VALIDATION REPORT

CERTEL (Cooperativa Regional de Eletrificação Teutônia Ltda), CERTAJA (Cooperativa de Geração de Energia e Desenvolvimento Taquari Jacuí Ltda) and Enerbio Consultoria Ltda.

CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda - Small Hydropower Plants

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Date of Issue:	**Project Number:**
18-08-2008	CDM.VAL1676
Project Title:	
CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda -Small Hydropower Plants	
Organisation:	**Client:**
SGS United Kingdom Limited	CERTEL, CERTAJA and Enerbio
Publication of PDD for Stakeholders Consultation	
Commenting Period:	From 29th February 2008 to 29th March 2008
First PDD Version and Date:	PDD version 1, 25th January 2008
Final PDD Version and Date:	PDD version 4, 10th July 2008

Summary:

CERTEL, CERTAJA and Enerbio have commissioned SGS to perform the validation of the project: CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda -Small Hydropower Plants

Methodology used: ACM0002: Methodology Consolidated for grid-connected electricity generation from renewable sources.

Version and Date: Version 7, 30th November 2007

The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. SGS has employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

The report is based on the findings of document reviews, the stakeholder consultation process and responses from the project participants to the findings raised in this report.

The report and the annexed validation describes a total of 4 findings which include:

- 4 Corrective Action Requests;
- 0 New Information Requests; and

All findings were closed out satisfactorily. The baseline and monitoring methodology as mentioned in approved methodology adopted for the proposed project activity and meets the relevant UNFCCC requirements for the CDM and relevant host country criteria.

Subject:		
CDM Validation		
Validation Team:		
Fabian Gonçalves – Lead Assessor Thaís Carvalho – Assessor (Trainee)		☒ No Distribution (without permission from the Client or responsible organisational unit)
Technical Review:	**Trainee Technical Reviewer:**	
Date: 13-05-2008 / 25-08-2008 Name: Dr Jochen Gross / Irma Lubrecht	Name: N/A	☐ Limited Distribution
Authorised Signatory:		
Name: Siddharth Yadav Date: 1st September 2008		☐ Unrestricted Distribution

Revision Number:	**Date:**	**Number of Pages:**
0	12-05-2008	45
1	18-08-2008	45
2	-	-

Abbreviations

ACM	Approved Consolidated Methodology
ANEEL	Agencia Nacional de Energia Elétrica (Brazilian Agency of Power Electricity).
Bey	Baseline emissions in year y (t CO2e/year)
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CERTAJA	Cooperativa de Geração de Energia e Desenvolvimento Taquari Jacuí
CERTEL	Cooperativa Regional de Eletrificação Teutônia LTDA
CCEE	Câmara de Comercialização de Energia Elétrica
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
EFy	Emission Factor in Year
Egy	Electricity Supplied by the Project Activity to the Grid (MWh)
Efgrid,CM,y	Combined Margin CO2 Emission Factor for Grid Connected Power Generation in Year
ER	Emissions Reduction
IL	Installation License
IRR	Internal Rate of Return
MP	Monitoring Plan
MW	Mega Watt
NIR	New Information Request
ONS	Operador Nacional do Sistema
PE	Project Emission
PDD	Project Design Document
PP	Project Participants
PROINFA	Programa de Incentivo às Fontes Alternativas de Energia Elétrica
R$	Reais
SGS	Société Générale de Surveillance
SHP	Small Hydropower Plant
tCO_2/MWh	Tonnes of CO2 Equivalent per Mega Watt Hour
UNFCCC	United Nations Framework Convention on Climate Change
WACC	Weighted Average Capital Cost
W/m^2	Watt per Meter Squared

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Annexes:

1. Validation Opinion

SGS United Kingdom Ltd has been contracted by CERTEL, CERTAJA and Enerbio to perform a validation of the project: CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda -Small Hydropower Plants in Brazil.

The Validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism (CDM) and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

SGS reviewed of the project design documentation, using a risk based approach and conducted follow-up interviews.

By the installation of two small hydro power plants to provide renewable electricity to the interconnected grid, the project activity will result in reductions of greenhouse gas emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project correctly applies methodology ACM0002 version 7. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be 143,807 t of CO2e over a 7 years crediting period, averaging 20,547 t of CO2e annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not change.

The project will hence be recommended by SGS for registration with the UNFCCC.

Signed on Behalf of the Validation Body by Authorized Signatory

Signature:

Name: Siddharth Yadav

Date: 1st September 2008

2. Introduction

2.1 Objective

CERTEL, CERTAJA and Enerbio have commissioned SGS to perform the validation of the project: CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda -Small Hydropower Plants with regard to the relevant requirements for CDM project activities. The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP) and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Certified Emission Reduction (CER). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board.

2.2 Scope

The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. SGS has employed a risk-based approach in the validation, 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 Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

2.3 GHG Project Description

The report summarizes the results of the validation of CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda -Small Hydropower Plants Project Activity, performed on the basis of UNFCCC criteria. The validation has been performed as a desk review of the project documents presented by CERTEL, CERTAJA and Enerbio Consultoria Ltda and a site visit carried out on 17th and 18th March 2008, where the details of the project activity were verified on-site.

The project activity consists of the installation of two small hydroelectric plants with a total installed capacity of 16.12 MW.. SHP Cazuza Ferreira has an installed capacity of 9.1 MW, small reservoir of 21.1 ha, located on Lajeado Grande River, in the city of São Francisco de Paula. SHP Rastro de Auto has an installed capacity of 7.02 MW, small reservoir of 20.8 ha, located on Forqueta River, in the cities of Putinga and São José Herval. All SHPs are located in Rio Grande do Sul State, Brazil.

The project has the objective to provide renewable electricity from the SHPs and dispatch the energy to interconnected system. This project will increase the supply of renewable source of energy to the grid, avoiding the use of non renewable sources from power plants connected to the interconnected system.

Total amount of emission reductions estimated for the first crediting period is 143,827 tCO_2e.

Baseline Scenario:

In the absence of the project activity the electricity should be generated by large hydro power and thermal generation to the grid.

With-project Scenario:

The installation of a small hydroelectric plant to provide renewable electricity to the interconnected system.

Leakage:

No leakage was identified for this project.

Environmental and Social Impacts:

The project is in line with host-country specific CDM requirements. It is expected that the project activity will help Brazil to fulfil its goals of promoting sustainable development. The contributions of the project activity for this were described in the PDD, and comprises, among others: clean and renewable energy delivered to the grid, reducing the use of fossil fuel and green house gases emission; popular participation in the region's economic development; training of the collaborators.

The environmental aspects of the SHPs were analyzed by the State Environmental Agency (FEPAM) when it issued the licenses.

2.4 The Names and Roles of the Validation Team Members

Name	Role	Affiliate
Fabian Gonçalves	Lead Assessor	SGS Brazil
Thaís Carvalho	Trainee Assessor	SGS Brazil

3. Methodology

3.1 Review of CDM-PDD and Additional Documentation

The validation is performed primarily as a document review of the publicly available project documents. The assessment is performed by trained assessors using a validation protocol.

A site visit is usually required to verify assumptions in the baseline.

The site visit was carried out on 17th and 18th March 2008 in CERTEL's office. The project developers were interviewed by the Lead Assessor.

The documents and evidences were confirmed on site visit. The results of this local assessment are summarized in Annex 1 to this report.

3.2 Use of the Validation Protocol

The validation protocol used for the assessment is partly based on the templates of the IETA / World Bank Validation and Verification Manual and partly on the experience of SGS with the validation of CDM projects. It serves the following purposes:

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation.

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	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 (Y), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). New Information Request (NIR) is used when the validation team has identified a need for further clarification.

The completed validation protocol for this project is attached as Annex A.1 to this report

3.3 Findings

As an outcome of the validation process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the Assessor shall raise a **New Information Request (NIR)** specifying what additional information is required.

