8,430,760.00</td></tr><tr><td>Dams and Dykes</td><td>1,848,560.00</td></tr><tr><td>Outlet Water and Pipelines</td><td>5,939,960.00</td></tr><tr><td>Turbines and Generators</td><td>5,040,000.00</td></tr><tr><td>Electrical Equipment Accessory</td><td>1,207,500.00</td></tr><tr><td>Miscellaneous Equipment Plant</td><td>444,570.00</td></tr><tr><td>Highway, Railway and Bridges</td><td>189,000.00</td></tr><tr><td>Others</td><td>512,090.00</td></tr><tr><td><b>Total</b></td><td><b>28.823.950,00</b></td></tr></tbody></table> <p>According to this budget /42/, the actual calculated investment value was: R\$28,823,950.00 as correctly included by the PP in the cash flow calculation file /38/.</p> <p>In addition, the audit team calculated the price per MW installed of <i>Providência</i> as 5,764.79 R\$/kW (R\$ 28,823,950.00 / kW 5,000), an estimated of U\$ 3,202.6/kW (using an exchange rate of 1.80 as determined by <i>Eletrobras</i> by the time of the budget calculation /42/).</p> <p>The value of U\$ 3,202.6/kW was cross-checked against values reported on “Renewable Power Generation Costs in 2012, An Overview – IRENA-”/45/, page 43 figure 5.4; in this document the actual range of cost goes from 1000 U\$/kW to 3500 and the total investment cost is also within the recognized world range of investment costs reported by IRENA.</p> <p>Taking into account the considerations abovementioned, the audit team deemed reliable and conservative the investment cost reported for the project.</p>	Item	R\$	Land Purchase	3,466,050.00	Structures and other improvements	1,745,460.00	Reservoir	8,430,760.00	Dams and Dykes	1,848,560.00	Outlet Water and Pipelines	5,939,960.00	Turbines and Generators	5,040,000.00	Electrical Equipment Accessory	1,207,500.00	Miscellaneous Equipment Plant	444,570.00	Highway, Railway and Bridges	189,000.00	Others	512,090.00	<b>Total</b>	<b>28.823.950,00</b>
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<b>Total</b>	<b>28.823.950,00</b>																										
Equity	8.647.185,00	R\$ - Real	<p>The audit team verified that equity value was officially approved by the <i>Providência Energia S.A</i> assembly; this was verified by reviewing the minutes from the meeting held on 18/03/2013 /42/: this minutes clearly state that: “...In this sense, Mr President informed of the necessity of approval of the investment proposal for PCH <i>Providência</i> construction, which total investment value on R\$28,824,000.00 ... being 70%BNDES and 30% EQUITY the authorized value by the investors present ” (form portuguese: “...Nesse sentido o Senhor Presidente informou a necessidade de aprovação da proposta de investimento para a construção da PHC <i>Providência</i>, cujo valor total do investimento em R\$28,824,000.00 ... sendo 70%BNDES e 30% EQUITY o que foi aprovado pelos acionistas presntes...” ) /42/.</p> <p>Differences between the value approved on the minute and the actual value used for cash flow calculations is due to rounding of the authorized value by <i>Eletrobras /42/</i>. Nevertheless PP correctly used the approved value when calculating the cash flow.</p> <p>Taking into account minutes abovementioned, the audit team agrees with the equity used on cash flow calculation file.</p>																								
Debt	20.176.765,00	R\$ - Real	<p>The audit team verified that equity value was officially approved by the <i>Providência Energia S.A</i> assembly; this was verified by reviewing the minutes from the meeting held on 18/03/2013 /42/: this minutes clearly state that: “...In this sense, Mr President informed of the necessity of approval of the investment proposal for PCH <i>Providência</i> construction, which total investment value on R\$28,824,000.00 ... being 70%BNDES and 30% EQUITY the authorized value by the investors present ” (form portuguese: “...Nesse sentido o Senhor Presidente informou a necessidade de aprovação da proposta de investimento para a</p>																								

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			<p>construção da PHC Providência, cujo valor total do investimento em R\$28,824,000.00 ... sendo 70%BNDDES e 30% EQUITY o que foi aprovado pelos acionistas presentes..." /42/.</p> <p>Differences between the value approved on the minute and the actual value used for cash flow calculations is due to rounding of the authorized value by <i>Eletrabras</i> /42/. Nevertheless PP correctly used the approved value when calculating the cash flow.</p> <p>Taking into account minutes abovementioned, the audit team agrees with the equity used on cash flow calculation file.</p>
Debt Interest	8.50%	%	<p>The audit team verified inputs included in the Debt Interest Calculation as follows:</p> <p>TJLP = 5.50% (for 2012). Information cross-checked on the website: <a href="http://www.ceicdata.com/en/blog/brazil-foreign-investors-substitute-bonds-equities">http://www.ceicdata.com/en/blog/brazil-foreign-investors-substitute-bonds-equities</a></p> <p>BNDDES Fee for Generation + Risk Fee = 3% (0.9%: - Information cross-checked on the website: <a href="http://www.bndes.gov.br/SiteBNDDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/energia_eletrica_geracao.html">www.bndes.gov.br/SiteBNDDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/energia_eletrica_geracao.html</a> + 2.1% information verified on files /50/</p> <p>For the all abovementioned, The audit team deemed reliable and conservative the debt interest reported for the project..</p>
Assured Energy	2.75	MW average	<p>The audit team verified FSR /12/ where it was determined the assured energy as 2.75 MW average. Additionally, the audit team verified the minute from a meeting held on 18/03/2013 /10/ where it was confirmed by the <i>Providência</i> S.A assembly the value of 2.75 MW average as the assured energy of the project.</p> <p>Taking into account the abovementioned, the audit team deemed reliable and conservative the assured energy reported by PP on cash flow calculation file /38/.</p>
Installed power	5.00	MW	<p>The audit team verified this figure on ANEEL Order Nº 541 /8/. PP correctly used this value on cash flow file /38/.</p>
Net Generated electricity per year	24,090.0	MWh/year	<p>The validation team verified calculation of the Annual Net Electricity Generation per year, being the result of assured energy calculated 2.75 MW multiplied by the 8,760 hours in a year:</p> <p>Net Generated Electricity per year = 2.75 MW x 8,760 hours/year Net Generated Electricity per year = 24,090 MWh/year.</p> <p>The validation team deemed the value reliable..</p>
Energy Price	135,00	R\$/MWh	<p>The validation team verified the value presented by PP cross-checking it against minutes from the meeting held on 18/03/2013 /41/. Additionally verified the energy price of other registered CDM projects, in Brazil as resumed as follows:</p> <ul style="list-style-type: none"> <li>Jirau Hydro Power Plant: 134.00 R\$/MW (available on the website: <a href="http://cdm.unfccc.int/filestorage/4/v/6R4O8MVS92JU1AZDXFNB05YEGCP7I3.pdf/PDD%20Jirau%20V03.pdf?t=M3B8bXlXMGIfDA94nFyEWZqZpKWUysP7iNn">http://cdm.unfccc.int/filestorage/4/v/6R4O8MVS92JU1AZDXFNB05YEGCP7I3.pdf/PDD%20Jirau%20V03.pdf?t=M3B8bXlXMGIfDA94nFyEWZqZpKWUysP7iNn</a>)</li> <li>Small Hydro Power Plants Santa Gabriela and Planalto: 133.00 R\$/MW (available on the website: <a href="http://cdm.unfccc.int/filestorage/u/c/K7BWIARXJ9DVMQP6GESTH0O2LF35ZN.pdf/9042%20PDD.pdf?t=Ukd8bXlXMGgxfDC8nxl4sUiYsZA-_YhL8XRr">http://cdm.unfccc.int/filestorage/u/c/K7BWIARXJ9DVMQP6GESTH0O2LF35ZN.pdf/9042%20PDD.pdf?t=Ukd8bXlXMGgxfDC8nxl4sUiYsZA-_YhL8XRr</a>)</li> <li>Small Hydro Power Plants Quartel I, II and III CDM Project: 139.00 R\$/MW (available on the website: <a href="http://cdm.unfccc.int/filestorage/d/h/9X537UJIC8BSFNMZHK4TD2Q6R0VWPY.pdf/7685-20121227-PDD.pdf?t=b0F8bXlXMHdxDCV7FjFu5DRLqi8x68wMmjZ">http://cdm.unfccc.int/filestorage/d/h/9X537UJIC8BSFNMZHK4TD2Q6R0VWPY.pdf/7685-20121227-PDD.pdf?t=b0F8bXlXMHdxDCV7FjFu5DRLqi8x68wMmjZ</a>)</li> </ul> <p>The audit team, taking into account the abovementioned facts agrees with the Energy price used in the cash flow analysis /38/.</p>



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Cash Flow Period Considered	20	years	<p>The audit team verified that PP correctly applied the “Clarification Applicability of the “Guidelines on the assessment of investment analysis” (available on the website: <a href="https://cdm.unfccc.int/filestorage/i/4/YZ9W23QKHPJTDECIX84GO7FUV10SNL.pdf/eb73_repan08.pdf?t=NWZ8bXlMW92fDCCnjjoKFwQ0AFdBLyxj1l">https://cdm.unfccc.int/filestorage/i/4/YZ9W23QKHPJTDECIX84GO7FUV10SNL.pdf/eb73_repan08.pdf?t=NWZ8bXlMW92fDCCnjjoKFwQ0AFdBLyxj1l</a>”; /, therefore agrees with the time span of the analysis.</p> <p>Clarification states: “If project participants choose a renewable crediting period and if the technical lifetime of the CDM project activity is more than 20 years, the investment analysis shall be conducted for 20 years and include the fair value of the project activity assets at the end of the assessment period”</p> <p>The audit team deemed that the PP correctly applied the requested clarification.</p>
Amortization	16	years	<p>The audit team verified established value by comparing it against information provided on the BNDES (National Bank of development), on table Total period (from Portuguese <i>Prazo Total</i>), on the website: <a href="http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoi_o_Financeiro/Produtos/FINEM/energia_eletrica_geracao.html">http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoi_o_Financeiro/Produtos/FINEM/energia_eletrica_geracao.html</a></p>
PIS - Social Contribution Program	0.65%	on gross revenue	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/PisPasepCofins/Reglncidencia.htm#Regime de incidência não-cumulativa">http://www.receita.fazenda.gov.br/PessoaJuridica/PisPasepCofins/Reglncidencia.htm#Regime de incidência não-cumulativa</a></p>
COFINS - Social Security Financing Transfers	3.00%	on gross revenue	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/PisPasepCofins/Reglncidencia.htm#Regime de incidência não-cumulativa">http://www.receita.fazenda.gov.br/PessoaJuridica/PisPasepCofins/Reglncidencia.htm#Regime de incidência não-cumulativa</a></p>
Base Value for the IR calculation	8.00%	on gross revenue	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/pessoajuridica/dipj/2000/orientacoes/determinacaolucro presumido.htm">http://www.receita.fazenda.gov.br/pessoajuridica/dipj/2000/orientacoes/determinacaolucro presumido.htm</a></p>
Base Value for the Social Contribution calculation	12.00%	on gross revenue	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/aliquotas/ContribCsll/ApuracaAnualIREcMensBascalcEst.htm">http://www.receita.fazenda.gov.br/aliquotas/ContribCsll/ApuracaAnualIREcMensBascalcEst.htm</a></p>
IR - Income Taxes	15%	on base value	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2000/Orientacoes/Determinacao2.htm#AI%C3%ADquota">http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2000/Orientacoes/Determinacao2.htm#AI%C3%ADquota</a></p>
CSLL - Social Contribution on Net Profit	9.00%	on base value	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr617a633.htm, note 619.">http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr617a633.htm, note 619.</a></p>
Additional IR	10%	on base value	<p>The audit team verified this value by reviewing the Law 10.637/2002 and 9.718/1998, available on the website: <a href="http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2000/Orientacoes/Determinacao2.htm#AI%C3%ADquota">http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2000/Orientacoes/Determinacao2.htm#AI%C3%ADquota</a></p>
Annual O&M, Insurance, Adm, Environm.	497,161	R\$	<p>The validation team cross-checked the estimated value reported by PP against the one suggested by IRENA (page 44, section 5.3 /45/), where is established that: “Annual O&amp;M costs are often quoted as a percentage of the investment cost per kW per year. The IEA assumes 2.2% to 3% for smaller projects”.</p> <p>The validation team calculated the O&amp;M cost percentage over the total investment cost of <i>Providência</i>, obtaining a percentage of 1.31% (497,161 / 28,823,950.00) which is lower than reported by IRENA.</p> <p>Taking into account the abovementioned, the validation team deemed reliable and conservative the O&amp;M cost reported by PP.</p>
ANEEL - Fiscalization fee	9,684.20	R\$ / year	<p>The audit team verified correctness on application of the “Technical Note N° 11/2013-SRE/ANEEL” /43/ where is set the way to calculate the fiscalization fee. In this document is the reported formula (1) :</p> $TF_{ape/pie} = 0,4\% \times (BETU \times P)$ <p>Where:</p>

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			<p>- <b>TF ape/pie</b> = Annual value of fiscalization tax expressed in R\$;</p> <p>- <b>BETU</b> = Typical average value of annual benefit arising from the operation of power generation activity, applicable to mixers and Independent Power Producers, expressed in U.S. \$ / kW;</p> <p>- <b>P</b> = Nominal power installed in commercial operation by December 31 of the previous year, pro rata, in kW;</p> <p style="text-align: center;"> <math>TF\ ape/pie = 0,4\% * 484.21 * 5,000</math>  <math>TF\ ape/pie = 9,684.20</math> </p> <p>The audit team found calculation procedure in accordance with applicable regulations and, therefore, agrees with figure used by PP on cash flow calculation file /38/.</p>
<b>Distribution Use of System Charge - TUSD</b>	2.92	R\$/KW	<p>The audit team verified this value by reviewing the table "V" (page 5) of the Annex I issued by ANEEL (available on the website: <a href="http://www.aneel.gov.br/cedoc/areh20131414_2.pdf">http://www.aneel.gov.br/cedoc/areh20131414_2.pdf</a>). This document states that the actual value of use of the system – TSDU, is 5.83 R\$/kW. Additionally, this value has to be 50% for Small Hydropower Plants.</p> <p>The audit team verified the calculation procedure findings correctness in its application, therefore agrees with figure used in the cash flow calculations /38/.</p>
<b>MRE fee - Mecanismo de Realocação de Energia</b>	8.75	R\$/MWh	<p>The audit team verified that reported value as the average value of the power plants enrolled in MRE since 2005 to 2008.</p> <ul style="list-style-type: none"> <li>- 2008: R\$ 7.77 <a href="http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/relatorio_anual_2008.pdf">http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/relatorio_anual_2008.pdf</a></li> <li>- 2009: R\$ 8.18 <a href="http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/relatorio_anual_2009_2.pdf">http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/relatorio_anual_2009_2.pdf</a></li> <li>- 2010: R\$ 9.245 <a href="http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/Relatorio_anual_2010_REV5.pdf">http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Relatorios_Publico/Anual/Relatorio_anual_2010_REV5.pdf</a></li> <li>- 2011: R\$ 8.99 <a href="http://www.em.com.br/app/noticia/economia/2011/12/13/internas_economia,267232/aneel-reajusta-tarifa-atualizada-de-referencia.shtml">http://www.em.com.br/app/noticia/economia/2011/12/13/internas_economia,267232/aneel-reajusta-tarifa-atualizada-de-referencia.shtml</a></li> <li>- 2012: R\$ 9.58 <a href="http://www.em.com.br/app/noticia/economia/2011/12/13/internas_economia,267232/aneel-reajusta-tarifa-atualizada-de-referencia.shtml">http://www.em.com.br/app/noticia/economia/2011/12/13/internas_economia,267232/aneel-reajusta-tarifa-atualizada-de-referencia.shtml</a></li> </ul> <p style="text-align: center;">Average = R\$ 8.753</p> <p>Taking into account this values, the audit team agrees with the value determined by PP</p>
<b>Comercialization Fee</b>	2%	on gross revenue	The audit team verified the applied value on the minute form meeting held on 18/03/2013 /41/, finding this assumption reasonable according to PP experience in commercialization of energy.
<b>Residual</b>	60%	on total asset	<p>ICONTEC verified from the study "Lifetime and Depreciation Study for Turbines and Generators"/44/, volume 2, page 249. This document states that, for generators the average lifetime is 30 years; and taking into account a depreciation rate of 2% per year, for 20 years of analysis, the asset will get a residual value of 60% over his total cost.</p> <p>ICONTEC deemed reliable and conservative the reported residual value for the Project.</p>

Validation of main parameters used in cash flow calculations for determining the Equity IRR, are in line with VVS paragraph 127 and Guidelines on the assessment of investment analysis /28/.

