
VALIDATION REPORT

Cristalino Energia Ltda

MGM Carbon Portfolio S.a.r.l

Cristalino Small hydroelectric Power Plant

SGS Climate Change Programme

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<p>Summary</p> <p>SGS has performed a validation of the project Cristalino Small Hydroelectric Power Plant. The Validation was performed on the basis of the UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. Using a risk based approach, the review of the project design documentation and the subsequent follow-up interviews have provided SGS with sufficient evidence to determine the fulfilment of the stated criteria.</p> <p>The project activity consists of the installation of a small hydroelectric plant with installed capacity of 4.0 MW. The plant is located on the Barra Preta River, in the municipality of Manuel Ribas, Paraná State, Brazil.</p> <p>Total amount of emission reductions estimated for the first crediting period of is 44,219 tCO₂e.</p> <p>The Letter of Approval from Brazilian DNA was issued on 29 January 2008.</p> <p>The Letter of Approval from UK DNA was issued on 5 March 2008.</p> <p>The changes in the version 3A are regarding the responses to “request for registration incomplete”, raised by CDM EB on 17/06/2008 and in version 3B are related to the “corrections required”, raised by CDM EB on 01/12/2008. Information about the timeline of the project was included in the section 3.2 of this report and new references were added at section 7.</p>			
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Abbreviations

ACM	Approved Consolidated Methodology
ANEEL	Agencia Nacional de Energia Elétrica (Brazilian Agency of Power Electricity).
CAR	Corrective Action Request
CER	Certified Emission Reduction
DNA	Designated National Authority
EF	Emission Factor
ER	Emissions Reduction
MP	Monitoring Plan
NIR	New Information Request
PDD	Project Design Document
SGS	Société Générale de Surveillance

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1 1 Introduction

1.1 Objective

Cristalino Energia Ltda has commissioned SGS to perform the validation of the project Cristalino Small Hydroelectric power plant 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.

1.2 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.

1.3 GHG Project Description

This report summarizes the results of the validation of Cristalino Small Hydroelectric Power Plant, performed on the basis of UNFCCC criteria. The validation has been performed as a desk review of the project documents presented by Cristalino Energia Ltda and MGM Carbon Portfolifo S.a.r.l and a site visit carried out on 24 and 25th May 2007, where the details of the project activity were verified on-site. During the site visit, Cristalino's manager and MGM consultant were interviewed.

The project activity consists of the installation of a small hydroelectric plant with an installed capacity of 4.0 MW, located in Barra Preta River, in the municipality of Manuel Ribas, Paraná State, Brazil. The project has the objective to provide renewable electricity from Cristalino Energia Ltda and dispatch the energy to interconnected system. The project activity has a small reservoir with 880 m² of area (Ref.6), offering lower environmental impact compared to large hydro powers. This project will increase the supply of renewable source of energy to the grid, avoiding the use of fossil fuel that would be burned in thermal power plants.

Total amount of emission reductions estimated for the first crediting period is 44,219 t CO₂e.

Baseline Scenario:

No investment in clean power generation; electricity generation by the existing generation mix operating in the grid. The baseline scenario is the continuation of the current situation of electricity supplied by large hydro and thermal power plants.

With-project scenario:

The installation of a small hydroelectric plant with installed capacity of 4.0 MW to provide renewable electricity to the grid. The project reduces emissions of greenhouse gas (GHG) by avoiding electricity generation by fossil fuel sources and its CO₂ emissions, which would be emitted in the absence of the project.

Leakage: No leakage is expected.

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 comprises, among others: decreasing the dependence on fossil fuels, increasing of energy supply and providing local distributed generation, contributing to the regional/local economic development.

The construction and operation of the plant have followed the legal requirements regarding environmental protection and control. During the site visit and the validation exercise, documented evidence regarding the environmental assessments was verified (see Ref.8, 9 and 10).

1.4 The names and roles of the validation team members

Name	Role
Aurea Nardelli – SGS Brazil	Lead Assessor
Geisa Principe – SGS Brazil	Assessor

Statement of Competence of team members are attached at Annex IV.

2 Methodology

2.1 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. Additional information can be required to complete the validation, which may be obtained from public sources or through telephone and face-to-face interviews with key stakeholders (including the project developers and Government and NGO representatives in the host country). These may be undertaken by the local SGS affiliate. The results of this local assessment are summarized in Annex 1 to this report.

2.2 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	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	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 2 to this report

2.3 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 3). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

2.4 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.

3 Determination Findings

3.1 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 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 receive and analyse the validation report. The Letter of Approval from Brazilian DNA was issued on 29 January 2008.

United Kingdom is listed as Annex 1 party. UK ratified the Kyoto Protocol on 31st May 2002. (http://unfccc.int/files/essential_background/kyoto_protocol/application/pdf/kpstats.pdf)

No letter of approval from Annex I country was provided to the validator. CAR 10 was raised.

The letter of approval was issued on 5 March 2008. CAR 10 was closed out.

3.2 Baseline selection and additionality

From the discussion provided in the first version of the PDD, it was not possible to conclude if the project is additional under the CDM rules. It was applied the “Tool for the demonstration and assessment of additionality”, but the steps of the tool (mainly the “Investment analysis”) were not followed correctly. The discussion of additionality was not clear and was not supported by objective evidences and information, as additional evidences regarding economic analysis or references of the sources of information mentioned. CAR 2 was raised.

During the site visit it was also verified that the project was financed (80% of the total investments) by the Banco Regional de Desenvolvimento do Extremo - BRDE. This information was not transparent in the PDD, nothing was mentioned about this financing in the discussion of the barriers. It was not clearly justified why the project faced the lack of local long-term financing. NIR 8 was raised.

To clarify NIR 8, the discussion of additionality was revised (PDD version 2), see also the closing out details of CAR 2. It was concluded that the financial barrier was not the strongest barrier faced by the project, as the sponsor had access to financing of 80% of the costs of the plant. The project proponents decided to discuss the barrier of the “Prevailing Business Practice”. The information about the financial barriers was excluded of the PDD. NIR 8 was closed out.

To close out CAR 2, The PDD was revised (see version 2). The “Tool”, used in the version 1, was replaced by the Attachment A to Appendix B. In accordance with Attachment A of Appendix B of the Simplified M&P for the Small-Scale CDM Project Activities, a barrier analysis could be carried out in order to demonstrate project additionally. It is required an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers: Investment barrier, Technological barrier, Barrier due to prevailing practice and Other barriers. The PDD discussed the barrier due the “Prevailing practice”.

The references mentioned to support the discussion were included in the PDD. Barrier due to “Prevailing Practice” - where prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions - was used by project developer to discuss the additionality. The discussion was based on the small participation of small hydro plants in Brazilian power market (less than 2% of the total generation in Brazil) and on the trends of the Brazilian power generation sector.

Specifically in the Paraná State, where the plant is installed, small hydro plants represent 1.07% of the total installed capacity. To confirm this data, it was checked the information available during the validation on ANEEL website (Energy National Agency/BIG – *Banco de Informação sobre geração* (Brazilian data base of power generation), <http://www.aneel.gov.br/aplicacoes/capacidadebrasil/GeracaoTipoFase.asp?tipo=5&fase=3>). To complement this information, it was verified the list of SHP in operation in Paraná State to identify the plants which have the same classification of Cristalino (classified as PIE – Independent Power Producer) are in the same scale (1 to 15 MW of installed capacity). It was verified that there are 28 plants installed (with capacity under the limit of 15MW). Among them, only 2 (excluding Cristalino and also excluding other CDM projects), are classified as Independent Power Producer. The other plants are classified as Public Service or Producers for

Auto-supplying. The two plants are SHP Vitorino (5.3MW), which is implemented in 2002 aiming to supply the internal demand of Anhambí Agroindustrial and only exporting to grid the exceeded electricity (information obtained in the website of the company group) and SHP Nova Jaguariaíva (1.22MW), originally installed in 1950 and retrofitted in 2004. Considering these characteristics (main objective, destination of electricity generated and date of construction), these two plants also are distinguished from Cristalino project, and did not face the same barriers or shared the same context.