Where a non-conformance arises the Assessor shall raise a **Corrective Action Request (CAR).** A CAR

is issued, where:

I. mistakes have been made with a direct influence on project results;

II. validation protocol requirements have not been met; or

III. there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be verified.

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may also lead to a CAR.

Observations may be raised which are for the benefit of future projects and future verification or validation actors. These have no impact upon the completion of the validation or verification activity.

Corrective Action Requests and New Information Requests are raised in the draft validation protocol and detailed in a separate form (Annex A.2). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

3.4 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

4. Validation Findings

4.1 Participation Requirements

Brazil is listed as the host Party. Brazil ratified the Kyoto Protocol on 23rd August 2002. (http://unfccc.int/files/essential_background/kyoto_protocol/application/pdf/kpstats.pdf).

At the time of the validation, no Letter of Approval from the host country had been provided. The Letter of Approval will be signed when the DNA of Brazil receives and analyses the validation report.

4.2 Project Design

The project activity consists of the installation of two small hydroelectric power plants with total installed capacity of 16.12 MW. The project activity will reduce emissions of greenhouse gas (GHG) as the result of the displacement of generation from fossil-fuel thermal plants that would have otherwise been delivered to the interconnected grid. Cazuza Ferreira and Rastro Auto are projected to start operating on June, 2010. Construction has not started yet.

The project design engineering reflects current good practices, applies “Francis turbine”, and is not likely to be substituted by other technologies within the project period.

The project assumes an operational lifetime of 30 years for each SHP. This exceeds the renewable crediting period of 7 years. The starting date of the project activity is 1st June 2010 or the date of registration, whichever occurs later.

4.3 Eligibility as a Small Scale Project

NA

4.4 Baseline Selection and Additionality

The baseline scenario is correctly described according to methodology. It is the electricity delivered to the grid by the project that would have been generated otherwise by the operation of a grid-connected power plant and by the addition of new generating sources. The emission factor used is calculated ex ante for the subsystem South-Southeast-Midwest (S-SE-CO), using data provided from official source (ONS) for the years 2005, 2006 and 2007 (Ref.19).

The tool for the demonstration and assessment of additionality, version 5 is used. Sub step 1a of the Tool requires that realistic and credible alternative scenarios be discussed in the PDD. This discussion was incomplete in the PDD and CAR 3 was raised to address the issue. The PDD was amended to include the discussion according to the requirements of the Tool version 5. CAR 3 was closed out.

The alternatives to the project activity provided were: continuation of current practice, build a mineral coal thermoelectric plant and project activity not as a CDM project.

As verified during validation assessment all alternatives are consistent with laws and regulations. The electricity could continue to be generated by existing grid and there is no obligation to build the hydro power plant. Also the Ministry of Mines and Energy projects a growth in the offer of energy generation from mineral coal thermoelectric until 2015 in Brazil.

The financial analysis for hydropower plants Cazuza Ferreira and Rastro de Auto was done considering data of year 2001. This year does not reflect the real starting date of these plants. The financial analysis should be done according to the decision to implement of each plant (i.e. 2005 for Cazuza Ferreira and 2006 for Rastro de Auto). CAR 2 was raised asking to present a revised financial analysis.

The revised financial analysis provided is in accordance with decision to implement each hydropower plant and uses the correct indicators, tax and reference values. CAR 2 was closed out.

As the starting date is after validation, evidence of consideration of CDM in the decision to go ahead with the project activity is not applicable but evidences were provided. The document provided during site visit mention CDM consideration, applicable for plants Cazuza Ferreira and Rastro de Auto. The CDM

consideration is dated of 2000. Several documents were provided as evidence (board meetings). The oldest document is dated of 2000. The original documents in Portuguese were verified and copy was provided. Also the construction of both plans does not started yet. Project plants have only the installation license.

The project developer selected the benchmark analysis for the assessment of additionality. The IRR was used as a financial indicator for comparison. It was used the project's Weighted Average Capital Cost – WACC. The calculated WACC for Cazuza Ferreira was 14.97% and for Rastro de Auto was 14.80% (Ref.12c).

The WACC (benchmark) used in the project "CERTEL – Cooperativa Regional de Eletrificação Teutônia Ltda - Small Hydropower Plants" is a calculated benchmark and not an internal data of the company. The validation team verified that the WACC calculated is based in the parameters and data available and audited.

The following data presented were checked during validation assessment for both small hydropower plants.

Installed capacity:

- Rastro de Auto: 7.02 MW; and Cazuza Ferreira 9.1MW according authorization from ANEEL.

Capacity factor: this data is used to estimate the total energy to be generated during the year and consequently the expected CER. The capacity factor is approximately 55% for all plant based on the Portaria Nº7, 22 March 2006 issued by ANEEL (Ref.4). This represents the average value of the energy generated and to be generated in all SHP's.

Revenues – the total revenues are based in the total energy assured and the energy estimated tariff based in the power purchase agreement and "Electricity energy 2005 and 2006". The approximate tariff of each plant is R$78.33 for Rastro de Auto and R$78.33 for Cazuza Ferreira.

Costs – the project is following the correct regulation and taxes applicable to the energy sector in the country.

The ANEEL tax, inspection tax are correctly applied in the investment analysis (Resolução Nº16, 14/01/2000, Ref. 16, and Despacho Nº3074, 28/12/2006, Ref. 8).

The IRR calculated is 12.61% for Cazuza Ferreira and 8.35% for Rastro de Auto. Those values represent a financial barrier for the project activity when compared to the WACC value of 14.97% and 14.80%. It was possible to re-calculate the internal rate of return of the project activity with data provided in the PDD and spreadsheets. The values obtained are consistent with spreadsheets, lower than the Benchmark.

It was concluded that the project is not attractive for investors.

A sensitivity analysis was conducted altering some parameters as electricity price, and investment costs. The IRR is still not financially attractive. The range of variation used is considered reasonable; +10% for electricity price that represent the revenue of the project and -10% for investment.

After sensitivity analysis the maximum IRR for Cazuza Ferreira is 14.12% and for Rastro de Auto is 9.56%. These IRRs are still lower than the Benchmark of 14.97% and 14.80% and are not attractive.

An expert of the financial sector was contracted to check the financial spreadsheets. The spreadsheets provided by project participant was recalculated and confirmed that the IRR and WACC of the two small hydro plants and the conclusion is that the project is not financial attractive.

The common practice analysis is based in the Brazilian electricity sector. The source of data presented was checked. According to ANEEL, small hydropower plants represent 2.31% of the energy generation in Rio Grande do Sul state, which belongs to the Subsystem South of the National Interconnected System. Small hydropower plants under construction represent 9.09%.

There are similar hydropower plants but with different characteristics. The construction of small hydropower plants without incentive or additional income is not attractive. The Federal Government created the PROINFA, a program to motivate the development of renewable energy technologies. This project activity does not receive any incentive from Federal program or PROINFA.

The applicable steps of the "Tool" were assessed correctly and it was concluded that the project is additional due to the financial analysis presented and the common practice in the region.

The applicable steps of the "Tool" were assessed correctly and it was concluded that the project is additional due to the financial analysis presented and the common practice in the region.

4.5 Application of Baseline Methodology and Calculation of Emission Factors

The methodology "ACM0002, version 7" and "Tool to calculate the emission factor for an electricity system, EB35" were correctly used.

"The baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of the grid-connected power plants and by the addition of the new generation sources, as EFy".

Bey=Egy*Efgrid,CM,y

Efy = 0.2654 tCO_2/MWh

The emission factor used is calculated ex-ante for the subsystem South-Southeast-Midwest (S-SE-CO), using data provided from official source (ONS) for the years 2005, 2006 and 2007 (Ref.19)

According to the methodology, leakage should be considered when the power density is between 4 W/m^2 to 10 W/m^2. In the project activity, the power density is greater than 10 W/m^2, so leakage=0.

According to the methodology, PE=0 since power density is greater than 10 W/m^2.

For the project activity:

- Cazuza Ferreira: 41.17 W/m^2
- Rastro de Auto: 25.07 W/m^2

Regarding the ER calculations:

- As described in the PDD and required by ACM0002, ER = EG_yx EF
- The emission factor was calculated ex-ante using data from official sources, 0.2654 tCO_2/MWh.

