RINA

VALIDATION REPORT

"Queluz and Lavrinhas Renewable Energy Project" in Brazil

REPORT NO. 2008-BQ-ME-59

REVISION NO. 02

RINA

VALIDATION REPORT

Project Name: "Queluz and Lavrinhas Renewable Energy Project"	**Country:** Brazil		**Estimated CERs** (tCO_2e)**:** 810,717
Client: AMBIO Participações Ltda (AMBIO)	**Client contact:** Mr. Luis Filipe Kopp		
Report title: "Queluz and Lavrinhas Renewable Energy Project" in Brazil	**Report No.:** 2008-BQ-ME-59	**Rev. No.** 02	**Date of this report:** 22/10/2009
Approved by: *(Final Report – DCI Director approval)* Roberto Cavanna	**Organizational Unit:** DCI		**Date:** 23/10/2009

Methodology

Reference:	**Version:**	**Title:**	**Sectoral Scope:**
ACM-0002	Version 9 of 13/02/2009	"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"	1

RINA has performed a validation of the CDM project activity "Queluz and Lavrinhas Renewable Energy Project" 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, the subsequent decisions by the CDM Executive Board and the Host country criteria.

The project applies the approved baseline and monitoring methodology ACM-0002, i.e. "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 9 of 13/02/2009. The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound**.** The monitoring methodology has been correctly applied and the monitoring plan sufficiently specifies the monitoring requirements.

In our opinion, the project, as described in the PDD of 28 September 2009 meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the approved baseline and monitoring methodology ACM-0002, i.e. "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 9 of 13/02/2009. The "Queluz and Lavrinhas Renewable Energy Project" project will hence be recommended by RINA for registration as a CDM project activity.

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.

Work carried out by: Ashok Kumar, Vicente San Valero	☒ No distribution without permission from the Client or responsible organizational unit ☐ Strictly confidential ☐ Unrestricted distribution
Work verified by: *(CRT Responsible approval)* Paolo Teramo	**Keywords:**

Abbreviations / Acronyms

Explain any abbreviations/ acronyms that have been used in the report here.

ANA	"Agência Nacional de Águas" (Brazilian Water Agency)
ANEEL	"Agência Nacional de Energia Elétrica" (Brazilian Electric Energy Agency)
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Request for Clarification
CER(s)	Certified Emission Reduction(s)
CH_4	Methane
CIMGC	"Comissão Interministerial de Mudança Global do Clima" (Interministerial Commission on Global Climate Change)
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DAIA	"Departamento de Avaliação de Impacto Ambiental" - Department of Evaluation of Environmental Impact (São Paulo State Environmental Authority)
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
ODA	Official Development Assistance
ONS	"Operador Nacional do Sistema Elétrico" (National Electric system Operator)
PDD	Project Design Document
PPA	Power Purchase Agreement
RINA	Registro Italiano Navale
SMA	"Secretaria de Estado do Meio Ambiente do Governo do Estado de São Paulo" - Environment State Secretary of the São Paulo State Government
SELIC	"Sistema Especial de Liquidação e de Custódia" - Special System of Clearance and Custody (Overnight Interest Rate)
SHP	Small Hydroelectric Plant (Pequena Central Hidroelétrica - PCH)
SIN	"Sistema Interconectado Nacional" - National Interconnected System
UNFCCC	United Nations Framework Convention on Climate Change

VALIDATION REPORT

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1 INTRODUCTION

The Client has commissioned RINA to perform a validation of the "Queluz and Lavrinhas Renewable Energy Project" in Brazil (hereafter called "the project"). This report summarizes the findings of the validation of the project, performed 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.

The validation team for this phase of the project consisted of the following personnel:

Role/Qualification	Last Name	First Name	Country
Team leader, CDM validator	San Valero	Vicente	Brazil
CDM validator	Kumar	Ashok	India
Technical reviewer	Teramo	Paolo	Italy

The draft validation report, including the initial validation findings, underwent a technical review before being submitted to the project participants. The technical review was performed by a technical reviewer qualified in accordance with RINA's qualification scheme for CDM validation and verification.

1.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party 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 is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology (ACM-0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 9 of 13/02/2009) /8/. The validation team has, based on the recommendations in the CDM Validation and Verification Manual /7/ (hereinafter referred as the VVM) employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consulting towards the project participants. However, stated Clarification and/or Corrective Actions Requests may have provided input for improvement of the project design.

1.3 GHG Project Description

The project activity will consist of two run-of-river hydroelectric power plants (Queluz and Lavrinhas small hydroelectric plants - SHP) located at the same river, Paraíba do Sul, that will supply electricity to the Brazilian interconnected grid from renewable sources and thereby reducing greenhouse gas emissions.

The total installed capacity of the project activity is 60 MW (30 MW each plant) with an estimated generation of 374,928 MWh/year (assured energy).

Emission reductions are claimed from displacing grid electricity with the estimated electricity that will be generated by the hydroelectric power plants and supplied to the grid. The forecasted amount of GHG emission reductions from the project is projected to be 810,717 tCO_2e (115,817 tCO_2e / year average) during the first renewable 7 years crediting period (with the potential of being renewed twice), with an expected operational lifetime of 30 years.

2 METHODOLOGY

The validation may consist of the following three phases:

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

Explain the different means of verification used, and any considerations related to adjustments made to the use of the validation protocol. There is a reference to the complete protocol in Appendix A. There should also be a reference to the Validation and Verification Manual for methodology and protocol.

Findings established during the validation can either be seen as a non-fulfillment of validation protocol criteria or where a risk to the fulfillment of project objectives is identified.

Corrective Action Request (CAR) shall be raised if one of the following occurs:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

(b) The CDM requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated..

The validation team shall raise a Clarification Request (CL) if:

information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A Forward Action Request (FAR) shall be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

VALIDATION REPORT

Validation Protocol Table 1: Mandatory Requirements			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification (CL) is used when the validation team has identified a need for further clarification.* *A Forward Action Request (FAR) shall be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the Client or other project participants during the communications with the validation team should be summarized in this section.*	*This section should summaries the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation protocol tables

2.1 Review of Documents

The initial Project Design Document (PDD Version 1) of 05 December 2008 /1/ and estimatives for the emission reductions and financial investments /2/, submitted by AMBIO Participações Ltda, were assessed by RINA. After initial validation findings were identified and communicated to the Client, revised versions of the PDD (Version 2 of 16 June 2009 /3/ and Version 3 of 28 September 2009 /5/) and estimatives for the emission reductions and financial investments (/4/ & /6/) were submitted and assessed by RINA.

RINA also assessed additional background documents (/7/ to /18/), related to the design and/or methodologies employed in the design or other reference documents.

2.2 Follow-up Interviews

On 20/01/2009, RINA performed a site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of AMBIO Participações Ltda, Usina Paulista Queluz de Energia S.A., Usina Paulista Lavrinhas de Energia S.A. and Engenhidro Engenharia (Engehidro Engineering – Inspection / Survey Company) were interviewed (/19/ to /25/).

The main topics of the interviews are commented through the report and summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
AMBIO Participações Ltda Usina Paulista Queluz de Energia S.A. Usina Paulista Lavrinhas de Energia S.A. Engenhidro Engenharia	- Clarifications on establishment of baseline, monitoring plan and emission reduction calculations - Resources, training needs and procedures for operation and maintenance - Monitoring Plan / Records (backups) - Maintenance program (calibration) - Project boundaries - Baseline and project emissions - Emissions reductions calculations - Environmental Licenses - Local stakeholders – invitations/confirmations

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve any outstanding issues, which need to be clarified for RINA's positive conclusion on the project design.

The Corrective Action Requests (06) and Clarification Requests (16) rose by RINA were resolved during communications between the Client and RINA. One (01) Forward Action Request (FAR) has been raised and should be checked in the first verification.

To guarantee the transparency of the validation process, the concerns raised and responses given are summarized and documented in more detail in the validation protocol in Appendix A to this report.

3 VALIDATION FINDINGS

Where RINA identified issues that needed clarification or that could represent a risk to the fulfillment of the project objectives, Clarification or Corrective Action Requests, respectively, have been issued. The requirements to be validated, means of validation and reporting requirements are documented in more detail in the Validation Protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation, CDM-PDD for the "Queluz and Lavrinhas Renewable Energy Project" project, Version 3, dated 16 June 2009 /5/.

3.1 Project Design

The "Queluz and Lavrinhas Renewable Energy Project" is located in the municipalities of Queluz and Lavrinhas, São Paulo State, Brazil. The geographical coordinates are:

- Queluz SHP: 22º 33' South and 44º 48' West;

- Lavrinhas SHP: 22º 34' South and 44º 52' West.

The proposed project activity falls under Project category "Grid-connected electricity generation from renewable sources" and Sectoral Scope 1- Energy industries (renewable/non-renewable sources).

The proposed project boundary (spatial extent) encompasses the physical, geographical sites of the renewable power generation sources and all power plants connected physically to the Brazilian interconnected grid.

The project is a renewable electricity generation project activity displacing grid electricity that is partly generated based on fossil fuels, with electricity generated from renewable sources and thus resulting in the reduction of emissions of greenhouse gases in the energy sector.

The project will consist of two run-of-river hydroelectric power plants/units, each equipped with two Kaplan turbines and two Alstom generators of 15 MW. Queluz power plant will have a dam level of 29.6 m with a head level of 12.8 m. Lavrinhas power plant will have a dam level of 28.4 m with a head level of 13.0 m. At the site visit it was informed that both plants will be interconnected (controls) and will deliver generated electricity to the same substation (Santa Cabeça), where it will join the National Interconnected System ("Sistema Interconectado Nacional" – SIN) of the Brazilian grid.

Both construction sites were visited and both have the diversions already in place. Queluz is in the stage of construction of the dam (head works) and powerhouse structures and tailrace channel. Lavrinhas is at the excavation stage yet. Therefore no operational people for the plants were already contracted/defined. Fish ladders are planned for both plants.

The project is expected to displace 374,928 MWh/year of electricity per year (Assured Energy[1]) and the total installed capacity of the project activity is forecasted to be 60 MW (Assured Power considering a Load Factor of 71.3% equal to 42.8 MW = 21.4 MW *2). The project design engineering reflects current good practice.

The Assured Energy of a hydroelectric plant is issued for each plant by ANEEL (Brazilian Electric Energy Agency), and serves essentially two purposes:

[1] http://www.aneel.gov.br/aplicacoes/capacidadebrasil/energiaassegurada.asp

(i) to establish an upper limit for energy supply contracts (PPAs), and

(ii) to define the share of each generating plant on the total amount of energy generated in the system by hydro plants.

The Assured Energy of the Brazilian electric system is defined as the maximum energy production that can be delivered almost continuously by hydroelectric plants throughout the years, simulating the occurrence of each one of the thousands of possibilities of statistically created flow sequences, admitting certain risk of not attendance to the load, that is, in determined percentile of the simulated years some rationing is allowed up to a limit considered acceptable by the system. The determination of the Assured Energy is associated to the conditions in the long term that each plant can supply to the system assuming an specific risk criteria of non-attendance to the market (risk of deficit), considering mainly the hydrologic variability to which the plant is submitted.

Project participants are AMBIO Participações Ltda, Usina Paulista Queluz de Energia S.A. and Usina Paulista Lavrinhas de Energia S.A.

The host Party Brazil meets all relevant participation requirements. No Annex I party has yet been identified.

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.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA.

A renewable crediting period of 7 years (with the potential of being renewed twice) with a forecasted start on 30/10/2009 (but not earlier than registration) was defined in the published PDD (Version 1, dated 05 December 2008) and later, on the revised PDD Version 3 of 28 September 2009, the forecasted crediting period starting date was revised to 01/01/20010 (but not earlier than registration).

The project's starting date was defined as 04/02/2008 in the published PDD (Version 1, dated 05 December 2008) and later, with proper evidence, confirmed as 01/12/2007 on the revised PDDs Version 2 of 16 June 2009 and Version 3 of 28 September 2009. Contract with Alstom Hydro Energia Brasil Ltda (Turbines-Generators) /16/, dated 01/12/2007, was presented and found acceptable as evidence for the project's starting date as the earliest commitment to expenditures related to the implementation or construction of the project activity.

The project has an expected operational lifetime of 30 years. The forecasted date for starting the operations for Queluz SHP is 30/10/2009 and Lavrinhas SHP will be starting the operations on 15/01/2010.