The validation team raised following findings once Desk review stage and On-site visit were carried out (for further information on the matter please refer to table A2):

- CAR 1: PP was asked to PP to provide explanations on the matters of Installed capacity value. This findings was successfully closed once PP provided explanations related to differences between support documentation provided, please refer to Table A2.
- CAR 2: PP was asked to provide support on PDD related to assumptions made for cash flow files. This finding was successfully closed once PP provided enough information.
- CAR 3: PP was requested to adjust the IRR calculation files /37/ and /38/ to 20 years as required on "Guidelines on the assessment of investment analysis", version 05.0 /34/. Clarification was closed as described on table A2.
- CAR 7: since reported value of total investment didn't match figures expressed in file "OPE\_POF\_dezembro de 2011 rev1.pdf", the audit team asked PP to use the actual figures of estimated total investment. Changes are visible on IRR calculation file for Providência /38/.
- CAR 8: Related to assumption on the matters of Amortization period, closed once PP provided proper explanations and supported on cash flow calculation files /37/ and /38/
- CL 13: it was raised since PP did not provide support of CERs price as an assumption. Clarification was closed once PP provided explanations and the audit team cross-checked information provided as described on tables 8 and 9.

## IRR calculations

As a result of carrying on an investment analysis, PP determined following figures for the project:

**Table10: Summary of IRR calculations**

	Equity IRR (%)	Cost of Equity Benchmark (%)
Poço Fundo	6.58	19.49
Providência	4.65	19.49

The audit team conducted a thorough review of assumptions and calculation methods presented by PP on cash flow files, finding compliance with mandatory requirements established on the Guidelines on the assessment of investment analysis /34/. Calculated equity IRRs are far lower than established Cost of Equity Benchmark which demonstrates the project is not financially feasible without the revenues.

## Sub-step 2d: Sensitivity Analysis

A sensitivity analysis was performed /48/ and /49/ by means of testing parameters: Total Investment, Assured Energy, Energy Price and O&M costs, in order to check the financial impact of variations in these parameters, by determining the necessary variations to get the IRR Benchmark (Breakeven point). Result of this analysis is presented on table 11 as follows:

**Table11: Sensitivity Analysis**

		Actual value	Equity IRR (parameter +/- 10%)	Breakeven point	Deviation %
Poço Fundo	Investment (R\$)	69,564,515.18	8.64 %	41,523,059.11	- 40.31
	Assured Energy (MW average)	7.2	8.59 %	11.26	+56.44
	Energy Price (R\$/MWh)	135.00	8.75 %	205,81	+ 52.45%
	Operation and Maintenance (R\$/MWh)	913,294	6.83 %	Not sensible enough to reach the benchmark	- 100%

Providência	Investment (R\$)	28,823,950.00	6.45 %	15,123,926.57	- 47.53%
	Assured Energy (MWaverage)	2.75	6.40 %	4.62	+ 67.87%
	Energy Price (R\$/MWh)	135.00	6.54 %	225,54	+ 67.07%
	Operation and Maintenance (R\$/MWh)	497,161	4.96%	Not sensible enough to reach the benchmark	- 100%

As an outcome of the sensitivity analysis, the validation team concluded that is highly unlikely the project become financially feasible since required variation of assessed variables (Investment, Assured Energy, Energy Price and O&M) have to be too high.

### Step 3: Barrier Analysis

The PP did not apply barrier analysis.

### Step 4: Common Practice Analysis

PP addressed a stepwise analysis as established on common practice guideline /46/. First of all, PP considered the geographical area as the entire host country, according to the applicable geographical area definition. The validation team verified operating plants as reported by ANNEL /47/. Then PP followed the stepwise approach as described as follows:

**STEP 1:** The audit team found that applicable output range was properly assessed by PP as +/- 50% of the design capacity of the proposed project activity, resulting in a range from 9.72 to 29.16 MW. This range was established taking into account the total installed capacity of the project as prescribed on the common practice guideline /46/, therefore the audit team agreed with these values. The audit team cross-checked projects listed on tab step 1 against information provided by ANEEL (official source) /47/.

**STEP 2:** As a mean to identify similar projects, a list of power plants that became operational in the national grid along 2004-2013 was first elaborated, the list was presented on common practice calculation file /52/ Tab step 1; a total of 216 plants was identified. The validation team agrees with criteria applied by PP when determining similar projects since criteria applied matches criteria proposed on common practice guidelines paragraph 6 /46/.

In addition, the validation team agrees that, power plants that became operatives in the period 2004-2013 matches criteria established by the common practice guidelines /46/ of having started commercial operation before the start date of the project. Finally, the electricity market drastically changed up to 2004-2005 /50/, accordingly PP determined 2004 as the beginning of the period to be analyzed.

**STEP 3:** Once the number of plants in the established range was determined within step 2, those plants being part of CDM, project activities submitted for registration and project activities undergoing validation were taken out of the count. As a result of this analysis, a total of 143 plants were identified as  $N_{all}$  ( $N_{all}=149$  /52/).

On the other hand, audit team verified information related to the Plants which became operational at the range established for common practice analysis, finding no differences between results presented by PP.

**STEP 4:** In order to determine  $N_{diff}$ , PP identified those projects obtained on step 3 that “apply technologies that are different to the technology applied in the proposed project activity” /46/.

The validation team considered relevant to raise two findings related to figures determined. In the first place, CAR 9 in order to ask PP to provide evidences enough for exclusion of Piranhas, Sao Bernardo and Senador Jonas Pinheiro being part of PROINFA program /51/; the audit team closed this finding once PP provided proper explanations on requested matters. Additionally, CL 8 was raised in order to ask PP to fully description of procedure carried out for common practice analysis. The validation team found satisfactory information added to PDD version 2 /5/.

The validation team agrees with the number determined as  $N_{diff}$  by PP ( $N_{diff} = 143$ ).

**STEP 5:** Applying formula  $F=1- N_{diff} /N_{all}$  /52/, the factor F was calculated as  $F=0.04027$ , and  $N_{all} - N_{diff} = 6$ . The proposed project activity is not a “common practice” given that, conditions established by the guideline on common practice /46/ <are met.

## ADDITIONALITY CONCLUSION

Once carried out a review of the analysis presented by PP to determine the additionality status of the project, and after verify through cross-checking of information sources provided by PP and different sources, the validation team concludes that the project is not the most likely baseline scenario. Hence, the emission reductions occurring from the project are deemed additional to those that would occur in the absence of the project activity. Furthermore, relatively large variations (beyond +- 10%) would be necessary in order to reach the breakeven point,

## 3.6. MONITORING PLAN

Monitoring plan described on the latest version of the PDD /58/, complies with requirements of methodology /2/ ACM0002 and all applied tools.

During validation activities, one request (CL 6) was raised on regard to the completeness of the monitoring plan. A lack of information was determined on parameter  $EG_{y, Cap_{PJ}}$ , and  $A_{PJ}$ . Finding was corrected on the latest version of the PDD /58/, and therefore CL 6 on table A2 was closed.

Monitoring of GHG Emission reduction is based on the electricity generation by the project activity, which is transparently presented in section B.7 of the PDD /58/.

ICONTEC verified through interviews with relevant personnel and document review that the project will be equipped with an extensive monitoring system. Staff training and the monitoring plan will be established to maintain installed equipment and technology performance, as well as to assure measurements accuracy and data reported. Validation team checked all parameters presented at the monitoring plan of the latest version of the PDD /58/, against methodology and applied tools requirements; no deviations to the project activity were found.

The main parameter to be monitored is: Quantity of net electricity generation supplied by the project activity to the grid ( $EG_{facility,y}$ ), in year y. The audit team confirms that, the latest version of the PDD clearly states that the parameter will be measured as required by the methodology. Baseline parameters to be monitored ex-post were indicated in Section B.7.1 of PDD and are:

**Table 12: Data and parameters ex-post**

Data / Parameter	ICONTEC's Means of Validation
$EG_{Providência,y}$	<p>The electricity generation will be measured continuously and recorded at least monthly with 2 bidirectional electricity meters (main and backup meter), with accuracy class 0.2 that comply with national standards and industrial regulations. It will be located in a panel inside the Ampla substation.</p> <p>Responsibility of cross-checking data will be on the hands of the PP. The data from the energy</p>



	<p>meters will be cross checked with the CCEE databank. The meters will have to comply with national standards stated by ONS, available on the website: <a href="http://extranet.ons.org.br/operacao/prdocme.nsf/principalPRedeweb?openframeset">http://extranet.ons.org.br/operacao/prdocme.nsf/principalPRedeweb?openframeset</a>. The periodicity of the calibration will follow the Procedure 12.335 of ONS.</p> <p>This information was verified by interviewing Mr. Pimenta, technical director of Providência.</p> <p>The audit team considers this monitoring plan is viable and it is possible to carry out proposed activities.</p>
<i>EG Poço Fundo,y</i>	<p>The electricity generation will be measured continuously and recorded at least monthly with 2 bidirectional electricity meters (main and backup meter) with accuracy class 0.2 that comply with national standards and industrial regulations. It will be located in a panel inside the Ampla substation.</p> <p>Responsibility of cross-checking data will be on the hands of the PP. The data from the energy meters will be cross checked with the CCEE databank. The meters will have to comply with national standards stated by ONS, available on the website: <a href="http://extranet.ons.org.br/operacao/prdocme.nsf/principalPRedeweb?openframeset">http://extranet.ons.org.br/operacao/prdocme.nsf/principalPRedeweb?openframeset</a>. The periodicity of the calibration will follow the Procedure 12.335 of ONS.</p> <p>This information was verified by interviewing Mr. Pimenta, technical director of Poço Fundo.</p> <p>The audit team considers this monitoring plan is viable and it is possible to carry out proposed activities.</p>
<i>EF<sub>grid,CM,y</sub></i>	<p>The Combine Margin Emission Factor will be calculated annually by using the weighted-average formula, considering the <math>EF_{grid,OM-DD,y}</math> and the <math>EF_{grid,BM,y}</math> and default <math>w_{OM}</math> and <math>w_{BM}</math> weights. Data will be updated and adjusted annually by PP by taking information from the Designated National Authority website: <a href="http://www.mct.gov.br/index.php/content/view/307492.html">http://www.mct.gov.br/index.php/content/view/307492.html</a></p>
<i>EF<sub>grid,OM-DD,y</sub></i>	<p>Data will be updated and adjusted annually by PP by taking information from the Designated National Authority website: <a href="http://www.mct.gov.br/index.php/content/view/307492.html">http://www.mct.gov.br/index.php/content/view/307492.html</a></p> <p>The Operating Margin data will be updated annually in order to be applied in ex-post calculation of the Combined Margin Emission Factor</p>
<i>EF<sub>grid,BM,y</sub></i>	<p>Data will be updated and adjusted annually by PP by taking information from the Designated National Authority website: <a href="http://www.mct.gov.br/index.php/content/view/307492.html">http://www.mct.gov.br/index.php/content/view/307492.html</a></p> <p>The Build Margin data will be updated annually in order to be applied in ex-post calculation of the Combined Margin Emission Factor</p>
<i>Cap<sub>BL</sub> Poço Fundo</i>	<p>Installed capacity of the project will be monitored annually by reviewing the installed capacity allocated in the nameplate of the generator. The viability of this activity was confirmed by interview with the technical director.</p>
<i>Cap<sub>BL</sub> Providência</i>	<p>Installed capacity of the project will be monitored annually by reviewing the installed capacity allocated in the nameplate of the generator. The viability of this activity was confirmed by interview with the technical director.</p>
<i>A<sub>BL</sub> Providência</i>	<p>The area of the reservoir will be monitored by a third party company that will be hired for the development of topographic surveys and/or satellite image processing.</p> <p>The audit team considers this monitoring plan is viable and it is possible to carry out proposed activities.</p>
<i>A<sub>BL</sub> Poço Fundo</i>	<p>The area of the reservoir will be monitored by a third party company that will be hired for the development of topographic surveys and/or satellite image processing.</p> <p>The audit team considers this monitoring plan is viable and it is possible to carry out proposed activities.</p>

The audit team verified all parameters on monitoring plan contained on the latest version f the PDD /58/ against methodology requirements/2/, finding no deviations.

Procedures established by PPs on section B.7 of the latest version of the PDD were reviewed by the audit team based on the sector experience and through documental review (please see References) and interviews (please see Section 2.1).This information, along with a physical inspection, allowed the audit team to confirm that, proposed monitoring plan is feasible and also, within the project design. Parameters *EG Providência,y*, and *EG Poço Fundo,y* , to be monitored, were

discussed with the PPs. Energy supplied monitoring will be performed using 2 meters: Main and back-up.