The calculation and related data are presented in the PDD and spreadsheet. All sources of data and calculations are described in Ref.11.

Regarding application of Monitoring Methodology and Monitoring Plan, CAR 4 was raised because the PDD version 1 did not present the monitoring parameter Cap (installed capacity of the hydro power plant after the implementation of the project activity) according to methodology ACM0002 version 7. As the PDD was revised, CAR 4 was closed out.

The following parameters will be monitored:

- electricity supplied by the project activity to the grid;
- total electricity produced by the project activity, including the electricity supplied to the grid and supplied to internal loads;
- installed capacity after the implementation of the project activity;
- reservoir area

The monitoring plan follows the required by the methodology.

4.6 Choice of the Crediting Period

CAR 1 was raised because during site visit, it was verified that the starting dates of the SHPs did not reflect the date on which the implementation or construction or real action of a project activity began.

To close out CAR 1 the dates were modified in PDD version 4 and the evidences of each date were sent:

- The starting date of the SHP Cazuza Ferreira is 02/01/2009. This is the forecast for the beginning of the construction of SHP. If the construction starts at a different date, the effective construction date will be whichever occurs first;
- The starting date of the SHP Rastro de Auto is 02/01/2009. This is the prevision for the beginning of the construction of SHP. If the construction starts at a different date, the effective construction date will be whichever occurs first..

Cazuza Ferreira and Rastro Auto are projected to start operating on June, 2010.

The crediting period to the project activity is 7 years. The period starts on 1st June 2010 or the date of registration, which occurs later.

4.7 Environmental Impacts

The project power plants have the applicable environmental licenses required by the state environmental agency (FEPAM). The following licenses were verified:

SHP Cazuza Ferreira (Ref.7)

- Installation License (IL) – nº 23/2007 – DL

SHP Rastro de Auto (Ref.13)

- Installation License (IL) – nº 486/2008 – DL

4.8 Local Stakeholder Comments

The local stakeholder consultation is required by Brazilian DNA. It is necessary to invite the relevant stakeholders, before the validation process starts. During the site visit documented evidences, indicating that consultation was carried out in January 2008, were provided. Copies of the letters sent in January and February 2008 to the stakeholders and receipts of mailing were available (Ref.14 and 15). The following stakeholders were invited by letters to comment on the project:

- Putinga City Hall
- Putinga Municipal Assembly
- Putinga Municipal Environmental Secretary
- São José do Herval City Hall
- São José do Herval Municipal Assembly
- São José do Herval Municipal Environmental Department
- São Francisco de Paula City Hall
- São Francisco de Paula Municipal Assembly
- São Francisco de Paula Municipal Environmental Department
- Pró-Rio Taquari Foundation
- ECOBÉ Foundation
- Projeto-Terra Foundation
- State of RS Attorney for Public Interest
- Brazilian Forum of NGOs and Social Movements for Environment and Development
- State Environmental Agency (FEPAM)

The local stakeholder consultation process is correct and attends the Brazilian DNA requirements.

No comments were received.

5. Comments by Parties, Stakeholders and NGOs

In accordance with sub-paragraphs 40 (b) and (c) of the CDM modalities and procedures, the project design document of a proposed CDM project activity shall be made publicly available and the DOE shall invite comments on the validation requirements from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available. This chapter describes this process for this project.

5.1 Description of How and When the PDD was Made Publicly Available

The Project Design Document for this project was made available on the SGS website *http://cdm.unfccc.int/Projects/Validation/DB/6E5N1O296P8G45ODJGWUPS50TQB6AB/view.html* and was open for comments from 13-06-2008 until 12-07-2008. Comments were invited through the UNFCCC CDM homepage

5.2 Compilation of all Comments Received

Comment Number	Date Received	Submitter	Comment
0			0

5.3 Explanation of How Comments Have Been Taken into Account

No comments were received.

6. List of Persons Interviewed

Date	Name	Position	Short Description of Subject Discussed
17th and 18th March 2008	Eduardo Baltar de Souza Leão	Consultant- Enerbio	Validation process and findings. Technical issues, operational issues, investment analysis, Monitoring plan, baseline emission factor.
	Julio C. Saleckey	Manager-CERTEL	Financial issues related to the project, environmental and quality management system; environmental impacts, technical issues, plant operation.
	Juliana Brandão Brune	Administrator-CERTEL	
	Ricardo Vasper	Environmental area-CERTEL	
	Milton Huve	Financial Director	
	Ermani Aloisio Mallmann	Manager	
	Egon Edio Hoerlle	President – CERTEL	Project implementation, starting date, CDM consideration.

7. Document References

Category 1 Documents (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):

/1/ Project Document- CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda –Small Hydropower Plants, version 1 – 25/01/2008; version 2 – 19/03/2008; version 3-09/06 and version 4- 10/07/2008.

/2/ Methodology ACM0002 version 7: Consolidated baseline methodology for grid-connected electricity generation from renewable sources

/3a/ Tool for the demonstration and assessment of additionality, version 5.

/3b/ Tool to calculate the emission factor for an electricity system, version1

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

/4/ Portaria Nº7, 22 March 2006 issued by ANEEL

/5/ ANEEL- Despacho Nº 434, issued on 27 May, 2004

/6/ ANEEL-Despacho Nº 455, issued on 31 July, 2002

/7/ Cazuza Ferreira Installation License LI nº 23/2007-DL, issued on 11 January, 2007

/8/ Despacho ANEEL nº 3074, 28/12/2006

/9/ Cazuza Ferreira Revised Basic Environmental Project

/10/ Rastro de Auto Revised Basic Environmental Project

/11/ Excel document with CERs calculation

/12a/ Cazuza Ferreira cash flow

/12b/ Rastro de Auto cash flow

/12c/ Cazuza Ferreira and Rastro de Auto Weighted Average Capital Cost (WACC)

/13/ Rastro de Auto Installation License nº486/2008-DL, issued on 14th May 2008

/14/ Letters (invite) – Local Stakeholders

/15/ Ars – Local Stakeholders

/16/ Resolução ANEEL Nº16, 14/01/2000

/17/ CDM consideration

/18/ Sensitivity analysis

/19/ Emission Factor

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A.1 Annex 1: Local Assessment

This checklist is designed to provide confirmation of in-country data and information provided in the Project Design Document for CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda –Small Hydropower Plants.
It serves as a "**reality check**" on the project that is completed by a local assessor from SGS Brazil

Issue	**Findings**	**Source/Means of Verification**	**Further Action / Clarification / Information Required?**
Confirm the installed capacity informed in the PDD (is there a project description or a license issued by ANEEL where this capacity can be confirmed?).	The installed capacities of the two SHPs totalize 16.12 MW. The following was verified through environmental licenses: -Rastro Auto: 7.02 MW (Ref 5) -Cazuza Ferreira: 9.1 MW (Ref 6)	Ref 5: ANEEL- Despacho Nº 434, issued on 27 May, 2004. Ref 6: ANEEL-Despacho Nº 455, issued on 31 July, 2002	No

