VALIDATION REPORT

Global Energia S.A.

EcoSecurities Group PLC

Baruíto Hydroelectric Project

SGS Climate Change Programme
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Baruíto Hydroelectric Project	SGS Climate Change Programme
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Summary

SGS has performed a validation of the project: Baruíto Hydroelectric Project. The Validation was performed on the basis of the UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. Using a risk based approach, the review of the project design documentation and the subsequent follow-up interviews have provided SGS with sufficient evidence to determine the fulfilment of the stated criteria.

The project activity consists of the installation of a small hydroelectric plant with a capacity of 18 MW, located in Sangue River, in the municipality of Campo Novo dos Parecis/MT - Brazil. The plant has the objective to provide renewable electricity to the municipality.

Total amount of emission reductions estimated for the first crediting period is 230,076tCO_2e.

The SGS will request the registration of the Baruíto Hydroelectric Project as a CDM project activity, once the written approval by the DNA of the participating Parties and the confirmation by the DNA of Brazil that the project assists in achieving sustainable development has been received.

Subject.:			
CDM validation			**Indexing terms**
Work carried out by			
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Technical review			
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Abbreviations

AM	Approved Methodology
CAR	Corrective Action Request
CER	Certified Emission Reduction
DNA	Designated National Authority
MP	Monitoring Plan
NIR	New Information Request
PDD	Project design Document
SGS	Société Générale de Surveillance
EF	Emission Factor

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1. Introduction

1.1 Objective

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

1.2 Scope

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

The validation is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 GHG Project Description

This report summarizes the results of the validation of Baruíto Hydroelectric Project, performed on the basis of UNFCCC criteria. The validation has been performed as a desk review of the project documents presented by Global Energia and EcoSecurities and a site visit, located in Cuiabá and Campo Novo dos Parecis, Mato Grosso, Brazil. During site visit, managers and EcoSecurities consultant were interviewed.

The purpose of the project activity is to provide renewable electricity to the municipality of Campo Novo dos Parecis/MT, connected to the S-SE-CO interconnected system.
The plant was built in a remote and non developed area.
The Baruíto hydroelectric consists of the installation of a small hydro power plant with a capacity of 18 MW, located in Sangue River.

The project activity is helping the country to fulfill its goals of promoting sustainable development.
The hydro power plant has three sets of equipments (horizontal Kaplan S type turbine and three-phase generators).

Total amount of emission reductions estimated for the first crediting period is 230,076 tCO_2e.

Baseline Scenario:
No investment in clean power generation; electricity will continue to be generated by the existing generation mix operating in the grid.

With-project scenario:
The project activity consists of the installation of a new small hydro power plant with capacity of 18

MW. It will result in GHG emissions reductions avoiding the dispatch of same amount of energy produced by fossil-fuelled thermal plants to the grid.

Leakage:
No leakage is anticipated.

Environmental and social impacts:

The environmental impact of the project activity is considered not significant, considering the host country definition of small-hydro plants, given the small dam and reservoir size.
With the use of small hydropower facilities to generate electricity for local use and for delivery to the grid, the project displaces part of the electricity derived from diesel, a finite fossil fuel, and gives less incentive for the construction of large hydro plants which can have major environmental and social impacts.
Regarding the compliance with environmental legislation of the host country, the Brazilian regulation requires an environmental licensing process, including: the construction license (Licença de Instalação or LI); and the operating license (Licenca de Operação or LO).

It was verified during the site visit that the plant obtained the installation and operation licenses. The licenses were issued by the State Environmental Agency.

It is expected that the project activity will contribute to improve the supply of electricity, while contributing to the environmental, social and economic sustainability.

1.4 The names and roles of the validation team members

Name	***Role***
Fabian Gonçalves – SGS Brazil	*Lead Assessor*
Geisa Principe – SGS Brazil	*Assessor*
Irma Lubrecht – SGS NL	*Technical reviewer*

2. Methodology

2.1 Review of CDM-PDD and additional documentation

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

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

2.2 Use of the validation protocol

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

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

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

Checklist Question	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements are linked to checklist questions the project should meet.	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**Y**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **New Information Request (NIR)** is used when the validation team has identified a need for further clarification.*

The completed validation protocol for this project is attached as Annex 2 to this report

2.3 Findings

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

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

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

is issued, where:

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

II. validation protocol requirements have not been met; or

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

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

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

Corrective Action Requests and New Information Requests are raised in the draft validation protocol and detailed in a separate form (Annex 3). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

2.4 Internal quality control

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

3. Determination Findings

3.1 Participation requirements

Brazil is listed as the host Party. Brazil has ratified the Kyoto Protocol on 23rd August 2002.