As mentioned in the published PDD, the project is expected to reduce CO_2 emissions to the extent of 471,845 tCO2e (67,406 tCO2e / year average) over the 7 years renewable crediting period (with the potential of being renewed twice). Later, due to the change of the crediting period starting date and the update of the grid emission factor of the Brazilian grid system (from 0.1842 to 0.3112 tCO_2/MWh), the expected total of CO_2 emissions reductions were revised and now the project is expected to reduce CO_2 emissions to the extent of 810,717 tCO2e (115,817 tCO_2e / year average), as reflected in the PDD Version 3 of 28 September 2009.

The project activity helps Brazil to fulfill its goals by promoting sustainable development, specially in the two municipalities, Queluz and Lavrinhas, with an estimated population of 11,000 and 7,000 habitants, respectively. The main positive impacts are:

- Increasing employment opportunities in the area where the project is located, either for the implementation work or for the operation of the new facilities;

- Generates tax revenues to the area (municipalities) where the project is located;

- Using clean, renewable and efficient technologies;

- Increasing the offer of renewable energy in a developing country.

3.2 Baseline

The project applies the approved consolidated baseline methodology ACM-0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 9 of 13/02/2009 /8/.

The approved methodology refers to the latest approved versions of the following tools:

- Tool for the demonstration and assessment of additionality (*verified to be Version 05.2*);

- Tool to calculate the emission factor for an electricity system (*verified to be Version 01.1*);

- Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (*verified to be Version 02*).

The project does not involve switching from fossil fuels to renewable energy at the site(s) of the project activity.

ACM-0002 is applicable to the "Queluz and Lavrinhas Renewable Energy Project" because:

- the project activity will result in the installation of two hydro power plants/units (either with a run-of-river reservoir or an accumulation reservoir);

- the project activity will result in new reservoirs and the power density of the power plants, as per definitions given in the Project Emissions section, is greater than 4 W/m^2;

- the geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available.

It was verified that the power density of the power plants is greater than 4 W/m^2 (Queluz=24 W/m^2 and Lavrinhas= 39 W/m^2). Furthermore, the power density of the power plants is greater than 10 W/m^2 and thus the project emissions from the reservoir(s) are considered as equal to zero (PE_y=0).

Queluz and Lavrinhas Power Plants are considered as Small Hydroelectric Plants (SHP), according to the Resolution #652 (issued on 09/12/2003) from the Brazilian Power Regulatory Agency (Agência Nacional de Energia Elétrica – ANEEL) /15/, which states that small hydro's in Brazil must have an installed capacity greater than 1MW but not more than 30MW and with reservoir area less than 3 km^2. Queluz and Lavrinhas installed generation capacity will be 30 MW each and the reservoirs areas will be, respectively, 1.27 and 0.76 km^2.

The following emissions sources were included in or excluded from the project boundary:

Baseline emissions

Source	Gas	Included?	Justification / Explanation
CO_2 emissions from electricity generation in fossil fuel fired	CO_2	Yes	Emissions from fossil fuel power plants connected to the national grid.

power plants that are displaced due to the project activity.	CH_4	No	Minor emission source.
	N_2O	No	Minor emission source.

Project Activity Emissions

Source	Gas	Included?	Justification / Explanation
For hydro power plants, emissions of CH_4 from the reservoir.	CO_2	No	There is no increase of fossil fuel or electricity consumption due to the project activity.
	CH_4	No	There is no reservoir included in this project.
	N_2O	No	Minor emission source.

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

Emission reductions were initially estimated (published PDD), using the latest grid emission factor of the Brazilian grid system, available at the time baseline study and the monitoring methodology were concluded (05/12/2008), and equal to 0.1842 tCO_2/MWh (2007 data).

In the PDD version 3, dated 28 September 2009, this factor was updated and the emission reductions were estimated *ex-ante* based on the latest available emission factor of the Brazilian grid system for 2008, (= 0.3112 tCO_2/MWh - average OM=0.4766 tCO_2/MWh and BM= 0.1458 CO_2/MWh). The emission factor provided by the Brazilian DNA ("Comissão Interministerial de Mudança Global do Clima"– CIMGC) is calculated according to the Tool to calculate the emission factor for an electricity system, Version 01.1 and considering all four regions connected (North, Northeast, South and Southeast-Midwest).

The following timeline and related evidences shows the development of the project:

Date	Event / Issue
03/10/2006*	ANEEL Authorizations - Resolutions numbers 715 (Queluz) and 716 (Lavrinhas), transferring previous authorizations from Empreendimentos Patrimoniais Santa Gisele Ltda. to Usina Paulista Queluz de Energia Ltda and Usina Paulista Lavrinhas de Energia Ltda.
10/04/2007	Proposal from a CDM consultancy company to develop a CDM project to the project developer group, ALUSA Engineering.
28/08/2007	Environmental Installation Licenses: Queluz No.00290 Lavrinhas No. 00289
30/08/2007	Proposals from the financial institution UNIBANCO - União de Bancos Brasileiros S.A. (economical-financing assessment of the project activity and commercialization of carbon credits) to "Usinas Paulista Lavrinhas and Queluz de Energia S.A.".
16/10/2007	Power Purchase Agreements / QUELUZ-Contract 090/2007 with Perdigão Agroindustrial S.A., dated 16/10/2007 (energy supply-contracted from 01/11/2009 to 31/12/2024). LAVRINHAS-Contract 115/2007 with Perdigão Agroindustrial S.A., dated 16/10/2007 (energy supply-contracted from 01/11/2009 to 31/12/2024).
01/12/2007	Contract with Alstom Hydro Energia Brasil Ltda (Turbines-Generators).
13/02/2008	First payment invoices (QUELUZ invoice No.937 and LAVRINHAS invoice No.938) from the company responsible for construction, Alusa Engenharia Ltda

	(work order of the 1st and 2nd construction's phases - construction job site/bed)
26/05/2008	National Water Agency (Agência Nacional de Águas - ANA) / Hydric resources use permits: QUELUZ-Resolution No. 303 and LAVRINHAS-Resolution No. 304.
30/06/2008	Communication between project participant and CDM consultancy company AMBIO.
08/07/2008	AMBIO CDM consultancy contracts with "Usinas Paulista Lavrinhas and Queluz de Energia S.A.".
14/10/2008	Communication from project participants with Brazilian DNA and UNFCCC.
12/11/2008	Contract with RINA signed
11/12/2008	PDD made publicly available through the CDM website

***** *The Brazilian Electric Energy Agency (Agência Nacional de Energia Elétrica - ANEEL) authorization (or permit) is typically used as the starting point for project developers in Brazil to secure or close financing for projects (i.e. ANEEL grants a permission for a project to be built, but the authorization alone is no guarantee that a project will be actually built[2]).*

Evidence that the incentive from the CDM was seriously considered in an early stage was mentioned in the published PDD as been the elaboration and presentation of the business plan to the investors, in 2007. During the site visit, proposals for an Economic-Financier Assessorship from UNIBANCO - União de Bancos Brasileiros S.A /9/, dated 30 August 2007 (to Usina Paulista Lavrinhas de Energia S.A. and Usina Paulista Queluz de Energia S.A., were presented as evidences that CDM was seriously considered in the decision to implement the project activity.

In a earlier date (10/04/2007) a proposal from a consultancy company, also referring to carbon credits, was received but, as negotiations did not resulted in a formal contract and the proposal was not considered in the project participants business plan it is considered as an action towards secure CDM status (please, see below paragraph) but not the decisive factor in the decision to proceed with the project.

Other CDM consideration continuous actions verified were: (1) the earlier CDM consultancy proposal received on 10/04/2007; (2) the communications with AMBIO consultancy company on 30/06/2008; (3) the contracts signed between AMBIO and Usina Paulista Lavrinhas de Energia S.A. and Usina Paulista Queluz de Energia S.A. on 08/07/2008; (4) the communication with the Brazilian DNA and UNFCCC on 14/10/2008 and the contract for Validation services signed between AMBIO and RINA on 12/11/2008. Therefore, it is clearly demonstrated that continuing and real actions were taken to secure the CDM status of the project in parallel with its implementation.

The project's additionality is demonstrated by project participants as per the "Tool for the demonstration and assessment of additionality" - Version 05.2.

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

Two alternative baseline scenarios were considered:

Alternative 1: electricity consumption from the Brazilian National Interconnected System (SIN);

Alternative 2: the project activity undertaken without being registered as a CDM project activity.

[2] http://rss.clicabrasilia.com.br/portal/noticia.php?IdNoticia=26969

Step 2: Investment analysis

Determine appropriate analysis method.

Among the three options available for investment analysis as discussed in the "Tool for the demonstration and assessment of additionality", projects participants have chosen the benchmark analysis as simple cost and the investment comparison analysis are not applicable. The simple cost analysis is not applicable because the project activity will generate financial and economic benefits (from electricity sales) other than CDM related income. Neither is the investment comparison analysis applicable because the only alternative to the project activity is the supply of electricity from a grid, which is not to be considered a similar investment project.

Apply benchmark analysis

The approach used by projects participants was correct. They compared the projects' IRR (internal rate of return) with the SELIC rate. The SELIC rate is defined and calculated by the Brazilian Central Bank and is the weighted average of the rates traded in overnight repurchase agreements (repos) backed by government bonds. In other words, it is Brazilian Central Bank's overnight lending rate and considered the country's risk-free rate.

Contrarily to other countries, in Brazil there is not a specific internal rate of return that works as a benchmark for SHP projects, which is the same to say that the Brazilian government does not require a minimum profitability in projects of this kind nor there is a widely accepted benchmark applied by several different players in the Brazilian small hydropower industry. The attractiveness of any project in this area depends exclusively on the minimum rate of return required by project participants. To be economically attractive, the Internal Rate of Return of any investment project implemented in Brazil should exceed the SELIC rate as projects carry risks (i.e. execution risks, financial risks etc) and therefore should include a premium over the risk-free rate.

SELIC data used by projects participants are official and available at Brazilian Central Bank's home page[3]. However, given the difficulties predicting the behavior of the SELIC rate in the future, the best estimate for the SELIC rate at the time of decision making would be an average of the previous years instead of the previous 7 years, mentioned in the published PDD (version 1, dated 05 December 2008). Conservatively, projects participants limited on the revised PDDs (Version 2 of 16 June 2009 and Version 3 of 28 September 2009) the average to a range of only 2 years (2006-2007) in order to capture the recent downward trend of the SELIC rate, resulting in a 13.63% SELIC rate (benchmark).

Calculation and comparison of financial indicators.

The total initial amount of R$311.6 million is very reasonable considering the magnitude of such investments (average of R$ 5,000/kW installed is in line with the average of similar projects) which is reinforced by the expected trend in construction material prices. The Brazilian construction materials industry reported a 33% revenues growth in 2008 compared to 2007 and for 2009 ABRAMAT (The Brazilian Association of the Construction Material Industry)[4] is forecasting revenues growth of 6%, showing that demand for construction materials continues to trend upwards, pushing up prices.

Although operational costs are another important parameter to be validated, it is worthy of mention that the impact of any variation of this variable is very small showing a very inelastic

[3] www.bcb.gov.br
[4] www.abramat.org.br

relationship between O&M costs and the Internal Rate of Return of both Queluz and Lavrinhas. According to their data, when O&M costs are theoretically slashed by 100%, Queluz's and Lavrinhas' IRR grow to only 11% and 11.7%, respectively, well below the proposed benchmark. In any case, the average COGS (Cost of Goods Sold) margin of 14% is in line with the average of projects of this size. The breakdown of each investment is shown in the table 1 below and in table 2 there are the other parameters for calculating the financial indicators.

Table 1 –Breakdown of Project Investment

Investment costs	**QUELUZ** (k R$)	**LAVRINHAS** (k R$)
Land and environmental actions	-3,100	-2,643
Engine room	-10,174	-9,429
Dam construction	-57,075	-46,843
Turbine and Generator	-44,860	-44,860
Electrical equipments	-15,138	-21,370
Engineering	-27,879	-28,311
TOTAL	**-158,226**	**-153,456**

Table 2 –Parameters for the calculation of financial indicators

		QUELUZ	**LAVRINHAS**
Installed capacity	MW	30	30
Total investment	R$ million	158.2	153.4
Estimated annual output	MWh	187,464	187,464
Electricity Tariff	R$ / MWh	146.0	146.0
Gross Revenues	R$ million	26.8	27.3
Operation and maintenance cost	R$ million	2.5	2.5
Operating Cash Flow	R$ million	15.7	16.0
Project lifetime	Years	30	30
Taxes		32%	32%
Period of depreciation	Years	30	30

The lifetime of both project's plants is 30 years.

