
VALIDATION REPORT

Lumbrás Energética S.A

Ecoinvest Carbon Brasil Ltda.

**Angelina Small hydro Power Plant
Project – A Brascan Energética S/A
Project Activity**

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Summary:			
<p>Lumbrás Energética S.A and Ecoinvest Carbon Brasil Ltda has commissioned SGS to perform the validation of the project: Angelina Small Hydro Power Plant Project – A Brascan Energética S/A Project Activity</p> <p>Methodology used: ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources.</p> <p>Version: version 7, EB36</p> <p>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.</p> <p>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.</p> <p>The report and the annexed validation describes a total of 7 (seven) findings which include:</p> <ul style="list-style-type: none"> • 2 Corrective Action Requests; • 5 New Information Requests; and 2 observations <p>All findings were closed out satisfactorily. SGS's opinion to the CDM project activity recommends to the Executive Board for a request for registration. 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. 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.</p> <p>The Letter of approval from the Brazilian DNA was issued on January 27th, 2008.</p> <p>The only amendment made to this validation report compared to the report referred in the Brazilian LoA is related to information provided regarding the Letter of Approval received.</p>			
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CDM Validation			
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Abbreviations

ACM	Approved Consolidated Methodology
ANEEL	Agencia Nacional de Energia Elétrica (Brazilian Agency of Power Electricity).
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emissions Reduction
MP	Monitoring Plan
NIR	New Information Request
PDD	Project Design Document
PPA	Power Purchase Agreement
PP	Project Participants
ROA	Return on Assets
SHPP	Small Hydro Power Plant
SGS	Société Générale de Surveillance
UNFCCC	United Nation Framework Convention on Climate Change

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1. Validation Opinion

SGS United Kingdom Ltd has been contracted by Lumbrás Energética S.A and Ecoinvest Carbon Brasil Ltda to perform a validation of the project: Angelina Small Hydro Power Plant Project – A Brascan Energética S/A Project Activity 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 small hydro power plant to provide renewable electricity to the South-Southeast-Midwest 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 285,648 t of CO₂e over 7 years of crediting period, averaging **40,807** tCO₂e 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: 6th February 2009

2. Introduction

2.1 Objective

Lumbrás Energética S.A has commissioned SGS to perform the validation of the project: Angelina Small Hydro Power Plant Project – A Brascan Energética S/A Project Activity 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 Angelina Small Hydro Power Plant – A Brascan Energética S/A Project Activity, performed on the basis of UNFCCC criteria. The validation has been performed as a desk review of the project documents presented by Lumbrás Energética S.A and Ecoinvest Carbon Brasil Ltda and a site visit carried out on 7th January 2008, where the details of the project activity were verified on-site. During the site visit, Lumbrás's manager and Ecoinvest consultant were interviewed.

The project activity consists of the installation of a small hydroelectric plant with an installed capacity of 26.27MW and a small reservoir of 0.4km², located on the Garcia River, in the municipalities of Angelina and Major Gercino, Santa Catarina State, Brazil.

The project has the objective to provide renewable electricity from Angelina SHPP 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 fossil fuel that would be burned in thermal power.

Total amount of emission reductions estimated for the first seven years crediting period is 285,648 tCO₂e.

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 South-Southeast-Midwest 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: decreasing the dependence on fossil fuels, thus improving air quality; increasing employment opportunities in the area where the project is located; promotion of better revenue distribution since it contributes to the regional/local economic development and encouraging other similar companies that want to replicate this experience.

The construction and operation of the plant have followed the legal requirements regarding environmental protection and control. During the site visit, documented evidences regarding the environmental assessments were verified, including the Environmental Report. The environmental and social impacts were identified before the installation of the project and measures have been taken to minimize these impacts.

2.4 The Names and Roles of the Validation Team Members

Name	Role	Affiliate
Fabian Gonçalves	Lead Assessor	SGS Brazil
Geisa Principe	Lead Assessor (Trainee)	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 7th January, 2008 in the Brascan office. The project developers were interviewed by Lead Assessor trainee.

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:

- 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 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.

4.2 Project Design

The first objective of the project activity is to help Brazil to meet its raising demand for energy and to improve the supply of electricity contributing to the environmental, social and economic sustainability of the country. The project activity will reduce GHG emissions by substituting fossil fuel generated electricity by renewable energy sources.

The project design engineering reflects good practices. The project will apply the “Francis turbine”. The technology employed is probably the most know option among water turbines for power generation. The project activity will be implemented in two phases:

- The first phase (25MW of installed capacity) will become operational in the first half of 2009.
- The second phase (1.27MW of installed capacity) will start its operational on August, 2009.

The Angelina SHPP is under construction. The equipments are not installed; however, all documents related to technical description were verified by document review (Ref.7).

The crediting period to the project activity is of 7 years. The period is expected to start on 1st July 2009. The operational lifetime of 35 years excesses the crediting period.

The description of the emissions sources and gases related to project boundary is correctly described in PDD. The spatial extent comprises Angelina SHPP and all power plat connected to the Brazilian grid S-SE-CO. The reservoir is also included in the boundary. No project emission was identified.

The project uses the correct PDD template (version 3). No changes in the document were occurred. The specific requirements were addressed under each header of the template.

The follow issue was raised, regarding the table for the indication of projected emission reduction:

CAR 1: The table for indication of projected emission reduction was not correctly applied. The indicated starting period was May 2009, which does not comply with the starting date of the crediting period informed in section C of the PDD.

The project participants revised the PDD to include tables 2 and 8 (Ref.10) and item C.2.1.1 in accordance with starting date of the crediting period (01/07/2009). **CAR 1 was closed out.**

4.3 Eligibility as a Small Scale Project

Not applicable.

4.4 Baseline Selection and Additionality

The methodology applied to the project activity is “ACM0002 – Approved Consolidated baseline and monitoring methodology, version 7 (EB36).”

For calculation of the Emission Factor of the grid, it was applied the “Tool to calculate, scope the emission factor for an electricity system (EB35)”.

For the discussion of additionality, it was used the “Tool for demonstration and assessment of additionality, version 5” and the guidance for the investment analysis

The latest approved versions used were confirmed through UNFCCC website: <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>

The methodology is applicable to the grid- connected renewable power generation project activities such as Angelina SHPP. The project activity meets all criteria of applicability: a small hydropower with a new reservoir with a power density greater than 4W/m².

The project activity is applicable under the following conditions:

- The project activity entails the installations of one small hydro power with 26.27MW of installed capacity (Ref.5);
- The project activity has a new reservoir of 0.4Km², with power density of 65.67W/m².

In order to evidence that the CDM was seriously considered for the project implementation, the following timeline was verified:

- Investment decision: 17th December 2007: EPC (Engineering, Procurement and Construction contract) signing for the construction of the plant (start date of the project activity);
- Start date of Global stakeholder consultation: 16th February 2008;
- Commissioning starting date (predicted): 10th May, 2009;
- Commercial operations starting (predicted): 25th June 2009.

It was provided documented evidence that Brascan seek for the carbon credits to develop its projects. This was evidenced through the letter sent to BNDES dated of 05/09/2007. Follow the transcription of the Letter (Ref.8):

Considering the governmental appeal (to meet the electric energy demand increase of the country), Lumbrás Energética S.A. obtained authorization to explore the hydroelectric potential in the condition of independent producer, aiming the commercialization of the electric energy produced. As the project refers to a Small Hydroelectric Power Plant, it will help the diversification of the Brazilian grid, besides reducing the greenhouse gas effects, becoming a Clean Development Mechanism (CDM) project, responsible for the emission of CERs (Certified Emission Reductions) likely to the commercialization in the carbon credit market.,

Considering that the investment decision was on 17th December 2007, the date in which EPC contract was signed, the project activity considered the CDM before its implementation. The knowledge of CDM consideration can be also demonstrated in Brascan Energética S.A. experience with other five registered CDM projects.

Regarding the baseline scenario and alternatives for the project activity, one clarification was requested during the validation process:

NIR 2: The discussion of the identification of the most likely baseline scenario was found to be unclear. Section B.4 of the PDD presents the alternatives for the project (i.e. other investments areas of interest to the group). The information and evidence why the group decided to invest in power market (built the SHP Angelina) and not to invest in other areas should be provided.

For clarification of the NIR 2, about baseline scenario, the PP provided information about current (previous) situation of large hydropower and thermal generation in Brazil. The most plausible baseline scenario of the project activity is the continuation of the current scenario by large hydropower that represents 75% of

Brazilian's generation and 21% by thermal powers (<http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.asp>). The data sources and justifications for the baseline scenario discussed in the revised PDD are satisfactory.

To support the discussion of the alternatives for the project activity, the Group Company provided, in Ref.12, the internal benchmark company of 16% in 2007. Ref. 2 is a presentation from Brascan Energética ("BESA") which owns and operates all of Brookfield Asset Management's generation power assets in Brazil that defines the minimum return of 16% for small hydro power plants.