Issue	Findings	Source/Means of Verification	Further Action / Clarification / Information Required?
Confirm the locality (river, coordinates etc). Inform details of evidences verified on-site.	The localities are: SHP Rastro de Auto: • Latitude: 29°03'43" South and Longitude: 52°13'05 West, located on basin Atlântico Sudeste (Ref 5) SHP Cazuza Ferreira: • Latitude: 29°01'10" South and Longitude: 50°43'50" West, located on Lajeado Grande river (Ref 6)	Site visit Ref 1: PDD Ref 5: ANEEL- Despacho Nº 434, issued on 27 May, 2004. Ref 6: ANEEL-Despacho Nº 455, issued on 31 July, 2002.	No
Confirm the reservoir area of mentioned in the PDD (check the environmental license and studies, check maps or topographic maps of the dam).	The reservoirs area were verified through environmental licenses: SHP Rastro de Auto: -20.8 ha (Ref 5) SHP Cazuza Ferreira: -21.1 ha (Ref 7)	Ref 5: ANEEL- Despacho Nº 434, issued on 27 May, 2004. Ref 7: Installation License LI nº 23/2007-DL, issued on 11 January, 2007.	No
Give evidences of who is the responsible part of the project. Verify: social contract of the Certel and Certaja that evidences that the company is formally constituted and that is the owner of the plant.	Certel (Cooperativa Regional de Eletrificação Teutônia LTDA) is the owner PCH Rastro de Auto (Ref.5). Certel and Certaja are the owners of PHC Cazuza Ferreira (Ref.6).	Ref 5: ANEEL- Despacho Nº 434, issued on 27 May, 2004. Ref 6: ANEEL-Despacho Nº 455, issued on 31 July, 2002	No

Issue	Findings	Source/Means of Verification	Further Action / Clarification / Information Required?
Investment analysis: confirm the values applied for calculation. Ask copies of evidences (costs, tariffs, investments, operational costs, financial charges etc). Check assumptions and data. Verify the costs (investments and expenses) and the revenues of the project used for that cash flow.	The investment analyses were checked through spreadsheets, interview and references provided during validation assessment. It was possible to re-calculate the internal rate of return of the project activity with the data provided in the PDD and spreadsheets. The values obtained are consistent with spreadsheets and lower than Benchmark. The WACC (benchmark) used in the project "CERTEL – Cooperativa Regional de Eletrificação Teutônia Ltda - Small Hydropower Plants" is a calculated benchmark and not an internal data of the company. The validation team verified that the WACC calculated is based in the parameters and data available and audited. See section B.4 of the validation protocol for more detail.	DR/site visit	No

A.2 Annex 2: Validation Protocol

Table 1 Participation Requirements for Clean Development Mechanism (CDM) Project Activities (Ref PDD, Letters of Approval and UNFCCC website)

Requirement	Reference	Comments	Conclusion
1. All Parties (listed in Section A3 of the PDD) have ratified the Kyoto protocol and are allowed to participate in CDM projects	Marrakech Accords, CDM Modalities §30	Brazil is listed as the non-Annex-I Party, has ratified the protocol on 23rd August 2002 and is allowed to participate http://maindb.unfccc.int/public/country.pl?country=BR	OK
2. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3 and be entered into voluntarily.	Marrakech Accords, CDM Modalities §29 and §30	There is no Annex I Party in this project.	OK
3. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof, and be entered into voluntarily	Marrakech Accords, CDM Modalities §29 and §30 Kyoto Protocol Art. 12.2, Marrakech Accords, CDM Modalities §40a	There is no letter of approval from DNA Brazil at this phase (just after submission of validation report).	Pending

Requirement	Reference	Comments	Conclusion
4. 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	PDD publicly available: 29 Feb 08 – 29 Mar 08 http://cdm.unfccc.int/Projects/Validation/DB/G6MRUTMXPNSNQ8T9Z8P4EO4MJW2BPU/view.html. First PDD. The Project Design Document for this project was made available again on the SGS website due to changes in the PDD http://cdm.unfccc.int/Projects/Validation/DB/6E5N1O296P8G45ODJGWUPS50TQB6AB/view.html and was open for comments from 13-06-2008 until 12-07-2008. No comments received	OK
5. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	It follows the CDM- PDD template version 03.1.	OK
6. The project participants shall submit a letter on the modalities of communication (MoC) before submitting a request for registration	EB-09 F_CDM_REG form	Letter of MoC is to be provided.	Pending
7. For AR projects, the host country shall have issued a communication providing a single definition of minimum tree cover, minimum land area value and minimum tree height. Has such a letter been issued and are the definitions consistently applied throughout the PDD?		NA	NA