According to the Tool for Additionality, it should be determined whether the proposed project activity is not: (a) The most economically or financially attractive; or (b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs). The Internal Rate of Return of Queluz and Lavrinhas, according to the spreadsheet provided by project participants, were 9.48%pa and 9.84%pa, respectively, much lower than the benchmark (SELIC rate = 13.63%), showing that both projects are not the most economically or financially attractive.

Considering the Carbon revenues, the IRR for Queluz SHP was 11.2% and for Lavrinhas 11.6%, still lower than the benchmark (SELIC rate = 13.63%).

Sensitivity Analysis

The following parameters were taken into account in the sensitivity analysis: (i) revenues; (ii) total investment and (iii) annual operational costs. The magnitude of IRR variations will depend on the extent to which these parameters vary. Positive variations of the first parameter have a positive impact on the projects' IRR while the opposite holds true for total investment and annual operational costs.

Sensitivity analysis was limited to variations of +/- 20% in the three parameters listed above. Since the objective of this sensitivity analysis is to assess the impact of more favorable scenarios on the IRR and their economic feasibility of Queluz and Lavrinhas projects, revenues have been increased up to 20% while investment and operational costs have been gradually reduced by the same 20%. Below we are providing mode detailed data on the variations of above-mentioned parameters and how they affect the projects' IRR.

Queluz									
Variation / IRR	-20%	-16%	-10%	-6%	0%	6%	10%	16%	20%
Revenues	6.7%	7.3%	8.1%	8.7%	9.5%	10.3%	10.8%	11.6%	12.1%
Investment	12.3%	11.6%	10.7%	10.2%	9.5%	8.8%	8.4%	7.8%	7.5%
Annual Operational Costs	9.8%	9.8%	9.7%	9.6%	9.5%	9.4%	9.3%	9.2%	9.1%
Lavrinhas									
Variation / IRR	-20%	-16%	-10%	-6%	0%	6%	10%	16%	20%
Revenues	7.0%	7.6%	8.4%	9.0%	9.8%	10.7%	11.2%	12.0%	12.5%
Investment	12.7%	12.0%	11.1%	10.6%	9.8%	9.2%	8.7%	8.2%	7.8%
Annual Operational Costs	10.2%	10.1%	10.0%	10.0%	9.8%	9.7%	9.6%	9.5%	9.5%

According to data above, positive variations of 20% in revenues would fall short of making Queluz and Lavrinhas projects meet the benchmark. If Queluz's revenues happened to be 20% higher than originally forecasted, IRR would reach 12.1%, higher than the original 9.48%pa but still below the proposed benchmark of 13.63%. On its turn, a 20% variation in Lavrinhas' initially forecasted revenues would push the IRR to only 12.5%, higher than the original 9.84%pa but still below the benchmark. It is important to point out that the variations in revenues are naturally related to the variations in the electricity price or in the electricity generation (plant load factor) which are extremely unlikely to present such variations as the electricity price is defined in the contracts (PPAs) and the electricity generation (assured energy) of a hydroelectric plant is defined/limited for each plant by ANEEL (Brazilian Electric Energy Agency) as previously explained on item 3.1.

With respect to investments, reductions of 20% would also be too small to make Queluz and Lavrinhas projects meet the benchmark. Queluz and Lavrinhas projects would not meet the benchmark even if investments were cut by 20%. With respect to operational cost, it is worth pointing out that the impact of any variation of this variable is very small showing a very inelastic relationship between O&M costs and the Internal Rate of Return of both projects. Reductions of 20% in operational costs of both projects would result in relatively small changes in their IRR.

In addition, projects participants calculated how large should these variations be to make the projects' NPV equal zero or, in other words, to make their IRR equal the benchmark. Their results are shown below.

Variation Needed	Queluz SHP	Lavrinhas SHP
Investment	-27%	-25%
Revenues & Taxes	32%	29%
Operational Cost	No impact	No impact

Investment costs in Queluz and Lavrinhas would have to drop approximately by 27% and 25%, respectively, which would not be possible since the contract with the construction company has been determined at a fixed price. Net revenues on its turn would have to climb by 32% and 29%, which would not be possible either as power purchase agreements are defined until 2024. Finally, as we mentioned, there is a very inelastic relationship between O&M costs and projects' IRR.

Step 3: Barrier analysis

Not applicable as only Step 2 was selected.

Step 4: Common practice analysis

Considering plants capacity and similar amount of investments, the PDD has selected plants from 10 MW to 30 MW (upper limit for SHPs), mentioning the plants that started operations from 2006 until 2008 and the plants that will start operations on 2009-2010, and identifying -when information was available- the plants that received incentives like CDM and/or PROINFA. From a total of 43 plants, 20 of the plants that are operating have received some kind of incentives and 10 of the plants that will start operations on 2009-2010 are considering some kind of incentive in the future (Tables of PCHs- PDD/Annex 3). RINA was able to verify this information on the ANEEL site[5] and UNEP Risø Centre (01/05/2009). Thus, it can be confirmed that the implementation of similar projects are made by availing CDM benefits.

Nowadays, SHPs are generating around 2.5% of the total authorized generation in Brazil. A total of 254 SHPs from 1 MW to 30 MW (all phases - operating, under construction, construction not started) can be found in ANEEL's site (Generation information bank[6]). From these 254 plants, 128 (all phases – 50% of total SHPs) are in the range from 10 to 30 MW and 4.7% of them are or will be located in the state of São Paulo.

The project activity is not the business-as-usual scenario in Brazil, where large Hydropower and Natural Gas Thermo Power plants represent the majority (95%) of present installed capacity.

3.3 Monitoring Plan

The project applies the approved consolidated monitoring methodology ACM-0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 9 of 13/02/2009.

The project is a grid-connected renewable power generation, with power density greater than 4W/m2, which is applicable for ACM-0002.

The net electricity generated from the project will be measured and recorded continuously (hourly reading and recorded monthly). This data will be cross verified against the sales receipts of the electricity delivered to the grid.

[5] http://www.aneel.gov.br/37.htm

[6] http://www.aneel.gov.br/aplicacoes/capacidadebrasil/energiaassegurada.asp

Project emissions are regarded as zero and leakage accounting is not required under ACM-0002 and thus has not been considered for the project.

All data collected as part of monitoring will be archived and kept at least for 2 years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

The following parameters are available at validation (not monitored):

* $\mathbf{A_{BL}}$ - Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full;

* $\mathbf{Cap_{BL}}$ - Installed capacity of the hydro power plant before the implementation of the project.

The following data and parameters will be monitored:

* $\mathbf{EG_y}$ Electricity supplied by the project activity to the grid;

* $\mathbf{EF_{grid,CM,y}}$ Combined margin CO_2 emission factor for grid connected power generation in the year.

3.4 Calculation of GHG Emissions

The formulas and factors used in the project's emissions calculations are in accordance to the approved baseline and monitoring methodology ACM-0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 9 of 13/02/2009.

***Ex-ante* calculation of emission reductions**

Emission reductions were initially estimated (published PDD), using the latest grid emission factor of the Brazilian grid system, available at the time baseline study and the monitoring methodology were concluded (05/12/2008), and equal to 0.1842 tCO_2/MWh (2007 data).

In the PDD version 3, dated 28 September 2009, this factor was updated and the emission reductions were estimated *ex-ante* based on the latest available emission factor of the Brazilian grid system for 2008, (= 0.3112 tCO_2/MWh - average OM=0.4766 tCO_2/MWh and BM= 0.1458 CO_2/MWh). The emission factor provided by the Brazilian DNA ("Comissão Interministerial de Mudança Global do Clima"– CIMGC) is calculated according to the Tool to calculate the emission factor for an electricity system, Version 01.1 and considering all four regions connected (North, Northeast, South and Southeast-Midwest).

***Ex-post* calculation of emission reductions**

The combined margin emissions factor ($EF_{grid,CM,y}$) will be calculated *ex-post* using the CO_2 emission factors for the build margin and the operational margin that are provided by the Brazilian DNA. CO_2 emission factors for the build margin and the operational margin for electricity generation in Brazil's National Interconnected System (SIN) are calculated, according to the dispatch analysis, from generation records of plants dispatched in a centralized manner by the National Electric System Operator (ONS).

3.5 Environmental Impacts

The project developer complies with all laws and regulations applicable. The State Environmental Authority is the Department of Evaluation of Environmental Impact - DAIA (Departamento de Avaliação de Impacto Ambiental), i.e. Environmental Agency of the State of São Paulo (Secretaria de Meio Ambiente do Estado de São Paulo), requests the Preliminary

Environmental Report (RAP-Relatório Ambiental Preliminar) for activities with potential to cause environmental impacts.

The following licenses were presented and verified during the site visit:

- Lavrinhas Environmental Installation License No.00289 from the Environment State Secretary – São Paulo State Government (Licença Ambiental de Instalação No.00289 da Secretaria de Estado do Meio Ambiente (SMA) do Governo do Estado de São Paulo), dated 28/08/2007 and valid until 25/03/2010;
- Queluz Environmental Installation License No.00290 from the Environment State Secretary – São Paulo State Government (Licença Ambiental de Instalação No.00290 da Secretaria de Estado do Meio Ambiente (SMA) do Governo do Estado de São Paulo), dated 28/08/2007 and valid until 25/03/2010.

No transboundary impacts are foreseen.

3.6 Comments by Local Stakeholders

As required by the Interministerial Commission on Global Climate Change (CIMGC) and in accordance to the Resolution 7 of the Brazilian DNA (05 March 2008), the project participants sent letters, inviting for comments, to the following stakeholders/City authorities:

City Hall of Queluz	Prefeitura Municipal de Queluz	Rua Prudente de Moraes, 100 – Centro CEP 12800-000 – Queluz - SP
City Hall of Lavrinhas	Prefeitura Municipal de Lavrinhas	Paço Municipal, 200 – Centro CEP 12760-970 – Lavrinhas - SP
Chamber of Deputy of Queluz	Câmara Municipal de Queluz	Praça Joaquim Pereira – S/Nº- Centro CEP 12800-000 – Queluz - SP
Chamber of Deputy of Lavrinhas	Câmara Municipal de Lavrinhas	Rua Manoel Machado, 82 – Centro CEP 12760-970 – Lavrinhas - SP
District Attorney of São Paulo	Ministério Público do Estado de São Paulo	Rua Riachuelo, 115 - Centro CEP 01007- 904 – São Paulo - SP
Federal Attorney	Ministério Público Federal	SAF Sul Quadra 4 Conjunto C CEP 70050-900 - Brasília – DF
Environment agencies from the State and Local Authority	Secretaria do Meio Ambiente do Estado de São Paulo - SMA	Av. Prof. Frederico Hermann Júnior, 345- Alto de Pinheiros CEP 05459-010 - São Paulo - SP
Environment agencies from the State and Local Authority	CETESB - Companhia de Tecnologia de Saneamento Ambiental	Av. Prof. Frederico Hermann Júnior, 345- Alto de Pinheiros CEP 05459-010 - São Paulo - SP
Environment agencies from the State and Local Authority	DAIA - Departamento de Avaliação de Impacto Ambiental	Av. Prof. Frederico Hermann Júnior, 345- Alto de Pinheiros CEP 05459-010 - São Paulo - SP
Environment agencies from the State and Local	DAEE - Departamento de Águas e Energia Elétrica	Rua Butantã, 285 - Pinheiros

Authority		CEP 05424-140 - São Paulo - SP
Environment agencies from the State and Local Authority	Comitê das Bacias Hidrográficas do Rio Paraíba do Sul	Largo Stª Luzia, 25 - Bairro Santa Luzia CEP 12010-510 – Taubaté - SP
Brazilian Forum of NGOs	Fórum Brasileiro de ONGs e Movimentos Sociais - FBOMS	SCS, Quadra 08, Bloco B-50, salas 133/135 Ed. Venâncio 2000 CEP 70.333-970 - Brasília – DF

Letters posted and ARs (Avisos de Recebimento = "Receiving acknowledgment receipts") were presented during the site visit and verified. All letters were sent on 05/12/2008 and no comments were received.