It was confirmed that the company Group would invest in other market such as the financial market. The Group has the internal ROA (risk profile of the investment) of 16%, which is greater than the IRR of 14.1% per year calculated for the project (unleveled pre-tax – Ref. 9).

It was justified the alternatives for the project activity presented in the PDD. The Group would be investing in other areas as financial market, and not in the power market. The clarification provided by the client is acceptable. **NIR 2 was closed out.**

The PDD considered the baseline scenario and demonstrated additionality using the "Tool for the demonstration and assessment of additionality (version 5.2)". The following credible scenarios were presented:

- Continuation of electricity supplied by large hydropower plant with reservoirs and/or thermal power plant;
- The project activity implemented without been registered as CDM.

During desk study, the following issue was raised about step 1a of the "Tool":

CAR 3: During the desk study, it was verified that the "Tool" was used to demonstrate additionality. Step 1a: Other realistic and credible alternative to the proposed project activity was not considered according to the Tool.

Project participant provided information about "the mission and goal" of the Brascan company. Among others things, the main mission is the generation of power energy for small hydropower (Brascan website). Through Brascan website it was verified that company have as characteristic in its business, the development, production and implementation of power energy focused in small hydroelectric.

According to the Tool, the alternatives to the project activity presented by PDD are acceptable.

It was confirmed through Brascan website, that alternative (b) of the Tool requests "other realistic and credible scenarios". However, this alternative is not applicable to the project activity because the project owner has its business focussed on development, construction, implementation and operation of the small hydroelectric, as Angelina SHPP. The explanation was accepted and **CAR 3 was closed out.**

Among other possible discussed scenarios, the selected baseline for the project activity is: In the absence of the project activity the electricity should be generated by large hydro power and thermal generation to the grid. The small hydro power plant Angelina will avoid GHG emissions from the Brazilian grid S-SE-CO.

Considering the steps required by the "Tool for demonstration and assessment of additionality", the PDD discussed the additionality using the investment analysis (STEP2) and barriers analysis (STEP3).

Regarding the investment analysis (STEP2), **NIR 5 was raised:** Evidences and source of the data used to calculate the IRR shall be provided. Shall be described in which documents the information can be confirmed. The company presented an internal rate of return called ROA (return on assets) of 16% but evidence that support this value was not provided.

The financial indicator IRR (internal rate of return) was calculated using the spreadsheet "Angelina cash flow" (Ref. 9). The cash flow shows that Angelina project activity was planned with an expected IRR of 14.1% (after tax) per year. The company internal benchmark is the ROA (return assets). ROA is a measure used in all business (investments, strategy, principles, prospects etc) made by the company in 2007.

To close out NIR 5, evidences and sources used for calculation of IRR were provided and discussed with the client during the site visit. As the analysis was performed before the construction date, all sources were estimated.

The “Angelina cashflow” presented the following sources:

- Total Investment: R\$ 133.961 Million (including interest tax + local tax). (Ref. 9 -const.cost.)
- Investment with interest: R\$ 123.703 (Ref. 8)
- Interests rate: 9.50%
- PPA: R\$ 136,54
- ROA of 16% (Ref. 12 – page 34).

The calculations, data and their sources were validated. The financial analyses verified on-site are in compliance with information presented in the PDD.

From the benchmark analysis, it was demonstrated that the IRR (14.1%) of the project activity was lower than the company internal benchmark (16%). Also, the IRR of Salto project is lower than Brascan's WACC 15.63%. The financial spreadsheet presented was prepared by Brascan at the time of decision to implement the project activity. The period of 22 years was adopted for the analysis as a practice in Brascan Company. It was confirmed on-site that other projects developed by the company adopted the same period of 22 years.

The sensitivity analysis (Ref. 9) was performed according to the guidance for investment analysis; it was considered increasing in the project revenues and reduction in running costs. The investment was not considered in the sensitivity analysis because this is not a parameter expected to change, once the investment is defined in contract.

The sensitivity analyses were performed changing each of these parameters by 10% and assessing what would be the impact on the IRR. It was confirmed that the project IRR remained lower than benchmark even in the case where these parameters change in favour of the project activity. The maximum IRR calculated in the sensitivity analysis was 15.2%, still lower than the benchmark.

The financial analysis were verified and all assumption used were confirmed. It was possible to redo the calculation presented and the results were considered correct. The conclusion is that the Internal Rate of Return of SHP Angelina is not attractive without carbon credit revenues.

Regarding the common practice, further detail was required during the desk study. As required by the step 4 of the additionality tool, similar project activities should be described and the differences between each of these activities and the project should be clearly indicated. **NIR 6 was raised.**

To clarify the NIR, the project participants provided official information (ANEEL Agency) about similar and different project activities that are occurring in the region and the number of small hydro power plants in operation since 2005.

In the reference 12 (Official information from ANEEL) and ANEEL website (www.aneel.gov.br), it was verified that there are 43 SHPPs that started operation since 2005 (14 received incentives from PROINFA and 18 from CDM).

Further information about similar and differences project activities that are occurring in the region was provided. The revised PDD included the results of a research about small hydro power plants that have started operation in 2005.

The discussion of the research is based on the participation of small hydro plants (maximum of installed capacity of 30MW, resolution ANEEL 652, 9/12/03) in the Brazilian Energy Market. From 41 SHPPs, 12 received incentives from PROINFA, and 16 from CDM and 2 SHPP received incentives from both programmes (a total of 30 projects which make up 73% of the SHPPs). With regards to installed potency, these 30 projects make up 90.6% of the total 520.18MW of energy produced by SHPPs.

In Santa Catarina state, where the project activity is located, there are 8 SHPPs that started operations in 2007. From these SHPPs, 3 received incentives from PROINFA and 1 from CDM. In terms of installed capacity, 37.34% (81.96MW) are installed in Santa Catarina. Of this, 79.9% receive some kind of incentive. The other 4 plants located in the same state has installed capacity lower than Angelina (3.2MW, 5.55MW, 5.55MW and 2.16MW) and due this difference, can not be compared with project activity.

The validation assessment concludes that the construction of SHPPs is not a common practice and incentives like PROINFA or CDM is necessary. **NIR 6 was closed out.**

Regarding the starting date of the project activity, additional information and references were requested during the validation. NIR 4 was raised.

To clarify NIR 4, the document "EPC contract between Lumbrás Energética and Engevix Engenharia SA, dated on 17/12/2007, was provided to SGS. This document is evidence that the starting date of the project activity is 17/12/2007. This document represents the real action to start the project activity, the contract for the construction and purchase of equipments for SHPP Angelina. NIR 4 was closed out.

The project activity is considered additional due to the financial analysis presented, and conclusion that it is not financially attractive and can not be considered a 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".

The baseline emissions are calculated using the following equation:

$$BEy = EGy * EF_{grid,CM,y}$$

Where,

EG = Net electricity supplied to the grid

EF_{grid} = CO2 Emission factor of the grid

The net electricity is the electricity exported minus the electricity consumed in the auxiliary systems. All sources of data and calculations are correctly described in Ref.10. The capacity factor (63%) was considered in the calculation of the electricity to be generated, verified in the "Technical report Jul-Sep 2007

EF_{grid} was calculated *ex-ante*, following the steps and formulas defined by ACM0002 and will be fixed for the first crediting period. According to the selected methodology ACM0002 the baseline emission factor (EFy) is achieved by calculating the "operating margin" (OM) and "build margin" (BM) as well as the "combined margin" (CM). The simple adjusted operating margin emission factor was selected to calculate the EF OM.

Following the baseline emission factor EF, as the weighted average of the operating margin factor and the build margin factor:

$$EF_{grid} = wOM.EFOM + wBM.EFBM$$

Where the weights wOM and wBM, by default, are 50% (i.e., wOM = wBM = 0.5).

With these numbers:

$$EF_{grid} = 0.5 \times 0.4749 + 0.5 \times 0.0903 = 0.2826 \text{ tCO}_2/\text{MWh}$$

Then, the value calculated for EF_{grid} and used for baseline calculation is 0.2826 tCO₂/MWh

For project activities with new reservoir, the project emissions shall be calculated considering the Power Density (installed capacity/area of the reservoir). If the power density is greater than 10W/m², the **PE =0**.

For SHPP Angelina, the power density was calculated as below:

$$\text{Power Density} = 26.27\text{MW}/0.4\text{Km}^2 = 65.67\text{MW}/\text{km}^2 \text{ or } 65.67\text{W}/\text{m}^2$$

As the power density is greater than 10W/m², no Project Emissions should be considered.

The reservoir area was confirmed through document "DESPACHO N° 3.470, DE 23 DE NOVEMBRO DE 2007" (Ref.5) issued by ANEEL.

Regarding the ER calculations:

As described in the PDD and required by ACM0002, $ER = BE - PE - LE$

$BE = E_{G,y} \times EF$

$PE = 0$

$LE = 0$

So, $ER = BE = E_{G,y} \times EF$

The calculation and related data are presented in the PDD and in the spreadsheet (Ref.10).