It was also verified from ANEEL data that there are three power plants been constructed in the Paraná State, which will add 30,530 MW to the grid. These three plants are all thermal plants (using wood biomass or natural gas).

From this discussion, it was demonstrated that the small hydroelectric power plants are not a business-as-usual scenario (the information provided in the revised PDD was confirmed at Aneel website: <http://www.aneel.gov.br/area.cfm?idArea=15&idPerfil=2>). It was confirmed that is common practice in Brazil the power generation from large hydroelectric plants and thermal fossil fuel plants. CAR 2 was closed out, as the project provided an explanation to show that the project activity would not have occurred due to at least one of the barriers required for the small scale project activities.

The registration of the proposed project activity will help Cristalino SHP to improve its economic performance and it was an incentive for its implementation. It also may have a strong impact in prepare for and facilitate the implementation of similar projects in Brazil.

The “Glossary of CDM terms” defines the start date of a CDM project activity as: “the earliest date at which either the implementation or construction or real action of a project activity begins”. The start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity, as the date on which contracts have been signed for equipment or construction/operation services required for the project activity. The start date of Cristalino was 02/07/2004, when the agreement for purchase of the main equipment was signed.

As the project start date (02/07/2004) was before the date of validation, it was required evidence in the PDD that CDM was seriously considered in the decision to proceed with the project activity

The timeline of the project activity was verified from documented evidences, as described below:

Event	Date
Internal meeting of partners: Prior CDM consideration	25/05/2002 (Ref 15)
Internal meeting of partners: CDM was also mentioned, including trying to contact consultants for development of a CDM project.	31/03/2003 (Ref.15)
Legal permits: Previous Installation License	02/02/2004 (Ref.09a)
Basic project approval - ANEEL license, nº 226. Document publicly available on ANEEL's website: http://www.aneel.gov.br/cedoc/dsp2004226.pdf	22/03/2004 (Ref. 17)
CDM project commercial proposal received from Lumina Energia (consultant): the company sent a commercial proposal for remuneration purposes for the Cristalino CDM project development	13/05/2004 (Ref. 24)
Project Start date: Agreement for purchase of the main equipments	02/07/2004 (Ref.25)
Internal meeting of partners: There was said that inputs from sale of carbon credits could accelerate the construction of the plant, as the construction start was already delayed. Discussion about consultant proposals.	20/07/2004 (Ref.26)

Loan Approval by BRDE for construction of the project (80% of the investment)	18/11/2004 (Ref.18)
Revised CDM project proposal by advisory Lumina Energia: Lumina Energia sent a revised commercial proposal in which the services for the Cristalino CDM project development would be compensated by assigning a percentage of 30% of all CERs issued for remuneration purposes.	07/03/2005 (Ref.19)
Internal meeting of partners: the subject of this meeting was basically Clean Development Mechanism and Carbon Credits.	28/04/2005 (Ref.27)
Commercial proposal from Carbo Trader	25/01/2006 (Ref.28)
Start contact of the company with MGM: e-mail to MGM International containing initial information about Cristalino SHPP and informed that the client would like to discuss about the project development; MGM International received project information to evaluate Cristalino SHPP as a CDM project.	24/02/2006 (Ref. 29) and 15/03/2006 (Ref.20)
PDD draft starting development (by an external consultant).	10/04/2006 (Ref.21)
Internal meeting of partners: presented to the shareholders the technical proposals for the development of the CDM project. Partners concluded that the most attractive proposal was sent by MGM International.	27/05/2006 (Ref.30)
MGM Services Contract signature: Cristalino and MGM International signed the agreement for the development of Cristalino CDM project.	30/05/2006 (Ref.31)
PDD draft received from external consultant	06/10/2006 (Ref.22)
Preparation for the local stakeholder consultation process	21/11/2006 (Ref.23)
Proposal from SGS to MGM for the SHP projects (including Cristalino)	22/11/2006
Global stakeholder consultation (UNFCCCwebsite): the first consultation, when PDD was prepared using methodology version 10. Available on http://cdm.unfccc.int/Projects/Validation/DB/YZI57AA9CU3PCRD7ZQTKVIK2IAPJXN/view.htm	18/04/2007,

The minutes of the Meeting of the Partners of Cristalino Energia Ltda (Meeting Notes, 25/05/2002 and 31/03/2003) mentioned the knowledge, based in a newspaper report, that Small Hydro Power Plant projects using clean, renewable energy (possibly the same case for the Cristalino SHPP project) are eligible to the Kyoto Protocol's Clean Development Mechanism (CDM). According to the views of all Cristalino Energia Ltda partners, carbon credits would be very useful at the beginning of the construction since equity is required in order to obtain the financial resources from the bank that shall cover 80% of the full project costs (as documented in the meeting notes).

The project chronology was provided, supported by documented evidences, which are attached to this report. From these evidences, the events and dates were confirmed, which demonstrated the efforts of PP aiming to develop the CDM project activity. The chronology covered the period comprised from the first consideration of CDM, the starting date and the start of the global stakeholder consultation.

From the information and documents available to the validation team, it is supported that CDM was seriously considered in the decision to proceed with the project activity.

3.3 Application of Baseline methodology and calculation of emission factors

The methodology applied to this Small Scale Project Activity is Type 1: Renewable energy projects.

Category, D: Grid connected renewable electricity generation, version12.

Baseline calculations are done according to Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

Cristalino Small hydroelectric power plant uses the renewable hydro potential of the Barra Preta River to generate electricity with 4.0 MW of total installed capacity (under the eligibility limit of 15 MW for small scale projects). This activity confirms with category I.D Renewable electricity generation for a grid, that comprises renewable energy generation units that supply electricity to an electricity distribution system that is or would have been supplied by at least one fossil fuel or non-renewable biomass fired generation unit.

It was verified on site that the project is not a debundled component of a larger activity. The project is located in the Barra Preta River and is an independent hydro power plant generating electricity and supplying to the grid, unrelated to any other CDM project activity in the region. In addition, the UNFCCC website was verified and does not show another registered project with the same characteristics in the same place.

As described in the PDD, the baseline calculations were performed following the Appendix B of the simplified modalities and procedures for small-scale CDM project activities. The baseline emissions should be calculated as the amount of electricity (kWh) produced by the renewable generating unit multiplied by an emission coefficient calculated in a transparent and conservative manner.

During the desk study it was not possible to verify the baseline information provided in the Annex 3 of PDD. The complete spreadsheets with data and formulas used for calculation of the EF grid were not available for the validation team. NIR 7 was raised

To clarify NIR 7, the spreadsheet with data and formulas for EF calculation was provided to the validation team (ref. 4). The data and formula for calculation of the EF were checked and it was possible to confirm the information provided in the PDD. The calculation of the baseline Emission Factors was performed as required by the methodology ACM0002 (version 6) as a combined margin (CM) emission factor, consisting of the combination of operating margin (OM) and build margin (BM) emission factors. The parameters were calculated *ex-ante* based on the most recent information available at the time of PDD submission (data from 2003 to 2005). Details about the data used for calculation of OM and BM emission factors were presented in the PDD and its annexes. NIR 7 was closed out.