The latest version of the PDD and other relevant documentation will also be published on the internet by the project participants until the project is registered.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 05 December 2008 was made publicly available on the UNFCCC CDM website and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 11 December 2008 to 09 January 2009. No comments were received.

5 VALIDATION OPINION

RINA has performed a validation of the "Queluz and Lavrinhas Renewable Energy Project" project in Brazil. The validation was performed on the basis of UNFCCC criteria 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 (PDD Version 1, dated 05 December 2008 and PDD Version 2, dated 16 June 2009, subsequently revised to Version 3, dated 28 September 2009 /7/ and the subsequent follow-up interviews have provided RINA with sufficient evidence to determine the fulfillment of stated criteria.

The project participants are AMBIO Participações Ltda, Usina Paulista Queluz de Energia S.A. and Usina Paulista Lavrinhas de Energia S.A.. The host Party Brazil meets all relevant participation requirements. No participating Annex I Party is yet identified.

The proposed project activity falls under Project category "Grid-connected electricity generation from renewable sources" and Sectoral Scope 1- Energy industries (renewable/non-renewable sources) and the project boundary (spatial extent) encompasses the physical, geographical sites of the renewable power generation sources and all power plants connected physically to the Brazilian interconnected grid. The project is a renewable electricity generation project activity displacing grid electricity that is partly generated based on fossil fuels, with electricity generated from renewable sources and thus resulting in the reduction of emissions of greenhouse gases in the energy sector and will consist of two run-of-river hydroelectric power plants/units, each equipped with two Kaplan turbines and two Alstom generators of 15 MW. The total installed capacity of the project activity is 60 MW (30 MW each plant) with an estimated generation of 374,928 MWh/year (assured energy).

An analysis of the technological, prevailing practice and other barriers demonstrates that the proposed project activity 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. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions during the selected 7 years renewable crediting period.

Emission reductions were estimated ex-ante using the latest available combined margin CO_2 emission factor of 0.3112 tCO_2/MWh (2008) -calculated according to the Tool to calculate the emission factor for an electricity system (Version 01.1)- for the Brazilian grid system, provided by the Brazilian DNA /14/, "Comissão Interministerial de Mudança Global do Clima"– CIMGC and considering all four regions connected (North, Northeast, South and Southeast-Midwest).

The validation is based on the information made available to us and the engagement conditions detailed in this report. The only purpose of this report is its use during the registration process as part of the CDM project cycle.

The project applies the approved baseline and monitoring methodology ACM-0002, i.e. "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*, Version 9 of 13/02/2009. The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound. The monitoring methodology has been correctly applied and the monitoring plan sufficiently specifies the monitoring requirements.*

VALIDATION REPORT

In our opinion, the project, as described in the PDD of 16 June 2009 meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The "Queluz and Lavrinhas Renewable Energy Project" project will hence be recommended by RINA for registration as a CDM project activity.

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.

6 REFERENCES

Category 1 Documents:

List documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority). These should have been used as direct sources of evidence for the validation conclusions, and are usually further checked through interviews with key personnel.

/1/ AMBIO Participações Ltda CDM-PDD for the "Queluz and Lavrinhas Renewable Energy Project", Version 1 of 05 December 2008.

/2/ ALUSA - estimatives.xls, dated 04/12/2008.

/3/ AMBIO Participações Ltda CDM-PDD for the "Queluz and Lavrinhas Renewable Energy Project", Version 2 of 16 June 2009.

/4/ "ALUSA - estimatives.xls" (ERs and IRR calculations), dated 18/05/2009.

/5/ AMBIO Participações Ltda CDM-PDD for the "Queluz and Lavrinhas Renewable Energy Project", Version 3 of 28 September 2009.

/6/ "ALUSA - estimatives 200.10.19.xls" (ERs and IRR calculations), dated 19/10/2009.

Category 2 Documents:

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

/7/ CDM Validation and Verification Manual – Version 01, dated 28 November 2008.

/8/ ACM-0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" - Version 9 of 13/02/2009.

/9/ Proposals to "Usinas Paulista Lavrinhas and Queluz de Energia S.A." for an Economic-Financier Assessorship from UNIBANCO - União de Bancos Brasileiros S.A, dated 30/08/2007.

/10/ Tool for the demonstration and assessment of additionality - Version 05.2.

/11/ Tool to calculate the emission factor for an electricity system - Version 01.1.

/12/ Lavrinhas Environmental Installation License No.00289 from the Environment State Secretary – São Paulo State Government (Licença Ambiental de Instalação No.00289 da Secretaria de Estado do Meio Ambiente (SMA) do Governo do Estado de São Paulo), dated 28/08/2007 and valid until 25/03/2010.

/13/ Queluz Environmental Installation License No.00290 from the Environment State Secretary – São Paulo State Government (Licença Ambiental de Instalação No.00290 da Secretaria de Estado do Meio Ambiente (SMA) do Governo do Estado de São Paulo), dated 28/08/2007 and valid until 25/03/2010.

/14/ Fatores de Emissão de CO_2 pela geração de energia elétrica no Sistema Interligado Nacional do Brasil - Ano Base 2008 (CO_2 emission factors from electric energy generation in Brazil's National Interconnected System – Baseline year 2008). http://www.mct.gov.br/index.php/ (accessed on 08/06/2009).

/15/ Resolution #652 from the Brazilian Power Regulatory Agency (Agência Nacional de

Energia Elétrica – ANEEL), dated 09/12/2003.

/16/ Contract with Alstom Hydro Energia Brasil Ltda (Turbines-Generators), dated 01/12/2007.

/17/ ANEEL Authorization - Resolution number 715, transferring previous authorizations from Empreendimentos Patrimoniais Santa Gisele Ltda. to Usina Paulista Queluz de Energia Ltda, dated 03/10/2006.

/18/ ANEEL Authorization - Resolution number 716, transferring previous authorizations from Empreendimentos Patrimoniais Santa Gisele Ltda. to Usina Paulista Lavrinhas de Energia Ltda, dated 03/10/2006.

Persons interviewed:

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

/19/ Mr. Arcilio Alves Filho / Technician-Construction Inspector / Engenhidro Engenharia

/20/ Mr. Alexandre Lisboa Humphreys / Civil Engineer / Usina Paulista Lavrinhas de Energia S.A.

/21/ Itamar Marcondes Neto / Technical Director / Usina Paulista Queluz de Energia S.A. & Usina Paulista Lavrinhas de Energia S.A.

/22/ Mr. Carlos Cavate / Civil Engineer / Engenhidro Engenharia

/23/ Mr. Sérgio Galvão / Administration / Usina Paulista Queluz de Energia S.A.

/24/ Mr. Luis Filipe Kopp / Consultant / AMBIO Participações Ltda

/25/ Mr. Marcelo Duque / Consultant / AMBIO Participações Ltda

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APPENDIX A

CDM VALIDATION PROTOCOL

This document contains a generic Validation Protocol for CDM projects, which must be seen in conjunction with the Validation and Verification Manual and the Validation Report Template. The entries in the protocol should be adjusted and amended as appropriate to prepare for the validation of a particular project.

This validation protocol serves the following purposes:

- *It organizes, details and clarifies the requirements a CDM project is expected to meet; and*
- *It ensures a transparent validation process by inducing the Validator to document how a particular requirement has been validated and which conclusions have been reached;*

This protocol contains two tables with generic requirements for validation projects. Table 1 shows the requirements that the GHG emission reduction project will be validated against. Table 2 consists of a checklist with validation questions related to one or more of the requirements in Table 1. The checklist questions may not be applicable for all investors, and should not be viewed as mandatory for all projects. Where a finding is issued, a corrective action request or clarification request are stated. The resolution and final conclusions of these requests should be described in Table 3 of this protocol.

Before this generic validation protocol can be applied to validate a specific project, the Validator must review and adjust/amend the protocol to make it applicable to individual project characteristics and circumstances as well as individual investor criteria. The application of the Validator's professional judgment and technical expertise should ensure that checklist amendments cover all necessary specific project requirements that have impact on project performance and acceptance of the project. Given the above, the checklist part of the protocol is neither exhaustive nor prescriptive.

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reductions commitment under Art. 3.	Kyoto Protocol Art.12.2	**OK**	Table 2, Section, B.6.3, B.6.4 No Annex I party has yet been identified.
2. The project shall assist non Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	--	Table 2, Section A.2.3 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.
3. The project shall assist non Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	**OK**	Table 2, Section B.6.3, B.6.4
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved.	Kyoto Protocol Art.12.5a, Marrakesh Accords, CDM Modalities §40a, § 28	--	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.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	**OK**	Table 2, Section A.4.4, B.6.3, B.6.4
6. Reductions in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by	Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43 and § 44	**OK**	Table 2, Section B.5

Requirement	Reference	Conclusion	Cross Reference / Comment
sources are reduced below those that would have occurred in the absence of the registered CDM project activity.			
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance (ODA) and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	**OK**	Table 2, Section A.4.5
8. Parties participating in the CDM shall designate a national authority for the CDM.	Marrakech Accords, CDM Modalities §29	**OK**	The Brazilian designated national authority for the CDM is the "Comissão Interministerial de Mudança Global do Clima" (CIMGC).
9. The host country and the participating Annex I Party shall be a Party to the Kyoto Protocol.	Marrakech Accords, CDM Modalities §30	**OK**	Brazil has ratified the protocol on 23 August 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	**OK**	No Annex I party has yet been identified.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	**OK**	No Annex I party has yet been identified.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	Marrakech Accords, CDM Modalities §37b	**OK**	Table 2, Section E As required by the Interministerial Commission on Global Climate Change (CIMGC) and in accordance to the Resolution 7 of the Brazilian DNA (05 March 2008), the project participants sent letters, inviting for comments, to local stakeholders/City authorities.
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if	Marrakech Accords, CDM Modalities §37c	**OK**	Table 2, Section D

Requirement	Reference	Conclusion	Cross Reference / Comment
those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.			
14. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel.	Marrakech Accords, CDM Modalities §37e	**OK**	Table 2, Section B
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	Marrakech Accords, CDM Modalities §37f	**OK**	Table 2, Section B.7
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	Marrakech Accords, CDM Modalities, §40	**OK**	The PDD of 05 December 2008 was made publicly available on the UNFCCC CDM website and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 11 December 2008 to 09 January 2009. No comments were received.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	Marrakech Accords, CDM Modalities, §45 b, c, d, e	**OK**	Table 2, Section B.4
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	Marrakech Accords, CDM Modalities, §47	**OK**	Table 2, Section B.4
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	**OK**	PDD is in accordance with CDM-PDD form (version 03 of 28 July 2006).