4.6 Application of Monitoring Methodology and Monitoring Plan

As required the ACM0002 (version 7) and Methodological Tool, 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 main data to be monitored for determining the emissions reductions is the net electricity generated by the plant. The emissions a reduction is reached by applying an emission factor through the net electricity.

The project activity is not in operation yet, but the monitoring plan will follow the procedures as established in the section B.7.2 of the PDD. It was verified that other operational small hydro plants from the same group (Brascan) have specific procedures and defined responsibilities. It was informed by PP that the same kind of procedures will be implemented in Angelina SHPP.

4.7 Choice of the Crediting Period

NIR 4 was raised requesting evidence and an explanation for the starting date of the project activity.

To close out NIR4, the document "EPC contract between Lumbrás Energética and Engevix Engenharia SA, 17/12/2007, was provided to SGS. This document is evidence that the starting date of the project activity is 17/12/2007. This document represents the real action to start the project activity, the contract for the construction and equipments of SHP Angelina. NIR 4 was closed out.

The crediting period of the project activity is of 7 years. The period will start on 01/07/2009.

4.8 Environmental Impacts

The project has applicable environmental licenses required by the state environmental agency.

Verified the Installation license n° 023/07, issued by the state environmental agency (FATMA – Fundação do Meio Ambiente) on September, 5th 2007 (Ref.11a and b).

It is not expected any adverse environmental effects.

4.9 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, it was provided documented evidences indicating that consultation was carried out in November 2007. Copies of the letters sent to the stakeholders and receipts of mailing were available. Local stakeholders were invited for comments and the PDD could be requested through email: info@ecoinvestcarbon.com. The following stakeholders were invited by letters to comment on the project:

- Angelina and Major Gercino City Hall

- Municipal Assembly of Angelina and Major Gercino
- Environmental Agency of Angelina and Major Gercino
- Communitarian Association of Angelina Residents and
- Communitarian Association of Major Gercino Residents
- Santa Catarina Environmental Agency – FATMA
- State Attorney for the Public Interest of the State of Santa Catarina
- Brazilian Forum of NGOs and Social Movements for the Development and Environment

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/T9YA6Y9O0FJFXCMRWBLA4CP9VX8IH/view.html> and was open for comments from 16-02-2008 until 16-03-2008. Comments were invited through the UNFCCC CDM homepage.

5.2 Compilation of all Comments Received

Comment Number	Date Received	Submitter	Comment
0			

5.3 Explanation of How Comments Have Been Taken into Account

No comments received.

6. List of Persons Interviewed

Date	Name	Position	Short Description of Subject Discussed
07/01/2008	Karen Nagai	Consultant Ecoinvest	Validation process and findings. Technical issues, operational issues, investment analysis, MONITORING plan, baseline emission factor.
	Julien Dominic Publio Dias	Manager – Brascan (represents Lumbrás)	Financial issues related to the project, Environmental and quality management system; environmental impacts, Technical issues, plant operation.

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 - Angelina Small Hydro Power Plant Project – A Brascan Energética S/A Project Activity version 1, 19/10/2007 (available for global stakeholder consultation);
version 2, 27/11/2007;
version 3, 12/02/2008;
version 4, 02/04/2008;
version 5, 07/10/2008.
Version 6, 24/11/2008.
- /2/ Consolidated baseline methodology for grid-connected electricity generation from renewable sources – ACM 0002, version 7 – EB36.
- /3a/ Tool for the demonstration and assessment of additionality, version 5.2.
- /3b/ Tool to calculate the emission factor for an electricity system, version1 – EB35.

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/ Social contract
- /5/ ANEEL license, n°3470
- /6/ Schedule of implementation (Angelina SHP)
- /7/ Engevix-Angelina_Basic project
- /8/ CDM Consideration (English and Portuguese)
- /9/ Angelina_CashFlow
- /10/ Angelina_CERs_2008 04 02
- /11a/ LAI n° 023-07 (05-09-2007)
- /11b/ LAI n° 023-07 (03-09-2007)
- /12/ Corporate Profile BESA_Ext Ingles_21062007 v2
- /13/ Common practice - number of SHPPs
- /14/ Internal procedure
- /15/ P.O. calibration procedure
- /16/ Emission factor calculation
- /17/ Letters (invite) – Local Stakeholders
- /18/ ARs – Local Stakeholders
- /19/ EPC contract between Lumbrás Energética and Engevix Engenharia SA, 17/12/2007.

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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 Angelina Small Hydro Power Plant project – A Brascan Energética S/A Project Activity.

It serves as a “**reality check**” on the project that is completed by a local assessor from SGS Brazil.

Issue	Findings	Source/Mean of Verification	Further Action / Clarification / Information Required?
What is the capacity factor? How was this value obtained? Please provide evidences.	<p>The capacity factor is 63%. Engevix Angelina basic project was presented during site visit as evidence of the capacity factor (Ref. 7 page 37).</p> <p>Capacity factor = ensured energy (MW average) 16.64 / installed capacity (MW) 26.27 = 63%</p>	Engevix Angelina -basic project, 101/US-10-RL-0001-0A/ site visit	Ok
Confirm if Lumbrás Energética S.A is owner of Angelina SHPP.	It was confirmed through a Social Contract that Brascan Energética S.A owns 89.7% of the Angelina project and that Lumbrás Energética S.A owns 10.3%. Ref.4	Site visit/DR	Ok
Please, provide evidence that proves that CDM was considered to project activity before the start of the project.	<p>During the validation assessment the document from Brascan Energética S.A, evidencing the CDM Consideration to project activity was provided.</p> <p>The document is a letter from Brascan to BNDES (bank) requesting the financial investment to Angelina SHP.</p> <p>The document is attached as reference 8 (Portuguese and English).</p>	Site visit/ DR/I	Ok

Issue	Findings	Source/Mean of Verification	Further Action / Clarification / Information Required?
Verify licence from ANEEL (national energy agency) and its installed capacity.	<p>The following licenses were verified during the validation assessment:</p> <p>ANEEL License, N°3470, 23 November 2007 – Angelina basic project approval (Ref 5).</p> <p>ANEEL License description:</p> <ul style="list-style-type: none"> • Installed capacity of 26.27MW • Reservoir area of 0.40km² 	ANEEL License, n° 3470/site visit	Ok

Issue	Findings	Source/Mean of Verification	Further Action / Clarification / Information Required?
Verify that the project conforms with the PDD.	<p>The project activity is located in Angelina and Major Gercino municipalities (27°28'S and 48°50'). The location description of the PDD corresponds to ANEEL license, N° 3470 (Ref.5).</p> <p>The Angelina SHP is under construction.</p> <p>The project activity will be implemented in two phases. The first phase will become operational in the first half of 2009 (Ref.6). The second phase will become operational in August, 2009.</p> <p>In the first phase, 2 turbo-generators, with a total installed capacity of 25MW, will be implemented (Ref. 7 page 9) and in the second phase, 1 turbo-generator of 1.27MW will be implemented (Ref.7 page 11).</p> <p>The following technical descriptions were confirmed through "Engevix – Angelina Basic project":</p> <p>First phase (Ref. 7 page 14 and 15) 2 turbines: Francis; 12.89MW; 514.3rpm. 2 generators: synchronic; 13,900KVA; 13.80KV; 514.3 rpm.</p> <p>Second phase (Ref. 7 page 15 and 16 – technical information under studying, however, the installed capacity will not be modified). turbine: Francis; 1,309kW; 720rpm generator: synchronic; 1,412kVA; 3.30kV; 720rpm.</p> <p>Technical information regarding the energy metering will be available during the verification assessment. See FAR 1.</p>	<p>ANEEL license, n° 3470/site visit</p> <p>Schedule/site visit/I</p> <p>Engevix Angelina -basic project, 101/US-10-RL-0001-0A/ site visit</p>	<p>FAR 1</p> <p>23/68</p>



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	Brasil is listed as a non-Annex-I Party, has ratified the protocol on 23 rd August 2003 and is allowed to participate in CDM projects. 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	No Annexure-I party is involved at this stage	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). The Letter of approval from the Brazilian DNA was issued on January 27 th , 2008.	Ok
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: 16 Feb 2008 – 16 March 2008 http://cdm.unfccc.int/Projects/Validation/D/B/T9YA6Y9O0FJFXCMMRWBLA4CP9VX8IH/view.html No comments were received.	Ok

Requirement	Reference	Comments	Conclusion
5. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	The PDD follows the CDM-PDD template version 03.	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 provided	Ok
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?		N/A	