Table 2 PDD

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity					
A.1. Project Title					
A.1.1. Does the used project title clearly enable to identify the unique CDM activity?	A.1	DR	Yes, the title "CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda –Small Hydropower Plants" identifies the unique CDM project activity.	Ok	Ok
A.1.2. Are there an indication of a revision number and the date of the revision?	A.1	DR	Yes, PDD version 4, 10/07/2008.	Ok	Ok
A.1.3. Is this in consistency with the time line of the project's history?	A.2	DR	Yes, the PDD version and date are Ok.	Ok	Ok
A.2. Description of the Project Activity					
A.2.1. Is the description delivering a transparent overview of the project activities?	A.2	DR	The description of the project is Ok.	Ok	Ok
A.2.2. Is all information provided in compliance with actual situation or planning?	A.2	DR Site visit	The information provided in section A.2 is in compliance with the observed during the site visit.	Ok	Ok
A.2.3. Is all information provided consistent with details provided in further chapters of the PDD?	A.2	DR	The information of the Section A.2 of the PDD is consistent with further chapters.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
A.3. Project Participants					
A.3.1. Is the table required for the indication of project participants correctly applied?	A.3	DR	Brazil is the only Party involved in the project. The project participants are three private entities: • CERTEL (Cooperativa Regional de eletrificação Teutônia LTDA), • CERTAJA (Cooperativa de Geração de Energia e Desenvolvimento Taquari Jacuí), • Enerbio Consultoria LTDA The Party is not a project participant.	Ok	Ok
A.3.2. Is all information provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	A.3 Annex 1	DR	The description of annex 1 is consistent with the information described in section A.3 of the PDD.	Ok	Ok
A.4. Technical Description of the Project Activity					
A.4.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)? Are the latitude and longitude of the site indicated (decimal points)	A.4.1.4 Ref.5 Ref.6	DR	Yes. The locations are: • SHP Rastro de Auto: Latitude: 29°03'43" South and Longitude: 52°13'05 West (ANEEL- Despacho Nº 434-Ref 5) • SHP Cazuza Ferreira: Latitude: 29°01'10" South and Longitude: 50°43'50" West (ANEEL-Despacho Nº 455- Ref 6)	Ok	Ok
A.4.2. Do the project participants possess ownership or licenses which will allow the implementation of the project at that site / those sites?	A.4.1.4 Ref.5 Ref.6	DR	CERTEL possesses ownership and licenses which allow the implementation of SHP Rastro de Auto. CERTEL and CERTAJA possess ownership and licenses which allow the implementation of the SHP Cazuza Ferreira. Confirmed through environmental licenses verified.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
A.4.3. Is the category(ies) of the project activity correctly identified?	A.4.2 UNFCCC web site	DR	The category is correctly identified: Sectoral Scope 1- Energy Industries (Renewable Source)	Ok	Ok
A.4.4. Does the project design engineering reflect current good practices?	A.4.3	DR	The project design engineering follows the good practice applied in Brazil. Francis turbines will be used.	Ok	Ok
A.4.5. Does the description of the technology to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance and is the explanation how the project will reduce greenhouse gas emission transparent and suitable?	A.2 Ref.5 Ref.6	DR	The information on section A.2 clearly describes how the project will reduce the GHG, by avoiding electricity generation by fossil fuel sources (and CO_2 emissions), which would be generating (and emitting) in the absence of the project. The installed capacities of the SHPs totalize 16.12 MW. -Cazuza Ferreira: 9.1 MW (ANEEL-Despacho 445- Ref 6) -Rastro Auto: 7.02 MW (ANEEL-Despacho 434-Ref 5)	Ok	Ok
A.4.6. Is all information provided in compliance with actual situation or planning as available by the project participants?	A.4.3	DR Site visit	Yes, the technical description of section A.4.2 of the PDD was cross checked with the information seen by the local assessor in the site visit.	Ok	Ok
A.4.7. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	A.4.3	DR	The technology applied by the project activity follows the common practice of its sector.	Ok	Ok
A.4.8. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	A.4.3	DR	The project activity uses common technology applied in its sector and it's not likely to be substituted.	Ok	Ok
A.4.9. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?		I	As the project activity is part of plants operation, no specific training is required.	Ok	Ok
A.4.10. Does the project make provisions for meeting training and maintenance needs?		I	There is no record of training but personnel interviewed demonstrate knowledge of the plant operation.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
A.4.11. Is a schedule available on the implementation of the project and are there any risks for delays?	A.2	DR	Cazuza Ferreira and Rastro Auto are projected to start operating on June, 2010.	Ok	Ok
A.4.12. Is the table required for the indication of projected emission reductions correctly applied?	A.4.4	DR	Yes, the table follows the CDM-PDD template.	Ok	Ok
A.5. Public Funding					
A.5.1. Does the information on public funding provided conform with the actual situation or planning as presented by the project participants?	A.4.5 Annex 2	DR	No public funding is being used for the project activity.	Ok	Ok
A.5.2. Is all information provided consist with details provided by further chapters of the PDD (in particular annex 2)?	A.4.5 Annex 2	DR	No public funding is being used for the project activity.	Ok	Ok
A.5.3. In case of public funding from Annex I Parties is it confirmed that such funding does not result in a diversion of official development assistance	A.4.5 Annex 2	DR	There is no Annex I Party participating of the project activity.	Ok	Ok
B. Baseline and Monitoring Methodology					
B.1. Choice and Applicability					
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	B.1 Ref.2 Ref.3a Ref.3b	DR	The project activity uses the approved methodology ACM0002 version 7 (Ref. 2). This methodology also refers to the latest approved version of the Tool for the demonstration and assessment of additionality (Ref.3a), which is used in this project and Tool to calculate the emission factor for an electricity system (Ref.3b).	Ok	Ok
B.1.2. Is the baseline methodology the one deemed most applicable for this project?	B.2 Ref.2	DR	Yes, the baseline methodology is Ok.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.1.3. Is the choice of the methodology correctly justified by the PDD and is the project in conformance with all applicability criteria of the applied methodology?	B.2 Ref.2	DR	Yes, it follows the requirements of the methodology.	Ok	Ok
B.2. Project Boundary					
B.2.1. Are all emission sources and gasses related to the baseline scenario, project scenario and leakage clearly identified and described in a complete manner?	B.3 Ref.2	DR	The source in baseline is CO_2 emissions from electricity generation in fossil fuel fired power plants that is displaced due to the project activity. In the project activity, there is no emission source included and leakage is not considered.	Ok	Ok
B.2.2. In case of grid connected electricity projects: Is the relevant grid correctly identified in accordance with EB guidance and the underlying methodology?	B.3	DR	Both SHPs are connected to the same grid: South-Southeast-Midwest (S-SE-CO).	Ok	Ok
B.2.3. Are the project's spatial boundaries (geographical) and the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	B.3	DR	The project boundaries include both project power plants and the South-Southeast-Midwest (S-SE-CO).	Ok	Ok
B.3. Identification of the Baseline Scenario					
B.3.1. Does the PDD discuss the identification of the most likely baseline scenario? Does the PDD follow the steps to determine the baseline scenario required by the methodology and is the application of the methodology and the discussion and determination of the chosen baseline transparent?	B.4 Ref.2 Ref.19	DR	The baseline scenario is correctly described according to the methodology. It is the electricity delivered to the grid by the project that would have been generated otherwise by the operation of a grid-connected power plant and by the addition of new generating sources. The emission factor used is calculated ex ante for the subsystem South-Southeast-Midwest (S-SE-CO), using data provided from official source (ONS) for the years 2005, 2006 and 2007 (Ref.19).	Ok	Ok
B.3.2. Does the application consider all potential realistic and credible baseline scenarios in the discussion taking into account relevant national and/or sectoral policies, macro-economic trends and political aspirations??	B.4	DR	See CAR 3.	See CAR 3	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.3.3. Is the choice of the baseline compatible with the available data?	B.4	DR	Yes.	Ok	Ok
B.3.4. Is conservativeness addressed in the way of identifying the baseline?	B.4	DR	Yes, the identification of baseline is conservative. In the absence of the project, electricity should be delivered by non-renewable sources from power plants.	Ok	Ok
B.3.5. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	B.4 Ref.2	DR	See B.3.1.	Ok	Ok
B.4. Additionality					
B.4.1. Does the PDD clearly demonstrate the additionality using the approach as given by the methodology and by following all the required steps?	B.5 Ref.3a	DR	See B.4.2	Ok	Ok
B.4.2. In case of using the additionality tool: Is the 'Additionality Tool' used in the PDD latest version? If an earlier version has been used, do the changes impact the discussion in the PDD? Are all steps followed in a transparent manner?	B.5 Ref.3a	DR	The tool for the demonstration and assessment of additionality, version 5 is used. Sub step 1a of the Tool requires PPs to discuss other realistic and credible scenarios. PDD needs to be modified to reflect this. CAR 3 was raised. In PDD version 2, the option "The project activity undertaken without being registered as a CDM Project Activity" was added. As the information provided complies with the requirement by the Tool version 5, CAR 3 was closed out. The alternatives to the project activity provided were: continuation of current practice, build a mineral coal thermoelectric plant and project activity not as a CDM project. As verified during validation assessment all alternatives are consistent with laws and regulations. The electricity could continue to be generated by the existing grid and there is no obligation to build the hydro power plant. Also the Ministry of Mines and Energy projects a growth in the offer of energy generation from mineral coal thermoelectric until 2015 in Brazil. The project developer selected the benchmark analysis for the assessment of additionality. The IRR was used as a financial indicator for comparison. It was used the project's Weighted	~~CAR 3~~	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
			Average Capital Cost – WACC. The calculated WACC for Cazuza Ferreira was 14.97% and for Rastro de Auto was 14.80% (Ref.12c). The WACC (benchmark) used in the project "CERTEL – Cooperativa Regional de Eletrificação Teutônia Ltda - Small Hydropower Plants" is a calculated benchmark and not an internal data of the company. The validation team verified that the WACC calculated is based in the parameters and data available and audited. The following data presented were checked during validation assessment for both small hydropower plants. Installed capacity: • Rastro de Auto: 7.02 MW; and Cazuza Ferreira 9.1MW according authorization from ANEEL. Capacity factor: this data is used to estimate the total energy to be generated during the year and consequently the expected CER. The capacity factor is approximately 55% for all plant based on the Portaria Nº7, 22 March 2006 issued by ANEEL (Ref.4). This represents the average value of the energy generated and to be generated in all SHP's. Revenues – the total revenues are based in the total energy assured and the energy estimated tariff based in the power purchase agreement and "Electricity energy 2005 and 2006". The approximate tariff of each plant is R$78.33 for Rastro de Auto and R$ 78.33 for Cazuza Ferreira. Costs – the project is following the correct regulation and taxes applicable to the energy sector in the country. The ANEEL tax, inspection tax are correctly applied in the investment analysis (Resolução Nº16, 14/01/2000, Ref. 16, and Despacho Nº3074, 28/12/2006, Ref. 8). The IRR calculated is 12.61% for Cazuza Ferreira and 8.35% for Rastro de Auto. Those values represent a financial barrier for the project activity when compared to the WACC value of 14.97% and 14.80% It was possible to re-calculate the internal rate of return of the project activity with data provided in the		