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. General Description of Project Activity. *The project design is assessed.*					
A.1. Title of the project activity.					
A.1.1. Title of the project activity, version number and date of document (PDD).	/1/	DR	The title of the project activity is "Queluz and Lavrinhas Renewable Energy Project", as per PDD Version 1 of 05 December 2008.	**OK**	**OK**
A.2. Description of project activity.					
A.2.1. Is the purpose of the project activity included?	/1/	DR	The project activity will consist of two run-of-river hydroelectric power plants (Queluz and Lavrinhas small hydroelectric power plants - SHPP) located at the same river, Paraíba do Sul, that will supply electricity generated from renewable sources to the Brazilian National Interconnected System (SIN) grid and thereby reducing greenhouse gas emissions. Emission reductions are claimed from displacing grid electricity with the estimated electricity that will be generated by the hydroelectric power plants and supplied to the grid.	**OK**	**OK**
A.2.2. Is it explained how the project activity reduces greenhouse gas emissions, i.e. technology, measures?	/1/	DR	The project is a renewable electricity generation project activity displacing grid electricity that is partly generated based on fossil fuels, with electricity generated from renewable sources and thus resulting in the reduction of emissions of greenhouse gases in the energy sector.	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2.3. Contribution to Sustainable Development. Table 1 - 2					
A.2.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/ /12/ /13/	DR	The following licenses were presented and verified during the site visit: - Lavrinhas Environmental Installation License No.00289 from the Environment State Secretary – São Paulo State Government (Licença Ambiental de Instalação No.00289 da Secretaria de Estado do Meio Ambiente (SMA) do Governo do Estado de São Paulo), dated 28/08/2007 and valid until 25/03/2010; - Queluz Environmental Installation License No.00290 from the Environment State Secretary – São Paulo State Government (Licença Ambiental de Instalação No.00290 da Secretaria de Estado do Meio Ambiente (SMA) do Governo do Estado de São Paulo), dated 28/08/2007 and valid until 25/03/2010. See D.1.6.	**OK**	**OK**
A.2.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR	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.	--	--
A.2.3.3. Is the project in line with sustainable	/1/	DR	Prior to the submission of the Project Design	--	--

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
development policies of the host country?			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.		
A.2.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project activity helps Brazil to fulfill its goals by promoting sustainable development, especially in the two municipalities, Queluz and Lavrinhas, with an estimated population of 11,000 and 7,000 habitants, respectively. The main positive impacts are: - Increasing employment opportunities in the area where the project is located, either for the implementation work or for the operation of the new facilities; - Generates tax revenues to the area (municipalities) where the project is located; - Using clean, renewable and efficient technologies; - Increasing the offer of renewable energy in a developing country.	**OK**	**OK**
A.3. Project participants. Annex 1					
A.3.1. Are Party (ies) and private and / or public entities involved in the project activity listed?	/1/	DR	Project participants are AMBIO Participações Ltda, Usina Paulista Queluz de Energia S.A. and Usina Paulista Lavrinhas de Energia S.A.	**OK**	**OK**
A.3.2. Is the contact information provided in Annex 1 of the PDD, using the (proper table) tabular	/1/	DR	Yes, it is using the proper table (tabular format).		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
format?			Please clarify different project participants' names (Ltda or S.A.) from Table A.3 and Annex 1.	~~CL 2~~	
A.4. Technical description of the project activity.					
A.4.1. Is the location of the project activity clearly defined, including details of the physical location and information allowing the unique identification of this project activity(ies)?	/1/	DR/I	The "Queluz and Lavrinhas Renewable Energy Project" is located in the municipalities of Queluz and Lavrinhas, São Paulo State, Brazil. Geographical coordinates: Queluz SHP - 22º 33' South and 44º 48' West ; Lavrinhas SHP - 22º 34' South and 44º 52' West.	**OK**	**OK**
A.4.2. Is (are) the category (ies), type(s) and sectoral scope(s) of the proposed project activity specified?	/1/	DR	The proposed project activity falls under Project category "Grid-connected electricity generation from renewable sources" and Sectoral Scope 1- Energy industries (renewable/non-renewable sources).	**OK**	**OK**
A.4.3. Technology to be employed. *Validation of the project technology focuses on the project engineering, choice of technology competence/ maintenance needs. The Validator should ensure that environmentally safe and sound technology and know how is used / transferred.*					
A.4.3.1. Does the project design engineering reflect current good practices?	/1/	DR	The project design engineering reflects current good practice. The project will consist of two run-of-river hydroelectric power plants/units, each equipped with two Kaplan turbines and two Alstom generators of 15 MW. Queluz power plant will have a dam level of 29.6 m with a head level of 12.8 m. Lavrinhas power	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			plant will have a dam level of 28.4 m with a head level of 13.0 m. Both plants will be interconnected between each other and to Santa Cabeça substation.		
A.4.3.2. Does the project use the state of the art technology or could the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	At this particular time, the technology used can be considered as state of the art. See also A.4.3.1.	**OK**	**OK**
A.4.3.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	The expected operational lifetime of the project is 30 years. The project technology is not likely to be substituted by other or more efficient technologies within the project period. See C.1.2.1	**OK**	**OK**
A.4.3.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/		See B.7.2.7.	~~**CL 8**~~	**OK**
A.4.3.5. Does the project make provisions for meeting training and maintenance needs?	/1/		Training of monitoring personnel is mentioned, but neither training needs nor procedures (including emergency preparedness) for training monitoring personnel were identified. Training of monitoring personnel (including emergency preparedness) for monitoring personnel should be checked in the first verification. See A.4.3.4.	~~**CL 8**~~ **FAR 1**	**OK**
A.4.4. Estimated amount of emission reductions over the chosen crediting period. Table 1 - 5					

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.4.4.1. Is the chosen crediting period, total and annual estimated reductions defined and presented in a (proper table) tabular format? (*check these figures against item B.6.4 figures*)	/1/	DR	Yes. As mentioned in the published PDD, the project is expected to reduce CO_2 emissions to the extent of 471,845 tCO2e (67,406 tCO2e / year average) over the 7 years renewable crediting period (with the potential of being renewed twice). Later, due to the change of the crediting period starting date and the update of the grid emission factor of the Brazilian grid system (from 0.1842 to 0.3112 tCO_2/MWh), the expected total of CO_2 emissions reductions were revised and now the project is expected to reduce CO_2 emissions to the extent of 810,717 tCO2e (115,817 tCO_2e / year average), as reflected in the PDD Version 3 of 28 September 2009.	**OK**	**OK**
A.4.5. Public funding of the project activity. Table 1 - 7 & Annex 2					
A.4.5.1. Is it indicated whether public funding from Parties included in Annex 1 is involved in the proposed project activity?	/1/	DR	The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Brazil.	**OK**	**OK**
A.4.5.2. If public funding is involved, is information on sources of public funding for the project activity is provided in Annex 2, including an affirmation that such funding does not result on a diversion of official development assistance (ODA) and is separate from and is not counted towards the financial obligations of those Parties?	/1/	DR	See A.4.5.1.	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B. Project Baseline Application (methodologies). *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.* Table 1 - 14 & Annex 3					
B.1. Baseline Methodology. *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel? *(correctly quoted and interpreted?)*	/1/ /8/	DR	The project activity applies the approved consolidated baseline methodology ACM-0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" - Version 9 of 13/02/2009. ACM0002 Version 9 is valid from 27 February 2009 onwards. Please update PDD accordingly.	~~**CL 11**~~	**OK**
B.1.2. Are other methodologies or tools drawn up by the approved methodology mentioned? *(correctly quoted and interpreted?)*	/1/ /8/	DR	The approved methodology refers to the latest approved versions of the following tools: - Tool to calculate the emission factor for an electricity system (Version 01.1); - Tool for the demonstration and assessment of additionality (Version 05.2); - Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (Version 02). The project does not involve switching from fossil fuels to renewable energy at the site(s) of the project activity. At the site visit it was mentioned the future	~~**CAR 2**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			installation of a diesel backup generator. Thus, the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" should be mentioned in the PDD, provisions for monitoring according to this tool should be provided and the project emissions included in the calculations.		
B.2. Description of how the methodology is applied in the context of the project activity.					
B.2.1. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/ /8/	DR	Yes. ACM-0002 is applicable to the "Queluz and Lavrinhas Renewable Energy Project" because: - the project activity will result in the installation of two hydro power plants/units (either with a run-of-river reservoir or an accumulation reservoir); - the project activity will result in new reservoirs and the power density of the power plants, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; - the geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available. See B.7.2.2.	**OK**	**OK**
B.2.2. Background information or documentation, including tables with time series data, documentation of measurement results and data sources are properly addressed? (*check Annex 3*)	/1/	DR	Yes.	**OK**	**OK**

<table>
<tr><th colspan="2">Checklist Question</th><th>Ref.</th><th>MoV*</th><th>Comments</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td>B.2.3.</td><td>If comparable information is available from sources other than that used in the PDD, cross check the PDD against the other sources to confirm that the project activity meets the applicability conditions.</td><td>/1/</td><td>DR</td><td>When applicable, comparable information was cross checked and mentioned in the report.</td><td>OK</td><td>OK</td></tr>
<tr><td colspan="2">B.3. Description of the sources and the gases included in the project boundary. (physical delineation of the proposed CDM project activity)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>B.3.1.</td><td>Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?</td><td>/1/</td><td>DR</td><td>The "Queluz and Lavrinhas Renewable Energy Project" is located in the municipalities of Queluz and Lavrinhas, São Paulo State, Brazil. The geographical coordinates are:
- Queluz SHP: 22º 33' South and 44º 48' West
- Lavrinhas SHP: 22º 34' South and 44º 52' West
The proposed project boundary (spatial extent) encompasses the physical, geographical sites of the renewable power generation sources and all power plants connected physically to the Brazilian interconnected grid.</td><td>OK</td><td>OK</td></tr>
<tr><td>B.3.2.</td><td>Are all emission sources and significant GHGs included in the project boundary clearly identified and described in the appropriate table? Are the demonstration / justification (also for exclusions) adequate and sufficient?</td><td>/1/</td><td>DR</td><td>The following emissions sources were included in or excluded from the project boundary:
Baseline emissions
<table>
<tr><th>Source</th><th>Gas</th><th>Included?</th><th>Justification / Explanation</th></tr>
<tr><td>CO_2 emissions from electricity generation in</td><td>CO_2</td><td>Yes</td><td>Emissions from fossil fuel power plants connected to the national</td></tr>
</table></td><td></td><td>OK</td></tr>
</table>

<table>
<tr><th>Checklist Question</th><th>Ref.</th><th>MoV*</th><th>Comments</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><td rowspan="3">fossil fuel fired power plants that are displaced due to the project activity.</td><td></td><td></td><td>grid.</td></tr>
<tr><td>CH_4</td><td>No</td><td>Minor emission source.</td></tr>
<tr><td>N_2O</td><td>No</td><td>Minor emission source.</td></tr>
</table>
Project Activity Emissions
<table>
<tr><th>Source</th><th>Gas</th><th>Included?</th><th>Justification / Explanation</th></tr>
<tr><td rowspan="3">For hydro power plants, emissions of CH_4 from the reservoir.</td><td>CO_2</td><td>No</td><td>There is no increase of fossil fuel or electricity consumption due to the project activity.</td></tr>
<tr><td>CH_4</td><td>No</td><td>There is no reservoir included in this project.</td></tr>
<tr><td>N_2O</td><td>No</td><td>Minor emission source.</td></tr>
</table>
The project does not involve switching from fossil fuels to renewable energy at the site(s) of the project activity.

Project participants are requested to clarify: 1) what sources were already excluded conservatively; 2) how the project activity will not increase electricity consumption and 3) the justification (no reservoir) for the CH4 project activity emissions source.</td><td>~~CL 4~~</td><td></td></tr>
<tr><td>B.3.3. If GHG emissions occurring within the proposed CDM project activity boundary (not addressed by the applied methodology), as a</td><td>/1/</td><td>DR</td><td>No GHG emissions occurring within the proposed CDM project activity boundary (not addressed by the applied methodology), as a</td><td>OK</td><td>OK</td></tr>
</table>