Table 2PDD

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 clearly identifies the CDM project activity. The title is "Angelina Small Hydro Power Plant Project – A Brascan Energética S/A Project Activity".	Ok	Ok
A.1.2. Is there an indication of a revision number and the date of the revision?	A.1	DR	Validation desk study: PDD version number: 1, 19/10/2007 At the final validation: PDD version 5, 13/08/2008.	Ok	Ok
A.1.3. Is this in consistency with the time line of the project's history?	A.2	DR Ref.6	The first phase of the project will become operational in the first half of 2009. The second phase will become operational in August, 2009.	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 first objective of the project activity is to help Brazil to meet its raising demand for energy and to improve the supply of electricity contributing to the environmental, social and economic sustainability of the country. The PDD states clearly that the project's activity will reduce GHG emissions by substituting fossil fuel generated electricity by renewable energy sources.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
A.2.2. Is all information provided in compliance with actual situation or planning?	A.2	DR Annex 1	The description of section A.2 of the PDD was cross checked with the information verified by the local assessor 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	Yes.	Ok	Ok
A.3. Project Participants					
A.3.1. Is the table required for the indication of project participants correctly applied?	A.3	DR	Yes. Lumbrás Energética S.A and Ecoinvest Carbon Brasil Ltda.	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	DR	The information provided in the Section A.3 of the PDD complies with the Annex 1.	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	DR/site visit	The PDD clearly provides the location of the project activity. The location was verified through ANEEL license, n°3470 that project activity is located on Garcia River, in the municipalities of Angelina and Major Gercino (27°28'S and 48°50'W), East of Santa Catarina, Brazil.	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.11 a and b	DR	The Environmental and ANEEL licenses, which give permission for project's implementation, were 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 UNFC CC web site	DR	Yes, information in the PDD includes: Type: Energy and Power; Sectoral Scope: 1 – Energy industries (renewable - / non-renewable sources); Category: Renewable electricity generation for a grid (energy generation, supply, transmission and distribution).	Ok	Ok
A.4.4. Does the project design engineering reflect current good practices?	A.4.3 Ref.6	DR/site visit	Yes. The project will apply the “Francis turbine”. The technology employed is probably the most known option among water turbines for power generation. As informed in the PDD (pages 6-7 PDD version 4), the project activity will be implemented in two phases. The first phase will become operational in the first half of 2009 (Ref.6). The second phase will become operation on August, 2009.	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.4.3 Ref. 7	DR/site visit	The information on section A.2 clearly describes how the project will reduce the GHG. The equipments are not installed yet. The Angelina SHP is under construction. All documents relating to technical description were verified on site visit. The information presented in the PDD, section A.4.3 was confirmed (Ref. 7).	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	Details about the project such as location, capacity and reservoir are mentioned in the PDD and were confirmed on-site by the local assessor.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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 follow 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	It is not expected.	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?	A.4.3 Ref.4	DR/I	Brascan Group is owner of 10.3% of Lumbrás Energética S.A (see annex 1). Brascan has extensive experience in energy sector. The company has been working in the electricity sector since 1998. However, no extensive training or maintenance efforts will be required.	Ok	Ok
A.4.10. Does the project make provisions for meeting training and maintenance needs?	A.4.3	DR/I	Please, see comments above A.4.9	Ok	Ok
A.4.11. Is a schedule available on the implementation of the project and are there any risks for delays?	A.4.3 Ref.5 Ref.6 Ref.7 Ref.8 Ref. 11a 11b	DR/I	The chronogram of implementation (ref.6) was verified during site visit. The project will be implemented in two phases: The first phase will become operational in the first half of 2009 (Ref.6). The second phase will become operational on August, 2009. Checked: budget approved, engineering projects, and purchased orders. The installation license was issued by the environmental agency. The license for energy production was also issued by ANEEL.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
A.4.12. Is the table required for the indication of projected emission reductions correctly applied?	A.4.4 Ref.10	DR	The table required for the indication of projected emission reductions was not correctly applied. The indicated starting period was May 2009, which does not comply with the starting date of the crediting period informed in Section C of the PDD. CAR 1 was raised. Table 1 in the revised PDD is now complying with the starting date of the crediting period (10/05/2009). CAR 1 was closed out.	CAR 1	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?	Ref. 8	DR	Yes. The project will be partially financed by the owner and the other part will be financed by a Brazilian financial entity. There are no foreign donors for the project.	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.	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	DR	No ODA funding has been provided for this project. The Project will be financed by BNDES - Banco Nacional de Desenvolvimento Econômico e Social (Brazilian Development Bank).	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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 ACM0002, version 7 EB36 Tool (EB35)	DR	Yes. Methodologies used are: "Approved Consolidated baseline and monitoring methodology ACM0002, version 7". The tool used was: "Tool to calculate the emission factor for an electricity system (EB35)". The methodology and tool are current.	Ok	Ok
B.1.2. Is the baseline methodology the one deemed most applicable for this project?	B.2 ACM0002, version 7	DR	Yes. The methodology is applicable to grid-connected renewable power generation project activities such as Angelina SHPP. The project activity meets all criteria of applicability: a small hydropower with new reservoir with a power density greater than 4W/m ² .	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 AMC0 002, versio n 7 Ref.5	DR	<p>The following criteria of applicability was discussed in the PDD (page 8) and verified on site visit:</p> <ul style="list-style-type: none"> The project activity entails the installation of one small hydro power with 26.27MW of installed capacity (ANEEL License, n°3470, 23/11/07). The project activity has a new reservoir of 0.4Km², with power density of 65.67W/m², so the power density is greater than 4W/m² (ANEEL license, n° 3470, 23/11/07). 	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 ACM0 002, versio n 7 Guideli nes	DR	The project boundary is correctly described in the PDD.	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 ACM0 002, versio n 7 Ref.9	DR	The S_SE_CO Brazilian grid was correctly identified and in accordance with EB guidance and methodology.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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 ACM00, version 7	DR	Yes. The spatial extent comprises Angelina SHPP and all power plants connected to the Grid S-SE-CO. The reservoir area is also included in the special boundary.	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. 9 Ref.12	DR	The discussion of the identification of the most likely baseline scenario was found to be unclear. Section B.4 of the PDD presents the alternatives for the project (i.e. other investments areas of interest to the group). The information and evidence why the group decided to invest in power market (built the SHP Angelina) and not to invest in other areas should be provided. NIR 2 was raised. The most plausible baseline scenario of the project activity is the continuation of the current scenario by large hydropower that represents 75% of Brazilian's generation and 21% by thermal powers. The data sources and justifications for the baseline scenario discussed in the PDD (version 4) are satisfactory. Regarding alternatives for the project activity presented in the PDD, the Group would be investing in others areas as financial market, and not in the power market. The clarification provided by client is acceptable. NIR 2 was closed out.	NIR 2	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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 B.5	DR	The following credible scenario were presented: - continuation of electricity supplied by large hydropower with reservoirs and thermal power; - the project activity implemented without been registered as CDM.	Ok	Ok
B.3.3. Is the choice of the baseline compatible with the available data?	B.4 B.5	DR	Yes, in the absence of the project activity the electricity will be supplied by large hydro plants and thermal plants.	Ok	Ok
B.3.4. Is conservativeness addressed in the way of identifying the baseline?	B.4	DR	See NIR 2.	NIR 2	Ok
B.3.5. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	B.4	DR	In the absence of the project activity the electricity should be generated by large hydro power and thermal generation to the grid. The small hydro power plant Angelina will avoid GHG emissions for the S-SE-CO.	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	DR	See item 4.2	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
<p>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?</p>	Ref.3a	DR	<p>The "Tool" version 4 is used to demonstrate additionality. Step 1a: other realistic and credible alternative to the proposed project activity should be considered according to the Tool. CAR 3 was raised. According to the Tool (version 4), the alternatives to the project activity presented by PDD are acceptable. It was confirmed through Brascan website, that alternative (b) of the Tool requests "other realistic and credible scenarios". However, this alternative is not applicable to the project activity because the project's owner has its business focussed on development, construction, implementation and operation of the small hydroelectric, as Angelina SHPP. CAR 3 was closed out. After receiving the letter of approval from Brazilian DNA it was necessary to revise the PDD to use the recent version of the "Tool". PDD version 5 uses the Tool version 5, and it is correctly applied.</p>	CAR 3	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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	C.1.1 Ref. 8	DR	It was not provided evidence and an explanation to support the starting date of the project activity: 01/09/2007. NIR 4 was raised. The document "EPC contract between Lumbrás Energética and Engevix Engenharia SA, 17/12/2007, was provided to SGS. This document is evidence that the starting date of the project activity is 17/12/2007. This document represents the real action to start the project activity, the contract for the construction and equipments of SHP Angelina. <u>NIR 4 was closed out.</u>	NIR 4	Ok
B.4.4. Is the discussion on additionality consistent with the identification all potential realistic and credible baseline scenarios	B.5	DR	See CAR 3, , NIR 5, NIR 6, NIR4	CAR 3 NIR5 NIR6 NIR4	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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	A.2 Ref.5	DR	<p>The information on section A.2 clearly describes how the project will reduce the GHG.</p> <p>Transparent inputs of technical description to be checked by the local assessor in the site visit. Checked evidence of the reservoir area: 0,4Km² installed capacity of the plant: 26,27MW</p> <p>First phase (Ref. 7 page 14 and 15) 2 turbines: Francis; 12.89MW; 514.3rpm. 2 generators: synchronic; 13,900KVA; 13.80KV; 514.3 rpm.</p> <p>Second phase (Ref. 7 page 15 and 16 – technical information under studying, however, the installed capacity will not be modified). turbine: Francis; 1,309kW; 720rpm generator: synchronic; 1,412kVA; 3.30kV; 720rpm.</p>	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.8 Ref.10	DR	<p>To provide evidences and source of the data used to calculate the IRR. Please describe in which documents the information can be confirmed (ex. Energy tariff = PPA, among others).</p> <p>The company has an internal rate of return called ROA (return on assets) of 16%. To provide evidence of this value.</p> <p>NIR 5 was raised.</p> <p>Evidences and sources used for calculation of IRR were provided on site visit. As the project activity was planned before of construction date, all sources were estimated. The “Angelina cashflow” presents the following sources:</p> <ul style="list-style-type: none"> • Total Investment : R\$ 133.961 Million (including interest tax + local tax). (See Ref.9 -const.cost.) • Investment with interest: R\$ 123.703 (Ref.8) • Interests tax: 9.50% • PPA: R\$ 136,54 • ROA of 16% (Ref. 10 – page 34). <p>All calculate, data, sources were validated. The financial analyses comply with information presented in the PDD.</p> <p>NIR 5 was closed out.</p>	NIR 5	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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?	B.5	DR	<p>Further substantiation is required regarding how the barriers prevent the implementation of this specific project activity and do not impact on the baseline. If the main argument to demonstrate the additionality of the project activity is the low IRR, this should be demonstrated using only step 2 of the additionality tool.</p> <p>The PDD states that “It is important to notice that the direct comparison between the SELIC rate and the IRR is not accurate and the idea is not to introduce a benchmark analysis, but to set a parameter as a reference”. In the investment analysis (step 2) a different value was used as benchmark.</p> <p>The PDD states that “the region where the project is located is isolated and undeveloped. And due to that, there is a lack of infrastructure, such as roads, reliable electricity supply, communication and transports”. Generally it’s necessary to develop some infrastructure to implement the project, especially hydro power plants. This is a natural condition of this kind of project but not a barrier. Therefore, further clarification is required regarding lack of infrastructure as a barrier.</p>	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.4.8. Has it been shown that the project is not common practice?	B.5 Ref.12	DR	<p>Regarding the common practice further detail should be provided in accordance with the requirements of step 4 of the additionality tool. Similar project activities should be described and the differences between each of these activities and the project should be clearly indicated. NIR 6 was raised.</p> <p>Further information about similar and differences project activities that are occurring in the region was provided.</p> <p>The PDD includes a research of small hydro power plants that have started operating in 2005. The discussion of the research made, is based on the participation of small hydro plants (maximum of installed capacity of 30MW, resolution ANEEL 652, 9/12/03) in the Brazilian Energy Market. From 43 SHPPs, 14 received incentives from PROINFA and 18 from CDM (a total of 32 projects which make up 74.4% of the SHPPs). With regards to installed potency, these 32 projects make up 90,6% of the total 520.18MW of energy produced by SHPPs.</p> <p>In 2007, when Angelina project activity started operating, there were 14 SHPPs in construction. Among the 14 SHPP's, 11 have received incentives (5 from CDM and 6 from PROINFA).</p> <p>In Santa Catarina, where the project activity is located, there are 8 SHPPs that started operations in 2007. From these SHPPs, 3 received incentives from PROINFA and 1 from CDM. In terms of installed capacity, 37.34% (81.96MW) are installed in Santa Catarina. Of this, 79.9% receive some kind of incentive.</p>	NIR6	Ok
* MoV = Means of Verification, DR= Document Review, I= Interview				Page 41/68	