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
			PDD and spreadsheets. The values obtained are consistent with spreadsheets, lower than the Benchmark. It was concluded that the project is not attractive for investors. A sensitivity analysis was conducted altering some parameters as electricity price, and investment costs. The IRR is still not financially attractive. After sensitivity analysis the maximum IRR for Cazuza Ferreira is 14.12% and for Rastro de Auto is 9.56%. These IRRs are still lower than the Benchmark of 14.97% and 14.80%and are not attractive. The common practice analysis is based in the Brazilian electricity sector. The source of data presented was checked. According to ANEEL, small hydropower plants represent 2.31% of the energy generation in Rio Grande do Sul state, which belongs to the Subsystem South of the National Interconnected System. Small hydropower plants under construction represent 9.09%. There are similar hydropower plants but with different characteristics. The construction of small hydropower plants without incentive or additional income is not attractive. The Federal Government created the PROINFA, a program to motivate the development of renewable energy technologies. This project activity does not receive any incentive from Federal program or PROINFA. The applicable steps of the "Tool" were assessed correctly and it was concluded that the project is additional due to the financial analysis presented and the common practice in the region.		
B.4.3. Is the discussion on additionality and the evidence provided consistent with the starting date of the project If the project has started before the validation is it discussed how the CDM was taken into account in the decision to go ahead with the project activity	B.5 Ref.9 Ref.10 Ref.17	DR	Starting date of the project activity should be the earliest date on which the implementation or construction or real action of a project activity begins. • SHP Cazuza Ferreira – 2008; • SHP Rastro de Auto – 2008 These dates which were presented in PDD version 1 do not reflect the condition above. CAR 1 was raised.	~~CAR1~~	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
			The starting dates were modified in PDD version 4: • The starting date of the SHP Cazuza Ferreira is 02/01/2009. This is the forecast for the beginning of the construction of SHP. If the construction starts at a different date, the effective construction date will be whichever occurs first; • The starting date of the SHP Rastro de Auto is 02/01/2009. This is the prevision for the beginning of the construction of SHP. If the construction starts at a different date, the effective construction date will be whichever occurs first. As the starting dates were revised in the PDD version 4 and they reflect the earliest date on which the implementation or construction or real action of a project activity began, CAR 1 was closed out. The document provided during site visit mention CDM consideration and it is applicable for plants Cazuza Ferreira and Rastro de Auto.		
B.4.4. Is the discussion on additionality consistent with the identification all potential realistic and credible baseline scenarios B.4.5. Do the identified alternative include technologies and practices that include outputs (e.g) cement or services comparable with the proposed CDM project activity	B.5 Ref.3a	DR	Yes.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.4.6. If an investment analysis has been used, has it been shown that the proposed project activity is economically or financially less attractive than at least one other alternative without the revenue from the sale of CERs?	B.5 Ref.3a	DR	The financial analysis for the hydropower plants Cazuza Ferreira and Rastro de Auto was done considering data of year 2001. This year does not reflect the real decision to implement these plants. The financial analysis should be done according to the decision to implement of each plant (i.e. 2005 for Cazuza Ferreira and 2006 for Rastro de Auto). CAR 2 was raised. The revised financial analysis provided is in accordance with implementation decision of each hydropower plant and uses the correct indicators, tax and reference values. CAR 2 was closed out.	~~CAR 2~~	OK
B.4.7. If a barrier analysis has been used, has it been shown that the proposed project activity faces barriers that prevent the implementation of this type of proposed project activity but would not have prevented the implementation of at least one of the alternatives?	NA	NA	NA	NA	NA
B.4.8. Has it been shown that the project is not common practice?	B.5	DR	The project is not common practice. It was shown in the PDD that according to official sources (ANEEL), the SHPs operating in Rio Grande do Sul state represent 2, 31% of the entrepreneurships and, under construction, the SHPs represents 9,09% of the entrepreneurships.	Ok	Ok
B.4.9. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario	B.5	DR	The project activity is different from the baseline scenario. It will provide clean energy to the grid, while in the baseline scenario the energy would be generated by other sources (mineral coal, natural gas).	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.5. Application of the Baseline Methodology					
B.5.1. Has the approved methodology been applied correctly for determining **baseline emissions**?	B.6 Ref.2 Ref.3b Ref.19	DR	Yes, the determination of baseline emission is applied as required by the methodology. The emission factor for theSouth-Southeast-Midwest subsystem is defined as $EF_{grid, CM,y}$ and was calculated ex ante, using data from 2005, 2006 and 2007 provided by ONS (federal agency) (Ref.19). The baseline emissions are calculated by using the annual electricity generation times the CO_2 average emission rate of the estimated baseline, as follows: Monitored project electricity generation in MWh * Baseline emission rate factor in tCO_2/MWh. In this project the emission factor is 0.2654 tCO_2/MWh.	Ok	Ok
B.5.2. Has the approved methodology been applied correctly for determining **project emissions**?	B.6.1 Ref.2	DR	Yes, it follows the required by the methodology. As the power density is grater than 10W/m², consequently, project emissions (Pey) = 0.	Ok	Ok
B.5.3. Has the approved methodology been applied correctly for determining **leakage**?	B.6.1 Ref.2	DR	No leakage is considered. According to the methodology, leakage should be considered when the power density is between 4 W/m^2 to 10 W/m^2. In the project activity, the power density is greater than 10 W/m^2.	Ok	Ok
B.5.4. Where applicable, has the approved methodology been applied correctly for the **direct calculation of emission reductions**	B.6.1 Ref.2 Ref.3b	DR	Yes, it followed the required by the methodology.	Ok	Ok
B.5.5. Have all the methodological choices been explained, have they been properly justified and are they correct	B.6.1 B.6.3 Ref.2 Ref.3b	DR	The methodological choices are according to the methodology ACM0002.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.5.6. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	B.6.1 Ref.2	DR	Conservative values to estimate baseline GHG emission were used. The capacity factor (55%) was considered in the calculation of the electricity to be generated. The uncertainties (hydrological or operational problems) are considered in the capacity factor defined. In the project activity, there are neither project emissions nor leakage.	Ok	Ok
B.6. Ex-ante Data and Parameters Used					
B.6.1. Are the data provided in compliance with the methodology?	B.6.2 B.6.3 Ref.2 Ref.3b	DR	The ex-ante data and parameter ($EF_{grid,CM,2005,2006,2007}$) that are mentioned in the PDD are correct and in compliance with the methodology. The parameters Cap_{BL} and A_{BL} are zero, according to the methodology.	Ok	Ok
B.6.2. Is all the data derived from official data sources or replicable records and have these been correctly quoted?	B.6.2 B.6.3	DR	Yes, all data of emission factor are derived from official source (ONS,).	Ok	Ok
B.6.3. Is the vintage of the baseline data correct?	B.6.2 B.6.3 MCT web site	DR	Yes, it was used the most recent data available.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.7. Calculation of Emissions Reductions					
B.7.1. Has the approved methodology been applied correctly for determining **emission reductions**?	B.6.2 B.6.3 Ref.2 Ref.3b Ref.11 REF 12 a,b,c	DR	Yes, the methodology was applied exactly as defined for determining emission reductions. The PDD states which equations will be used to calculate emission reductions. The required steps have been followed. Emissions reductions are estimated as follows: Ery = Bey = Egy * $EF_{grid,CM,y}$.	Ok	Ok
B.7.2. Are the emission reduction calculations documented in a complete and transparent manner?	B.6.2 B.6.3 Ref.2 Ref.3b	DR	The equations are presented in the PDD. With the data provided in the PDD it's possible to reproduce the calculation.	Ok	Ok
B.7.3. Have conservative assumptions been used to calculate emission reductions?	B.6.2 B.6.3 Ref.11	DR	Yes, data are from official sources.	Ok	Ok
B.7.4. Is the projection based on provable input parameter?	B.6.3 Ref.11	DR	Yes, see B.6.	Ok	Ok
B.7.5. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	B.6.3 Annex 4	DR	The projection is based on monitoring plan.	Ok	Ok
B.7.6. Is the calculation of the emission reduction correct?	B.6.3	DR	See B.7.1	Ok	Ok
B.8. Emission Reductions					