In addition, the audit team verified that procedures designed for monitoring of electricity generation by the project activity will follow the parameters and regulations of the Brazilian energy sector. The National Grid Operator (ONS) and the Electric Power Commercialization Chamber - CCEE (from Portuguese *Câmara de Comercialização de Energia Elétrica*) are the responsible entities for specification of technical requirements of energy measurement system for billing, i.e, those bodies are monitoring and approving projects for accurate accounting of energy.

Stored data is going to be collected by the Energy Data Collecting System: SCDE (from Portuguese: *Sistema de Coleta de Dados de Energia Elétrica*) of the CCEE, remotely and automatically, through direct access to the agent's meters or intermediated for the agent through its Meter Collecting Unit – UCM.

QA/QC of the project will consists of the calibration of meters by a qualified organization that will conduct the calibration at least every two years in accordance with the stated in the “Grid Procedures” from the National Grid Operator: Module 12, sub module 12.2 available on the website: <http://extranet.ons.org.br/operacao/prdocme.nsf/principalPRedeweb?openframeset>.

The emergency procedures will consist the estimation of data by applying the item 7.1 of the Procedure of Energy Commercialization – Module 2 in case of unavailability of measures from any point of measurement, due to maintenance, commissioning or for any other reason. All equipment will have to be technically approved by ANEEL. The National Grid Operator (ONS) and the Electric Power Commercialization Chamber (CCEE), entities responsible of the technical requirements of the energy measurement and for the billing, monitor and approve accurate energy accounting. Data from energy meters will be cross checked against billing.

All data gathered in the monitoring range will be electronically filled and will keep for at least 2 years after the last crediting period. The emission reductions to be generated will be calculated regularly by the project proponents and will keep for the verification phase.

All necessary training for the plants' operational team shall be provided by the equipment's suppliers, during the installation and pre operational phases, and by the PPs during the project lifecycle. The emergency procedures related to the project activity operation (for instance: workers' safety and health, dam safety related with emergency drills/exercises, etc, according to the Brazilian legislation), will be included in the training courses that the third party company will offer.

Poço Fundo S.A. and Providência S.A. are going to be responsible of the maintenance and calibration of the monitoring equipment, compliance of operational requirements and corrective actions related to the functionality of the hydropower plants. Moreover, the companies have the authority and the responsibility for registration, monitoring and measurements as well as managing of all issues related to the project activity, to organize staff training and to use appropriated techniques in those procedures.

The audit team confirms that the monitoring plan established by the PP, is feasible and that the PP has the ability and means of implementation sufficient to ensure that the emission reductions achieved as a result of the proposed project activity, can be reported ex-post and verified. It is according to paragraph 138 of VVS.

### 3.7. CALCULATION OF GHG EMISSIONS

According to methodology /2/, ER of the project activity shall be calculated using formula 11 as follows:

$$ER_y = BE_y - PE_y$$

Where:

$ER_y$  = Emission reductions in year  $y$  (tCO<sub>2</sub>e/yr)

$BE_y$  = Baseline emissions in year  $y$  (tCO<sub>2</sub>/yr)

$PE_y$  = Project emissions in year  $y$  (tCO<sub>2</sub>e/yr)

### Baseline Emissions:

According to methodology /2/, Baseline Emissions of the project activity shall be calculated using option a), formula 6 as follows:

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

Where:

$BE_y$  = Baseline emissions in year  $y$  (tCO<sub>2</sub>/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<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. (tCO<sub>2</sub>/MWh)

Additionally, and according to methodology /2/, the 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) shall be 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)

According to PPs, and as verified by the audit team and as described on CERs calculation file /6/, the total amount of energy generated corresponds to the amount of energy generated by each facility:  $EG_{PoçoFundo,y} + EG_{Providência,y} = 63,072 + 24,090$

$$EG_{PJ,y} = 87,162 \text{ MWh/yr}$$

On the other hand, Brazilian DNA provides the official calculation of the emission factor, this figure was the one used by PP to calculate the actual Baseline emission. Finally, as referred in Section 3.4 BASELINE DETERMINATION and calculation file /6/, the baseline emissions are product of electrical energy baseline  $EG_{PJ,y}$  expressed in MWh/yr of electricity produced by the renewable generating unit multiplied by the grid emission factor:  $BE_y = (EG_{Providência,y} * EF_{grid,CM,y}) + (EG_{PoçoFundo,y} * EF_{grid,CM,y})$ ;  $BE_y = (63,072 * 0.3593) + (24,090 * 0.3593) = 31,316 \text{ tCO}_2/\text{yr}$

$$BE_y = 31,316 \text{ tCO}_2/\text{yr}$$

The validation team reviewed calculation procedure and equations used, finding no differences between formula established on methodology /2/ and no mistakes on calculation procedure, reason why agrees with figures determined for Baseline emissions.

### Project Emissions:

PP correctly determined project emission as zero (0) since, as established by applicable methodology /2/: power density of the two project sites is greater than 4 W/m<sup>2</sup> and less than or equal to 10 W/m<sup>2</sup>. Project emissions are based upon formula 3 of methodology /2/ as described as follows:



Where:

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

$PE_{HP,y}$  = Project emissions from water reservoirs (tCO<sub>2</sub>e/yr)  
 $EF_{Res}$  = Default emission factor for emissions from reservoirs of hydro power plants in year y (kgCO<sub>2</sub>e/MWh)  
 $TEG_y$  = Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (MWh)

$$PE_{HP,y} = 0 \text{ tCO}_2/\text{year}$$

The validation team agrees with assumption described by PP on the latest version of the PDD reason why agrees with figures determined for Project Emissions.

### Leakage Emissions:

According to methodology /2/, “No leakage emissions are considered”, PP correctly addressed methodological requirement as described on section B.6.4 of the latest version of the PDD /58/.

### EMISSION REDUCTIONS:

As previously describe, PP used formula 11 of the methodology in order to determine the total amount of emission reductions for the crediting period. Table 12 summarizes the emission reduction calculations as described on calculation file /6/:

**Table13: Summary ex-ante Emission Reductions Calculation**

Year	Baseline Emissions (t CO <sub>2</sub> e)	Project Emissions (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	Emission Reductions (t CO <sub>2</sub> e)
2018	31,316	0	0	31,316
2019	31,316	0	0	31,316
2020	31,316	0	0	31,316
2021	31,316	0	0	31,316
2022	31,316	0	0	31,316
2023	31,316	0	0	31,316
2024	31,316	0	0	31,316
<b>Total</b>	<b>219,212</b>	<b>0</b>	<b>0</b>	<b>219,212</b>
<b>Annual average over the crediting period</b>	<b>31,316</b>	<b>0</b>	<b>0</b>	<b>31,316</b>

Assumptions and data used to determine emission reductions are listed in the latest version of the PDD /58/. All sources were checked and confirmed by the audit team and the calculations can be replicated. The audit team raised CL 7 in order to ask PP to provide explanation on the matters of different figures of ER along calculation files /6/, nevertheless information was corrected and therefore clarification was closed.

Based upon information reviewed it can be confirmed that, sources used are correctly quoted and interpreted in the PDD, the calculations are complete, and the numbers are as reasonable as accurate. The steps taken and equations applied to calculate the emission reductions comply with the requirements of the selected baseline and monitoring methodology ACM0002 version 15.0 and tools, and these were correctly applied.

### 3.8. ENVIRONMENTAL IMPACTS

ICONTEC confirmed that according to legislation of host country, the PP made an Environmental Impact Study was elaborated as described and licenses granted as follow:

**Table14: Environmental Impact Studies and licences of the project activity**

SHP	Entity developing the environmental Impact Study	Entity Granting Licence
<i>Poço Fundo</i>	SIGMA	INEA
<i>Providência</i>	Watermark (to be finished by 2014)	INEA

- Poço Fundo:
  - INEA: Previous licence issued on 28/01/2011 /22/; Installation license request /23/. Finally, environmental impact assessment /25/.
- Providência:
  - INEA: Currently, the previous license has been asked to the environmental entity and has not been issued yet /24/. According to the Resolution CONAMA dated on 23/01/1986 /26/, since Providencia has an installed capacity lower than 10MW does not need to present an EIA

Brazilian legislation requires a development of an Environmental Impact Assessment (EIA) for those projects that due to its characteristics could have a negative impact on natural resources or the environment, as a requirement for obtaining the previous license. Nevertheless, according to applicable legislation /26/, Resolution N°001from 23/01/1986 article 2 paragraph VII, hydropower plants with characteristics such as the ones displayed by SHP Providência, do not need to develop an environmental Impact. Conservatively PP is currently performing an EIA that will be finished by 2014 as expressed by Mr. Pimenta (please refer to section 2.1 of this document), while carrying out the on-site.

The audit team verified all original documents and cross-checked them against supporting information provided by PP, finding no differences between the two sources of information.

The validation team verified the actions taken by PP with the aim to identify and analysis the environmental and social impacts, in accordance with the requirements requested by the Brazilian Government. In the first place the EIA of the projects were reviewed. The audit team carried out an interview with Mr. Carlos Bezeril, responsible of coordinating the environmental impact assessment. MR. Bezeril did not express any relevant environmental impact.

Additional validation of environmental impacts was carried out by performing a second interview with Mr. Rogelio Capuso: Agricultural secretary of Sao Jose do Vale do Rio Preto (please refer to section 2.1). Through this interview, the audit team was able to validate that no relevant impacts were identified and that, both Poço Fundo and Providência comply with applicable environmental legislation.

PP undertook an analysis of environmental impacts as described in the latest version of the PDD /58/, section D.1. Additionally, environmental licences were granted by environmental authorities in the case of Poço Fundo and in the case of Providência have been asked by PP. The audit team verified that Providência previous license has been requested by PP /24/. Finally, the audit team considered necessary to raise CL 11 in order to ask PP to fully describe environmental impacts on section D.1 of the PDD. Once PP added requested information, the audit team closed CL 11.

ICONTEC concluded that no significant environmental impacts were identified, and this information is consistent with design documentation and audit team experience. There will be no transboundary impacts resulting from this project activity.

### 3.9. COMMENTS BY LOCAL STAKEHOLDERS

PP followed procedures set out by the DNA of Brazil and sent letters /53/ to local stakeholders that could reasonably be considered relevant for the proposed project activity. The latest version of the PDD /58/ (Section E.1) includes a list of the 12 different parties involved and considered as informed stakeholders through this letter: .

- i. City Hall of São José do Vale do Rio Preto
- ii. City Hall of Teresópolis
- iii. City Council of São José do Vale do Rio Preto
- iv. City Council of Teresópolis
- v. Environmental Agency of São José do Vale do Rio Preto
- vi. Environmental Agency of Teresópolis
- vii. Community Association Rural Industrial and Commercial Association of São José do Vale do Rio Preto (from Portuguese *“Associação Comercial Industrial e Rural de São José do Vale do Rio Preto”*)
- viii. Community Association ACIAT - Commerce, Industry and Agriculture of Teresopolis (from Portuguese *“ACIAT - Associação Comercial, Industrial e Agrícola de Teresópolis”*)
- ix. Environmental Agency of the Rio de Janeiro State (INEA – Instituto Estadual do Ambiente)
- x. Brazilian Forum of NGOs and Environmental and Development Social Movements – FBOMS;
- xi. Federal Public Attorney
- xii. State Public Attorney of the Rio de Janeiro State

Additionally, PP held a public meeting /54/ and /55/ announced through local newspaper in order to inform local community about the project activity. No comments were received during the 30 days period of comments as verified by the audit team by means of review of the original records: Communications between PP and Federal Public Attorney in order to answer the questions.

Through the delivery date of the receipt of mail from Brazil, ICONTEC was able to confirm the delivery of the letters sent to stakeholders submitted the project.

Within the activities carried out in the on-site visit. The audit team interviewed two local inhabitants in order to know their opinion of the project and its affectation to other local inhabitants. MRS Sonia Regina and Cecilia Pires Costa expressed their sympathy for the project and did not identify any negative impact on the local community.

ICONTEC can confirm that, description in the latest version of the PDD /58/, section E, is correct and that the stakeholder consultation was in line with CDM and host country requirements. Stakeholders that can reasonably be considered relevant for the proposed CDM project activity were invited. ICONTEC determined that the stakeholder consultation was adequate.

## 4. GLOBAL STAKEHOLDERS CONSULTATION

The PDD version 01 submitted by PP, was made publicly available at UNFCCC website during the period 22/06/2013 to 21/07/2013 as verified by the audit team on the website:

<http://cdm.unfccc.int/Projects/Validation/DB/YQ23AR7H5LV3ADP91BF0JPEAEQFWGK/view.html>  
Parties, stakeholders and NGOs were invited to provide comments through the website.

No comments were received during the public consultation until the submission of this report.

## 5. VALIDATION OPINION

ICONTEC performed the validation of the SHPS Poço Fundo and Providência CDM Project (Jun1133), Brazil, in Brazil. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the Project Design Documentation and the subsequent follow-up interviews provided ICONTEC with sufficient evidence to determine the fulfilment of the stated criteria.

The project activity is being proposed as multilateral project by POÇO FUNDO ENERGIA S.A. and PROVIDÊNCIA ENERGIA S.A. Brazil provided approval of voluntary participation and meets all requirements to participate in CDM. The Brazilian DNA confirmed that the project helps in achieving sustainable development.

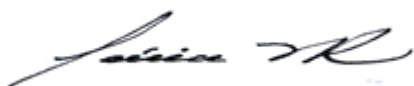
The project correctly applies the methodology: ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” version 15.0.

The project involves the development of two hydro power plants the ones take advantage from Preto River water flow. These hydro power plants are named: Poço Fundo SHP (located in Preto River, São José do Vale do Rio Preto, Rio de Janeiro State) featuring an installed capacity of 14.44MW and Providência SHP (located in Preto River Teresópolis, Rio de Janeiro State) featuring an installed capacity of 5.0MW. The main purpose of the project activity is to provide electric power to the National Interconnected System, displacing the thermal generation from fossil fuels present in the system with the generation of renewable energy. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average of 31,316 tCO<sub>2</sub>e per year over the selected 7 years crediting period. The emission reductions forecasted was checked and it is deemed likely that the stated amount is achieved because the underlying assumptions do not change.

In summary, it is the ICONTEC opinion that the “SHPs Poço Fundo And Providência CDM Project (Jun1133), Brazil” in Brazil, as described in the latest version of the PDD dated on 30/07/2013, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” version 15.0. ICONTEC thus requests the registration of the project as a CDM project activity.