The grid emission factor calculated from OM and BM emission factors above mentioned and applied for baseline emission reductions estimative was 0.2611 tCO₂e/MWh. It is considered fixed along the first crediting period. It was verified that the estimative of Baseline Emissions, Project Emissions and Emissions Reductions was calculated applying the correct emission factor and the formulas required by the methodology (revised PDD).

3.4 Application of Monitoring methodology and Monitoring Plan

According to Type I, Category D of small-scale project activity categories contained in Appendix B of the Simplified M&P for CDM Small-Scale Project Activity, monitoring shall consist of metering the electricity generated by the renewable technology.

During the desk study, it was verified that the description of the Monitoring Plan (section B.7.2 of PDD, version 1) was not complete. The organizational chart indicates the management/operational structure, but no information about responsibilities and activities was provided. NIR 3 was raised. Detailed information related to the monitoring plan (procedures, calibration certificates among others) was not available during the site visit to clarify NIR 3. CAR 9 was raised.

It is also informed in the Annex 4 that a spreadsheet model was developed for the project (an electronic worksheet will be complete on a monthly basis and will automatically provide annual totals in terms of GHG reductions achieved by the project). This spreadsheet was not available to the validation team during the desk study and site visit. NIR 5 was raised.

To close out CAR 9, additional information and evidences related to the monitoring plan was provided to the validation team. The work instruction OP 004466, Vol 1, 21/02/2005 was verified. It was identified that the responsible for the project is manager of the Cristalino project. Copies of the calibration certificates of the meters installed were provided: EXAUT (Energia e Automação), issued on 09/06/2005 referring to the SAGA 1000 meters serial numbers 504455 and 504456 (Ref.3). It was informed that the meters will be calibrated each 3 years.

It was verified that the monitoring system covers the total electricity generated by the plant. There are records for gross generation, self consumption and for exported electricity. During the audit, the local assessor visited the sub-station Manoel Ribas (a COPEL sub-station) located 14.5 km from the plant (see also information about the sub-station in Ref.05). The local assessor confirmed that the meters (principal and back-up) are installed on this site. There is also an internal system operating in the plant which meters the gross generation. There are monthly reports informing about gross generation, consumption by auxiliary systems and the net electricity exported (Ref.16).

The revised PDD (version 2) included additional information under the description of the monitoring plan (section B.7.2). The procedures that will be prepared before the starting of the crediting period were identified and listed in the PDD (version 2). The spreadsheet presented in the Annex 4 of the PDD was prepared and sent to the validation team (ref. 11). It was not in use yet, as there is not monitoring data. NIR 5 and CAR 9 were closed out and the Observation (1) was raised. Observation 1: procedures required to implement the monitoring plan shall be completely prepared and in place before the starting date of the crediting period.

Considering that the Observation (1) will be addressed adequately before the starting of the crediting period, the monitoring plan described in the final PDD is in line with the monitoring methodology mentioned in category I.D. The data monitored in combination with an emission factor will be used for calculation the achieved emission reductions.

3.5 Project design

The Cristalino project consists in the installation of a small hydroelectric power plant. 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.

The project uses state of the art technology applied to this kind of plant. The facility contains a small dam, which corresponds to the natural water body of the Barra Preta River, which stores water in order to generate electricity for short periods of time. It was designed to function designed as run of river scheme.

The project boundary encompasses the physical, geographical site of the hydropower generation source, which is represented by the Barra Preta River basin close to the power plant facility and the interconnected grid. The generation system described in the PDD is according to the equipments verified on site by the local assessor. It was presented the document issued by ANEEL (Ref. 5), which informed the installed capacity of 4.0 MW.

The operational lifetime assumed is 25 years. This exceeds the renewable crediting period of 7 years. The starting date of the first crediting period will be 1st March 2008.

In some pages of the PDD, the project was referenced as "FAXSHP project", which is not the correct name. CAR 1 was raised. To close out CAR 1 the PDD was revised (see version 2, ref. 1) and the name of the project was corrected (it was changes for CristalSHP). CAR 1 was closed out.

The other information presented in the final PDD (location, specification and installed capacity of the SHP, total amount of electricity generated and sources of external data and references regarding baseline scenario and additionality) was accurate and reliable, as confirmed by the validation team.

The project design engineering reflects current good practices and is not likely to be substituted by other or more efficient technologies within the project period. Small hydro is considered to be one of the most cost effective power plants in Brazil.

3.6 Environmental Impacts

The project with a power capacity of 4.0 MW, is a low impact plant whose dam, designed to function as run of river, will flood 880m² under regular operation conditions. Run-of-river schemes do not include significant water storage, and must therefore make complete use of the water flow. Considering this characteristics, it was not expected to have significant adverse environmental impacts from this kind of project.

No references or source of information was provided for the following statement in section D.2: *"The environmental impacts associated with the project activity are modest because the regional topography allows the dam to be naturally contained in a valley. Furthermore, this valley has a low demographic and land use rate"*. It was not clear if this information is from an environmental evaluation or other document mentioned in the section D.1. NIR 4 was raised.

To close out NIR 4, the environmental licenses were provided, as indicated below:

- Installation license, N° 2892, issued by Instituto Ambiental do Paraná – IAP, valid until 31st May 2007 (ref.09).
- Operation license, N° 7536, issued by Instituto Ambiental do Paraná – IAP, valid until 30th May 2008 (ref.10).

It was also verified the Environmental Control Plan, issued on 4th February, 2003 – Instituto Ambiental do Paraná – IAP (Environmental Agency). See ref.8.

Regarding to the information about "environmental impacts..." the sponsor had not evidence about this affirmation so it was excluded of the revised PDD (version 2).

The current licenses issued by the State Environmental Agency were considered evidences that the project has been implemented in compliance with the legal requirements related to environmental impacts. NIR 4 was closed out.

3.7 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. It was not possible to check during the desk study if the stakeholder consultation process was carried out in accordance with the DNA requirements. The PDD did not provide a list of the stakeholders consulted, detailing the names of the organizations and agencies contacted. NIR 6 was raised. During the site visit, it was verified the complete list of names of the local stakeholders consulted. The letters sent to local stakeholders were verified. The complete list of stakeholders was included in the revised PDD (version 2). NIR 6 was closed out.

It was confirmed that the letters were sent in December, 2006. The following stakeholders were invited to comment on the project:

- Municipality of Manuel Ribas - PR
- City Council of Manuel Ribas - PR
- Municipal Environmental Agency of Manuel Ribas – PR (Secretária da Agricultura e Meio Ambiente)
- State Environmental Agency – PR (Instituto Ambiental do Paraná)
- Brazilian Forum of NGOs and Social Movements for Environmental and Development
- Community association and workers union (Associação Comercial e Industrial de Manoel Ribas and Sindicatos dos Trabalhadores Rurais de Manoel Ribas)
- State Attorney of the Manuel Ribas - PR

The comments received during the consultation process were supportive to the project. It was not required change in the project activity or specific response. This explanation about comments received from local stakeholders was included in the PDD, section E.2.

4 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.

4.1 Description of how and when the PDD was made publicly available

The PDD and the monitoring plan for this project were made available on the SGS website <http://cdm.unfccc.int/Projects/Validation/DB/GUONB2CARY0RPFOE73GYABKM0XQ6B/view.html> and were open for comments from 13 December 2007 to 11 January 2008. Comments were invited through the UNFCCC CDM homepage.

4.2 Compilation of all comments received

No comment was received to the DOE during the 30 days commenting period.

4.3 Explanation of how comments have been taken into account

No comment was received.

5 Validation opinion

Actions have been taken to close out nine findings. .