B.8.1. Will the project result in fewer GHG emissions than the baseline scenario?	B.6.3	DR	Yes, emissions reductions are achieved by the total net electricity generated and delivered to the grid.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.8.2. Is the form/table required for the indication of projected emission reductions correctly applied?	B.6.4	DR	Yes, it follows the PDD template.	Ok	Ok
B.8.3. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	B.6.3	DR	Yes.	Ok	Ok
B.9. Monitoring Methodology					
B.9.1. Does the monitoring methodology provide a consistent approach in the context of all parameter to be monitored and further information provided by the PDD? Are all parameters and data that is available at validation consistent with the approved methodology	B.7 Annex 4 Ref.2 Ref.3b	DR	Yes, the monitoring plan and Annex 4 are consistent to the required by the methodology.	Ok	Ok
B.9.2. Does the monitoring methodology apply consistently the choice of the option selected for monitoring both of project and baseline emissions?	B.7 Annex 4 Ref.2 Ref.3b	DR	See B.9.1	Ok	Ok
B.10. Data and Parameters Monitored					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period?	B.7 Annex 4	DR	The monitoring plan states that all data collected as part of the monitoring will be kept for at least two years after the last period of credit.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.10.2. Are the choices of project GHG indicators reasonable and in conformance with the requirements set by the approved methodology applied?	B.7.1	DR	Section B.7.1 of the PDD version 1 does not present the monitoring parameter Cap (installed capacity of the hydro power plant after the implementation of the project activity) according to methodology ACM0002 version 7. CAR 4 was raised. The parameter was included in PDD version 2 as required by the methodology. CAR 4 was closed out.	~~CAR 4~~	OK
B.10.3. Will it be possible to determine the specified project GHG indicators?	B.7.1	DR	Yes.	Ok	Ok
B.10.4. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	B.7.1	DR	The information provided describes properly the implementation of the monitoring plan.	Ok	Ok
B.10.5. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	B.7.1	DR	Data will be collected directly from the meters, consolidated in monthly reports and it will be cross checked against the spreadsheets available by CCEE website and receipts of sales, if necessary.	Ok	Ok
B.10.6. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	B.7.1	DR	Yes, it will be possible to cross check the data. The monitoring approach is in line with current good practice for the energy sector in the country (following ONS procedures).	Ok	Ok
B.10.7. Are all formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	B.7.1	DR	PE = 0	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.11. Quality Control (QC) and Quality Assurance (QA) Procedures					
B.11.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	B.7.1 Annex 4	DR	The level of uncertainty is low because the data related to the emission factors come from official sources. Also it will be possible to cross check the data from the energy delivered to the grid.	Ok	Ok
B.11.2. Is the belonging determination of uncertainty levels done correctly for each ID in a correct and reliable manner?	B.7.1 Annex 4	DR	See B.11.1	Ok	Ok
B.11.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	B.7.1 Annex 4	DR	See B.11.1	Ok	Ok
B.11.4. Is it ensured that data will be bound to national or internal reference standards?	B.7.1 Annex 4	DR	See B.11.1	Ok	Ok
B.11.5. Is it ensured that data provisions will be free of potential conflicts of interests resulting in a tendency of overestimating emission reductions?	B.7.1 Annex 4	DR	See B.11.1	Ok	Ok
B.12. Operational and Management Structure					
B.12.1. Is the authority and responsibility of project management clearly described?	B.7.2	DR	Yes, CERTEL is responsible for the project management and a consultant company was contracted to prepare the monitoring report.	Ok	Ok
B.12.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	B.7.2	DR	Yes. •Special Measurement Department is responsible for collecting information from the CERTEL's meters • Electricity Generation Department is responsible for the consolidation and analysis of monthly spreadsheets and for SCDE software supervision.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.12.3. Are procedures identified for training of monitoring personnel?	B.7.2	DR	No formal procedure identified. Verified	Ok	Ok
B.13. Monitoring Plan (Annex 4)					
B.13.1. Is the monitoring plan developed in a project specific manner clearly addressing the unique features of the CDM activity?	Annex 4	DR	Annex 4 is consistent to the required by the methodology. Procedures will be implemented before verification. The project activity will follow official procedures from ANEEL and ONS to monitor the energy generated and delivered to the grid and calibration.	Ok	Ok
B.13.2. Does the monitoring plan completely describes all measures to be implemented for monitoring all parameter required, including measures to be implemented for ensuring data quality?	Annex 4	DR	See B.13.1.	Ok	Ok
B.13.3. Does the monitoring plan provide information on monitoring equipment and respective positioning in order to safeguard a proper installation?	Annex 4	DR	Yes, it will follow the Brazilian industry standards.	Ok	Ok
B.13.4. Are procedures identified for calibration of monitoring equipment?	Annex 4	DR	Yes, it will follow the required by ONS.	Ok	Ok
B.13.5. Are procedures identified for maintenance of monitoring equipment and installations?	Annex 4	DR	See B.13.3.	Ok	Ok
B.13.6. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	Annex 4	DR	Yes, in the monitoring plan all routine for procedure of generation data collection, data consolidation procedure, crosschecking of the internal generation data with the third part reports and data storage were described.	Ok	Ok
B.13.7. Are procedures identified for dealing with possible monitoring data adjustments and missing data allowing redundant reconstruction of data in case of monitoring problems??	Annex 4	DR	Yes, there will be data from project and CCEE's report.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.13.8. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	Annex 4	DR	Yes, it will follow the required by ONS.	Ok	Ok
B.13.9. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	Annex 4	DR	Yes, data will be cross checked with third part report (CCEE spreadsheets).	Ok	Ok
B.14. Baseline Details					
B.14.1. Is there any indication of a date when determine the baseline?	C.1.1	DR	Yes, 25th January 2008	Ok	Ok
B.14.2. Is this in consistency with the time line of the PDD history?	C.1.1	DR	Yes.	Ok	Ok
B.14.3. Is all data required provided in a complete manner by annex 3 of the PDD?	C.1.1 Annex 3	DR	Yes.	Ok	Ok
***C.* Duration of the Project / Crediting Period**					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	C.1.1	DR	See CAR 1 30 years is the operational expected lifetime for each small hydro plant (applicable lifetime for SHP1s).	~~CAR 1~~	OK
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?	C.2.1	DR	Renewable crediting period (7 years).	Ok	Ok
C.1.3. Does the project's operational lifetime exceed the crediting period	C.2.1	DR	The life times of all SHPs are greater than the crediting period.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
D. Environmental Impacts					
D.1.1. Does the project comply with environmental legislation in the host country?	D.1 D.2	DR	Yes, the environmental licenses are in compliance with Brazilian laws requirements.	Ok	Ok
D.1.2. Has an analysis of the environmental impacts of the project activity been sufficiently described?	D.1 Ref.7 Ref.13	DR	The environmental aspects of the SHPs were analyzed by the State Environmental Agency (FEPAM) when it issued the licenses. **SHP Cazuza Ferreira** (Ref.7) ▪ Installation License (IL) – nº 23/2007 – DL -Signed on: February 11th, 2007 -Valid until: December 30th, 2009 **SHP Rastro de Auto** (Ref.13) ▪ Installation License (IL) – nº 486/2008 – DL -Signed on: May 14th, 2008 -Valid until: March 30th, 2012	Ok	Ok
D.1.3. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	D.1 Ref.7 Ref.13	DR	See D.1.2	Ok	Ok
D.1.4. Will the project create any adverse environmental effects?	D.1 Ref.7 Ref.13	DR	See D.1.2. Adverse environmental effects were considered by the environmental agency when issuing the applicable licenses.	Ok	Ok
D.1.5. Are transboundary environmental impacts considered in the analysis?	D.1 Ref.7 Ref.13	DR	See D.1.2. Transboundary impacts were considered by the environmental agency.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
D.1.6. Have identified environmental impacts been addressed in the project design?	D.1 Ref.7 Ref.13	DR	See D.1.2. No significant environmental impact detected.	Ok	Ok
E. Stakeholder Comments					
E.1.1. Have relevant stakeholders been consulted?	E	DR	Yes, as listed in the PDD, section E.1.	Ok	Ok
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	E Ref.14 Ref.15	DR	Yes, the letters were in local language. Copy of the letters and AR were provided.	Ok	Ok
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	E Ref.14 Ref.15	DR	Yes, the stakeholder consultation process follows the Brazilian DNA Resolution No. 1, issued on September 11th, 2003	Ok	Ok
E.1.4. Is the undertaken stakeholder process described in a complete and transparent manner?	E Ref.14 Ref.15	DR	Yes.	Ok	Ok
E.1.5. Is a summary of the stakeholder comments received provided?	E Ref.14 Ref.15	DR	No comments were received.	Ok	Ok
E.1.6. Has due account been taken of any stakeholder comments received?		NA	Ok	Ok	Ok