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
result of project's implementation, are expected to contribute more than 1% of the overall expected average annual emissions reductions, are they informed in the PDD?			result of project's implementation, are expected to contribute more than 1% of the overall expected average annual emissions reductions.		
B.4. Description of how baseline scenario is identified. Baseline Determination. Table 1 - 17, 18 *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.4.1. Is the application of the methodology and the discussion and determination of the chosen baseline scenario transparent?	/1/ /8/	DR	Yes. The baseline scenario is the following: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system". Emission reductions were initially estimated (published PDD), using the latest grid emission factor of the Brazilian grid system, available at the time baseline study and the monitoring methodology were concluded (05/12/2008), and equal to 0.1842 tCO_2/MWh (2007 data). In the PDD version 3, dated 28 September 2009, this factor was updated and the emission reductions were estimated *ex-ante* based on the	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			latest available emission factor of the Brazilian grid system for 2008, (= 0.3112 tCO_2/MWh - average OM=0.4766 tCO_2/MWh and BM= 0.1458 CO_2/MWh). The emission factor provided by the Brazilian DNA ("Comissão Interministerial de Mudança Global do Clima"– CIMGC) is calculated according to the Tool to calculate the emission factor for an electricity system, Version 01.1 and considering all four regions connected (North, Northeast, South and Southeast-Midwest).		
B.4.2. Has the baseline been determined using conservative assumptions where possible? *(confirm that any procedure contained in the methodology to identify the most reasonable baseline scenario, has been correctly applied)*	/1/ /8/	DR	See B.4.1.	**OK**	**OK**
B.4.3. Has the baseline been established on a project-specific basis?	/1/	DR	The baseline scenario has been established on a project-specific basis. See B.4.1	**OK**	**OK**
B.4.4. Does the baseline scenario sufficiently take into account relevant national and / or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	National and/or sectoral policies implemented during the initial phase were considered.	**OK**	**OK**
B.4.5. Is the baseline determination compatible with the available data?	/1/	DR	The baseline determination is compatible with available data. See B.4.2.	**OK**	**OK**
B.4.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	The selected baseline represents the most likely scenario among the two alternative scenarios discussed.	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Two alternative baseline scenarios were considered: ***Alternative 1***: electricity consumption from the Brazilian National Interconnected System (SIN); ***Alternative 2***: the project activity undertaken without being registered as a CDM project activity. See B.4.1.		
B.4.7. Have the major risks to the baseline been identified? (*Are uncertainties in the GHG emission estimates properly addressed in the documentation?*)	/1/	DR	The major risk of the project is not being able to produce the estimated amount of electricity to the grid.	**OK**	**OK**
B.4.8. Is all literature and sources clearly referenced?	/1/	DR	Yes.	**OK**	**OK**
B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (*Assessment and demonstration of additionality*). Table 1 - 6					
B.5.1. Does the PDD follow all the steps required in the methodology to determine the additionality? (*Is an approved additionality tool required / used? - Note: the guidance in the methodology shall supersede the tool*)	/1/ /8/ /10/		The project's additionality is demonstrated by project participants as per the "Tool for the demonstration and assessment of additionality" - Version 05.2. ***Step 1: Identification of alternatives to the project activity consistent with current laws and regulations*** Two alternative baseline scenarios were considered:		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Alternative 1: electricity consumption from the Brazilian National Interconnected System (SIN); ***Alternative 2***: the project activity undertaken without being registered as a CDM project activity.. ***Step 2: Investment analysis*** Total construction costs for the two power plants are presented to be as R$ 158.23 million (Queluz) and R$ 153.46 million (Lavrinhas). The net revenue for selling (exporting) electricity to the grid will be R$ 53.7 million per year. The IRR for this project, without carbon revenues, is presented as follows: - Queluz = 12.26%; - Lavrinhas = 12.82%. Those IRR's are compared with an average SELIC rate (last seven years) of 17.07%. ***Step 3: Barrier analysis*** Not applicable as only Step 2 was selected. ***Step 4: Common practice analysis*** Please identify in the PDD selected options (analysis method) as per Step 2 of the "Tool for the demonstration and assessment of additionality" and references to the guidance provided on investment analysis (attached to the tool) used to compare with defined	~~**CAR 4**~~	

Checklist Question		Ref.	MoV*	Comments	Draft Concl.	Final Concl.
				alternative(s). Furthermore, complete spreadsheets for the investment analysis (including sensitivity analysis, financing, PPAs...) must be provided.		
B.5.2.	Is the discussion on the additionality clear and have all assumptions been conservative, supported by transparent and documented evidence for all steps?	/1/ /8/ /10/	DR	Please inform period used for the 7 seven years 17.07% average SELIC rate.	~~**CL 6**~~	**OK**
B.5.3.	Is it demonstrated / justified that the project activity itself is not a likely baseline scenario? (*e.g. through **(a)** a flow-chart or series of questions that lead to a narrowing of potential baseline options, **(b)** a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, **(c)** a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or **(d)** an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's legislation/regulations*)	/1/ /8/ /10/	DR	Please explain/elaborate (PDD-B.5-Sub-step 4a) the assumption that common practice for SHPs is the implementation of the activity through the CDM incentives.	~~**CAR 5**~~	**OK**
B.5.4.	If the starting date of the project activity is before 2 August 2008, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, evidence to demonstrate that the CDM was seriously considered in the decision to implement the project activity, was provided, adequate and sufficient to justify it? (If starting date is on or after 2 August 2008, see C.1.1.2)	/1/ /8/ /10/	DR	The starting date addressed by project activity is 01/12/2007. Project participants are requested to inform evidences to demonstrate that the CDM was seriously considered in the decision to implement the project activity and that continuing and real actions were taken to	~~**CAR 3**~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			secure CDM status for the project in parallel with its implementation (please refer to EB 41 - Annex 46 – paragraph 5).		
B.5.5. Is the above evidence based on official, legal and / or other corporate document that was available at, or prior to, the start of the project activity?	/1/ /8/ /10/	DR	See B.5.4.	~~**CAR 3**~~	**OK**
B.5.6. If investment analysis has been used to demonstrate the additionality of the proposed CDM project activity, evidences that the proposed CDM project activity would not be: (a) The most economically or financially attractive alternative; or (b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs); were provided? (*"Guidance on the Assessment of Investment Analysis")*	/1/ /8/ /10/		See B.5.1.	~~**CAR 4**~~	**OK**
B.6. Emission Reductions. *Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.*					
B.6.1. Explanation of methodological choices.					
B.6.1.1. Have the project, baseline and leakage emissions and emission reductions been properly explained and determined using the same appropriate methodology and conservative assumptions?	/1/ /8/	DR	The baseline scenario is the following: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			calculate the emission factor for an electricity system". ***Ex-ante* calculation of emission reductions** Emission reductions were initially estimated (published PDD), using the latest grid emission factor of the Brazilian grid system, available at the time baseline study and the monitoring methodology were concluded (05/12/2008), and equal to 0.1842 tCO_2/MWh (2007 data). In the PDD version 3, dated 28 September 2009, this factor was updated and the emission reductions were estimated *ex-ante* based on the latest available emission factor of the Brazilian grid system for 2008, (= 0.3112 tCO_2/MWh - average OM=0.4766 tCO_2/MWh and BM= 0.1458 CO_2/MWh). The emission factor provided by the Brazilian DNA ("Comissão Interministerial de Mudança Global do Clima"– CIMGC) is calculated according to the Tool to calculate the emission factor for an electricity system, Version 01.1 and considering all four regions connected (North, Northeast, South and Southeast-Midwest). ***Ex-post* calculation of emission reductions** The combined margin emissions factor ($EF_{grid,CM,y}$) will be calculated *ex-post* using the CO_2 emission factors for the build margin and the operational margin that are provided by the Brazilian DNA. CO_2 emission factors for the build margin and the operational margin for		

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			electricity generation in Brazil's National Interconnected System (SIN) are calculated, according to the dispatch analysis, from generation records of plants dispatched in a centralized manner by the National Electric System Operator (ONS). The project does not involve switching from fossil fuels to renewable energy at the site(s) of the project activity. At the site visit it was mentioned the future installation of a diesel backup generator. Thus, the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" should be mentioned in the PDD, provisions for monitoring according to this tool should be provided and the project emissions included in the calculations. According to ACM0002, potential leakage effects, such as emissions arising from power plant construction and land inundation do not have to be considered.	**CAR 2**	
B.6.1.2. Does the proposed project clearly state which equations for the calculation of emission reductions are used, as given by the approved / applied methodology?	/1/ /8/	DR	The project activity uses the adequate equations and calculations methods, all of them in line with applied baseline methodology.	**OK**	**OK**
B.6.1.3. Are the demonstration / justification for the choice of the chosen scenario (for example, in ACM0006) or case, option / method (for example in ACM0002) adequate and	/1/ /8/ /10/	DR	ACM-0002 is applicable to the "Queluz and Lavrinhas Renewable Energy Project" because: - the project activity will result in the installation of two hydro power plants/units	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
sufficient?			(either with a run-of-river reservoir or an accumulation reservoir); - the project activity will result in new reservoirs and the power density of the power plants, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; - the geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available. It was verified that the power density of the power plants is greater than 4 W/m^2 (Queluz=24 W/m^2 and Lavrinhas= 39 W/m^2). Furthermore, the power density of the power plants is greater than 10 W/m^2 and thus the project emissions from the reservoir(s) are considered as equal to zero (PE_y=0).		
B.6.1.4. Are the demonstration / justification for the chosen default values adequate and sufficient?	/1/	DR	The chosen default values are adequate and sufficient.	**OK**	**OK**
B.6.2. Data and parameter those are available at validation. *Data that is calculated with equations provided in the methodology or default values specified in the methodology should not be included in the compilation.*					
B.6.2.1. Is the list of the *ex-ante* data and parameters used by the project -including data from other sources- complete, transparent, documented and available? (*measurements*	/1/	DR	The following parameters are available at validation (not monitored): * $\mathbf{A_{BL}}$ - Area of the reservoir measured in the		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
after the implementation of the project activity should not need to be included here but in the tables in section B.7.1)			surface of the water, before the implementation of the project activity, when the reservoir is full; * **Cap_{BL}** - Installed capacity of the hydro power plant before the implementation of the project. The parameters **Cap_{PJ}** and **A_{PJ}** are mentioned on PDD-B.6.2 instead of **Cap_{BL}** and **A_{BL}**. Furthermore, for new reservoirs, the value of **A_{BL}** is zero and the parameters **Cap_{PJ}** and **A_{PJ}** are to be included as monitored parameters.	~~**CL 7**~~	
B.6.2.2. Is the chosen value or, where relevant, the qualitative information for each supporting data or parameter(s) provided in a (proper table) tabular form and the choice for the source of data explained / justified with clear and transparent references or additional documentation? (*check Annex 3)*	/1/	DR	See B.6.2.1.	~~**CL 7**~~	**OK**
B.6.2.3. If values were measured, a description of measurement methods and procedures (standards), indicating the responsible(s) for carrying out the measurement(s), dates and results of measurement(s) was provided? (*check Annex 3*)	/1/	DR	See B.6.2.1.	~~**CL 7**~~	**OK**
B.6.3. *Ex-ante* calculation of emission reductions. Table 1 - 1, 3, 5					
B.6.3.1. Is the *ex-ante* calculation of the expected project, baseline and leakage emissions transparent, conservative, accurate, and documented and as per the approved /	/1/ /8/	DR	***Ex-ante* calculation of emission reductions** Emission reductions were initially estimated (published PDD), using the latest grid emission factor of the Brazilian grid system, available at		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
applied methodology (equations) of the project activity?			the time baseline study and the monitoring methodology were concluded (05/12/2008), and equal to 0.1842 tCO_2/MWh (2007 data). In the PDD version 3, dated 28 September 2009, this factor was updated and the emission reductions were estimated *ex-ante* based on the latest available emission factor of the Brazilian grid system for 2008, (= 0.3112 tCO_2/MWh - average OM=0.4766 tCO_2/MWh and BM= 0.1458 CO_2/MWh). The emission factor provided by the Brazilian DNA ("Comissão Interministerial de Mudança Global do Clima"– CIMGC) is calculated according to the Tool to calculate the emission factor for an electricity system, Version 01.1 and considering all four regions connected (North, Northeast, South and Southeast-Midwest). At the site visit it was mentioned the future installation of a diesel backup generator. Thus, the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" should be mentioned in the PDD, provisions for monitoring according to this tool should be provided and the project emissions included in the calculations. Please clarify figures for estimated energy generation (PDD-B.6.3.1) providing evidences to support the 71% load factor used..	~~CAR 2~~ ~~CL 3~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.6.3.2. Sufficient background information and / or data to assess the calculation(s) and enable its reproduction, including electronic files (i.e. spreadsheets), was provided? (*check Annex 3*)	/1/	DR	Detailed spreadsheets for all calculations (project/baseline emissions, emission reductions ex-ante & ex-post) must be provided, indicating formulas and/or default values/data sources.	~~**CL 14**~~	**OK**
B.6.4. Summary of *ex-ante* estimation of emission reductions. Table 1 - 1, 3, 5					
B.6.4.1. Is all *ex-ante* estimation of emission reductions summarized in a (proper table) tabular form for all years of the crediting period? (*Check against A.4.4.1 figures*)	/1/	DR	Yes. *Ex-ante* estimation of emission reductions, is properly summarized in table A.4.4, for 7 years, totalizing 810,717 tones of CO_2e.	**OK**	**OK**
B.7. Application of monitoring methodology and description of the monitoring plan. *Compliance of the monitoring plan with the approved methodology and Implementation of the plan* Table 1 - 15 & Annex 4					
B.7.1. Data and parameters monitored. *(background documentation in Annex 4)*					
B.7.1.1. Specific information on how the data and parameters that need to be monitored would actually be collected during monitoring for the project activity is provided? (m*easurements after the implementation of the project activity should be included here*)	/1/	DR	The following data and parameters will be monitored: * **EG_y** Electricity supplied by the project activity to the grid; * **$EF_{grid,CM,y}$** Combined margin CO_2 emission factor for grid connected power generation in the year. **TEG_y** is not included as a parameter to be monitored. As the project activity is to have some electricity consumption (internal loads)	~~**CL 13**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			please clarify reason(s).		
B.7.1.2. Are all the parameters and its sources of data reliable, specified and documented in a (proper table) tabular form?	/1/	DR	The parameters $\mathbf{Cap_{PJ}}$ and $\mathbf{A_{PJ}}$ are mentioned on PDD-B.6.2 instead of $\mathbf{Cap_{BL}}$ and $\mathbf{A_{BL}}$. Furthermore, for new reservoirs, the value of $\mathbf{A_{BL}}$ is zero and the parameters $\mathbf{Cap_{PJ}}$ and $\mathbf{A_{PJ}}$ are to be included as monitored parameters.	~~**CL 7**~~	**OK**
B.7.1.3. Where data or parameters are supposed to be measured, are measurement methods and procedures, including a specification of which accepted industry standards or national or international standards will be applied, specified?	/1/	DR	See B.7.1.2.	~~**CL 7**~~	**OK**
B.7.1.4. Are the measuring instruments / equipments, measurement methods, accuracy and interval, measurement responsible(s) and calibration procedures specified?	/1/	DR	Please provide all project activity monitoring instruments (e.g., meters), addressing its measurements points (location/s), monitoring frequency and QA/QC-Calibration procedures as per applicable Tools and/or applied methodology.	~~**CL 10**~~	**OK**
B.7.1.5. Are the QA / QC procedures applied described and complying with existing good practice? (*The parameters related to the performance of the project will be monitored using meters and standard testing equipment, which will be regularly calibrated following standard industry practices*)	/1/	DR	See B.7.1.4.	~~**CL 10**~~	**OK**
B.7.2. Description of monitoring plan. *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable*					