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.4.8. Continued			<p>Therefore, it was confirmed that, without financial incentives, in Brazil SHPPs are not common practice. Instead, Large hydro power plants and thermal fossil fuel generation are common practice. NIR 6 was closed.</p> <p>The other SHPPs similar to the project activity can not be compared because the information of these similar projects is not accessible to conduct this analysis. The only data available is that informed in the PDD, location, installed capacity, incentives from PROINFA, but there is no information about financing and other characteristics.</p> <p>The validation assessment concludes that the construction of SHPPs is not a common practice and incentives like PROINFA or CDM is necessary.</p>		
B.4.9. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario	B.5	DR	<p>See NIR 2, NIR6</p> <p>During validation assessment were confirmed:</p> <ul style="list-style-type: none"> - It was confirmed that the project is not the most attractive investment if compared with the internal benchmark of the company. - the generation of electricity by SHPP without financial incentives is not a common practice in the region where the project is installed. <p>Considering both the investment analysis and barriers analysis, it was concluded that the project is additional (is not itself a baseline scenario).</p>	NIR 2 NIR 6	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 ACM0002, version 7 Tool for EF Ref. 9 Ref.10	DR	<p>Yes. The methodology “ACM0002, version 7” and “Tool to calculate the emission factor for an electricity system, EB35” were correctly used.</p> <p>“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”.</p> <p>BE_y = E_{Gy} * EF_{grid,CM,y}</p> <p>EF_y = 0.2826 tCO₂/MWh.</p> <p>According to the selected methodology ACM0002 the baseline emission factor (EF_y) is achieved by calculating the “operating margin” (OM) and “build margin” (BM) as well as the “combined margin” (CM). The simple adjusted operating margin emission factor was selected to calculate the EF OM.</p>	Ok	Ok
B.5.2. Has the approved methodology been applied correctly for determining project emissions ?	B.6.1 B.6.3 ACM000, version 7 Ref.10	DR	<p>Yes.</p> <p>For project activities with new reservoir, the project emissions shall be calculated.</p> <p>In the case of Angelina SHPP, project emissions = zero.</p> <p>Then,</p> <p>PD = 26.27MW/0,4Km² = 65.67MW/Km² or 65.67W/m²</p> <p>If the power density is greater than 10W/m³, the PE = 0.</p>	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.5.3. Has the approved methodology been applied correctly for determining leakage ?	B.6.1 B.6.3 ACM0002, version 7	DR	No leakage was considered. LE=0.	Ok	Ok
B.5.4. Where applicable, has the approved methodology been applied correctly for the direct calculation of emission reductions	B.6.1 B.6.3 ACM0003 Methodological Tool Ref.10	DR	For the calculation of emission reductions, the ACM0002, version 7 and methodological tool (EB35) were correctly used. Regarding the ER calculations: As described in the PDD and required by ACM0002, $ER = EG_y \times EF$ EF was calculated ex-ante, following the steps and formulas defined by ACM0002. The value obtained was 0.02826 tCO ₂ /MWh. Net quantity is the exported energy minus the energy consumed in the auxiliary systems. All sources of data and calculations are described in Ref.10.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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 ACM0002, version 7 Methodological tool (EB35) Ref.10	DR	The baseline emission factor follows the ACM0002 version 07 and methodological tool (EB35). Method used: The calculation and related data are presented in the PDD and spreadsheet.	Ok	Ok
B.5.6. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	B.6.1 B.6.3 Ref.10	DR	Yes, the capacity factor (63%) was considered in the calculation of the electricity to be generated. The uncertainties (hydrological or operational problems) are considered in the capacity factor defined.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.6. Ex-ante Data and Parameters Used					
B.6.1. Are the data provided in compliance with the methodology?	B.6.2 Ref.2 Ref.5 Ref.9	DR	<p>The ex-ante parameters mentioned in the PDD are in compliance with the Methodology.</p> <p>Parameters ex-ante:</p> <ul style="list-style-type: none"> • EF_y, - CO2 emission factor of the grid, • $EF_{OM,y}$ – CO2 operating margin emission factor of the grid • $EF_{BM,y}$ – CO2 build margin emission factor of the grid • Fraction of time during which low-cost/must-run sources are on the margin • $F_{i,y}$ – mass of volume • $GEN_{j,kn/y}$ – electricity generation of each power plant • $GE_{jj,k,ll,y}$- electricity imports quantity to the project electricity system • $COEF_{i,j,y}$ – CO2 emission coefficient of fuels used in connected electricity system • $COEF_{i,j,y}$ – CO2 emission coefficient of each fuel type • Installed capacity of 26.27MW • Reservoir area of 0.4Km² 	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.6.2. Is all the data derived from official data sources or replicable records and have these been correctly quoted?	Ref.11 a,b Ref.5 Ref.9	DR	All data are derived from official sources, as per environmental license ref.11a and b and ANNEL license ref.5. Data used in the calculation of the Emission factor are from official sources.	Ok	Ok
B.6.3. Is the vintage of the baseline data correct?	Ref.16	DR	Yes, emission factor of the grid (baseline data) is calculated using official data from ONS. Data used was calculated ex-ante using the most recent data according to validation of this project activity (years 2004-2006).	Ok	Ok
B.7. Calculation of Emissions Reductions					
B.7.1. Has the approved methodology been applied correctly for determining emission reductions ?	B.6.1 B.6.2 B.3 Ref.2 Ref.9 Ref.10	DR	Yes, as described in the PDD and required by ACM0002, $ER = EG_y \times EF$ See also comments under B.5.4 and comments about EF in the section B.6 above.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.7.2. Are the emission reduction calculations documented in a complete and transparent manner?	B.6.1 B.6.2 ACM0002, version 7 Methodological tool (EB35) Ref.9 Ref.10	DR	Yes, it was clearly documented in the PDD and a spreadsheet with data and formula was provided during the validation. The estimated emissions reductions calculation presented is considered correct. Data calculated according to installed capacity (26.27MW), capacity factor (63%) and electricity emission factor.	Ok	Ok
B.7.3. Have conservative assumptions been used to calculate emission reductions?	B.6.2 B.6.3 Ref.9	DR	Yes, emissions reductions are considered conservative because uses the correct data provided during validation.	Ok	Ok
B.7.4. Is the projection based on provable input parameter?	B.6.3 Ref.9	DR	Yes, see section B.6	Ok	Ok
B.7.5. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	B.3	DR	Yes, the same procedure to calculate the estimate emissions reduction and emission factor of the grid will be used during monitoring period.	Ok	Ok
B.7.6. Is the calculation of the emission reduction correct?	B.3	DR	Formulas to calculate emissions and emission reductions were checked and were found correct..	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.8. Emission Reductions					
B.8.1. Will the project result in fewer GHG emissions than the baseline scenario?	B.6.3	DR	Yes, the project activity will result in fewer GHG emissions than the baseline scenario, that is the electricity supplied by large hydro plants and thermal plants.	Ok	Ok
B.8.2. Is the form/table required for the indication of projected emission reductions correctly applied?	B.6.4	DR	Yes, follows the correct form/table.	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, no delays spected.	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	DR	Yes. The monitoring plan provided follows the requirements of ACM0002 version 7 and methodological tool (EB35).	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.7.1 Annex Ref.9	DR	Yes, specifically in this project the PE is zero and the baseline emission is the grid emission factor. The EF is correctly applied and follows the ACM0002 version 7.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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.7.1	DR	Yes, monitoring plan provide the applicable parameter (Electric energy Generated (EGy)).	Ok	Ok
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	Yes, indicator in conformance with the requirements of ACM0002 version 7.	Ok	Ok
B.10.3. Will it be possible to determine the specified project GHG indicators?	B.7.1	DR	All monitored data could be cross checked with official sources. The internal control (by project sponsor) and electricity purchase or evidences from CCEE will used as source data for the monitoring.	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	Yes.	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	The information provided describes properly the implementation of the monitoring plan.	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	The electricity generated will be monitored by the project (internal monthly report) and it will be checked by reports emitted by CCEE (official source).	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.10.7. Are all formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	B.7.1	DR	Project emissions are not applicable for this project. The power density is greater than 10W/m ² , PE=0.	Ok	Ok
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 project will proceed with the necessary measures for the monitoring. Applicable procedures by both ANEEL and ONS will be used. Information about energy supplied to the grid is controlled by the Chamber of Electric Energy Commercialization CCEE. Calibrated meters will be used.	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	Yes, the level of uncertainty is low because the data related to the emission factor comes from official source. The electricity energy generated can be cross checked with official source.	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	The monitoring plan includes the operations of all data, data analysis and data compilation systems to be employed by the project participants.	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	Yes. The monitoring data can be compared with official source.	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	Yes. The electricity energy generated is controlled by third party. The electricity delivered to the grid is available and will be controlled by governmental agency.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
B.12. Operational and Management Structure					
B.12.1. Is the authority and responsibility of project management clearly described?	B.7.1 Annex 4 Ref.13	DR/I	<p>The structure (authority and responsibility) is defined and described in the PDD.</p> <p>The Lumbrás S.A will be responsible for the calibration and maintenance of the monitoring equipments.</p> <p>Brascan will be responsible for the project management, for training of the staff, measurement, for preparing of an operation, maintenance and emergency manual.</p>	Ok	Ok
B.12.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	B.7.1 Annex 4 Ref.13	DR/ I	No, the project activity is not implemented yet and the authority and responsibility will be established before project operation. Verified that other operational plants from Brascan has procedures implemented, authority and responsibility defined.	Ok	Ok
B.12.3. Are procedures identified for training of monitoring personnel?	B.7.1 Annex 4	DR/I	<p>The project is not implemented.</p> <p>The training of the staff for the monitoring will be carried out before of the start-up.</p>	Ok	FAR 1