SGS has performed a validation of project: Cristalino Small Hydroelectric Power plant. The validation was performed on the basis of the UNFCCC criteria and host country criteria, as well as criteria given to provide consistent project operations, monitoring and reporting.

Using a risk based approach, the validation of the project design documentation and the subsequent follow-up interviews have provided SGS with sufficient evidence to determine the fulfilment of the stated criteria.

By the displacement of fossil fuels by renewable energy sources in the generation of electricity, the project results in reducing greenhouse gas emissions that are real, measurable and give long-term benefits to the mitigation of climate change. A review of the barriers presented demonstrates that the proposed project activity was 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. If the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

The validation is based on the information made available to SGS and the engagement conditions detailed in the report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence SGS can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

6 List of persons interviewed

Date	Name	Position	Short description of subject discussed
24 and 25 May, 2007	João Franco	Consultant - MGM	Technical issues, findings, monitoring plan, baseline, licenses.
24 and 25 May, 2007	Victor Pulz	Consultant – MGM	Technical issues, findings, licenses.
24 and 25 May, 2007	Walter	Cristalino Energia Ltda	Licenses, stakeholder consultation process, findings, operational issues, monitoring plan.

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 Design Document, Cristalino Small Hydroelectric Power Plant, Version 1 (02/02/2007), Version 2 (24/07/2007), Version 3 (30/10/2007), Version 4 (06/12/2007), Version 5 (16/09/2008).
- /2/ AMS-I.D: - Grid connected renewable electricity generation (Simplified baseline and monitoring methodologies for selected small scale CDM project activity - Type I – Renewable Energy Projects/ I.D. Grid connected renewable electricity generation), Version 12.

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):

- /3/ Calibration Certificate of the electricity meter (monitoring plan)
- /4/ BR-Grid EF SSECO-2003 to 2005-2006.08.28 (Emission factor calculation data)
- /5/ ANEEL license N° 651
- /6/ Information about the reservoir area
- /7/ ANEEL license N° 981
- /8/ PCA – Environmental control plan of the project
- /9/ (a) Previous Installation license, issued by IAP on 02/02/2004; (b) Installation license, issued by IAP on 31/05/2005.
- /10/ Operation license
- /11/ Spreadsheet MGM (monitoring plan)
- /12/ ANEEL License N° 113
- /13/ Spreadsheet for CERs calculation
- /14/ Financing information
- /15/ Cristalino Energia Meeting notes (25 May 2002 and 31/03/2003)
- /16/ Energy generation records (sample of monthly reports)
- /17/ ANEEL license, n° 226, 22/03/2004 (Basic project approval)
- /18/ Loan Approval by BRDE – 18/11/2004
- /19/ CDM project proposed by advisory (revised proposal by Lumina Engenharia e Consultoria Ltda) – 07/03/2005
- /20/ Start contact with MGM – 15/03/2006
- /21/ PDD draft started by advisor (10/04/2006)
- /22/ PDD received from advisor – 06/10/2006
- /23/ Summary received from advisor for local stakeholders consultation (13/11/2006)
- /24/ CDM project proposed by advisory (initial proposal by Lumina Engenharia e Consultoria Ltda) – 13/05/2004
- /25/ Agreement for purchase of the equipments (02/07/2004)

- /26/ Minute of the Meeting of the partners (20/07/2004).
- /27/ Minute of the Meeting of the partners (28/04/2005).
- /28/ Commercial proposal from Carbo Trader (25/01/2006)
- /29/ Initial contact with MGM consultant (24/02/2006)
- /30/ Minute of the Meeting of the partners (27/05/2006)
- /31/ MGM Services Contract signature (30/05/2006)

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8 Annex 1 - Local assessment checklist

This checklist is designed to provide confirmation of in-country data and information provided in the Project Design Document. It serves as a “reality check” on the project. It is to be 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 (4 MW); check the equipment installed on-site and the ANEEL document.	Confirmed the installed capacity. It was presented the ANEEL license, N° 651, issued on 26 th November 2002 (ref. 5).	Site visit/DR	No
Confirm the locality (Barra Preta river, coordinates etc). Check if the project is not a debundled project. Inform details of evidences verified on-site.	It was presented the ANEEL license, N° 651 (ref.5) that confirms the localities. The project is localized in the Barra Preta river, Manuel Ribas municipality – Paraná. Coordinates: 24 34'19"S e 51 33'31" W Cristalino SHP is not debundled project.	Site visit/DR/I	No
Confirm if the plant is run-off-river and if the flood area is 880 m². (check the environmental license and studies, check maps or topographic maps of the dam).	Confirmed the flood area of the 880m² in the Environmental document “ <i>Memorial Técnico Descritivo – reservatório</i> ” (ref. 6)	Site visit/DR	No
Give evidences of who is the responsible part of the project. For example, confirm if the company's name is shown in ANEEL licenses or environmental licenses.	Verified that Cristalino Enegia Ltda is responsible of the project. Evidences were confirmed on site visit (ref. 5 and 9).	Site visit/DR/I	No
Confirm what data was used for estimate the energy produced annually (is applied some capacity factor?). How many MWh the plant will generate/year?	The data used for estimate the energy was obtained from ANEEL license, N° 981, issued on 9 th August 2005: permission to starting operation of the plant (ref. 7). Capacity factor: 0,70% (The license ANEEL N° 113-03-2003 (ref. 12) defines 2.83 MW as the ensured energy. Capacity factor= 2.83 : 4 = 0.70.	Site visit/DR	No

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Check which evidences confirm the project license issued by ANEEL.	ANEEL license, N° 226, issued on 22 th March 2004.	Site visit/DR	No
All the financial investment was done with own capital? Any financing? Please confirm.	No. 80% of the project was financed by a bank (Banco Regional de Desenvolvimento do Extremo - BRDE). Total cost of the project: R\$ 7.795.764,92 Total financed: R\$ 5.050.000,00 Ref. 14	Site visit/DR/I	See also NIR 8
Confirm by document review, interviews and on-site observations if the monitoring plan is implemented (responsibilities, procedures and work instructions, archiving time, calibration and maintenance of the meters:.. Please provide detailed evidences (if possible, copies of calibration certificates, copies of procedures or work instructions etc).	It was verified on-site that there is no monitoring plan implemented yet. There is no implemented procedures to (backup, calibration, internal auditing). It was informed that the monitoring plan will be implemented before crediting period.	Site visit/DR/I	See NIR 3 and CAR 9
Is there an operation authorization issued by ANEEL? Please check and provided details. Ask copy of this authorization.	Yes. Authorization by ANEEL, N° 981, issued on 9 th August 2005 (ref.7).	Site visit/DR	No
Verify the environmental licensing process. Check the environmental studies (if there is a PCA, a RAP and a PRAD or other study and plan required by IAP). Check the current operation license and the conditions defined by the environmental agency. Ask copies of the current license and record the details of all relevant documents verified on-site.	Verified on site the Environmental Control Plan, issued on 4 th February, 2003 – Instituto Ambiental do Paraná – IAP (Environmental Agency). See ref.8. The following documents related to compliance with legal requirements were provided: - Installation license, N° 2892 – Instituto Ambiental do Paraná – IAP, valid 31st May 2007 (ref.9). - Operation License, N° 7536 – Instituto Ambiental do Paraná – IAP, valid until 30th May 2008 (ref.10).	Site visit/DR	No
Verify if this conclusion presented in the PDD (section D.2) is from an environmental study: “The environmental impacts associated with the project activity are modest	There is no document that clarifies this affirmation.	Site visit/DR/I	See NIR 4