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
emission reductions are properly addressed.					
B.7.2.1. Is the monitoring methodology previously approved by the CDM Methodology Panel?	/1/ /8/	DR	The project applies the approved consolidated monitoring methodology ACM-0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 9 of 13/02/2009. ACM0002 Version 9 is valid from 27 February 2009 onwards. Please update PDD accordingly.	~~**CL 11**~~	**OK**
B.7.2.2. Is the monitoring methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/ /8/	DR	The applied monitoring methodology is the one deemed most applicable to the Project. The project is a grid-connected renewable power generation, with power density greater than 4W/m^2, which is applicable for ACM-0002. See B.2.1.	**OK**	**OK**
B.7.2.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/ /8/	DR	All data collected as part of monitoring will be archived and kept at least for 2 years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later. A specific and complete monitoring plan (all necessary parameters data, management and QA/QC procedures, calibration...) has to be developed.	~~**CL 9**~~	**OK**
B.7.2.4. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /8/	DR	See B.7.2.3.	~~**CL 9**~~	**OK**
B.7.2.5. Is the authority and responsibility of project	/1/ /8/	DR	See B.7.2.3.	~~**CL 9**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
management clearly described?					
B.7.2.6. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/ /8/	DR	See B.7.2.3.	~~CL 9~~	**OK**
B.7.2.7. Are procedures identified for training of monitoring personnel?	/1/ /8/	DR	Training of monitoring personnel is mentioned, but neither training needs nor procedures (including emergency preparedness) for training monitoring personnel were identified. Training of monitoring personnel (including emergency preparedness) for monitoring personnel should be checked in the first verification. See. A.4.3.4.	~~CL 8~~ **FAR 1**	**OK**
B.7.2.8. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/ /8/	DR	Training of monitoring personnel is mentioned, but neither training needs nor procedures (including emergency preparedness) for training monitoring personnel were identified. Training of monitoring personnel (including emergency preparedness) for monitoring personnel should be checked in the first verification.	~~CL 8~~ **FAR 1**	**OK**
B.7.2.9. Does the monitoring plan reflect good monitoring and reporting practices?	/1/ /8/	DR	See B.7.2.3.	~~CL 9~~	**OK**
B.7.2.10. Is the discussion and selection of all required monitoring parameters and / or data variables (for example, project emissions, project electricity generation, baseline grid / captive power emission	/1/ /8/	DR	See B.7.2.3.	~~CL 9~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
factor) of the monitoring plan according to the approved / applied methodology transparent?					
B.8. Date of completion of the application of the baseline and monitoring methodology and the name of responsible person(s) / entity (ies).					
B.8.1. Is the date of completion of the application of the methodology to the project activity provided and mentioned in the format *DD / MM / YYYY*?	/1/ /8/	DR	Yes, the date of completion of the application of the methodology to the project activity is 05/12/2008.	**OK**	**OK**
B.8.2. Is the contact information of the person(s) / entity (ies) responsible for the baseline and monitoring methodology to the project activity provided? If applicable, are they indicated as project participants in Annex 1?	/1/ /8/	DR	The responsible for the baseline and monitoring methodology is AMBIO Participações Ltda and they are identified as project participants in Annex 1.	**OK**	**OK**
C. Duration of the Project activity / Crediting Period. *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1. Duration of project activity.					
C.1.1. Starting date of project activity.					
C.1.1.1. Is the project's activity starting date (the earliest date at which either the implementation or construction or real action of a project activity begins implementation, construction or real action - *project participant has committed to expenditures related to the implementation or related to the construction of the project activity*) clearly defined and reasonable?	/1/	DR	The project's starting date was defined as 04/02/2008 in the published PDD (Version 1, dated 05/12/2008) and later, with a proper evidence (Contract with Alstom Hydro Energia Brasil Ltda / Turbines-Generators), confirmed as 01/12/2007 on the revised PDDs Version 2 of 16 June 2009 and Version 3 of 28 September 2009.		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Project proponents are requested to confirm and provide evidences of the starting date of the project activity (EB41 meeting report, paragraph 67).	~~CAR 1~~	
C.1.1.2. If the project activity started on or after 2 August 2008, were the Host Party DNA and/or the UNFCCC secretariat informed in writing of the commencement of the project activity and of the intention to seek CDM status? (If starting date is before 2 August 2008, see B.5.4)	/1/	DR	The project activity started before 2 August 2008.	**OK**	**OK**
C.1.2. Expected operational life time of the project.					
C.1.2.1. Is the project's operational lifetime (mentioned in years and months) clearly defined and reasonable? (*check against crediting period and equipment lifetime*)	/1/	DR	The expected operational lifetime of the project is 30 years (0 months), and deemed reasonable. Please provide a complete technical description of all project equipments and instruments, including information about their lifetime, as well as power plant(s) operational main characteristics. Please provide details of the transmission lines and substation.	 ~~CL 1~~ ~~CL 5~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
C.2. Choice of crediting period. *The crediting period may only start after the date of registration of the proposed activity as a CDM project activity.*					
C.2.1. Is the chosen crediting period clearly defined (mentioned in years and months) and its starting date mentioned in the format *DD / MM / YYYY*? (*renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal*)	/1/	DR	A renewable crediting period of 7 years (with the potential of being renewed twice) with a forecasted start on 30/10/2009 (but not earlier than registration) was defined in the published PDD (Version 1, dated 05 December 2008) and later, on the revised PDD Version 3 of 28 September 2009, the forecasted crediting period starting date was revised to 01/01/20010 (but not earlier than registration).	**OK**	**OK**
D. Environmental impacts. *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the Validator.* Table 1 - 13					
D.1. Documents on Environmental impacts, including transboundary impacts.					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	The project proponent is requested to provide the Preliminary Environmental Report and/or EIA (analysis of possible environmental impacts/effects), to include considerations about transboundary environmental impacts in the PDD and to elaborate considerations on section D.2.	~~**CAR 6**~~	**OK**
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	See D.1.1.	~~**CAR 6**~~	**OK**
D.1.3. Will the project create any adverse	/1/	DR	See D.1.1.	~~**CAR 6**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
environmental effects?					
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	See D.1.1.	~~**CAR 6**~~	**OK**
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	See D.1.1.	~~**CAR 6**~~	**OK**
D.1.6. Does the project comply with the environmental legislation in the host country?	/1/ /12/ /13/	DR	Yes. See A.2.3.1.	**OK**	**OK**
E. Stakeholders' comments. *The Validator should ensure that stakeholders' comments have been invited and that due account has been taken of any comments received.* Table 1 - 12					
E.1. Description of how comments by local stakeholders have been invited and compiled. *The local stakeholder process shall be completed before submitting the proposed project activity to a DOE for validation.*					
E.1.1. Have relevant stakeholders been adequately consulted / invited for comments?	/1/	DR	Yes.	**OK**	**OK**
E.1.2. If a stakeholder consultation process is required by regulations / laws in the host country, has the stakeholders' consultation process been carried out in accordance with such regulations / laws?	/1/	DR	As required by the Interministerial Commission on Global Climate Change (CIMGC) and in accordance to the Resolution 7 of the Brazilian DNA (05 March 2008), the project participants sent letters, inviting for comments, to local stakeholders/City authorities. Letters posted and ARs ("Receiving acknowledgment receipts") were presented during the site visit and verified. All letters were sent on 05/12/2008 and no comments		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			were received. The latest version of the PDD and other relevant documentation will also be published on the internet by the project participants until the project is registered. Please provide the links were latest version of the PDD and other relevant documentation will be hosted until the project is registered.	~~**CL 12**~~	
E.1.3. Was the stakeholders' consultation process conducted, within a reasonable time for comments submission, in an open and transparent manner to facilitate comments and properly described?	/1/	DR	Yes.	**OK**	**OK**
E.2. Summary of comments received.					
E.2.1. Are the stakeholders who made comments identified (addresses provided / available)?	/1/	DR	No comments were received from local stakeholders (forwarded by project participants) until 12/03/2009.	**OK**	**OK**
E.2.2. The summary of the stakeholders' comments received is provided / available?	/1/	DR	No comments were received from local stakeholders (forwarded by project participants) until 12/03/2009.	**OK**	**OK**
E.3. Report on how due account was taken of any comments received.					
E.3.1. Has due account been taken of any stakeholders' comments received?	/1/	DR	No comments were received from local stakeholders (forwarded by project participants) until 12/03/2009.	**OK**	**OK**
Annex 1. *Contact information on project participants*					
• Are the Names of all organization given? (*as listed in section A.3*)	/1/	DR	Yes.	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
• Name of contact person, Street, City, Post fix / ZIP, Country, Telephone Fax or e-mail mandatory fields are filled?	/1/	DR	All the mandatory fields were corrected fulfilled.	**OK**	**OK**
Annex 2. ***Information regarding public funding*** Table 1 – 7 & Table 2, A.4.5					
• Is information from Parties included in Annex I on sources of public funding for the project activity provided?	/1/	DR	The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Brazil.	**OK**	**OK**
• Does the information provided above include an affirmation that such funding does not result in a diversion of ODA and is separate from and is not counted towards the financial obligation of those Parties?	/1/	DR	See above.	**OK**	**OK**
Annex 3. ***Baseline information*** Table 1 - 14, 17, 18 & Table 2, B.2.2 B.6.2.2 B.6.2.3 B.6.3.2					
• Is any needed further background information used in the application of the baseline methodology, i.e. tables with time series data, documentation of measurement results and data sources, provided?	/1/	DR	Please provide source(s) for information provided on tables. See B.6.2.2 B.6.2.3 B.6.3.2. .	~~**CL 16**~~	**OK**
Annex 4. ***Monitoring information*** Table 1 - 15 & Table 2, B.7 B.7.1					
• Is any needed further background information used in the application of the monitoring methodology, i.e. tables with time series data, documentation of measurement results and data sources, provided?	/1/	DR	If sections of the CDM-PDD, CDM-NM are not applicable, it shall be explicitly stated that the section is left blank on purpose. Please revise PDD. Furthermore, please revise sections C.2.2.1 & C.2.2.2.	~~**CL 15**~~	**OK**