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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 Ref.13 Ref.14	DR	Yes, the monitoring plan explains about the energy measurement process. Verified the procedure to collect the generation data of the Brascan Energética S.A (for other CDM projects – ref.13), the same procedure will be adopted for Angelina SHPP. According to monitoring, the project will follow the CCEE procedure. Measurements will be controlled in real time by the Operation and Management System Center (COGS) – Brascan, in Curitiba	Ok	FAR 1
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 item B.13.1. The energy generated will be controlled internally and by third party (CCEE	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	See item B.13.1	Ok	Ok
B.13.4. Are procedures identified for calibration of monitoring equipment?	Annex 4 Ref.13	DR	The project will follow the National System Operator procedure (ONS – modulo 12). The energy metering (principal and backup) will be calibrated each two years.	Ok	Ok
B.13.5. Are procedures identified for maintenance of monitoring equipment and installations?	Annex 4	DR	See item B.12.1	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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 Ref.14	DR/I	No, the project is not operational yet and the specific procedure will be available during verification. FAR 1 was raised.	Ok	FAR 1
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 Ref.14	DR	See item B.13.1	Ok	Ok
B.13.8. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	Annex 4 Ref.13 Ref.14	DR	See item B.13.1	Ok	Ok
B.13.9. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	Annex 4	DR	See item 13.1	Ok	Ok
B.14. Baseline Details					
B.14.1. Is there any indication of a date when determine the baseline?	C.1.1 Ref.8	DR	Informed in the PDD as 05/09/2007	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?	Annex 3 Ref. 16	DR	Yes, the information is provided of the emission factor (from official source), used the build margin and operating margin calculation of 2004 – 2006. The data is used correctly being the last updated value.	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
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 Ref.8	DR	To provide evidence and an explanation for the starting date of the project activity: 01/09/2007. NIR 4 was raised. The document "EPC contract between Lumbrás Energética and Engevix Engenharia SA, 17/12/2007, was provided to SGS. This document is evidence that the starting date of the project activity is 17/12/2007. This document represent the real action to start the project activity, the contract for the construction and equipments of SHP Angelina. NIR 4 was closed out. xx	NIR 4	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	Yes, renewable crediting period of max 7 years with potential for 2 renewals.	Ok	Ok
C.1.3. Does the project's operational lifetime exceed the crediting period	C.2.1	DR	Project lifetime is 35 years, exceeds the project crediting period of maximum 21 years.	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 Ref. 11a And 11b	DR	Yes. During the site visit it was presented the installation license, n°023/07 issued by Fundação do Meio Ambiente (FATMA) on 3 and 5 September 2007 (valid per 24 months). The Installation license gives the permission to the implementation of the Angelina SHPP. The project activity complies with environmental legislation in Brazil.	Ok	Ok
D.1.2. Has an analysis of the environmental impacts of the project activity been sufficiently described?	D.1 D.2 Ref. 11a 11b	DR	Environmental impacts were considered by the environmental agency when issuing applicable licenses.	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 D.2 Ref. 11a 11b	DR	Yes, the environmental agency required the environmental impact assessment in order to issue the installation license.	Ok	Ok
D.1.4. Will the project create any adverse environmental effects?	D.1 D.2 Ref. 11a 11b	DR	It is not expected any adverse environmental effects.	Ok	ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
D.1.5. Are transboundary environmental impacts considered in the analysis?	D.1 D.2 Ref. 11a 11b	DR	Transboundary environmental impact was considered in the licensing process.	Ok	Ok
D.1.6. Have identified environmental impacts been addressed in the project design?	D.1 D.2 Ref. 11a 11b	DR	The project obtained the licenses required by the Brazilian environmental regulation and environmental impacts were considered by FATMA (environmental agency).	Ok	Ok
E. Stakeholder Comments					
E.1.1. Have relevant stakeholders been consulted?	E Ref.17 Re.18	DR	Yes, as listed in the PDD, section E and verified during the validation assessment.	Ok	Ok
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	E Ref.17 Re.18	DR	Verify language and information used in the consultation process. Letters sent to stakeholders were verified. They are prepared in local language.	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.17 Re.18	DR	Yes, the stakeholder consultation process follow the Brazilian DNA Resolution No. 1, issued on September 11th, 2003, Local stakeholders were invited for comments and the PDD could be requested through email: info@ecoinvestcarbon.com	Ok	Ok