Bogotá D.C., September 2014



Signature  
Monica Vivas  
ICONTEC

## 6. REFERENCES

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- /6/ Emission Reductions calculation files: *CERs JUN1133\_v1.xls* and *CERs JUN1133\_v2.xls*
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- /20/ Legal constitution of Poço Fundo; certified by the Pernambuco State Board of Trade (form Portuguese "Junta Comercial do Estado de Pernambuco"), file: *Ata da Reunião do Conselho Poço Fundo.pdf* and *2009-10-16 Estatuto PFE.pdf*
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- Guidelines on The Demonstration and Assessment of Prior Consideration of The CDM  
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## **7. ANNEXES**



**Annex A**

**Validation Protocol**

## VALIDATION REPORT VVS Annex A



The audit team conducts a thorough, independent assessment of the registered project activities.

The next table contains questions that the audit team shall follow in order to determine whether the project activity complies with the requirements of paragraph 62 of the CDM modalities and procedures. The audit team ensures that only the verification activities, undertaken after the publication of the monitoring report on the UNFCCC CDM website, were used as the basis for ICONTEC to conclude the verification and submission of a request for issuance of CERs to the board.

Questions were answered on the right column using the following scores:

- Full: When the audit team had full access to the required information, the information is complete and satisfactory
- Partial: When the audit team did not have access to the information, or the information is incomplete, or not satisfactory. In this case, indicate finding type and number.
- Resolved: When a partial score is assigned, indicate the date when the finding was closed
- N/A: Shall be used when the question does not apply.

When raising a clarification request, corrective action request and forward action, it is in accordance with VVS v 07.0§ 25-30.

**TableA1: Validation Protocol**

CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<b>1. Global Stakeholder Consultation</b>		
1.1 Has the validation team received and taken into account all comments on the PDD of the proposed project activity during the whole validation process? (not only during GSC) VVS (V 07.0) para. 35 and 36	Section 4	Full
1.2 If comments indicate that the proposed project activity does not comply with the CDM requirements, did the validation team request further clarification from the entity providing the comment? VVS (V 07.0) para.37	N/A	N/A
<b>2. Approval</b>		
2.1 Has the designated national authority (DNA) of each Party indicated (as being involved in the proposed CDM project activity in the PDD) provided a written letter of approval? VVS (V 07.0) para. 39-43	Section 3.2.1	Partial See CAR 4  Closed on 09/09/2014

# VALIDATION REPORT VVS Annex A



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<p>2.2 Is the letter(s) of approval issued by the respective Party's DNA the confirmation of:</p> <p>(a) The Party is a Party to the Kyoto Protocol;</p> <p>(b) Participation is voluntary;</p> <p>(c) In the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country;</p> <p>(d) It refers to the precise proposed CDM project activity title in the PDD being submitted for registration?</p> <p>VVS (v 07.0) para. 39-45</p>	Section 3.2.1	<p>Partial See CAR 4</p> <p>Closed on 09/09/2014</p>
<b>3. Authorization</b>		
<p>3.1 All project participants have been listed in a consistent manner in the project documentation, and their participation in the project activity has been approved by a Party to the Kyoto Protocol.</p> <p>VVS (V 07.0) para. 47</p>	Section 3.2.1	<p>Partial See CL 12</p> <p>Solved on 18/07/2013</p>
<p>3.2 Are there entities other than those authorized as project participants included in these sections of the PDD?</p> <p>VVS (V 07.0) para. 48</p>	Section 3.2.1	Full
<p>3.3 The approval of participation has been issued from the relevant DNA.</p> <p>VVS (V 07.0) para. 49</p>	Section 3.2.1	<p>Partial See CAR 4</p> <p>Closed on 09/09/2014</p>
<b>4. Modalities of communication</b>		
<p>4.1 All focal points included in the MoC, as well as the personal identities, including specimen signatures and employment status, have been validated by corporative, personal identify and other relevant documentation like notarized documentation.</p> <p>VVS (V 07.0) para. 54-59</p>	Section 3.2.2	<p>Partial See CL 10</p> <p>Solved on 23/07/2013</p>
<p>4.2 Was the MoC correctly completed and duly authorized?</p> <ul style="list-style-type: none"> <li>- The last version of the form F-CDM-MOC has been used?</li> <li>- The information required as per the F-CDM-MOC, including its annex 1, is correctly completed.</li> <li>-The authorized project participants signing the F-CDM-MOC correspond to the authorized project participants included in F-CDM-MOC, annex 1.</li> </ul> <p>VVS (V 07.0) para. 60-62</p>	Section 3.2.2	Full

# **VALIDATION REPORT VVS** **Annex A**



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<b>5. Project design document</b>		
5.1. The PDD was completed using the last version of the PDD form and guidance appropriate to the type of project activity. VVS (V 07.0) para. 63-64	Yes, see section 3.3	Partial CL 1  Solved on 18/07/2013
<b>6. Description of the project activity</b>		
6.1 The PDD is accurate, complete, and provides an understanding of the proposed CDM project activity (by reviewing available designs and feasibility studies and conducting comparison analysis with equivalent projects). VVS (V 07.0) para. 65-70	Yes, see section 3.3	Partial See CL 2 and CL 3  Solved on 18/07/2013 and 30/07/2013
6.2 The project is correctly classified as large scale, non-bundled small-scale projects with emission reductions exceeding 15,000 tons per year or bundled small-scale projects, each with emission reductions not exceeding 15,000 tonnes per year. VVS (V 07.0) para. 66	N/A	N/A
6.3 For other individual proposed small-scale CDM project activities with emission reductions not exceeding 15,000 tonnes per year, the DOE should conduct a physical site visit as appropriate. If not, it shall be justified by the DOE. VVS (V 07.0) para. 66	N/A	N/A
6.4 If applicable, was the use of any sampling approach made according to the "Standard for sampling and surveys for CDM project activities and programme of activities"? VVS (V 07.0) para. 67	N/A	N/A
<b>7. Application of the selected Baseline and monitoring methodology</b>		
7.1 The baseline and monitoring methodologies selected by the project participants are the valid versions of those approved by the Board. The selected version is valid at the time of submission of the proposed project activity for registration. VVS (V 07.0) para. 72	Section 3.4	Full
7.2 The selected methodology applies to the project activity and was correctly applied with respect to: Project Boundary, baseline identification, algorithms and/ formulae used to determine emission reduction, additionality, monitoring methodology. VVS (V 07.0) para. 73	Section 3.4	Partial See CL 5  Solved on

# VALIDATION REPORT VVS Annex A



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
		18/07/2013
7.3 Has each applicability condition listed in the approved methodology selected been confirmed? VVS (V 07.0) para. 78-79	Section 3.3	Full
<b>8. Deviation from an approved methodology</b>		
8.1 Did the project request a deviation from an approved methodology before the publication of the PDD? VVS (V 07.0) para. 80	N/A	N/A
8.2 if there are any requests for deviation from an approved methodology, the applicability of the appendix 1 of Project standard must be applied. VVS (V 07.0) para. 81-82	N/A	N/A
<b>9. Clarification on the applicability of an approved methodology</b>		
9.1 In the cases where the DOE cannot make a determination regarding the applicability of the selected methodology to the proposed project activity, Was there requested any clarification on the applicability of the approved methodology? VVS (V 07.0) para. 83	N/A	N/A
<b>10. Project boundary</b>		
10.1 Are all main GHG emission sources, the physical delineation of the proposed project activity and other relevant project and baseline emission sources covered in the methodology, included within the project boundary for the purpose of calculating project and baseline emissions for the proposed project activity? VVS (V 07.0) para. 84-85	Section 3.3	Full
10.2 Does the methodology allow project participants to choose whether a source or gas is to be included within the project boundary? -Has the project participant justified that choice? The DOE shall determine whether the justification provided is reasonable, based on an assessment of supporting documented evidence provided by the project participants and corroborated by observations if required. VVS (V 07.0) para. 86	N/A	N/A
10.3 For the project activities that have both A/R and non-A/R components, please confirm that the emissions associated with the A/R activity will be accounted for and documented by the A/R project activity. VVS (V 07.0) para. 87	N/A	N/A

# **VALIDATION REPORT VVS** **Annex A**



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<b>11. Baseline scenario identification and description</b>		
11.1 The Baseline identified for the proposed project activity is the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed project activity. VVS (V 07.0) para. 90	Section 3.4	Full
11.2 Please confirm that all tools required by the methodology have been used by the PP. VVS (V 07.0) para. 91	Section 3.4	Full
11.3 Assess the baseline scenarios based on financial expertise and local and sectoral knowledge, crosscheck the information provided in the PDD with other verifiable and credible sources, such as local expert opinion, if available, relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector. VVS (V 07.0) para. 92-97	N/A	N/A
<b>12. Algorithms and/or formulae used to determine emission reductions</b>		
12.1 Do the steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring methodology? VVS (V 07.0) para. 101	Section 3.7	Partial CAR 2  Closed 17/07/2013
12.2 If the methodology allows for selection between various equations or parameters, the DOE shall determine whether adequate justification has been provided and if the justification provided is reasonable, based on an assessment of supporting documented evidence provided by the project participants and corroborated by observations if required. VVS (V 07.0) para. 102	Section 3.7	Partial See CL 5  Solved on 18/07/2013
12.3 Verify the justification given in the PDD for the choice of data and parameters used in the equations (appropriate, conservative and reasonable). Data sources must be provided for each parameter. VVS (V 07.0) para. 103	Section 3.7	Full
<b>13. Additionality of a project activity</b>		
13.1 Assess and verify the reliability and credibility of all data and any assumptions, justifications and documentation provided by project participants to support the demonstration of additionality. Critically assess the evidence presented, using local knowledge and sectoral and financial expertise.	Section 3.5.2	Partial See Car 3, CAR 5, , CAR 7, CAR 8, CAR



# **VALIDATION REPORT VVS** **Annex A**



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
VVS (V 07.0) para. 106-107		9 and CL 13  Solved on 18/07/2013
13.2 Please confirm that all tools required by the methodology have been used by the PP. VVS (V 07.0) para. 108	Section 3.5.2	Full
13.3 For small scale project activities or micro scale project activities, the project participant used the applicable Guidelines, procedures and documents issued by the EB VVS (V 07.0) para. 165-169	N/A	N/A
<b>14. Assessment of prior consideration of the clean development mechanism</b>		
14.1 has the start date of the project activity been identified in accordance with the CDM glossary of terms? VVS (V 07.0) para. 112	Section 3.5.1	Partial See CL 9  Solved on 18/07/2013
14.2 Prior consideration assessment must be done according to the latest version of the "guidelines on the demonstration and assessment of prior consideration of the CDM." VVS (V 07.0) para. 112-117	Section 3.5.2	Full
14.3 Depending of the gap between the evidence documented, does the PP justify the validation opinion of the CDM status? VVS (V 07.0) para. 115-116	Section 3.5.2	Full
<b>15. Identification of alternatives (if apply)</b>		
15.1 Have the alternatives in accordance with the approved methodology and/or the tool of additionality been identified? VVS (V 07.0) para. 119	N/A	N/A
15.2 Does the DOE evaluate if the list of alternatives includes as one of the following options that the project activity is undertaken without being registered as a proposed project activity, contains all plausible alternatives of viable means of supplying the comparable outputs or that services are to be supplied by the proposed project activity and compliant with all applicable and enforced legislation? VVS (V 07.0) para. 120-122	N/A	N/A
<b>16. Investment analysis (if applicable)</b>		

# **VALIDATION REPORT VVS** **Annex A**



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
16.1 Was it applied for the PP's the latest version of Guidelines on the assessment of investment analysis? VVS (V 07.0) para. 125	Yes, see section 3.5.2.	Full
16.2 Does the DOE verify if the project activity is not the most economically or financially attractive alternative: <ul style="list-style-type: none"> <li>Does not produce financial or economic benefits other than CDM-related income,</li> <li>Is less economically or financially attractive than at least one other credible and realistic alternative:</li> <li>The financial returns of the proposed project activity would be insufficient to justify the required investment?</li> </ul> VVS (V 07.0) para. 126	Yes, see section 3.5.2.	Full
16.3 Was verified: <ul style="list-style-type: none"> <li>suitability of the financial indicator selected,</li> <li>assessment of all parameters and assumptions used in calculating such financial indicators, as well as a determination of accuracy and suitability</li> <li>cross-check the parameters against a third-party,</li> <li>review, as appropriate, feasibility reports, public announcements, annual financial reports</li> <li>sensitivity analysis</li> <li>All computations, the accuracy of implementation and documentation by PP's</li> </ul> VVS (V 07.0) para. 127	Yes, see section 3.5.2.	Full
16.4 Was verified: <ul style="list-style-type: none"> <li>Determine whether the type of benchmark applied is suitable for the type of financial indicator presented</li> <li>Ensure that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity</li> <li>Determine whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark.</li> </ul> VVS (V 07.0) para. 128	Yes, see section 3.5.2.	Partial See CAR 5 and CL 4  Solved on 18/07/2013
16.5 Was verified (if apply): <ul style="list-style-type: none"> <li>The FSR is the basis for the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short that it is unlikely in the context of the underlying project activity that the input values would have materially change</li> <li>The values used in the PDD and associated annexes are fully consistent with the FSR, and where inconsistencies occur the DOE shall assess the appropriateness of the values</li> <li>The input values from the FSR are valid and applicable at the time of investment decision. The DOE shall confirm this on the basis of its specific local and sectoral expertise and by cross-checking or other appropriate means.</li> </ul> VVS (V 07.0) para. 129	Yes, see section 3.5.2.	Partial See CAR 1  Solved on 18/07/2013