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
~~**CAR 1**~~ Project proponents are requested to confirm and provide evidences of the starting date of the project activity (EB41 meeting report, paragraph 67).	C.1.1.1	The project developer did the first financial commitment on 01/12/2007. The material evidence is the Contract with Alstom Hydro Energia Brasil Ltda.	The project's starting date was defined as 04/02/2008 in the published PDD (Version 1, dated 05 December 2008) and later, with a proper evidence, confirmed as 01/12/2007 on the revised PDD Version 2, dated 16 June 2009. Contract with Alstom Hydro Energia Brasil Ltda (Turbines-Generators) was presented and found acceptable as evidence for the project's starting date as the earliest financial commitment for the project. This CAR is closed.
~~**CAR 2**~~ At the site visit it was mentioned the future installation of a diesel backup generator. Thus, the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" should be mentioned in the PDD, provisions for monitoring according to this tool should be provided and the project emissions included in the calculations.	B.1.2 B.6.1.1 B.6.3.1	The backup generator will be used only for emergencies, mainly for start-up some electrical equipments in case the power plant stops. No use is beforehand expected. Thus, the PDD will be updated to include the necessary formulae, but no project emission will be calculated. The monitoring plan will also be updated to be according to the tool.	Project emissions from burning fossil fuel in the backup (or emergency) generator are considered in the PDD. "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" is now mentioned in the PDD and the Monitoring Plan will be updated to include the monitoring of the backup generator's. This CAR is closed.
~~**CAR 3**~~ Project participants are requested to inform	B.5.4	10/04/2007 - proposal from a CDM consultancy company to develop a CDM	Evidence that the incentive from the CDM was seriously considered in an early stage is

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
evidences to demonstrate that the CDM was seriously considered in the decision to implement the project activity and that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation (please refer to EB 41 - Annex 46 – paragraph 5).		project to the project developer group. 30/08/2007 - Proposals from the financial institution UNIBANCO. The document consisted of the economical assessment of the project activity and commercialization of carbon credits were clearly cited as part of the document. The business plan developed by UNIBANCO was decisive factor in the decision to proceed with the project. 16/10/2007 – Power purchase agreements between project developers and Perdigão S.A. 01/12/2007 - Contract with Alstom Hydro Energia Brasil Ltda (Turbines-Generators) - project activity construction start date 13/02/2008 – First payment invoices (QUELUZ invoice No.937 and LAVRINHAS invoice No.938) from the company responsible for construction, Alusa Engenharia Ltda 30/06/2008 – communication evidence between project participant and CDM consultancy company AMBIO. 14/10/2008 – communication from project participants with Brazilian DNA and UNFCCC to attend EB 41/ Annex 46 (adopted on 02/08/2008)	mentioned as been the elaboration and presentation of the business plan to the investors, in 2007. During the site visit, proposals for an Economic-Financier Assessorship from UNIBANCO - União de Bancos Brasileiros S.A /9/, dated 30 August 2007 (to Usina Paulista Lavrinhas de Energia S.A. and Usina Paulista Queluz de Energia S.A., were presented as evidences that CDM was seriously considered in the decision to implement the project activity. Other CDM consideration continuous actions are: (1) the earlier CDM consultancy proposal received on 10/04/2007; (2) the communications with AMBIO consultancy company on 30/06/2008; (3) the contracts signed between AMBIO and Usina Paulista Lavrinhas de Energia S.A. and Usina Paulista Queluz de Energia S.A. on 08/07/2008; (4) the communication with the Brazilian DNA and UNFCCC on 14/10/2008 and the contract for Validation services signed between AMBIO and RINA on 12/11/2008. This CAR is therefore closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
~~**CAR 4**~~ Please identify in the PDD selected options (analysis method) as per Step 2 of the "Tool for the demonstration and assessment of additionality" and references to the guidance provided on investment analysis (attached to the tool) used to compare with defined alternative(s). Furthermore, complete spreadsheets for the investment analysis (including sensitivity analysis, financing, PPAs...) must be provided.	B.5.1 B.5.6	The sub-step 2b option III – benchmark analysis was used, the IRR of the project was compared to government bound rate. When attractiveness of the project activity without CDM revenues is compared to the SELIC rate, which has lower risk compared to investing on a new SHP, it is clearly demonstrated that the project developer would look for better opportunities at the financial market, such as fixed interest rates. Sensitivity analysis was included in the PDD, comparing the IRR (costs were increased by 10% and revenues decreased by 10%). Even though the IRR is lower than the benchmark.	The Investment analysis spreadsheet "ALUSA - estimatives.xls" was provided as required and verified. Complete assessment carried out at report item 3.2. This CAR is closed.
~~**CAR 5**~~ Please explain/elaborate (PDD-B.5-Sub-step 4a) the assumption that common practice for SHPs is the implementation of the activity through the CDM incentives.	B.5.3	The intention was to demonstrate that to implement a SHP in Brazil it is necessary external incentives. PROINFA (Program for the Incentive of Electric Energy from alternate sources) incentive has been a decisive factor for new business enterprises. Excluding the SHPs that have PROINFA incentives, most of them have CDM incentives. Through numbers presented above, it can be proved that it is required a strong incentive to promote the construction of renewable energy projects in Brazil, where it includes SHPs.	On PDD Version 2, the common practice reference was deleted and the explanation of the necessity of incentives to develop similar projects is now understandable. All projects mentioned as having CDM incentives were verified and are already registered or at validation (one was rejected) so the explanation is accepted and confirms that the implementation of similar projects is possible by availing CDM benefits. This CAR is closed.
~~**CAR 6**~~	D.1.1	Considering the low impact potential of	RAP was provided and verified.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
The project proponent is requested to provide the Preliminary Environmental Report and/or EIA (analysis of possible environmental impacts/effects), to include considerations about transboundary environmental impacts in the PDD and to elaborate considerations on section D.2.		the project activity, only a Preliminary Environmental Report (RAP, from Relatório Ambiental Preliminar in Portuguese) was necessary. The following aspects were analyzed and no relevant impact detected on: - Influence on conservation areas; - Consequences to riparian woodlands or local fauna; - Archeological or indigenous area; - Economical and social impacts due to population moving.	Explanations provided to RINA's satisfaction. This CAR is closed.
~~**CL 1**~~ Please provide a complete technical description of all project equipments and instruments, including information about their lifetime, as well as power plant(s) operational main characteristics.	C.1.2.1	More information about equipments lifetime was included in the PDD.	Evidences about lifetime of hydroelectric plants were verified and mention lifetimes from 30 (Copel) to 50 years (Eletrobras). Moreover, ANEEL Resolutions (authorizations to produce energy) are usually valid for 30 years. This CL is therefore closed.
~~**CL 2**~~ Please clarify different project participants' names (Ltda or S.A.) from Table A.3 and Annex 1.	A.3.2	The PDD is revised	PDD revised accordingly. This CL is closed.
~~**CL 3**~~ Please clarify figures for estimated energy generation (PDD-B.6.3.1) providing evidences to support the 71% load factor	B.6.3.1	The average electricity generation will be 21.4MW and the installed capacity is 30MW. It can be evidenced by the Power Purchase Agreement.	PPA's verified and mentioning 21 MW (average) to be delivered in the period from November 2009 to October 2024. Nonetheless, the average assured energy of

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
used.			21.4 MW (load factor = 71.3%) for each plant was confirmed on the below ANEEL site. http://www.aneel.gov.br/aplicacoes/capacidadebrasil/energiaassegurada.asp This CL is closed.
~~**CL 4**~~ Project participants are requested to clarify: 1) what sources were already excluded conservatively; 2) how the project activity will not increase electricity consumption and 3) the justification (no reservoir) for the CH_4 project activity emissions source.	B.3.2	1) CH_4 and N_2O emissions in baseline from fossil fuel power plants in baseline were excluded as conservative assumption and being considered minor emission source in the methodology. N_2O emissions from reservoir were also excluded as being considered minor emission source. 2) The project activity will consider the net electricity produced. All electricity consumption will be subtracted from the total energy generated. 3) The power density for both power plants included in this project activity is greater than 10W/m². Thus, project emission is zero according to the approved consolidated methodology. Also, the small flooded area has not significant biomass content or it had been removed before construction started.	Clarifications provided to RINA's satisfaction. This CL is closed.
~~**CL 5**~~ Please provide details of the transmission	C.1.2.1	The SHP Queluz was connected to the SHP Lavrinhas substation by a 9km	Clarifications provided to RINA's satisfaction.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
lines and substation.		transmission line, so it can be linked to the national electrical system by a 13km transmission line. Both lines have 138kV. The substation will be placed at SHP Lavrinhas.	This CL is closed.
~~**CL 6**~~ Please inform period used for the 7 seven years 17.07% average SELIC rate.	B.5.2	A shorter period was considered. The period of 2 years started in 2006. The data used is available in a excel spreadsheet. More information is available at http://www.bcb.gov.br/?SELICDIA	Clarifications provided to RINA's satisfaction. This CL is closed.
~~**CL 7**~~ The parameters $\mathbf{Cap_{PJ}}$ and $\mathbf{A_{PJ}}$ are mentioned on PDD-B.6.2 instead of $\mathbf{Cap_{BL}}$ and $\mathbf{A_{BL}}$. Furthermore, for new reservoirs, the value of $\mathbf{A_{BL}}$ is zero and the parameters $\mathbf{Cap_{PJ}}$ and $\mathbf{A_{PJ}}$ are to be included as monitored parameters.	B.6.2.1 B.7.1.2	The PDD is revised.	PDD revised accordingly. This CL is closed.
~~**CL 8**~~ Training of monitoring personnel is mentioned, but neither training needs nor procedures (including emergency preparedness) for training monitoring personnel were identified.	A.4.3.5 B.7.2.7 B.7.2.8	Due to early stage of the construction, the personnel have not been hired yet and all monitoring equipment details have not been specified. All training procedures will be according to national standards.	This CL turned into a FAR (FAR 1).
~~**CL 9**~~ A specific and complete monitoring plan (all necessary parameters data, management and QA/QC procedures, calibration...) has to be	B.7.2.3	The PDD is revised.	PDD revised accordingly. PDD's section B.7.1 tables revised/updated. This CL is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
developed.			
~~**CL 10**~~ Please provide all project activity monitoring instruments (e.g., meters), addressing its measurements points (location/s), monitoring frequency and QA/QC-Calibration procedures as per applicable Tools and/or applied methodology.	B.7.1.4	The net energy generated by Queluz SHP will be measured at the exit of the plant and at a point connect to the Lavrinhas Substation. The difference between both readings is the transmission losses. The net energy generated by Lavrinhas SHP will be measured at the exit of the plant. There will be another meter installed at the connection to the grid, which is the net energy generated by both plants. Daily records from the readings at the exit of each plant will be kept at the respective plant for the purpose of emission reduction calculations.	Clarifications provided to RINA's satisfaction. This CL is closed.
~~**CL 11**~~ ACM0002 Version 9 is valid from 27 February 2009 onwards. Please update PDD accordingly.	B.1.1 B.7.2.1	The PDD is revised.	PDD revised accordingly. This CL is closed.
~~**CL 12**~~ Please provide the links were latest version of the PDD and other relevant documentation will be hosted until the project is registered.	E.1.2	The PDD has been public available since 05/12/2008 in English and host country language at: http://www.ambiosa.com.br/contents/pdf/alusa.zip PDD is also available under UNFCCC website at: http://cdm.unfccc.int/UserManagement/FileStorage/5RNS6LTY9QC87WV1U3OM	Clarifications provided to RINA's satisfaction. This CL is closed.

Draft report clarifications and corrective action requests	**Ref. to table 2**	**Summary of project participants' response**	**Validation team conclusion**
		Z4HKGXPJBI	
~~**CL 13**~~ **TEG_y** is not included as a parameter to be monitored. As the project activity is to have some electricity consumption (internal loads) please clarify reason(s).	B.7.1.1	This parameter would be necessary only if the power density is between 4W/m² and 10W/m².	Clarifications provided to RINA's satisfaction. This CL is closed.
~~**CL 14**~~ Detailed spreadsheets for all calculations (project/baseline emissions, emission reductions *ex-ante* & *ex-post*) must be provided, indicating formulas and/or default values/data sources.	B.6.3.2	The excel spreadsheet is submitted attached to the revised PDD.	Excel spreadsheets submitted. This CL is closed.
~~**CL 15**~~ If sections of the CDM-PDD, CDM-NM are not applicable, it shall be explicitly stated that the section is left blank on purpose. Please revise PDD. Furthermore, please revise sections C.2.2.1 & C.2.2.2.	Annex 4	The PDD is revised.	PDD revised accordingly. This CL is closed.
~~**CL 16**~~ Please provide source(s) for information provided on tables.	Annex 3	The excel spreadsheet is submitted attached to the revised PDD.	PDD revised accordingly. Sources included in Annex 3. This CL is closed.
FAR 1 Training of monitoring personnel (including emergency preparedness) for monitoring personnel should be checked in the first verification.	A.4.3.5 B.7.2.7 B.7.2.8		