Checklist Question	Ref. ID	MoV*	Comments	Draft Concl	Final Concl
E.1.4. Is the undertaken stakeholder process described in a complete and transparent manner?	E Ref.17 Re.18	DR	Yes, copy of the letters and delivery receipts were provided. The letters were sent in November 2007.	Ok	Ok
E.1.5. Is a summary of the stakeholder comments received provided?	E Ref.17 Re.18	DR	Yes, no comments received.	Ok	Ok
E.1.6. Has due account been taken of any stakeholder comments received?	E Ref.17 Re.18	DR	Yes, no comments received.	Ok	Ok

References

Reference ID	Title / Description	Comments
/1/	Project Design - Angelina Small Hydro Power Plant Project – A Brascan Energética S/A Project Activity version 1, 19/10/2007 (available for global stakeholder consultation); version 2, 27/11/2007; version 3, 12/02/2008; version 4, 02/04/2008; version 5, 07/10/2008. Version 6, 24/11/2008	
/2/	Consolidated baseline methodology for grid- connected electricity generation from renewable sources – ACM 0002, version 7 – EB36.	
/3a/	Tool for demonstration and assessment of additionality, version 5.2	
/3b/	Tool to calculate the emission factor an electricity system, version1 (EB35)	
/4/	Social contract	Contract social between Brascan and Lumbrás Energética S.A
/5/	ANEEL license, n°3470	ANEEL license, n°3470
/6/	Schedule of implementation (Angelina SHPP)	Schedule of implementation (Angelina SHPP)
/7/	Engevix-Angelina_Basic project	Technical description of the project.
/8/	CDM Consideration (English and Portuguese)	
/9/	Angelina Cash_flow	Investment analyses
/10/	Angelina CERs_2008 04 02	CERs worksheet
/11a/	LAI n°032-07 (05-09-2007)	Installation license
/11b/	LAI n°023-07 (03-09-2007)	Installation license
/12/	Corporate Profile Besa_ext Inglês _ 21062007 v2	Evidence of the internal benchmark

Reference ID	Title / Description	Comments
/13/	Common practice – number of SHPPs	Common practice – number of SHPPs
/14/	Internal procedure	Internal procedure
/15/	P.O. calibration procedure	P.O. calibration procedure
/16/	Emission factor calculation	Emission factor calculation
/17/	Letters (invite) – Local Stakeholders	Letters (invite) – Local Stakeholders
/18/	ARs – Local Stakeholders	ARs – Local Stakeholders
/19/	EPC contract between Lumbrás Energética and Engevix Engenharia SA, 17/12/2007.	Starting date of the project activity

A.3 Annex 3: Overview of Findings

Findings Overview

Findings from validation of Angelina Small Hydro Power Plant Project – A Brascan Energética S/A Project Activity.

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: This is an open list and more findings may be added as validation progresses.

Please Note: This is an open list and more findings may be added as validation progresses.									
Date:	11/12/2007				Raised by:	Fabian Gonçalves/Geisa Principe (trainee Lead Assessor)			
No.:	1	Type	CAR	Issue :	Starting date of the project activity			Ref.:	A.4.12
Lead Assessor Comment						Date: 11/12/2007			
The table required for the indication of projected emission reductions was not correctly applied. The indicated starting period was May 2009, which does not comply with the starting date of the crediting period informed in Section C of the PDD.									
Project Participant Response:						Date: 14/12/2007			
The starting date of the project activity is 10 th May, 2009. In that way, PDD was reviewed (version 3).									
Acceptance and Close out by Lead Assessor:						Date: 20/03/2008			
Information Provided: PDD revised, version 3. Information Verified: Table 2, table 8 and Item C.2.1.1 of the PDD.						Verified Document Reference: Ref. 10			
Reasoning for not acceptance or acceptance and close out: Tables 2 and 8 in the revised PDD are now complying with the starting date of the crediting period (10/05/2009).									
CAR 1 was closed out.									

Date:	11/12/2007				Raised by:	Fabian Gonçalves/Geisa Principe (trainee Lead Assessor)		
No.:	2	Type:	NIR	Issue :	Baseline scenario and alternatives to the project activity		Ref.:	B.3.1
Lead Assessor Comment						Date: 11/12/2007		

The discussion of the identification of the most likely baseline scenario was found to be unclear. Section B.4 of the PDD presents the alternatives for the project (i.e. other investments areas of interest to the group). The information and evidence why the group decided to invest in power market (built the SHP Angelina) and not to invest in other areas should be provided.	
Project Participant Response:	Date: 14/12/2007
PDD was reviewed in order to identify the most likely baseline scenario represented by the continuation of the current situation of electricity supplied by large hydro with large reservoirs and thermal power stations. Section B.4 of the PDD presents the identification of the baseline scenario and alternatives to the Group. Alternatives to the project activity are different from alternatives to the Group company. Alternatives to the project activities are: the continuation of the current situation of electricity supplied by large hydro with large reservoirs and thermal power stations and the proposed project activity undertaken without being registered as a CDM project activity. Alternatives to the Group company are to invest in other areas of the group as: financial market, baking, real state and not in the power market. The Group decided to invest in power market regarding the incentives from CDM that the project could receive, evidenced by "Angelina_CashFlow.xls" which considers carbon credits revenues. Besides, the Group successful experience with the other 11 CDM projects registered as CDM was the key point to decision-making to implement the project activity.	
Acceptance and Close out by Lead Assessor:	Date: 20/03/2008
<u>Information Provided:</u> The project participant provided information about current (previous) situation of large hydropower and thermal generation in Brazil, which is publicly available on ANEEL Website. <u>Information Verified:</u> The information that large hydropower represents 75% of the Brazilian's generation and thermal power 21%, was checked in ANEEL Website.	<u>Verified Document Reference:</u> ANEEL Website (Brazilian power regulatory agency). – banco de geração de energia
<u>Information Provided:</u> The Group Company provided, in Ref.12, the internal benchmark company of 16%. <u>Information Verified:</u> Confirmed that the Group company would invest in others market such as the financial market. The Group have the internal ROA (risk profile of the investment) of 16%, it is greater than the IRR of 14.1% per year (unlevered pre-tax - Ref.9).	<u>Verified Document Reference:</u> Ref.9 Ref.12
Reasoning for not acceptance or acceptance and close out: The most plausible baseline scenario of the project activity is the continuation of the current scenario by large hydropower that represents 75% of Brazilian's generation and 21% by thermal powers. The data sources and justifications for the baseline scenario discussed in the PDD (version 4) are satisfactory. Regarding alternatives for the project activity presented in the PDD, the Group would be investing in others areas as financial market, and not in the power market. The clarification provided by client is acceptable. <u>NIR 2 was closed out.</u>	

Date:	11/12/2007	Raised by:	Fabian Gonçalves / Geisa Principe (trainee Lead Assessor)			
No.:	3	Type:	CAR	Issue :	Step 1 a of the Additionality Tool, version4	Ref.: B.4.2
Lead Assessor Comment				Date: 11/12/2007		

The "Tool" version 4 is used to demonstrate additionality. Step 1a: other realistic and credible alternative to the proposed project activity should be considered according to the Tool.	
Project Participant Response:	Date: 14/12/2007 and 27/03/2007
Alternatives to the project activity are presented in PDD (version 3) according "Tool for the demonstration and assessment of additionality" (version 4).	
27/03/2007 Alternatives to the project activity are presented in PDD (version 4) according "Tool for the demonstration and assessment of additionality" (version 4). According the Tool alternatives are to include: (a) the proposed project activity undertaken without being registered as a CDM project activity; (b) other realistic and credible alternative scenario(s) to the proposed CDM project activity scenario that deliver outputs and on services with comparable quality, properties and application areas, taking into account, where relevant, examples of scenarios identified in the underlying methodology; (c) if applicable, continuation of the current situation (no project activity or other alternatives undertaken)". Alternatives to Angelina project activity are: - The proposed project activity undertaken without being registered as a CDM project activity (a). - The alternative to the project activity is the continuation of the current (previous) situation of electricity supplied by large hydro with large reservoirs and thermal power stations (c). For Angelina Project there are no other realistic and credible alternatives (b) with the characteristics described by the tool considering that Brascan Energética S.A. business, the company that controls Lumbrás Energética S.A., are focused in the development, implementation, construction and operation of small hydropower plants only. Then, this alternative is not applicable to the project activity proposed. More information can be seeing at Brascan website: http://www.brascanenergetica.com.br/	
Acceptance and Close out by Lead Assessor:	Date: 29/03/2008
Information Provided: Project participant provided information about "the mission and goal" of the Brascan company. Among others things, the main mission is the generation of power energy for small hydropower. Information Verified: Through Brascan website, it was verified that the Company have as characteristic in its business, the development, production and implementation of power energy focussed in small hydroelectric.	Verified Document Reference: http://www.brascanenergetica.com.br/empresa/missao.htm
Reasoning for not acceptance or acceptance and close out: According to the Tool (version 4), the alternatives to the project activity presented by PDD are acceptable. It was confirmed through Brascan website, that alternative (b) of the Tool requests "other realistic and credible scenarios". However, this alternative is not applicable to the project activity because the project's owner has its business focussed on development, construction, implementation and operation of the small hydroelectric, as Angelina SHPP. <u>CAR 3 was closed out.</u>	