# **VALIDATION REPORT VVS** **Annex A**



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<b>17. Barrier Analysis (if applicable)</b>		
<p>17.1 Does the DOE determine whether the proposed project activity faces barriers that:</p> <p>(a) Prevent the implementation of this type of proposed project activity (See the latest “Guidelines for objective demonstration and assessment of barriers”)</p> <p>(b) Do not prevent the implementation of at least one of the alternatives.</p> <p>VVS (V 07.0) para. 131</p>	N/A	N/A
<p>17.2 Did the DOE determine if the issues that have a direct impact on the financial returns of the project activity are not considered barriers and shall be assessed by investment analysis? This does not refer to either:</p> <p>(a) Risk related barriers, for example risk of technical failure, that could have negative effects on financial performance; or</p> <p>(b) Barriers related to the unavailability of sources of finance for the project activity.</p> <p>VVS (V 07.0) para. 132</p>	N/A	N/A
<p>17.3 Did the DOE apply the two step process to evaluate the barrier analysis performed and determine if the barriers are real and if so prevent the implementation of the project activity but not the implementation of at least one of the possible alternatives?</p> <p>VVS (V 07.0) para. 133</p>	N/A	N/A
<b>18. Common Practice Analysis(if applicable)</b>		
<p>18.1 For proposed large-scale project activities, unless the proposed project type is first-of-its-kind as determined in accordance with the relevant guidelines, the DOE has assessed whether the project participants have conducted a common practice analysis.</p> <p>VVS (V 07.0) para. 135</p>	Yes, see section 3.5.2	<p>Partial</p> <p>See CAR 9 and CL8</p> <p>Solved on 18/07/2013</p>
<p>18.2 Did the DOE use official sources and its local and sectoral expertise to:</p> <p>(a) assess whether the geographical scope (e.g. the defined region) of the common practice analysis is appropriate for the assessment of common practice related to the project activity,</p> <p>(b) Determine to what extent similar and operational projects (e.g. using similar technology or practice), other than project activities, have been undertaken in the defined region;</p> <p>(c) Assess, if similar and operational projects, other than project activities, are already “widely observed and commonly carried out” in the defined region, and whether there are essential distinctions between the proposed project activity and the other similar activities.</p> <p>(See the Tool for assessing the additionality and/or the latest version of the Guidelines for assessing the common practice)</p> <p>VVS (V 07.0) para. 136</p>	Yes, see section 3.5.2	Full

# **VALIDATION REPORT VVS** **Annex A**



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<b>19. Monitoring Plan</b>		
<p>19.1 The Audit team identified the list of parameters required by the selected approved methodology including applicable tool(s), and confirmed that it includes the data management and quality assurance and quality control procedures to ensure that the proposed project activity can be reported ex post and verified.</p> <p>To assess the implementation of the plan the DOE shall, by means of review of the documented procedures, conduct interviews with relevant personnel, project plans and any physical inspections of the proposed project activity site. VVS (V 07.0) para. 138-139</p>	Section 3.6	<p>Partial See CL 6</p> <p>Solved on 27/07/2013</p>
<b>20. Environmental Impacts</b>		
<p>20.1 Did the project participants develop an environmental impact analysis including trans boundary impacts? VVS (V 07.0) para. 141</p>	Section 3.8	<p>Partial See CL 11</p> <p>Solved on 18/07/2013</p>
<p>20.2 Did the project participant conduct an environmental impact assessment, if required to do so by the host Party, in accordance with the host Party's procedures? VVS (V 07.0) para. 142</p>	Section 3.8	Full
<b>21. Local stakeholder consultation</b>		
<p>21.1. Have the project participants completed a local stakeholder consultation process and were due steps were taken to engage stakeholders and solicit comments for the proposed project activity? VVS (V 07.0) para. 145</p>	Section 3.9	Full
<p>21.2 Did the DOE determine whether:</p> <p>(a) Comments have been invited from local stakeholders that are relevant for the proposed project activity;</p> <p>(b) The summary of the comments received as provided in the PDD is complete;</p> <p>(c) The project participants have taken due account of all comments received and have described this process in the PDD. VVS (V 07.0) para. 146</p>	Section 3.9	Full
<b>22. Specific validation requirements</b>		
<p>23.1. For certain specific validation activities such as SSC, A/R, and PoA, the DOE shall comply with the general validation requirements described in the sections above as well as those that follow, including the simplified modalities and procedures for small-scale project activities, the modalities and procedures for afforestation and reforestation project</p>	N/A	N/A

# VALIDATION REPORT VVS Annex A



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
activities, and Standards for PoA. VVS (V 07.0) 156		
<b>23. Small-scale project activities (if applicable)</b>		
<b>1. Project activity eligibility</b> <ul style="list-style-type: none"> <li>- The project activities fall within the threshold of the three possible types of small project activities.</li> <li>- The DOE verified that the small-scale methodologies were applied in conjunction with the general guidance to the methodologies.</li> <li>- The DOE verified that the project activity is not a debundled component of a large-scale project, in accordance with the rules defined in the appendix C of the simplified modalities for small-scale CDM project activities</li> </ul> VVS (v 07.0) para.. 157-159	N/A	N/A
<b>2. Debundling</b> <ul style="list-style-type: none"> <li>- The DOE shall verify that the proposed small-scale project activity is a debundled component of a large-scale project activity if there is a registered small-scale project activity or an application to register another small-scale project activity.</li> <li>- The DOE, where appropriate, has taken into account specific debundling requirements for Type I project activities and small-scale transport project activities.</li> </ul> VVS (v 07.0) para. 161-163	N/A	N/A
The proposed small-scale project activity is not a debundled component of a large-scale project activity in accordance with the Guidelines on assessment of debundling for SSC project activities VVS (V 07.0) para. 161	N/A	N/A
The proposed small-scale project activity is a debundled component of a large-scale project activity if there is a registered small-scale project activity or an application to register another small-scale project activity. VVS (V 07.0) para. 162	N/A	N/A
The Project participant takes into account specific debundling requirements for Type I project activities and small-scale transport project activities. VVS (V 07.0) para. 163	N/A	N/A
<b>3. Additionality</b> <ul style="list-style-type: none"> <li>- The DOE verified that the proposed SSC project activity is additional in accordance with CDM requirements applicable for small-scale project activities.</li> <li>- For the activities type I, II and III, the DOE assessed the fulfilment of the relevant criteria to establish the automatic additionality for these projects</li> </ul>	N/A	N/A

# VALIDATION REPORT VVS Annex A



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
- The DOE detailed all the steps taken to make the cross-check of the information contained in the PDD VVS (v 07.0) para. 165-169		
<b>24. Afforestation or reforestation project activities</b>		
<p>In addition to the requirements listed above, the DOE verified the specific requirements for A/R CDM project activities, which include:</p> <ul style="list-style-type: none"> <li>- Project boundary for A/R CDM;</li> <li>- Selection of carbon pool;</li> <li>- Eligibility of land;</li> <li>- Approach proposed to address non permanence;</li> <li>- Timing of management activities, including harvesting cycles and verifications;</li> <li>- Socioeconomic environmental impacts, including impacts on biodiversity and natural ecosystems.</li> </ul> <p>VVS (v 07.0) para. 171</p>	N/A	N/A
<p><b>1. Project boundary</b></p> <p>The DOE described the documentation assessed and oral statements delivered by persons interviewed and approved their acceptability under the legal system of the host country. In case the DOE has applied a sampling approach; the validation report shall describe how many sites have been assessed and how these were selected.</p> <p>VVS (v 07.0) para. 173-174</p>	N/A	N/A
<p><b>2. Selection of carbon pool</b></p> <p>The DOE verified whether the selection of the carbon pool complied with the applied approved methodology or whether the exclusion of a certain pool is allowed for the methodology and is correctly justified.</p> <p>VVS (v 07.0) para. 177</p>	N/A	N/A
<p><b>3. Eligibility of land</b></p> <p>DOE verified the reliable discrimination between forest and non-forest land according to the particular threshold adopted by the host country.</p> <p>VVS (v 07.0) para. 180</p>	N/A	N/A
<p><b>4. Addressing non permanence</b></p> <p>DOE verified the specification of the proposed approach to address non-performance in accordance with paragraph 38 of the modalities and procedures for A/R CDM projects activities.</p> <p>VVS (v 07.0) para. 183</p>	N/A	N/A



# VALIDATION REPORT VVS Annex A



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<b>5. Timing of management activities</b> <i>The DOE verified how the project participants would ensure that a systematic coincidence of verification and peaks in carbon stocks would be avoided.</i> VVS (v 07.0) para. 187	N/A	N/A
<b>6. Socioeconomic and environmental impacts</b> <i>The DOE verified using local official sources whether the project participants have undertaken an analysis of socio-economic and environmental impacts, including impacts on biodiversity and natural ecosystems, as well as impacts outside the project boundary.</i> VVS (v 07.0) para. 189-190	N/A	N/A
<b>25. Small-scale A/R project activities</b>		
<i>The DOE determined whether:</i> <i>The project activities qualify as a proposed small-scale A/R CDM project activity and comply with the threshold for the proposed small-scale A/R projects in accordance with the decision 5/CMP.1, annex paragraph 1(i).</i> <i>The project activity complies with one of the types of small-scale A/R project activities defined in appendix B of the annex to decision 6/CMP.1.</i> <i>The base line, monitoring methodology and the methodology is applied correctly.</i> <i>The proposed CDM project activity is not part of a debundled large-scale A/R project activity, in accordance with the rules defined in appendix C of the annex to decision 6/CMP.1.</i> <i>The proposed CDM project activity has been developed or implemented by low-income communities and individuals as confirmed by the host Party in accordance with the decision 5/CMP.1, annex paragraph 1(i).</i> VVS (v 07.0) para. 193	N/A	N/A
<b>26. Programme of activities / Component project activities</b>		
<b>1. Coordinating/managing entity and participants in a PoA</b> <i>The DOE assessed the management system described in the PoA design document (CDM PoA-DD) in accordance with the Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for the programme of activities</i> VVS (v 07.0) para. 230	N/A	N/A
<b>2. CPA design document</b> <i>The DOE assessed the proposed CPA that a coordinating/managing entity wished to include in the PoA.</i> VVS (v 07.0) para. 231-233	N/A	N/A

# VALIDATION REPORT VVS Annex A



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<b>3. Description of a PoA/CPAs</b> <i>The DOE assessed the CDM-PoA-DD and the PoA-specific CDM-CPA-DD that was submitted by the coordinating/managing entity and confirmed the framework developed for the implementation of the PoA, and defined a CPA under the PoA.</i> <b>VVS (v 07.0) para. 234</b>	N/A	N/A
<b>4. Application of multiple methodologies</b> <i>The DOE assessed the application of multiple methodologies in accordance with the Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities</i> <b>VVS (v 07.0) para. 235</b>	N/A	N/A
<b>5. Boundary for the PoA in terms of geographical area</b> <i>The DOE verified the boundary of the PoA within which all CPAs included in the PoA will be implemented and if the project participant has taken into account all the applicable national and/or sectoral policies and regulations.</i> <b>VVS (v 07.0) para. 236-237</b>	N/A	N/A
<b>6. Start date of CPA</b> <i>The DOE verified that the start date of the CPA is on or after the start date of the PoA.</i> <b>VVS (v 07.0) para.238</b>	N/A	N/A
<b>7. Prior consideration of the CDM</b> <i>The DOE shall assess prior consideration of the CDM for the PoA applying the provisions of paragraph 107 above mutatis mutandis.</i> <b>VVS (v 07.0) para. 239</b>	N/A	N/A
<b>8. Demonstration of additionality of the PoA as a whole</b> <i>The DOE verified the additionality of a PoA in accordance with the .Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities.</i> <b>VVS (v 07.0) para. 240</b>	N/A	N/A
<b>9. Eligibility criteria for inclusion of a CPA in the PoA</b> <i>The DOE assessed the eligibility criteria for inclusion of a CPA in the PoA in accordance with the .Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities.</i> <b>VVS (v 07.0) para. 241</b>	N/A	N/A
<b>10. Crediting period of a PoA/CPA</b> <i>The DOE determined that the length of a PoA does not exceed 28 years (60 years for A/R).</i>	N/A	N/A

# VALIDATION REPORT VVS Annex A



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
VVS (v 07.0) para. 242		
<b>11. Monitoring plan for a PoA/CPA</b> <i>The DOE verified that the monitoring plan for a CPA is in accordance with the approved monitoring methodology, including applicable tool(s).</i> VVS (v 07.0) para. 243	N/A	N/A
<b>12. Environmental Analysis of a PoA</b> <i>The DOE determined that an analysis of the environmental impacts of the PoA in accordance with CDM-PoA-DD and the CDM-CPA-DD was undertaken.</i> VVS (v 07.0) para. 244-245	N/A	N/A
<b>13. Local stakeholder consultation</b> <i>The DOE verified that the local stakeholder consultation process was carried out for the whole PoA or at the CPA level?</i>  <i>If comments by local stakeholders were invited with regard to the whole PoA, the DOE shall determine how these comments were invited; whether the summary of the comments received is complete and how due account was taken of all comments received.</i> VVS (v 07.0) para. 246	N/A	N/A
<i>If the local stakeholder consultation is conducted at the CPA level, the DOE shall determine whether it is in accordance with the level of consultation specified by the coordinating/managing entity and whether the local stakeholder comments were taken into account and described in the CDM-PoA-DD and the CDM-CPA-DD</i> VVS (v 07.0) para. 247	N/A	N/A
<b>14. Determination of occurrences of debundling under a PoA</b> <i>The DOE verified that the proposed small-scale CPA of a PoA is not a debundled component of a large-scale project activity in accordance with the Guidelines on assessment of debundling for SSC project activities.</i> VVS (v 07.0) para. 248	N/A	N/A
<b>15. Inclusion or renewal of a crediting period of a CPA under a registered PoA</b> <i>The DOE verified that the specific CDM-CPA-DD is in accordance with the latest version of the PoA and determined that the CPA meets the requirements of the PoA.</i> VVS (v 07.0) para. 249	N/A	N/A

# **VALIDATION REPORT VVS** **Annex A**



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<b>27. Validation status and outcomes, opinion, and report</b>		
<p><b>1. Validation status and outcomes</b></p> <p><i>The DOE provided an update of the status of its validation activity, unless the project activity has been submitted for registration 180 days subsequent to the end of the period for the submission of public comments.</i>  <i>The updated status presented for the DOE, must contain one of the following conditions:</i>  <i>Finalization of the validation contract</i>  <i>A negative validation opinion</i>  <i>Summary of the issues raised with updates or reconfirmations of the validation status at three month intervals</i>  <i>Which party/parties are involved in the absence of sending of a valid letter of approval</i>  <i>Explanations about the length of the validation activity and the update of the validation status if the validation activities are ongoing and the CAR or CL have not yet been sent to the project participant.</i>  <i>VVS (v 07.0) para. 148-149</i></p>	N/A	N/A
<p><b>2. Validation opinion</b></p> <p><i>It was emitted an opinion of the likelihood of the project activity achieving the anticipated emission reductions stated in the PDD, where the PP has been informed of the validation outcome, whether it is a positive or negative opinion.</i>  <i>The DOE's opinion must include:</i></p> <ul style="list-style-type: none"> <li>- <i>A summary of the validation methodology and process used and the validation criteria applied</i></li> <li>- <i>A description of project components or issues not covered by the validation process</i></li> <li>- <i>A summary of the validation conclusions</i></li> <li>- <i>A statement on the validation of the expected emission reductions</i></li> <li>- <i>A statement as to whether the proposed project activity meets the stated criteria.</i></li> <li>- <i>The validation opinion confirms whether the project meets the stated criteria and that the methods presented in the project design documentation are acceptable and have been correctly applied.</i></li> </ul> <p><i>VVS (v 07.0) para. 150-153</i></p>	Section 5, all along the validation report	Full
<p><b>3. Validation Report</b></p> <p><i>Is The validation report in line with IN-P-CC-01?</i></p> <p><i>The DOE included in the validation report a validation opinion that integrated:</i></p> <ul style="list-style-type: none"> <li>- <i>Conclusions regarding the proposed project activity's conformity with applicable</i></li> <li>- <i>CDM requirements</i></li> <li>- <i>Overview of the validation activities</i></li> <li>- <i>Findings and conclusions</i></li> </ul>	Yes, this information was indicated in all the content of the validation report.	Full