References

Reference ID	Title / Description	Comments
/1/	Project Document- CERTEL's – Cooperativa Regional de Eletrificação Teutônia Ltda – Small Hydropower Plants, version 1 – 25/01/2008; version 2 – 19/03/2008; version 3-09/06 and version 4- 10/07/2008.	
/2/	Methodology ACM0002 version 7: Consolidated baseline methodology for grid-connected electricity generation from renewable sources	
/3a/	Tool for the demonstration and assessment of additionality, version 5.	
/3b/	Tool to calculate the emission factor for an electricity system, version1	
/4/	Portaria Nº 7, 22 March 2006 issued by ANEEL	
/5/	ANEEL- Despacho Nº 434, issued on 27 May, 2004	Coordinates, installed capacity, reservoir area, ownership of SHP Rastro de Auto
/6/	ANEEL-Despacho Nº 455, issued on 31 July, 2002	Coordinates, installed capacity, ownership of SHP Cazuza Ferreira
/7/	Cazuza Ferreira Installation License LI nº 23/2007-DL, issued on 11 January, 2007	Reservoir area of Cazuza Ferreira
/8/	Despacho ANEEL nº 3074, 28/12/2006	The ANEEL inspection tax used in the investment analysis
/9/	Cazuza Ferreira Revised Basic Environmental Project	Evidence of Starting Date of Cazuza Ferreira
/10/	Rastro de Auto Revised Basic Environmental Project	Evidence of Starting Date of Rastro de Auto
/11/	Excel document with CERs calculation	
/12a/	Cazuza Ferreira cash flow	Cash flow and technical parameters
/12b/	Rastro de Auto cash flow	Cash flow and technical parameters
/12c/	Cazuza Ferreira and Rastro de Auto Weighted Average Capital Cost (WACC)	
/13/	Rastro de Auto Installation License nº486/2008-DL, issued on 14th May 2008	
/14/	Letters (invite) – Local Stakeholders	
/15/	ARs – Local Stakeholders	
/16/	Resolução ANEEL Nº16, 14/01/2000	The ANEEL tax used in the investment analysis
/17/	CDM consideration	Certel's meeting number 045-2000GAE on 13/11/2000.
/18/	Sensitivity analysis	Excel document with sensitivity analysis
/19/	Emission Factor	

A.3 Annex 3: Overview of Findings

Date:	17/03/2008			Raised by:	Fabian Gonçalves		
No.:	01	Type:	CAR	Issue:	Starting date of the project activity	Ref.:	B.4.3
Lead Assessor Comment					Date: 17/03/2008		
Starting date of the project activity should be the earliest date on which the implementation or construction or real action of a project activity begins. Dates presented in PDD version 1 do not reflect this condition.							
Project Participant Response: Eduardo Baltar (Enerbio Consultoria)					Date: 31/03/2008		
The starting date of the CERTEL Project's SHPs were reviewed and it reflects the date when: **The Cazuza Ferreira's: prevision for the beginning of the construction of SHPs** **The Rastro de Auto's: prevision for the beginning of the construction of SHPs**							
Acceptance and Close out by Lead Assessor:					Date: 07/05/2008		
Information Provided: The starting dates were modified in PDD version 4: SHP Cazuza Ferreira – 02/01/2009; SHP Rastro de Auto – 02/01/2009. Information Verified: PDD was verified and the documents where the starting dates were based on were checked.						Verified Document Reference: PDD version 4	
Reasoning for not acceptance or acceptance and close out: The starting dates presented in PDD version 4 reflect the earliest date on which the implementation or construction or real action of a project activity began. CAR 1 was closed out.							

Date:	17/03/2008			Raised by:	Fabian Gonçalves		
No.:	02	Type:	CAR	Issue:	Financial analysis (cash flow)	Ref.:	B.4.6
Lead Assessor Comment					Date: 17/03/2008		
The financial analysis for hydropower plants Cazuza Ferreira and Rastro de Auto was done considering data of year 2001. This year does not reflect the real decision to implement the project. The financial analysis should be done according to the decision to implement of each plant (i.e. 2005 for Cazuza Ferreira and 2006 for Rastro de Auto). Provide a revised financial analysis.							
Project Participant Response: Eduardo Baltar (Enerbio Consultoria)					Date: 31/03/2008		
The financial analysis, considering the decision to implement of each plant, was sent to the DOE on March 19th 2008.							
Acceptance and Close out by Lead Assessor:					Date: 07/05/2008		
Information Provided: Revised PDD version 2 and financial spreadsheets. Information Verified: Verified the financial analysis						Verified Document Reference: Ref.1, Ref.12a and 12b	
Reasoning for not acceptance or acceptance and close out: The revised financial analysis provided is in accordance with decision to implement of each hydropower plant and uses the correct indicators, tax and reference values. CAR 2 was closed out.							

Date:	17/03/2008			Raised by:	Fabian Gonçalves		
No.:	03	Type:	CAR	Issue:	Project alternatives	Ref.:	B.4.2
Lead Assessor Comment					Date: 17/03/2008		

According to the "Tool", version 5, Sub step 1a, please discuss other realistic and credible scenario.	
Project Participant Response: Eduardo Baltar (Enerbio Consultoria)	Date: 31/03/2008
It was included one more realistic and credible scenario as recommended in the "Tool" version 05.	
Acceptance and Close out by Lead Assessor:	Date: 07/05/2008
Information Provided: In PDD version 2, the option "The project activity undertaken without being registered as a CDM Project Activity" was included. Information Verified: PDD version 2 was verified.	Verified Document Reference: PDD version 2
Reasoning for not acceptance or acceptance and close out: As the information provided is according to the required by the Tool version 5, CAR 3 was closed out.	

Date:	17/03/2008			Raised by:	Fabian Gonçalves		
No.:	04	Type:	CAR	Issue:	Monitoring parameter	Ref.:	B.10.2
Lead Assessor Comment					Date: 17/03/2008		
Section B.7.1 of the PDD version 1 does not present the monitoring parameter Cap (installed capacity of the hydropower plant after the implementation of the project activity) according to methodology ACM0002 version 7.							
Project Participant Response: Eduardo Baltar (Enerbio Consultoria)					Date: 31/03/2008		
The monitoring parameter Cap (installed capacity of the hydro power plant after the implementation of the project activity) was added in the section B.7.1 of the PDD version 2, following the described on the methodology ACM0002 version 7.							
Acceptance and Close out by Lead Assessor:					Date: 07/05/2008		
Information Provided: The parameter was included in PDD version 2 as required by the methodology. Information Verified: PDD version 2 was verified.					Verified Document Reference: PDD version 2		
Reasoning for not acceptance or acceptance and close out: In PDD version 2, the section B.7.1 was completed as the required by the methodology. CAR 5 was closed out.							

A.4 Annex 4: Team Members Statements of Competency

Statement of Competence

Name: Fabian Goncalves SGS Affiliate: SGS Brazil

Status

- Product Co-ordinator ☒
- Operations Co-ordinator ☐
- Technical Reviewer ☐
- Expert ☐

	Validation	Verification
• Local Assessor	☒	☒
• Lead Assessor	☒	☒
• Assessor / Trainee Lead Assessor	☒	☒

Scopes of Expertise

1. Energy Industries (renewable / non-renewable) ☒
2. Energy Distribution ☐
3. Energy Demand ☐
4. Manufacturing ☒
5. Chemical Industry ☐
6. Construction ☐
7. Transport ☐
8. Mining/Mineral Production ☐
9. Metal Production ☐
10. Fugitive Emissions from Fuels (solid,oil and gas) ☐
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride ☐
12. Solvent Use ☐
13. Waste Handling and Disposal ☒
14. Afforestation and Reforestation ☐
15. Agriculture ☐

Approved Member of Staff by: Siddharth Yadav Date: 18/10/2007