Date:	13/08/2008	Raised by:	Fabian Gonçalves/Geisa Principe (trainee Lead Assessor)
No.:	4	Type:	NIR
Issue :	Starting date of the project activity	Ref.:	B.4.3
Lead Assessor Comment		Date: 13/08/2008	
To provide evidence and an explanation for the starting date of the project activity: 17/12/2007.			
Project Participant Response:		Date: 13/08/2008	

<p>PDD was reviewed (version 05) considering 17/12/2007 as the starting date of the project activity according evidences presented to DOE. This is the date of the EPC contract.</p>	
<p>Lumbrás Energética S.A. had chosen the EPC company to develop Angelina SHPP since September 20th, 2007. However, the contract was signed only in December 2007.</p>	
Acceptance and Close out by Lead Assessor:	Date: 13/08/2008
<p><u>Information Provided:</u> The PP provided the document "EPC contract".</p> <p><u>Information Verified:</u> Contract between Engevix and Lumbrás to confirm the starting date of the project activity.</p>	<p>Verified Document Reference: Ref.19</p>
<p>Reasoning for not acceptance or acceptance and close out: The document "EPC contract between Lumbrás Energética and Engevix Engenharia SA, 17/12/2007, was provided to SGS. This document is evidence that the starting date of the project activity is 17/12/2007. This document represents the real action to start the project activity, the contract for the construction and equipments of SHP Angelina. <u>NIR 4 was closed out.</u></p>	

Date:	11/12/2007	Raised by:	Fabian Gonçalves / Geisa Principe (trainee Lead Assessor)				
No.:	5	Type:	NIR	Issue :	Benchmark analysis	Ref.:	B.4.5
Lead Assessor Comment		Date: 11/12/2007					
<p>To provide evidences and source of the data used to calculate the IRR. Please describe in which documents the information can be confirmed (ex. Energy tariff = PPA, etc). The company has an internal rate of return called ROA (return on assets) of 16%. To provide evidence of this value.</p>							
Project Participant Response:		Date: 14/12/2007					
<p>Evidences regarding IRR calculation and Brascan ROA are together with this PP's comments/answers. All information from the PDD is provided in the PDD bibliography and footnotes.</p>							
Acceptance and Close out by Lead Assessor:		Date: 01/04/2008					
<p><u>Information Provided:</u> The project participants provided the following evidences: <ul style="list-style-type: none"> - Calculation of IRR - Interest tax of 9.50% - Price of the electricity of R\$ 136,54 - ROA of 16% </p> <p><u>Information Verified:</u> All evidences were confirmed during site visit. The financial indicator is the IRR (internal rate of return) that was calculated in the "Angelina cash-flow". The "cash-flow" shows that Angelina project activity was planned with an expected IRR of 12.9% (after tax) per year. The company internal benchmark is the ROA (return of assets). ROA is a measure used in all business (investments, strategy, principles prospects etc) made by company in 2007. The period for financial analysis considered was of 21 years (renewable crediting period).</p>		<p>Verified Document Reference: Ref.9 Ref. 8 Ref.10 pag 34</p>					

Reasoning for not acceptance or acceptance and close out:
Evidences and sources used for calculation of IRR were provided on site visit.
As the project activity was planned before of construction date, all sources were estimated.
The “Angelina cashflow” presents the following sources:

- Total Investment : R\$ 133.961 Million (including interest tax + local tax). (See Ref.9 -const.cost.)
- Investment with interest: R\$ 123.703 (Ref.8)
- Interests tax: 9.50%
- PPA: R\$ 136,54
- ROA of 16% (Ref. 10 – page 34).

All calculate, data, sources were validated. The financial analyses comply with information presented in the PDD.
NIR 5 was close out.

Date:	11/12/2007				Raised by:	Fabian Gonçalves/Geisa Principe (trainee Lead Assessor)		
No.:	6	Type:	NIR	Issue :	Common practice	Ref.:	B.4.8	
Lead Assessor Comment					Date: 11/12/2007			
Regarding the common practice further detail should be provided in accordance with the requirements of step 4 of the additionality tool. Similar project activities should be described and the differences between each of these activities and the project should be clearly indicated.								
Project Participant Response:					Date: 14/12/2007			
Common practice for similar projects in Brazil is the existence of the barriers and the necessity of incentives, as Proinfa and/or CDM. Information/data regarding common practice are provided in step 4, section B.5, from the PDD, and information/data sources.								
Acceptance and Close out by Lead Assessor:					Date: 23/03/2008			
<u>Information Provided:</u> The project participants provided official information (ANEEL Agency) about similar and different project activities that are occurring in the region. The number of small hydro powers occurring since 2005.					<u>Verified Document Reference:</u> http://www.aneel.gov.br/arquivos/pdf/Resumo_Geral_mar_2008.pdf Ref.12			
<u>Information Verified:</u> In the reference 12 (Official information from ANEEL) and ANEEL website, it was verified that there are 43 SHPPs that started operation since 2005 (14 receive incentives from PROINFA and 18 from CDM). In 2007, 8 SHPPs started operation in Santa Catarina. 3 SHPPs receive incentives from Proinfa and 1 from CDM.								

Reasoning for not acceptance or acceptance and close out:

Further information about similar and differences project activities that are occurring in the region was provided. The PDD includes a research of small hydro power plants that have started operating in 2005.

The discussion of the research made, is based on the participation of small hydro plants (maximum of installed capacity of 30MW, resolution ANEEL 652, 9/12/03) in the Brazilian Energy Market. From 43 SHPPs, 14 received incentives from PROINFA and 18 from CDM (a total of 32 projects which make up 74.4% of the SHPPs). With regards to installed potency, these 32 projects make up 90,6% of the total 520.18MW of energy produced by SHPPs.

In 2007, when Angelina project activity started operating, there were 14 SHPPs in construction. Among the 14 SHPP's, 11 have received incentives (5 from CDM and 6 from PROINFA).

In Santa Catarina, where the project activity is located, there are 8 SHPPs that started operations in 2007. From these SHPPs, 3 received incentives from PROINFA and 1 from CDM. In terms of installed capacity, 37.34% (81.96MW) are installed in Santa Catarina. Of this, 79.9% receive some kind of incentive. Therefore, it was confirmed that, without financial incentives, in Brazil SHPPs are not common practice. Instead, Large hydro power plants and thermal fossil fuel generation are common practice.

NIR 6 was close out.

Date:	22/09/2008			Raised by:	Fabian Gonçalves		
No.:	1	Type:	FAR	Issue :	Project Procedure	Ref.:	B.12/B.13
Lead Assessor Comment					Date: 22/09/2008		
The project is not operational yet, there is no formal procedure available. Before project operation the procedure to collect the generation data should be available addressing authority, responsibilities, data collection, calibration, record data, training, maintenance, emergency, etc.							
Project Participant Response:					Date:		
Acceptance and Close out by Lead Assessor:					Date:		
Information Provided:					Verified Document Reference:		
Information Verified:							

A.4 Annex 4: Team Members Statements of Competency

Statement of Competence

Name: Fabian Goncalves

SGS Affiliate: SGS Brazil

Status

- | | | |
|---------------------------|-------------------------------------|--------------------------|
| - Product Co-ordinator | <input checked="" type="checkbox"/> | |
| - Operations Co-ordinator | | <input type="checkbox"/> |
| - Technical Reviewer | <input type="checkbox"/> | |
| - Expert | <input type="checkbox"/> | |

Validation

Verification

- | | | |
|---------------------------|-------------------------------------|-------------------------------------|
| - Local Assessor | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| - Lead Assessor | <input checked="" type="checkbox"/> | <input checked="" 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 checked="" type="checkbox"/> | |
| 5. Chemical Industry | <input type="checkbox"/> | |
| 6. Construction | <input type="checkbox"/> | |
| 7. Transport | <input type="checkbox"/> | |
| 8. Mining/Mineral Production | <input type="checkbox"/> | |
| 9. Metal Production | <input type="checkbox"/> | |
| 10. Fugitive Emissions from Fuels (solid, oil and gas) | | <input type="checkbox"/> |
| 11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride | | <input type="checkbox"/> |
| 12. Solvent Use | <input type="checkbox"/> | |
| 13. Waste Handling and Disposal | <input checked="" type="checkbox"/> | |
| 14. Afforestation and Reforestation | <input type="checkbox"/> | |
| 15. Agriculture | <input type="checkbox"/> | |

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

Statement of Competence

Name: Geisa Principe

SGS Affiliate: SGS Brazil

Status

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

Validation

Verification

- Local Assessor ☒
- Lead Assessor ☐
- Assessor ☒
- / 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