## VALIDATION REPORT VVS Annex A



CHECKLIST QUESTION	REFERENCES	FINAL CONCLUSION
<ul style="list-style-type: none"> <li>- Information on the global stakeholder consultation process carried out.</li> <li>- A list of interviewees and documents reviewed</li> <li>- Details of the validation team</li> <li>- Information on quality control within the team and in the validation process</li> <li>- Appointment certificates or curricula vitae of the DOE's validation team members, technical experts and internal technical reviewers for the project activity.</li> </ul> <p>VVS (v 07.0) para. 154-155</p>		

**TableA2: Resolution of Corrective Action, Forward Action and Clarification Request**

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The following table explains how ICONTEC resolve or “close out” CARs and CLs describing how the project participants modify the project design, rectify the PDD or provide additional explanations or evidence that satisfy the ICONTEC’s concerns. VVS (V 03.0) para. 28

This table explains the issues raised, the responses provided by the project participants, the means of validation of such responses and references to any resulting changes in the PDD or supporting annexes. VVS (V 03.0) paragraph. 29

Report clarifications and corrective action requests	Reference	Summary of project owner response	Validation conclusion
<p><b>CAR 1</b> Installed capacity referred on file: “POF_rea20113004_PIE.pdf” is 14.000 KW. Nevertheless, installed capacity on PDD version 1 is described as 14,44MW. PP is requested to explain these differences</p> <p>Also, figures differ in support file: “OPE_POF_dezembro de 2011 rev1” which establishes an installed capacity of 14.00 MW</p>	VVS, version 03.0, paragraph 25	The value 14.44MW is the capacity in the output terminals of the generator, like described in Resolution ANEEL #3004 (2011) and ANEEL Summary. 14.00MW is the minimal effective power, like described in Dispatch 1914 (2011). We chose to use 14.44 that is the most conservative value.	<p>Verification Team Response: The audit team found explanatory statement satisfactory since the actual installed capacity was confirmed on documents issued by ANEEL</p> <p>Verification Team Conclusion CLOSED 17/07/2013</p>
<p><b>CAR 2</b> On PDD section B.5 sub step 2C table 5, figures reported for “Operation and Maintenance (R\$/MWh)” for both power plants (SHP Poço Fundo and SHP Providência) do not match with the ones reported in the files “IRR_POF_v1.xls and IRR_PRV_v1.xls”. Additionally assumptions have not been properly supported on PDD version 1 and cash flow calculation files.</p>	VVS, version 03.0, paragraph 25	The value in PDD included only the O&M. In the PDD version 2 this value was substituted by another one, that includes O&M, insurance, administration and environmental costs. The files “IRR_POF_v1.xls and IRR_PRV_v1.xls”, were substituted too, by version 2.	<p>Verification Team Response: Information was corrected on PDD version 2 /5/. Actual figures of O&amp;M costs were presented on table 5.</p> <p>Verification Team Conclusion CLOSED 17/07/2013</p>
<p><b>CAR 3</b> On PDD version 1 section B.5 sub step 2c: Calculation of Equity IRR, assessment period corresponds to thirty (30) years. This assessment period does not match with the clarification made by the board in the EB 73, annex 8: “If project participants choose a renewable crediting period and if the technical lifetime of the CDM project activity is more</p>	<p>VVS version 03.0, paragraph 25(b).</p> <p>Clarification on the Applicability of the “Guidelines on the assessment of investment analysis”, version 01.0, EB 73, annex 8.</p>	Besides the recommendation on the CDM Clarification about assesment period of the investment analysis with 20 years, in Brazil due to the exploitation period be issued to 30 years, the manufacturers’ statement about the lifetime of the main equipments (turbines and generator) with 30 years, the PP considered adequate this period in the SHPs’ cash flow.	<p>Verification Team Response: The validation team reviewd the cash flow calculation files finding that, PP corrected the time spam in accordance with “Guidelines on the assessment of investment analysis”, version 01.0, EB 73, annex 8..</p> <p>Verification Team Conclusion</p>



## VALIDATION REPORT VVS Annex A



<p><i>than 20 years, the investment analysis shall be conducted for 20 years and include the fair value of the project activity assets at the end of the assessment period."</i></p>		<p><i>Second answer on 31/07/2013: In the version 3 of PDD was made the change for 20 years.</i></p>	<p>CLOSED 30/07/2013</p>
<p><b>CAR 4</b> <i>Approval letter from Brazilian DNA has not been issued or presented while carrying out the desk review stage.</i></p>	<p>VVS, version 03.0, paragraph 38.  PS, version 02.1, paragraph 70</p>	<p><i>To be issued the Approval Letter in Brazil is necessary the Final Validation Report from the DOE responsible with a positive opinion about the CDM project activity. After that, it is possible to achieve the DNA approval letter.</i></p>	<p>Verification Team Response: The validation team takes into account PP explanation and remains waiting for the Approval Letter from Brazilian DNA</p> <p>Verification Team Conclusion Closed 09/09/2014</p>
<p><b>CAR 5</b> <i>Assessment period for the parameter <math>R_f</math> (form formula: <math>K_e = R_f + \text{Beta} * (\text{US Premium} + \text{Country ERP})</math> was determined by PP from 2002 to 2011.  The period should involve 2012, this is to be: from 2002 to 2012. Additionally, inflation figure assumption of the PDD version 1, referred as 3.95% was not properly justified.</i></p>	<p>VVS, version 03.0, paragraph 120 (a).</p>	<p><i>The period involved is referred to 10 years before the investment decision date. Due this the assessment period was adjusted for 2003 to 2012. The inflation was justified in the PDD (the forecasted inflation rate based on 10 years average US inflation rate).</i></p>	<p>Verification Team Response: The validation verified the assessment period, finding it was adjusted between 2003 and 2012</p> <p>The PP correctly explained the used inflation figure.</p> <p>Verification Team Conclusion CLOSED 27/07/2013</p>
<p><b>CAR 6</b> <i>Environmental license of the Providência SHP has not been provided together with support documentation by PP.</i></p>	<p>VVS, version 03.0, paragraph 43.</p>	<p><i>The Previous license had not had issued in the moment of the PDD publication. Follow annex the Letter of 29 June 2012, from Watermark to the Environmental Organ, the INEA, requiring the Previous Licence.</i></p>	<p>Verification Team Response: PP provided evidences of the request addressed to INEA asking for the environmental licence as describes previously on this report. Since the licence has not been issued yet, the audit team found satisfactory explanations provided by PP as well as supporting evidences.</p> <p>Verification Team Conclusion CLOSED 18/07/2013</p>

## VALIDATION REPORT VVS Annex A



<p><b>CAR 7</b> On table 5, reported cost of SHP Providência does not match figure provided on support file: "Relatório PB PROVID_NCIA_11-12-2010.pdf, page 6" and "OPE_POF_dezembro de 2011 rev1.pdf", page 4.).</p>	<p>VVS, version 03.0, paragraph 120 (a).</p>	<p>It was adopted the most conservative value of "Relatório PB PROVID_NCIA_11-12-2010.pdf, page 6" to "OPE_POF_dezembro de 2011 rev1.pdf", page 4.</p>	<p>Verification Team Response: Figure presented on table 5 of the PDD /5/ matches value expressed on cash flow file for Providência SHP (IRR_PRV_v2.xls) and OPE_POF_dezembro de 2011 rev1.pdf. The estimated total cost of the project will be: R\$ 28,823,950,00</p> <p>Verification Team Conclusion CLOSED 23/07/2013</p>
<p><b>CAR 8</b> The 16 years figure used as assumption of the Amortization Period was not properly justified in cash flow calculation files.</p>	<p>VVS, version 03.0, paragraph 94 (a)</p>	<p>It was corrected in the Cash Flow version 2.</p>	<p>Verification Team Response: PP provided support on the matters of assumption made for Amortization Period, then the audit team closed this finding</p> <p>Verification Team Conclusion CLOSED 18/07/2013</p>
<p><b>CAR 9</b> When carrying out the Common Practice analysis, PP did not justify how the plants: Piranhas, São Bernardo and Senador Jonas Pinheiro were considered as part of the PROINFA program.</p>	<p>VVS, version 03.0, paragraph 129 (b)</p>	<p>The links to the three SHPs that are included in the Proinfa govern program are:</p> <p>SHP Piranhas: <a href="http://www.setorialnews.com.br/materia.asp?y=20050111180050">http://www.setorialnews.com.br/materia.asp?y=20050111180050</a> SHP São Bernardo: <a href="http://www.rs.gov.br/newsletter/view_materia.php?codNews=%20109&amp;cod=%20753">http://www.rs.gov.br/newsletter/view_materia.php?codNews=%20109&amp;cod=%20753</a> SHP Senador: <a href="http://www.jusbrasil.com.br/diarios/714077/dou-secas-1-02-08-2005-pg-31">http://www.jusbrasil.com.br/diarios/714077/dou-secas-1-02-08-2005-pg-31</a></p>	<p>Verification Team Response: PP correctly addressed inquired information. Justification for inclusion of SHP Piranhas, São Bernardo and Senador Jonas Pinheiro as part of PROINFA program. This justification was assessed and verified by the audit team.</p> <p>Verification Team Conclusion CLOSED 15/08/2013</p>

# VALIDATION REPORT VVS Annex A



<p>CL1 On the front page of the PDD version 1, version of used methodology is missing. Furthermore, methodology version is missing in different section throughout PDD version 1. Finally, the whole document must be written in English and relevant information in other languages has to be translated</p>	<p>VVS, version 03.0, paragraph 64.</p> <p>Guidelines for completing the project design document form, version 01.0, section A.1.</p>	<p>It was corrected in the PDD version 2.</p>	<p>Verification Team Response: PP added methodology version on the front page of the PDD /5/ as well as along the body of the latest version of the PDD.</p> <p>Verification Team Conclusion CLOSED 18/07/2013</p>
<p>CL2 On section A.1 of the PDD version 1, PP is required to describe in a better way technologies used in the project activity. Also, clarify these aspects:</p> <ul style="list-style-type: none"> <li>Estimate of total GHG emission reductions for the chosen crediting period.</li> </ul>	<p>VVS, version 03.0, paragraph 64.</p> <p>Guidelines for completing the project design document form, version 01.0, section A.1.</p>	<p>It was clarified in the PDD version 2.</p>	<p>Verification Team Response: PP added information requested through this clarification. On the latest version of the PDD, section A.1 information added can be found.</p> <p>Verification Team Conclusion CLOSED 18/07/2013</p>
<p>CL 3 On section A.3. Technologies and/or measures, PP is requested to add the number of the sectoral scope, as well as clarify how it was established that: "the renewable energy power plant has priority over non renewable thermal generation" (paragraph three line two of the PDD version 1). Additionally:</p> <ul style="list-style-type: none"> <li>PP did not present links related to: the Brazilian Resolution number 652, in 09/12/2003, issued by ANEEL</li> <li>Measurement equipment position has not been fully described, this is: Information about the age and average lifetime of the equipment as well as Load factors and efficiencies has not been presented.</li> <li>Energy and mass flows and balances of the systems and equipment included in the project activity</li> </ul>	<p>VVS, version 03.0, paragraph 64.</p>	<p>It was clarified/ corrected in the PDD version 2. The equipments and systems had not been fully described because they have not been defined yet. The energy and mass flows and balances of the systems and equipment included in the project activity can be seen in the diagram on the PDD, page 11</p>	<p>Verification Team Response: PP completed information on section A.3 of the PDD. Requested information can be seen on the latest version of the PDD, section A.3</p> <p>Verification Team Conclusion CLOSED 30/07/2013</p>
<p>CL 4 On PDD version 1 section B.5 sub step 2c, it should be specified in a stepwise approach all</p>	<p>VVS, version 03.0, paragraph 26 and 102.</p>	<p>The values came from the Damodaran presentation (link <a href="http://www.docstoc.com/docs/3156656/-">http://www.docstoc.com/docs/3156656/-</a>)</p>	<p>Verification Team Response: Assumptions and calculations presented on section B.5 became clear once PP provided</p>

## VALIDATION REPORT VVS Annex A



<p><i>the assumptions made, the procedure used to calculate figures and explicit sources (link, workbook, cell or cells) of:</i></p> <ul style="list-style-type: none"> <li>• Risk free rate (Rf)</li> <li>• US Premium Rate</li> <li>• Country ERP</li> <li>• Beta</li> <li>• Inflation rate used</li> <li>• Debt/Equity ratio</li> </ul> <p><i>Finally, reported figure of “Energy Price” (135 R\$/MWh) does not match with the ones reported in the support documentation:</i></p> <ul style="list-style-type: none"> <li>• “Preo Energia - Portal EXAME.pdf, page 1”</li> <li>• “Leil_o Energia Nova ANEEL_2012, page 1”.</li> </ul> <p><i>Assumptions and calculations made should be presented in a clear way, showing their conservativeness, validity and applicability by the time the investment decision was taken by the project participant. In order to clarify this information, PP is requested to present all relevant assumptions and parameters used in the cash flow as well as methodological choices applied.</i></p>	<p><i>Guidelines for completing the project design document form, version 01.0, section B.5.</i></p> <p><i>Tool for the demonstration and assessment of additionality, version 07.0.0, paragraph 40.</i></p> <p><i>Guidelines on the assessment of investment analysis, version 05, paragraph 8, rationale.</i></p>	<p><a href="#"><i>Estimating-Discount-Rates-DCF-Valuation-Aswath-Damodaran-Estimating-Inputs</i></a>).</p> <p><i>The value R\$ 135.00 of energy price is the most conservative of</i></p> <ul style="list-style-type: none"> <li>• “Preo Energia - Portal EXAME.pdf, page 1” to</li> <li>• “Leil_o Energia Nova ANEEL_2012, page 1”.</li> </ul> <p><i>These datas and its calculations were demonstrated in a separate file, named “Ke POF_PRV_v1.xls”, that was updated to Ke POF_PRV_v2.xls. It was included a link to Damodaran presentation in this file.</i></p>	<p>enough information as requested by the audit team. Additionally, explanations provided on the matter of <i>Energy Price</i> are clear and satisfactory for the audit team.</p> <p>Verification Team Conclusion CLOSED 27/07/2013</p>
<p><b>CL 5</b> <i>In the PDD version 1 section B.6.1: Project Emissions refers to option a) of the methodology ACM002 version 13 when methodological choice is in fact option b).</i></p>	<p>VVS, version 03.0, paragraph 74.</p>	<p><i>It was corrected in the PDD version 2.</i></p>	<p>Verification Team Response: Correct methodological option was expressed on the latest version of the PDD, as verified by the audit team.</p> <p>Verification Team Conclusion CLOSED 18/07/2013</p>
<p><b>CL 6</b> <i>On PDD version 1 section B.7.1: Data and parameters to be monitored, parameters</i></p>	<p>VVS, version 03.0, paragraph 132 (a) (ii).</p>	<p><i>The monitoring equipments and the monitoring system had not been fully</i></p>	<p>Verification Team Response: Support file: <i>Plano de Monitoramento.pdf</i> defines and explains information requested</p>