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
because the regional topography allows the dam to be naturally contained in a valley. Furthermore, this valley has a low demographic and land use rate". If no, who mentioned this conclusion about the impacts evaluation? It could be confirmed on-site?			
Check the calculation of OM, BM and the emission factor of the grid (formulas and data used for the calculation). Ask for the complete spreadsheets with data used for the calculation and for reaching the value of EF=0.2611 tCO ₂ e/MWh. Ask copy of this spreadsheet.	The spreadsheets with the calculation were verified on site. The emission factor was confirmed by the local assessor. Copy of the spreadsheet with data used for EF grid calculation was provided. See reference ref.4.	DR/I	No
Verify and record <u>the names</u> of each stakeholder invited to comment on the project. It is possible to confirm the invitation by ARs? Are they covering the DNA requirements? Ask copies of ARs.	Confirmed the letters sent in December, 2006. <ul style="list-style-type: none"> ▪ Municipal Government of the Manuel Ribas - PR ▪ City Councils of the Manuel Ribas - PR ▪ Municipal Environmental Agency of the Manuel Ribas – PR (Secretária da Agricultura e Meio Ambiente) ▪ State Environmental Agency – PR (Instituto Ambiental do Paraná) ▪ Brazilian Forum of NGOs and Social Movements for Environmental and Development ▪ Community associations (Associação Comercial e Industrial de Manoel Ribas and Sindicatos dos Trabalhadores Rurais de Manoel Ribas) ▪ State Attorney of the Manuel Ribas - PR 	Site visit/DR	No
Confirm the letter and material sent to the stakeholders (language, media etc).	All letters sent to the stakeholders were confirmed.	Site visit/DR	No

Issue	Findings	Source /Means of Verification	Further action / clarification / information required?
Check the responses and comments received from the stakeholders.	Two comments were received (from FBOMS and the Municipal Chamber). No changes in the project or specific response were required.	Site visit/DR	No
Annex 4 "Monitoring plan": check the spreadsheet mentioned in the PDD for data input and results. Ask copy of the spreadsheet.	See NIR 5: The spreadsheet was presented (ref.11), however, it is not implemented. The monitoring plan will be implemented before the crediting period (see CAR 09).	Site visit/DR	No

9 Annex 2 – Validation Protocol

This validation protocol is designed to ensure that the project meets the requirements for CDM projects that are detailed in paragraph 37 of the CDM modalities and procedures. Each requirement is covered in a separate table. The following requirements are discussed in this protocol:

Requirement	Description	
Participation requirements	The participation requirements as set out in Decision 17/CP.7 need to be satisfied	Covered in table 1
Baseline and monitoring methodology	The baseline and monitoring methodology complies with the requirements pertaining to a methodology previously approved by the Executive Board	Baseline methodology is covered in table 9 Monitoring methodology is covered in table 9
Additionality	The project activity is expected to result in a reduction in anthropogenic emissions by sources of greenhouse gases that are additional to any that would occur in the absence of the proposed project activity	Covered in table 9
Monitoring plan	Provisions for monitoring, verification and reporting are in accordance with relevant decisions of the COP/MOP	Covered in table 9
Environmental impacts	Project participants have submitted to the designated operational entity documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts and, if those impacts are considered significant by the project participants or the host Party, have undertaken an environmental impact assessment in accordance with procedures as required by the host Party;	Covered in table 9
Comments by local stakeholders	Comments by local stakeholders have been invited, a summary of the comments received has been provided, and a report to the designated operational entity on how due account was taken of any comments has been received;	Covered in Table 7
Other requirements	The project activity conforms to all other requirements for CDM project activities in relevant decisions by the COP/MOP and the Executive Board.	Covered in Table 8

Small scale projects and AR projects have specific requirements which are covered in Table 9-11. Small scale SSC projects have special requirements which might deviate from the requirements of other CDM projects. These requirements are tested in table 9. Please note that some questions in table 9 overlap with questions in the other tables. Where the questions in table 9 contradict or overlap questions elsewhere in the checklist, the questions in table 9 shall prevail. For the validation of small scale projects, assessor is required to address the questions in table 9 first before starting with the questions in the other tables.

Further remarks on the use of this document:

- text in *italic blue* is meant as guidance for the assessor
- MoV = Means of Verification, DR= Document Review, I= Interview

This protocol should be adapted as required. For example, if the project is not a small scale project or an AR project, some tables can be deleted.

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

REQUIREMENT	MoV	Ref	Comment	Draft finding	Concl
1.1 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.	DR	PDD	No letter of approval from Annex I country, United Kingdom was provided to the validator. CAR 10 was closed out	CAR 10	ok
1.2 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	DR	PDD	No Letter of approval by host country (Brazil) has been submitted to the validator. The LoA will be sent after the Brazilian DNA analyse and approve the project. The Letter of approval from Brazilian DNA was issued on 29 January 2008.	Send the validation report to DNA.	Ok
1.3 All Parties (listed in Section A3 of the PDD) have ratified the Kyoto protocol and are allowed to participate in CDM projects	PDD	UNFCCC Web site	Yes. Brazil ratified the protocol on 23 August 2002. UK ratified the Kyoto Protocol on 31 st May 2002.	Ok	Ok
1.4 The project results in reductions of GHG emissions or increases in sequestration when compared to the baseline; and the project can be reasonably shown to be different from the baseline scenario	PDD	DR	The project activity reduces 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.	Ok	Ok
1.5 Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days (45 days for AR projects), and the project design document and comments have been made publicly available	DR	PDD UNFCCC webs ite	Yes, PDD was publicly available from 13 December to 11 January 2008. http://cdm.unfccc.int/Projects/Validation/DB/GUONB2CARY0RPFOE73GYABKMQ0XQ6B/view.html It was the second global stakeholder consultation. No comments were received.	Ok	Ok
1.6 The project has correctly completed a Project Design Document, using the current version and exactly following the guidance	DR	PDD	Yes; it was used the current version of the PDD.	Ok	Ok
1.7 The project shall not make use of Official Development Assistance (ODA), nor result in	DR	PDD	The project does not made use of ODA.	Ok	Ok

[illegible]

REQUIREMENT	MoV	Ref	Comment	Draft finding	Concl
			with data and formulas used for calculation of the EF grid were not available for the validation team during the desk study. To clarify NIR 7, the data were verified on-site by the local assessor. In addition, the spreadsheet with formulas and data was provided to the validation team. It was confirmed that the EF calculation used the data available from official sources (ONS) and followed the methods defined by ACM0002. The EF used for baseline emissions estimative (EF=0.2611 tCO ₂ e/MWh) was confirmed. <u>NIR 7 was closed out.</u>		

Table 2 - Baseline methodology(ies) (Ref: PDD Section B and E and Annex 3 and AM) – N/A

Table 3 - Additionality (Ref: PDD Section B3 and AM) – N/A

Table 4 - Monitoring methodology (PDD Section D and AM) – N/A

Table 5 - Monitoring plan (PDD Annex 4)- N/A

Table 6 - Environmental Impacts (Ref PDD Section F and relevant local legislation) – N/A

Table 7 - Comments by local stakeholders (Ref PDD Section G) – N/A

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
7.1 Have relevant stakeholders been consulted?	PDD/ Letters	DR Site visit	Yes. It was confirmed on site by document review. See also NIR 6.	Ok	Ok
7.2 Have appropriate media been used to invite comments by local stakeholders?	PDD/ Letters	DR	Yes, verified the letters sent in local language to local stakeholders.	Ok	Ok
7.3 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?	PDD/ Letters	DR	<u>NIR 6</u> : It was not possible to check during the desk study if the stakeholder consultation process was carried out in accordance with the DNA requirements. The PDD did not provide a list of the stakeholders consulted, detailing the names of the organizations and agencies contacted. <u>NIR 6 closing out details:</u>	NIR 6	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			During the site visit, it was verified the complete list of names of the local stakeholders consulted. The letters sent to local stakeholders were verified and the receipts of the mailing were available. The complete list of stakeholders was included in the revised PDD (version 2). <u>NIR 6 was closed out.</u>		
7.4 Is a summary of the stakeholder comments received provided?	PDD	DR	During the site visit, it was presented one comment from the Municipal Chamber of Manuel Ribas.	Ok	Ok
7.5 Has due account been taken of any stakeholder comments received?	PDD	DR	The presented comments were positive, emphasizing the project will contribute to the local sustainable development. It was included in the section E.2 of revised PDD.	Ok	Ok

Table 8 Other requirements

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
8.1 Project Design Document					
8.1.1 Editorial issues: does the project correctly apply the PDD template and has the document been completed without modifying/adding headings or logo, format or font.	PDD	DR	Yes, it was correctly applied.	Ok	Ok
8.1.2 Substantive issues: does the PDD address all the specific requirements under each header. If requirements are not applicable / not relevant, this must be stated and justified	PDD	DR	Yes, it was correctly applied.	Ok	Ok
8.2 Technology to be employed					
8.2.1 Does the project design engineering reflect current good practices?	PDD	DR/I Site Visit	Yes.	Ok	Ok
8.2.2 Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly	PDD	DR/I Site Visit	It is the technology applied for small hydroelectric plants (run-of-river power plant).	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
used technologies in the host country?					
8.2.3 Is the project technology likely to be substituted by other or more efficient technologies within the project period?	PDD	DR/I	It was not expected.	Ok	Ok
8.2.4 Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	PDD	DR/I	No. The power generation is the core business of the Cristalino and the required abilities are part of the routine of the plant.	Ok	Ok
8.3 Duration of the Project/ Crediting Period					
8.3.1 Are the project's starting date and operational lifetime clearly defined and reasonable?	PDD	DR	Starting date: 02/07/2004 (ref. 17). Lifetime: 25 years.	Ok	Ok
8.3.2 Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	PDD	DR	Yes, renewable period of 7 years.	Ok	Ok
8.3.3 Does the project's operational lifetime exceed the crediting period	PDD	DR	Yes. The operational lifetime is 25 years.	Ok	Ok

Table 9 Additional requirements for SSC projects

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
SSC projects use the SSC PDD and simplified baseline and monitoring methodologies as detailed in Appendix B (to the Modalities and Procedures for Small scale CDM projects, Annex II to Decision 21/CP.8) Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories					
9.1 Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	PDD	DR	Yes, renewable energy generation for a grid with installed capacity of 4.0 MW (lower than 15 MW - the limit for small scale projects).	Ok	Ok
9.2 The project conforms to one of the categories listed in Appendix B to Annex II to Decision 21/CP8	PDD	DR	Yes, ID – Grid connected renewable electricity generation.	Ok	Ok
9.3 The small scale project activity is not a debundled component of a larger project activity?	PDD	DR/I	Verified during site visit and checking the information available at UNFCCC website. The project activity is not debundled of a larger activity, there is no other project registered in the same place.	Ok	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
9.4 PDD has been prepared in accordance with appendix A of Annex II to Decision 21/CP8	PDD	DR	Yes, the current version is correctly applied.	Ok	Ok
9.5 The project uses a simplified baseline and monitoring methodology specified in Appendix B. If not, they may propose changes to the meths or a new SSC project category	PDD	DR	The project applied AMS type I, renewable energy projects. Category I.D – grid connected renewable electricity generation, version 12.	Ok	Ok
9.6 Is there any bundling of SSC activities into one PDD? If so, does the monitoring plan consider sampling of activities? Refer to para 19 of Annex II. Also, note bundling provisions in SSC Briefing Note and SSC meths I C / I D and III D and Para 22e of Appendix B	PDD	DR	No.	Ok	Ok
9.7 Is EIA required by host party? If not, none is required irrespective of SHC. If yes, has one been performed consistent with local requirements?	PDD	DR	<p><u>NIR 4:</u> No references or source of information was provided for the following statement in section D.2: <i>“The environmental impacts associated with the project activity are modest because the regional topography allows the dam to be naturally contained in a valley. Furthermore, this valley has a low demographic and land use rate”.</i> Is this from an environmental evaluation or other document mentioned in the section D.1 (as the Environmental Basic Project (<i>Proyecto Básico Ambiental</i>, PBA) or Preliminary Environmental Assessment?)</p> <p><u>NIR 4 closing out details:</u> The environmental licenses (ref. 9 and 10) and the Environmental Control Plan (ref. 8) were verified during the site visit and are in compliance with the applicable requirements. Regarding to the information about “environmental impacts...” the sponsor had not documented evidence about this affirmation so it was excluded of the revised PDD (version 2). <u>NIR 4 was</u></p>	NIR 4	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<u>closed out.</u>		
<p>9.8 The project results in emission reductions that are additional in accordance with the following requirements:</p> <p>(para 26) The project is additional if emissions are reduced below those in the absence of the project</p> <p>(Para 27) Simplified baseline can be used; if not, baseline proposed shall cover all gases, sectors and sources listed in Annex A to the KP</p> <p>Para 28) One or more barriers as detailed in attachment A to Appendix B to Annex II will be used to demonstrate that the project would not proceed without the CDM</p>	PDD	DR	<p><u>CAR 2:</u> From the discussion provided in the PDD, it was not possible to conclude if the project is additional under the CDM rules. The project did not apply the Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM projects activities and decided to use the “Tool for the demonstration and assessment of additionality”. The discussion of additionality was not clear and was not supported by objective evidences and information. The step 3 “Barrier analysis” was not clear; there was a lot of descriptive information and the discussion was not linked objectively to the Cristalino hydroelectric project. It was not clearly demonstrated that the identified barriers are prohibitive to the project but not for the alternatives. The discussion of “Prevailing Business Practice” under the Step 3 is confused. The complete sources of information used to support the Step 4 were not provided in the PDD (it is only mentioned “Agência Nacional de Energia Elétrica (ANEEL)”, but it was not provided the complete source or the names and dates of the documents consulted).</p> <p>The conclusion in the page 21 is similar to the old “Step 5” of the version 2 of the “Tool” and included confused information, not supported by the barriers analysis provided in the PDD (as the conclusion: “An increase of approximately 100 to 200 basis points (???), derived from CERs,</p>	<p>CAR 2</p> <p>NIR 8</p>	Ok

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>would be an important factor in determination to start such project"...).</p> <p><u>To close out CAR 2:</u> The PDD was revised (see version 2). The "Tool", used in the version 1, was replaced by the Attachment A to Appendix B. The references mentioned to support the discussion were included in the PDD. Barrier due to Prevailing Practice was used by project developer to discuss the additionality. The discussion was based on the small participation of small hydro plants in Brazilian power market. From this discussion, it was demonstrated that the small hydroelectric power plants are not a business-as-usual scenario (the information provided in the revised PDD, version 2, was confirmed at Aneel website). <u>CAR 2 was closed out.</u></p> <p><u>NIR 8:</u> During the site visit it was verified that the project was financed (80% of the total investments) by the Banco Regional de Desenvolvimento do Extremo - BRDE. This information was not transparent in the PDD version 1, nothing was mentioned about this financing in the discussion of the financial barriers. Considering this fact, it should be justify why the project faced the lack of local long-term financing.</p> <p>The discussion of additionality was revised (PDD version 2), see also closing out details of CAR 2. It was concluded that the</p>		