## VALIDATION REPORT VVS Annex A



<p><i>EG<sub>Poço Fundo, y</sub>, and EG<sub>Providência, y</sub> it should be added a better description for:</i></p> <ul style="list-style-type: none"> <li>• Description on the equipment used to monitor each parameter, including details on accuracy class.</li> <li>• Specification on the measurement methods and procedures, standards to be applied, accuracy of the measurements, person/entity responsible for the measurements.</li> <li>• QA/QC requested for the methodology.</li> </ul> <p><i>Also, parameters Cap<sub>PJ</sub>, (Providência and Poço Fundo) it should be added a better description for:</i></p> <ul style="list-style-type: none"> <li>• Source of data</li> <li>• Measurement methods and procedures</li> </ul> <p><i>Finally, parameters A<sub>PJ</sub>, (Providência and Poço Fundo) it should be added a better description for:</i></p> <ul style="list-style-type: none"> <li>• Source of data</li> <li>• QA/QC procedures</li> </ul> <p><i>The value applied for the A<sub>Providência</sub> in the section B.7.1 does not match with the one reported in section B.6.1.</i></p>	<p><i>PS, version 02.1, paragraph 56.</i></p> <p><i>Guidelines for completing the project design document form, version 01.0, section B.7.1.</i></p>	<p><i>defined yet, then, they don't have a complete description by now.</i> <i>It was annexed a new file, named "Plano de Monitoramento.pdf" that defines better the monitoring procedures that will be used.</i></p>	<p>by CL 6. Additionally, sources of data and measurement methods and procedures and QA/QC procedures were added to parameters on section B.7.1 of the PDD /58/. Finally, values of parameter A<sub>Providência</sub> are the same along PDD /58/.</p> <p>Verification Team Conclusion CLOSED 27/07/2013</p>
<p>CL 7</p> <p><i>In the PDD version 1 section B.6.4 table 12, total emission reductions reported (219,212 tCO<sub>2</sub>e) do not match figure reported in support file "CERs JUN1133_v1.xls", workbook "CERs", cell "G31".</i></p> <p><i>Also, the values for Annual Average Baseline emissions and Annual Average Emission Reductions over the crediting period do not</i></p>	<p><i>VVS, version 03.0, paragraph 99 (c).</i></p> <p><i>Guidelines for completing the project design document form, version 01.0, section B.6.4.</i></p> <p><i>PS, version 02.1, paragraph 50.</i></p>	<p><i>The difference is due to rounding. When the account is made considering the two power plants is estimated separately 1tCO<sub>2</sub> less.</i></p>	<p>Verification Team Response: Information was corrected on the latest version of the PDD, section B.6.4 and calculation file: CERs JUN1133_v2.xls</p> <p>Verification Team Conclusion CLOSED 18/07/2013</p>

## VALIDATION REPORT VVS Annex A



<i>match with the ones reported in the excel file.</i>			
CL 8  <i>On PDD version 1 section C.1.1, there were not included the evidences to support the dates of starting date for each project activity.</i>	VVS, version 03.0, paragraph 17 (d).  PS, version 02.1, paragraph 57.  <i>Guidelines for completing the project design document form, version 01.0, section C.1.1.</i>	<i>The timeline have already sent to DOE.</i>	Verification Team Response: PP provided support evidence of the start date of the project by providing the timeline for Poço Fundo: evidences were previously described on section 3.5.1 of the validation report.  Verification Team Conclusion CLOSED 18/07/2013
CL 9  <i>On PDD version 1 section C.1.1, there were not included the evidences to support the dates of starting date for each project activity.</i>	VVS, version 03.0, paragraph 17 (d).  PS, version 02.1, paragraph 57.  <i>Guidelines for completing the project design document form, version 01.0, section C.1.1.</i>	<i>The timeline have already sent to DOE.</i>	Verification Team Response: PP provided support evidence of the start date of the project by providing the timeline for Poço Fundo: evidences were previously described on section 3.5.1 of the validation report.  Verification Team Conclusion CLOSED 18/07/2013
CL 10  <i>The MoC statement still has not been issued by PP.</i>	VVS, version 03.0, paragraph 59-63.  PS, version 02.1, paragraph 72.	<i>Follow the document MoC signed.</i>	Verification Team Response: MoC document was provided by PP and verified by the audit team.  Verification Team Conclusion CLOSED 23/07/2013
CL 11  <i>On PDD version 1 section D.1, it was not included a summary of environmental impacts analysis for project.</i>	VVS, version 03.0, paragraph 134.  PS, version 02.1, paragraph 63.  <i>Guidelines for completing the project design document</i>	<i>The environmental impacts caused by the SHP are not considered significant by the project proponent. This observation was inserted in the section D.1. More details are described in the section D.2.</i>	Verification Team Response: Information was correctly addressed by PP on PP version 2 /13/.  Verification Team Conclusion CLOSED 18/07/2013



# VALIDATION REPORT VVS Annex A



	<i>form, version 01.0, section D.1</i>		
<p>CL 12</p> <p><i>On PDD version 1 appendix 1, it was not included the Contact information of the PP "Carbotrader Assessoria e Consultoria em Energia Eireli."</i></p>	<p><i>Guidelines for completing the project design document form, version 01.0, Appendix 1.</i></p>	<p><i>Carbotrader is not PP, the name was removed from version 2.</i></p>	<p>Verification Team Response: The audit team verified exclusion of Carbotrader as PP and therefore, from appendix 1</p> <p>Verification Team Conclusion CLOSED 18/07/2013</p>
<p>CL 13</p> <p><i>PP is requested to clarify source used to determine the price of CERs presented in cash flow. Also, to describe how the exchange rate was determined.</i></p>	<p>VVS, version 03.0, paragraph 20.</p>	<p><i>The source of prices of CERs is an estimative of Carbotrader based in its market experience, and reflect some datas of TFS green and Point Carbon, both referenced in the IRR calculation sheets). The exchange rate is an average of the last six months before the date in which the financial analysis was done.</i></p>	<p>Verification Team Response: The audit team found satisfactory explanations provided by PP and verified assumed figure.</p> <p>Verification Team Conclusion CLOSED 18/07/2013</p>

**Annex B**

**Letter of Approval (LoA)**

Federative Republic of Brazil  
Interministerial Commission in Global Climate Change

Letter of Approval

To: POÇO FUNDO ENERGIA S.A. (PROJECT PARTICIPANT)  
PROVIDÊNCIA ENERGIA S.A. (PROJECT PARTICIPANT)  
INSTITUTO COLOMBIANO DE NORMAS TÉCNICAS Y CERTIFICACIÓN  
(ICONTEC) (DESIGNATED OPERATIONAL ENTITY)

Date: July 31<sup>th</sup>, 2014

1. As President of the Interministerial Commission on Global Climate Change, the Designated National Authority for the Clean Development Mechanism under the Kyoto Protocol, I hereby confirm that:

(i) The Federative Republic of Brazil ratified the United Nations Framework Convention on Climate Change on February 28<sup>th</sup>, 1994 and the Kyoto Protocol on August 23<sup>rd</sup>, 2002;

(ii) The Federative Republic of Brazil participates voluntarily in the CDM;

(iii) The Project Activity "SHP Poço Fundo and Providência CDM Project (JUN1133), Brazil" as defined by the Project Design Document, dated of March 7<sup>th</sup>, 2014 and identified as Version 3.2, validated by the Designated Operational Entity Instituto Colombiano de Normas Técnicas y Certificación (ICONTEC), by means of the Validation Report dated of March 11<sup>rd</sup>, 2014 and identified as Revision 3, will assist the Federative Republic of Brazil in achieving sustainable development.

2. I henceforth declare that the Executive Secretary of the Brazilian DNA is authorized to submit to the Executive Board of the CDM a request for the review of the "Project", in case the Project Design Document and the Validation Report submitted to the Executive Board of the CDM for registration do not correspond to the documents identified in paragraph 1-(iii) above.

Yours sincerely,



CLÉLIO CAMPOLINA DINIZ  
Minister of Science, Technology and Innovation of the Federative Republic of Brazil  
President of the Interministerial Commission on Global Climate Change

**Annex C**

**Audit Team Experience and Knowledge**

**JACOBO CARRIZALES**  
**CDM Lead Auditor**

Bilingual Zootechnician (animal husbandry) and Environmental Management and Sustainable Development magister

**PROFESSIONAL EXPERIENCE**

- ICONTEC - 6<sup>th</sup> of December 2011 - Present

Position: Audit and Technical expert

Specialized technical services for CDM projects (Clean Development Mechanism) as well as auditing services for CDM Validation and Verification.

- Estudios Técnicos Diana Rauchwegwer - 20<sup>th</sup> to 24<sup>th</sup> of December 2011 and y 2<sup>nd</sup> to 10<sup>th</sup> of January 2012. Paz de Rio –Boyacá-

Position: Field Assistant

Soil associated wildlife recognition as part of environmental impact studies

- Corporación Colombia Internacional -CCI- 15<sup>th</sup> to 30<sup>th</sup> of November 2011. Bogotá

Position: Loan Reviewer

Credit requests documentation inspection

- Secretaría Distrital de Ambiente - 7<sup>th</sup> of March to 9<sup>th</sup> of June 2011. Bogotá

Position: Public server. Professional responsible of wildlife traffic prevention

Lectures on sensitizing about wildlife traffic on district public schools. Bogotá, teacher at the course “Good environmental practices in Animal Commercialization”. Escuela de Altos estudios -OPEL- (Secretaria Distrital de Ambiente).

- Secretaria Distrital de Ambiente - 8<sup>th</sup> of September 2010 to 7<sup>th</sup> of January 2011. Bogotá

Position: Public server. Professional responsible of wildlife traffic prevention

Wildlife legal use monitoring, lectures on sensitizing about wildlife traffic on district public schools

- O. G. Entertainment - 27<sup>th</sup> of April to 5<sup>th</sup> of September 2010. Bogotá

Position: English Educational advisor

Responsible of English teaching following a pre-established methodology

- Hacienda Agrominera Zelandia S.A. – Ricardo Arenas - 20<sup>th</sup> of May to 7<sup>h</sup> of May 2007. Susa – Cundinamarca

Position: Professional advisor in systematization and productive records updating

Productive records updating from 2000 to 2007 period, about 400 dairy cattle animals along the period

- Universidad Nacional de Colombia - Facultad de Ciencias, Departamento de Geociencias. Grupo: Centro De Estudios Historia Natural De Colombia. Profesora Cristina Garzón - 5<sup>th</sup> of February to 15<sup>th</sup> of May 2007. Bogotá, Villa de Leyva -Boyacá-

Position: Lecturer. Professional supporting the Project "Contributions to the natural history of Fauna and Flora of Villa de Leyva (Boyacá, Colombia)"

Lectures to public school students from Antonio Nariño school at Villa de Leyva. The main subject was traditional productive techniques and rustic poultry races

- Finca Sevilla – Raul Behar - August to December 2006. La Calera, Vereda el Volcán – Cundinamarca

Position: Professional in charge of protection and conservation of forest areas

Silvopastoral productive system design and reforestation

- Hacienda Tres Esquinas – Gloria de Luque - December 2005 to March 2006. La Calera Vereda Jerusalén – Cundinamarca

Position: Professional in charge of protection and conservation of forest areas

Silvopastoral productive system design, wetlands protection and reforestation

- Hacienda Juncales S.A. – Philip George - February to December 2004. Simijaca – Cundinamarca-

Position: Professional Practice

Productive duties and stock control. Productive, sanitary and reproductive records updating. Advisory in animal nutrition and management

## ACADEMIC BACKGROUND

- Environmental Management and Sustainable Development Magister - 2010 to 2012 – 14<sup>th</sup> of December 2012-

### Main Professional Skills

Masters focused on research, self-deepening on economic valuation of natural resources an environmental economy

Institution

Universidad Distrital Francisco José de Caldas

Dissertation Title

Potential use and management valuation of game wildlife associated to beef cattle productive areas in Orinoquia Region. Case of study: Venado Cola Blanca (*Odocoileus virginianus* Zimmermann, 1780) y Chiguiro (*Hydrochoerus hydrochaeris* Linnaeus, 1766) harvesting in "Pénjamo" farm of Hato Corozal county (Casanare)

Zootechnician (animal husbandry specialist) - 1999 a 2005 – 27<sup>th</sup> of October 2005

### Main Professional Skills

Domestic animal productive methods, wildlife breeding, quality process analysis and agricultural business administration

Institution

Universidad De La Salle

Dissertation Title

Relationship between age, weight and reproductive efficiency in competition Brahman females



### ADDITIONAL STUDIES

Market Research - August to October 2009

Institution

City University of London

Advanced Marketing - February to April 2009

Institution

City University of London

General English - June to December 20007

Institution

Avalon School of English. London

Emprendimiento y Empresarismo - February 2006

Institution

SENA. Bogotá

Artificial Insemination - June 2000

Institution

Asociación Club Bovino Lasallista. Universidad De La Salle. Bogotá

### EXPERIENCE IN CDM ACTIVITIES

Lead Auditor

- Verification of Monomeros nitrous oxide abatement project, Colombia
- Validation of Thuan Nhien Phong Wind Farm, Viet Nam
- Validation of Phuong Mai 3 Wind Power Project, Viet Nam

Specialist

- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Verification of Macaubas Landfill Gas Project, Brazil
- Verification of Ciudad Juarez Landfill Gas to Energy Project, México

Technical Reviewer

- Verification of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil
- Verification of Biogas energy plant from palm oil mill effluent, Guatemala
- Verification of Co-composting of EFB and POME project, Guatemala
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil
- Validation VCS of BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil

- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil
- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil
- Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil

### **CRISTIAN DARIO GRISALES BERNAL CDM SPECIALIST**

Electrical Engineer  
National University Of Colombia  
Bogotá - Colombia  
July 2009

ISO 9001 Lead Auditor  
ICONTEC  
August - October 2012

Intensive English  
National University Of Colombia  
January 2007 - May 2009

Intensive French  
National University Of Colombia  
January 2007 - May 2009

RETIE Update  
CIDET  
Bogotá - Colombia September 11, 2008

Academic Bachelor, Focusing on Electricity  
Claretiano Elementary School  
Bogotá - Colombia, December 20, 2002

### **PROFESSIONAL BACKGROUND**

CDM Professional  
ICONTEC  
May 2012 – Today

Electrical Maintenance Engineer  
Hydroelectric Power Plants Guaca, Tinta, Junca  
Bogotá River Hydroelectric Plants  
EMGESA S.A ESP. Colombia

Preventive, predictive and corrective maintenance of the generating units, auxiliary services, power transformers and electrical substation, developed of the investment projects interventory in accordance with annual operating budget, implementation of maintenance plans from systems analysis as RCM decision sheets, monthly service availability in the plant, and availability of full-time in failure attention, electrical testing of generators, transformers, motors and substation equipment.