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			financial barrier was not the strongest barrier faced by the project, as the sponsor had access to financing of 80% of the costs of the plant. The project proponents decided to discuss the barrier of the "Prevailing Business Practice". The information about the financial barriers was excluded of the PDD. <u>NIR 8 was closed out.</u>		
9.9 Leakage is calculated according to the provisions of the SSC methodologies in Appendix B (http://cdm.unfccc.int/Projects/pac/ssclistmeth.pdf)	PDD	DR	Leakage is not applicable.	Ok	Ok
9.10 The project boundary shall be constructed in accordance with the requirements of the SSC meths in Appendix B	PDD	DR	The boundary of project activities encompasses the Cristalino plant and the South-Southeast-Midwest national system.	Ok	Ok
9.11 The Monitoring plan shall be consistent with the requirements of the SSC methodology in Appendix B and shall provide for the collection and archiving of data needed to determine project emissions, baseline emissions and leakage.	PDD	DR	<p><u>NIR 3</u>: The description of the Monitoring Plan (section B.7.2, page 29 of PDD) was not complete. The organizational chart indicates the management/operational structure, but no information about responsibilities and activities to be performed by the personnel was provided.</p> <p>It was verified on-site that there is no procedure for monitoring implemented. <u>CAR 09 was raised.</u></p> <p>CAR 09 closing out details: The work instruction OP 004466, Vol 1, 21/02/2005 was verified.</p> <p>It was identified that the responsible for the project is manager of the Cristalino project. Copies of the calibration certificates of the meters installed were provided: EXAUT (Energia e Automação), issued on 09/06/2005 referring to the SAGA 1000 meters serial numbers 504455 and</p>	NIR 3 CAR 9	Ok Obs. 1

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			504456 (Ref.3) It was informed that the meters will be calibrated each 3 years. The revised PDD (version 2) included additional information regarding the monitoring plan. <u>CAR 09 was closed out</u> and the Observation (1) was raised: <u>Observation 1</u> : procedures required to implement the monitoring plan shall be completely prepared and in place before the starting date of the crediting period.		
9.12 The monitoring plan shall present good monitoring practice appropriate to the circumstances of the project activity (para 33)	PDD	DR	See NIR 3 and CAR 9	NIR 3 CAR 9	Ok Obs.1
9.13 If project activities are bundled, separate monitoring plan shall be prepared for each of the activities or an overall plan reflecting good monitoring practice will be prepared, consistent with the above requirements	PDD	DR	The project is not bundled.	Ok	Ok

Table 10 - Additional requirements for AR projects

Table 11 - Additional requirements for SSC AR projects

Table 12 - Additional information to be verified by local assessors / site visit (see Annex 1 – Local checklist)

ANNEX 3 - FINDINGS OVERVIEW

Each Table below represents a finding from the validation assessment. The findings are numbered consecutively, approximately in the order that they have been identified.

Description of table:

Type Findings are either New Information Requests (NIR) or Corrective Action Requests (CAR). CARs are items that must be addressed before a project can receive a recommendation for registration. NIRs may lead to the raising of CARs. Observations are included at the end and may or may not be addressed. They are primarily to act as signposts for the verifying DOE.

Issue Details the content of the finding

Ref refers to the item number in the Validation Protocol

Response Please insert response to finding, starting with the date of entry.

Rows for comments and further response will be appended to the table until the Findings has been addressed to the satisfaction of the Lead Assessor.

Please note that this is an open list and more findings may be added as validation progresses.

Date: 23/05/2007

Raised by: Aurea Nardelli

No.	Type	Issue	Ref
1	CAR	In some pages of the PDD, the project is referenced as "FAXSHP project", which is not the correct name.	1.11

Date: 25/06/2007

[Comments]: In the new version (02) these mistakes were corrected.

Date: 27/07/2007 – Aurea Nardelli

[Acceptance and close out]: The revised PDD was addressed the mistake. CAR 1 was closed. out.

Date: 23/05/2007

Raised by: Aurea Nardelli

No.	Type	Issue	Ref
2	CAR	<p>From the discussion provided in the PDD, it was not possible to conclude if the project is additional under the CDM rules. The project did not apply the Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM projects activities and decided to use the "Tool for the demonstration and assessment of additionality".</p> <p>The discussion of additionality was not clear and was not supported by objective evidences and information. The step 3 "Barrier analysis" was not clear; there was a lot of descriptive information and the discussion was not linked objectively to the Cristalino hydroelectric project. It was not clearly demonstrated that the identified barriers are prohibitive to the project but not for the alternatives.</p> <p>The discussion of "Prevailing Business Practice" under the Step 3 is confused. The complete sources of information used to support the Step 4 were not provided in the PDD (it is only mentioned "Agência Nacional de Energia Elétrica (ANEEL)", but it was not provided the complete source or the names and dates of the documents consulted).</p> <p>The conclusion in the page 21 is similar to the old "Step 5" of the version 2 of the "Tool" and included confused information, not supported by the barriers analysis provided in the PDD (as the conclusion: <i>"An increase of approximately 100 to 200 basis points (???) , derived from CERs, would be an important factor in determination to start such project"...</i>).</p>	9.8

Date: 25/06/2007

[Comments]: The project is now applying the Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities. The explanation regarding the Brazilian electricity market in the last years and the presented barriers, such as

- Investment Barrier (Long-term funding)
- Institutional Barrier
- Prevailing Business Practice. Aneel's complete data source was provided: (Capacidade Geração Brasil)

clearly demonstrates that CristalSHP is not a business-as-usual scenario in a country where large hydro and thermal fossil fuel projects are preferable. With the financial benefit derived from the CERs, it is anticipated that the project developer would benefit from this new source of revenues and would then decide to develop such project. The paragraph: "An increase of approximately 100 to 200 ..." it was excluded of the current version of the PDD.

Date: 27/07/2007 – Aurea Nardelli

[Acceptance and close out]: The PDD was revised (see version 2). The "Tool", used in the version 1, was replaced by the Attachment A to Appendix B. The references mentioned to support the discussion were included in the PDD. Barrier due to Prevailing Practice was used by project developer to discuss the additionality. The discussion was based on the small participation of small hydro plants in Brazilian power market. From this discussion, it was demonstrated that the small hydroelectric power plants are not a business-as-usual scenario (the information provided in the revised PDD, version 2, was confirmed at Aneel website). CAR 2 was closed out.

Date: 23/05/2007

Raised by: Aurea Nardelli

No.	Type	Issue	Ref
3	NIR	The description of the Monitoring Plan (section B.7.2, page 29 of PDD) was not complete. The organizational chart indicates the management/operational structure, but no information about responsibilities and activities to be performed by the personnel was provided.	9.11/9.12

Date: 25/05/2007

[Comments]: The PDD will be updated, including more detailed information regarding the monitoring activities and the equipment system.

Date: 28/05/2007 – Aurea Nardelli

[Acceptance and close out]: Detailed information (procedures, calibration certificates) was not available during the site visit. CAR 09 was raised.

Date: 23/05/2007

Raised by: Aurea Nardelli

No.	Type	Issue	Ref
4	NIR	No references or source of information was provided for the following statement in section D.2: <i>"The environmental impacts associated with the project activity are modest because the regional topography allows the dam to be naturally contained in a valley. Furthermore, this valley has a low demographic and land use rate"</i> . Is this from an environmental evaluation or other document mentioned in the section D.1 (as the Environmental Basic Project (<i>Projeto Básico Ambiental</i> , PBA) or Preliminary Environmental Assessment?)	9.7

Date: 25/06/2007

[Comments]: The environmental impact information stated above was informed by the sponsor, and it was verified during on-site visiting.