Phone (57-1) 6274738 Ext 101, Mobil (57) 3182611285  
November 3, 2009 - April 30, 2012

**Auxiliary Engineer****GPI LTDA**

Verification of reported assets by the network operators to the CREG.

Inspection of electrical networks (length, kind of conductor, type of support, geographic location and equipment) reported by the EEC and CODENSA to the Energy Regulatory Commission CREG

Phone (57-1) 7428241

January 2009 - February 2009

**Engineering Intern****SPECIALIZED ENGINEERING S.A.**

Quote visits to different industries, sales, design and assembly of shielding systems, grounding grids, power quality studies, calculation of electrical installations, inspections from RETIE point of view, diagnostic grounding systems, implementation, supervision and maintenance of the designs, marketing SSD's.

Phone (57-1): 7030032, Mobil (57) 3158322342

5 May, 2008- 30 October 2008

**EXPERIENCE IN CDM ACTIVITIES:****Specialist**

- Validation of Biogas project, Olmeca I, Santa Rosa, Guatemala
- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Validation of Macaubas Landfill Gas Project, Brazil
- Validation of Taurichuco Hydropower Project, Perú
- Validation of Teresina Landfill Gas Project, Brazil
- Validation of Maceio Landfill Gas Project, Brazil
- Verification of Amaime Minor Hydroelectric Power Plant, Colombia
- Validation of Doña Teresa Small Hydro Power Plant, Colombia

**Technical Reviewer**

- Validation of Thuan Nhien Phong Wind Farm, Viet Nam
- Validation of Phuong Mai 3 Wind Power Project, Viet Nam
- Validation of Chamelecón 280 Hydroelectric project, Honduras
- Validation of Providencia I: 1.8MW Small Hydro Power Generation Plant, Colombia
- Validation of Providencia III: 9.11MW Small Hydro Power Generation Plant, Colombia
- Validation of SHP Itaguacu CDM Project (JUN 1146), Brazil, Brazil
- Renewal of Aguafresca Multipurpose and Environmental Service Project, Colombia
- Validation of Feira de Santana Landfill Gas Project, Brazil
- Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
- Verification of Santa Ana Hydroelectric Plant, Colombia

Verification of Methane recovery and effective use of power generation project Norte III-B Landfill, Argentina

**ERIKA LUCIA URREGO**  
**Lead Auditor CDM**

Zootechnician, Universidad Agraria De Colombia, Bogotá D.C. August 1997.

Specialist Environmental Management Systems. Universidad Externado de Colombia. Bogotá D.C. September 2002

OHSAS 18001 Diploma, ICONTEC, Bogotá D.C. July 2005.

Food Harmlessness Management System under ISO 22000 standard Course, ICONTEC, Bogotá D.C. March, 2003

Updating on CDM Course, Ministry of Environment, Housing and Territorial Development, Bogotá D.C 2006

Presentation of proposals for developing CDM in the farming and animal husbandry industry. CAF – Corporación Andina de Fomento, Bogotá 2006

Quality Management Systems under ISO 9001:2000 standard Course, ICONTEC, Medellin. May 2007.

**PROFESSIONAL EXPERIENCE**

- ICONTEC (2006 – Actual)

To prepare and perform the certification services assigned as per her Career Plan qualification, according to the stated on the procedures. To provide guidance to the certification costumers about the technical aspects of the assigned services provision. To participate in changing or designing Certification services, by changing or creating the respective procedures.

- ASOCIACION COLOMBIANA DE PORCICULTORES-FNP (2003 – 2006)

To coordinate the activities to be performed by the Environmental Window Program in the various country areas. To allocate and execute resources engaged under the Cleaner Production agreements signed together with several environmental authorities. To lead the CDM project, focused to reduce methane (CH<sub>4</sub>) emissions issued by animal waste.

To be aware of the Ecuadorian and Chilean methodologies already approved by the CDM's Executive Board for Hog Breeding Sector to elaborate a proposal for the hog breeding sector together with the Ministry of Environment, Housing and Territorial Development in order to join farms to CDM projects.

- FICHTNER GmbH & Co. KG (2001 – 2002)

To prepare, design and apply surveys focused to identify power consumption in the sector of slaughter, processed meat and food concentrate for animals

- Regional Environmental Authority (CAR Sumapaz) 1998 – 2001

To support the environmental management unities on technical concepts of processes, permissions, sanctions, control, monitoring and assessment in the proper and timely management of the Sumapaz area's natural resources.

**EXPERIENCE IN CDM ACTIVITIES****Lead Auditor**

- Validation of Macano Small Hydro Power Plant, Panamá
- Validation of Montenegro Landfill Gas Recovery and Flaring, Colombia
- Validation of Monteria Landfill Gas Recovery and Flaring, Colombia
- Validation of Energy Efficiency at Ladrillera Alcarraza, Colombia
- Validation of Tunjita Diversion Hydroelectric Project, Colombia
- Validation VCS of Reforestación de áreas de pastura en la Sociedad Agrícola de Interés Social “José Carlos Mariátegui” – Proyecto Joven Forestal, Perú
- Validation of El Toqui wind power project, Chile
- Validation of Los Angeles Landfill Gas Flaring Project, Colombia
- Validation of Paramonga Bagasse Boiler Project, Perú
- Validation of Ferreira Gomes Hydro Power Plant CDM Project, Brazil
- Validation of BRASILM 1 - Avoidance of Methane Emissions through Composting of Manure Waste, Brazil
- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Validation of Macaubas Landfill Gas Project, Brazil
- Validation of Palmaceite Wastewater Treatment and Biogas Utilization Project, Colombia
- Validation of Teresina Landfill Gas Project, Brazil
- Validation of Maceio Landfill Gas Project, Brazil
- Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
- Verification of Biogas energy plant from palm oil mill effluent, Guatemala 2
- Verification of Doña Juana Landfill gas-to-energy project, Colombia
- Verification of Tres Valles Cogeneration Project, Honduras
- Verification of Landfill Gas to Energy Facility at the Nejapa Landfill Site, El Salvador, El Salvador
- Verification of La Venta II, México
- Verification of Jepirachi Wind Power Project, Colombia
- Verification of Santa Ana Hydroelectric Project, Colombia 2
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-01, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
- Verification of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
- Verification of Doña Juana Landfill gas-to-energy Project, Colombia
- Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
- Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
- Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil
- Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil
- Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil

**Specialist**

- Validation of ECC methane capture and combustion from AWMS at dairy farms in Mexico – I, México
- La Calera Biodigesters Project, Perú
- Pírgua Landfill Gas Recovery and Flaring, Colombia

## Technical Reviewer

- Validation of Fuel Switching through change of furnaces at Imusa S.A., Colombia
- Validation of Cervecería Hondureña Methane Capture Project, Honduras
- Validation of Paysandú Clean Energy, Uruguay
- Validation of Securitization and Carbon Sinks Project, Chile
- Validation of METALDOM Fossil fuel switch from reheat furnace, Republica Dominicana
- Validation of Reforestation of degraded/degrading land in the Caribbean Savannah of Colombia, Colombia
- Validation of Co-composting of organic residues in ORO ROJO's Palm Oil Mill at Sabana de Torres, Colombia
- Validation of EMGEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle, Colombia
- Validation of Energy efficiency at Malvinas Gas Plant, Perú
- Validation of Marañon Hydroelectric Project, Perú
- Validation of Santa Rita Hydroelectric Plant, Guatemala
- Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina
- Validation of Biogas project, Olmeca I, Santa Rosa, Guatemala
- Validation of CTR Rosario Landfill Gas Project, Brazil
- Validation of SHP Itaguacu CDM Project (JUN 1146), Brazil
- Validation of Taurichuco Hydropower Project, Perú
- Validation of Feira de Santana Landfill Gas Project, Brazil

Validation of Doña Juana Landfill gas-to-energy Project, Colombia

## FRANCY MILENA RAMÍREZ TORRES

### CDM Lead Auditor

Electrical Engineer. Universidad Los Andes, 2001

Postgrade: Assessment of Social Projects. Universidad Los Andes, 2005

University of Oxford. Course: Applying Knowledge Management, Principle and Practices (December 1 de 2009).

University of Oxford. Course: Successful Change Management for Engineers, Scientists and Staff in Hi-tech Companies (Diciembre 2 de 2009).

University of Oxford. Course: Essentials of Project Management for Engineers, Scientists and Staff in Hi-tech Companies (December 3 de 2009).

University of Oxford. Course: Advanced Project Management for Engineers, Scientists and Staff in Hi-tech Companies (December 4 de 2009).

Climate Change, Trade and Standardization - in a development perspective". Estocolmo, Suecia (23 y 25 de Noviembre de 2009)

ISO global workshop on Greenhouse Gas Schemes Addressing Climate Change – How ISO Standards Help, Estocolmo, Suecia. (20 y 21 de Noviembre de 2009)

Conference on Climate Change – Deforestation and Standardization. Bali, Indonesia (31 de mayo y 1 de junio de 2010)

### PROFESSIONAL EXPERIENCE

- ICONTEC. (2005 – Actually)

#### Professional of Standardization

Planning, coordinate, implement and ensure compliance with the program of national standardization in technical committees among which are electrical installations, electrical power quality, electrical transformers, substations and equipment for medium and high voltage, lighting, appliances and electrical accessories, protection against lightning strikes and electrical equipment.



Develop technical standards. Develop and manage special projects assigned. Participate in programs of regional and international standardization.

- CODENSA (2002 – 2005)

Inspections and electrical works coordinator

Supervise field work and download the results in the central information system, evaluate the inspections performed, reconciled with contractors, addressing the results of inspections to different areas of the company, charging inspections and electrical work to clients of the firm, coordination and support group field sales engineers, technical training for technical staff, administrative support to department business processes and lost control, maintenance of the database for internal management inspections. Project Leader for the Optimization of Technical Processes and Regional Trade in Cundinamarca.

## EXPERIENCE IN CDM ACTIVITIES:

Lead Auditor

- Validation of Guanaquitas 9.74 MW hydroelectric project, Colombia
- Validation of Fuel Switching through change of furnaces at Imusa S.A., Colombia
- Validation of Installation of a high-pressure/high-efficiency bagasse boiler to cogenerate heat and power, Argentina
- Validation of Cueva Maria Hydroelectric Expansion Project, Guatemala
- Validation of Paysandú Clean Energy, Uruguay
- Validation of La Vegona Hydroelectric project, Honduras
- Validation of Chamelecón 280 Hydroelectric project, Honduras
- Validation of Pardos SHPs and LOGICarbon CDM Project, Brazil
- Validation of Pequi and Sucupira SHPs and LOGICarbon CDM Project, Brazil
- Validation of Cambará and Embaúba SHPs and LOGICarbon CDM Project, Brazil
- Validation of Bonyic hydroelectric project, Panamá
- Validation of METALDOM Fossil fuel switch from reheat furnace, República Dominicana
- Validation of Toachi – Pilaton Hydroelectric Project, Ecuador
- Validation of EMGEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle, Colombia
- Validation of Energy efficiency at Malvinas Gas Plant, Perú
- Validation of Marañon Hydroelectric Project, Perú
- Validation of Santa Rita Hydroelectric Plant, Guatemala
- Validation of Ventana, Suba and Usaquén Hydroelectric CDM Bundled, Colombia
- Verification of Los Algarrobos hydroelectric project, Panamá
- Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina
- Validation of Taurichuco Hydropower Project, Perú
- Validation of Aguafresca Multipurpose and Environmental Service Project, Colombia
- Verification of Agua Fresca Multipurpose and Environmental Service Project, Colombia
- Verification of La Joya Hidroelectric project, Costa Rica
- Verification of Amaime Minor Hydroelectric Power Plant, Colombia

Specialist

- Validation of Rio Bonito and Baitaca SHPs and LOGICarbon CDM Project, Brazil
- Validation VCS of Pequi and Sucupira SHPs and LOGICarbon CDM Project, Brazil
- Verification of three crediting periods of La Vuelta and la Herradura hydroelectric project, Colombia

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- Validation of Improving energy efficiency in a new Gas Plant in Gibraltar - Colombia
- Validation of Tres Valles Cogeneration Project, Honduras
- Validation of Tunjita Diversion Hydroelectric Project, Colombia
- Validation of Ferreira Gomes Hydro Power Plant CDM Project, Brazil
- Verification of two crediting periods of La Venta II, México
- Verification of two crediting periods of La Joya Hidroelectric Project, Costa Rica

- Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina
- Verification of Tres Valles Cogeneration Project, Honduras
- Verification of Agua Fresca Multipurpose and Environmental Services, Colombia
- Verification of La Venta II, México
- Verification of two crediting periods of Fertinal Nitrous Oxide Abatement Project, México
- Verification of Co-composting of EFB and POME project, Guatemala
- Verification of Biogas Project, Olmeca III, Tecun Uman, Guatemala
- Verification of Jepirachi Wind Power Project, Colombia
- Verification of Biogas energy plant from palm oil mill effluent, Guatemala
- Verification of Santa Ana Hydroelectric Project, Colombia
- Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
- Verification of Biogas Project, Olmeca III, Tecun Uman, Guatemala

### Specialist Technical Reviewer

- Validation of Biogas project, Olmeca I, Santa Rosa, Guatemala
- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Validation of Macaubas Landfill Gas Project, Brazil