Date: 27/07/2007 – Aurea Nardelli

[Acceptance and close out]: The environmental licenses and the Environmental Control Plan were verified during the site visit and are in compliance with the applicable requirements. Regarding to the information about "environmental impacts..." the sponsor had not documented evidence about this affirmation so it was excluded of the revised PDD (version 2). NIR 4 was closed out.

Date: 23/05/2007

Raised by: Aurea Nardelli

No.	Type	Issue	Ref
5	NIR	The PDD did not clearly reflect all the information presented during the validation assessment. It is informed in the Annex 4 that a spreadsheet model was developed for the project (an electronic worksheet will be complete on a monthly basis and will automatically provide annual totals in terms of GHG reductions achieved by the project). This spreadsheet was not available to the validation team during the desk study.	1.10/9.12

<p>Date: 25/06/2007 [Comments]: The requested spreadsheet is being sent to SGS.</p>			
<p>Date: 27/07/2007 – Aurea Nardelli [Acceptance and close out]: The spreadsheet was prepared and sent to the validation team (ref. 11 of the validation report). It was not in use yet, as there is not monitoring data. NIR 5 was closed out.</p>			
Date: 23/05/2007		Raised by: Aurea Nardelli	
No.	Type	Issue	Ref
6	NIR	It was not possible to check during the desk study if the stakeholder consultation process was carried out in accordance with the DNA requirements. The PDD did not provide a list of the stakeholders consulted, detailing the names of the organizations and agencies contacted.	7.3
<p>Date: 25/06/2007 [Comments]: The invited entities were included in the PDD</p>			
<p>Date: 27/07/2007 – Aurea Nardelli [Acceptance and close out]: The complete list of local stakeholders invited was checked during the site visit. Documented evidences of the mailing were presented and it was possible to confirm that the stakeholder consultation was performed as required by Brazilian DNA requisites. The version 2 of PDD included the list with the names of the organizations. NIR 6 was closed out.</p>			
Date: 23/05/2007		Raised by: Aurea Nardelli	
No.	Type	Issue	Ref
7	NIR	It was not possible to verify the baseline information provided in the Annex 3 of PDD. The complete spreadsheets with data and formulas used for calculation of the EF grid were not available for the validation team during the desk study.	1.11
<p>Date: 25/06/2007 [Comments]: The requested spreadsheets were sent to SGS, on 04 may 2007. These worksheets are being sent to SGS.</p>			
<p>Date: 27/07/2007 – Aurea Nardelli [Acceptance and close out]: The data were verified on-site by the local assessor. In addition, the spreadsheet with formulas and data was provided to the validation team. It was confirmed that the EF calculation used the data available from official sources (ONS) and followed the methods defined by ACM0002. The EF used for baseline emissions estimative (EF=0.2611 tCO₂e) was confirmed. NIR 7 was closed out.</p>			
Date: 28/05/2007		Raised by: Aurea Nardelli	
No.	Type	Issue	Ref
8	NIR	During the site visit it was verified that the project was financed (80% of the total investments) by the Banco Regional de Desenvolvimento do Extremo - BRDE. This information was not transparent in the PDD, nothing was mentioned about this financing in the discussion of the barriers. Considering this fact, please justify why the project faced the lack of local long-term financing.	9.8
<p>Date: 25/06/2007 [Comments]: The sponsor informed that the project has been 80% of the total investment financed. For obtaining this financing, the PPs were obligated to offer any other guarantee, such as landed properties. Moreover, if the project had not obtained any financing, the difficulties to obtain long term funding as explained, would have lead to consider that there is a barrier. Therefore, the PPs would have to invest their own capital (if available).</p>			
<p>Date: 27/07/2007 – Aurea Nardelli [Acceptance and close out]: The discussion of additionality was revised (PDD version 2), see also closing out details of CAR 2. It was concluded that the financial barrier was not the strongest barrier faced by the project, as the sponsor had access to financing of 80% of the costs of the plant. The project proponents decided to discuss the barrier of the "Prevailing Business Practice". The information about the financial barriers was excluded of the PDD. NIR 8 was closed out.</p>			

Date: 28/05/2007 Raised by: Aurea Nardelli			
No.	Type	Issue	Ref
9	CAR	During the site visit it was verified that the procedures required for the implementation of good monitoring practices were not prepared. There is no mention in the PDD about procedures for data collection, maintenance and/or calibration of meters and for archiving of data related to the CDM project.	9.11/9.12
Date: 25/06/2007 [Comments]: The PDD was updated, and it included more detailed information regarding the monitoring activities and the equipment system. Some issues were clarified during the site visit.			
Date: 27/07/2007 – Aurea Nardelli [Acceptance and close out]: The work instruction OP 004466, Vol 1, 21/02/2005 was verified. It was identified that the responsible for the project is manager of the Cristalino project. Copies of the calibration certificates of the meters installed were provided: EXAUT (Energia e Automação), issued on 09/06/2005 referring to the SAGA 1000 meters serial numbers 504455 and 504456 (Ref.3 of the validation report). It was informed that the meters will be calibrated each 3 years. The revised PDD (version 2) included additional information regarding the monitoring plan. CAR 09 was closed out and the Observation (1) was raised.			
Date: 26/07/2007 Raised by: Geisa Principe/Aurea Nardelli			
No.	Type	Issue	Ref
10	CAR	No letter of approval from Annex I country, United Kingdom, was provided to the validator.	1.1
Date: 29/07/2007 [Comments]: The letter of approval is being provided, and it will be presented at the time of requesting registration.			
Date: 19/03/2008 The Letter of Approval from UK DNA was issued on 5 March 2008. [Acceptance and close out]: CAR 10 was closed out.			

Observation 1: Procedures required to implement the monitoring plan shall be completely prepared and in place before the starting date of the crediting period.

Statement of Competence

Name: Aurea Nardelli

SGS Affiliate: 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: Marco van der Linden Date: 16-03-2007

Statement of Competence

Name: Geisa Principe

SGS Affiliate: SGS Brazil

Status

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

Validation

Verification

- | | | |
|------------------|-------------------------------------|-------------------------------------|
| - Local Assessor | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| - Lead Assessor | <input type="checkbox"/> | <input type="checkbox"/> |
| - Assessor | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

/ Trainee Lead Assessor

Scopes of Expertise

- | | |
|---|-------------------------------------|
| 1. Energy Industries (renewable / non-renewable) | <input checked="" type="checkbox"/> |
| 2. Energy Distribution | <input type="checkbox"/> |
| 3. Energy Demand | <input type="checkbox"/> |
| 4. Manufacturing | <input type="checkbox"/> |
| 16. Chemical Industry | <input type="checkbox"/> |
| 17. Construction | <input type="checkbox"/> |
| 18. Transport | <input type="checkbox"/> |
| 19. Mining/Mineral Production | <input type="checkbox"/> |
| 20. Metal Production | <input type="checkbox"/> |
| 21. Fugitive Emissions from Fuels (solid, oil and gas) | <input type="checkbox"/> |
| 22. Fugitive Emissions from Production and
Consumption of Halocarbons and Sulphur Hexafluoride | <input type="checkbox"/> |
| 23. Solvent Use | <input type="checkbox"/> |
| 24. Waste Handling and Disposal | <input type="checkbox"/> |
| 25. Afforestation and Reforestation | <input type="checkbox"/> |
| 26. Agriculture | <input type="checkbox"/> |

Approved Member of Staff by Siddharth Yadav Date: 22/08/2007