UK is listed as annex I party. UK has ratified the Kyoto Protocol on 31st May 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 and annex I country had been provided. The Letter of Approval will be signed when the DNA of Brazil receive and analyse the validation report.

3.2 Baseline selection and additionality

The methodology applied to this Project Activity is: ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources/ Consolidated monitoring methodology for grid-connected electricity generation from renewable sources" (version 06, issued on 19th May, 2006).

ACM 0002 is applicable to grid-connected renewable power generation project activities which include among other conditions "new hydro power projects with reservoirs having power density greater than 4 W/m2."

The project consists of installation of a new small hydroelectric power plant: Baruíto hydroelectric with 18 MW of total installed capacity. The project boundary encompasses the physical, geographical site of the hydropower generation and the interconnected grid. The baseline calculation boundary is covered by the S-SE-CO interconnected grid and the plant is connected to this grid and baseline calculations use the electricity generation data from this region.

The project follows the "Tool" to demonstrate additionality.

The PDD version 1 follows the "Tool" version 2. A new version is available. CAR 1 was raised.

The revised version 2 of the PDD follows the "Tool" version 3. CAR 1 was closed out.

It was not clearly informed in the PDD (Section B.5 - Investment analysis step 2.c,) which period was considered for the financial analysis. In the EXCEL spreadsheet provided during the desk study, the stated period adopted for the NPV was 10 years, however in the section C of the PDD the project's lifetime was indicated as being with more than 30 years. The project proponent was asked to clarify why the NPV analysis without CERs considers the crediting period and not other approach (as the lifetime of the plant, for example). NIR 2 was raised.

The average timeline for loans in Brazilian electric sector is 12 years, so the financial analysis was changed to be in accordance with 12 years period (Verified the document "Informe BNDES"). NIR 2 was closed out.

Step 1: Alternatives to the project activity were provided. Continuation of current practice, build a thermoelectric plant and project activity not as a CDM project. To build a thermoelectric plant was excluded because this not part of the core business.

Alternative 1 (scenario 1) was selected. As verified during validation assessment the continuation of current practice and the project not undertaken as a CDM project are consistent with laws and regulations. The electricity could continue to be generated by existing grid and there is no obligation to build the hydro power plant.

Step 2: the project developer selected the benchmark analysis. The NPV was used as a financial indicator for comparison. The discount rate used is the SELIC. The SELIC rate is defined by Central Bank of Brazil. The minimum SELIC value in the year 2000 is 13.49%, but the project decided to use a conservative value of 13% in the financial analysis. Verified the worksheet with financial analysis. The data presented were checked during validation assessment:

Investments – verified the financial contract between Eletrobrás and Global Energia Elétrica S.A., nºECF-1900-C/2002 (Ref 7). Verified by interview and documents that the final project cost was higher than planned. During construction some problems were faced that increased the costs. A new transmission line of 138 KV was built, the original was 69 KV (verified the ANEEL license for the transmission line).

Revenues are according PPA signed with CEMAT (concessionary) and installed capacity. Ref 6.

Costs – confirmed by internal reports (Demonstrativo custo obra Baruíto, Operational costs, 07/11/06).

Carbon credits – according to CER estimation based in the installed capacity. CER value was estimated.

The NPV presented is negative that represents a financial barrier for the project activity. The NPV without carbon credit is R$ (12,571,131.21) and considering carbon credit is R$ (5,227,159.45); and the IRR are 10% and 12% respectively. The IRR is lower than benchmark (13%) with or without carbon credit.

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

A sensitivity analysis was conducted altering some parameters. The NPV is still negative and not financially attractive.

Step 3: not selected.

Step 4: the common practice analysis is based in the Brazilian electricity sector. Source of data presented were checked. The common practice in Brazil is not the construction or operation of small hydro plants.

Brazil has 1608 plants in operation (large hydro, small hydro, thermal, etc.), 280 plants are small hydro plants. The total energy generation in Brazilian grid is 98,212,584 kW and small hydro plants represent only 1,641,872 kW (1.67% of total installed capacity). There are about 30 small hydro plants CDM project registered or under registration in Brazil. Most of the other small hydro plants were built before 2000; 104 small hydro plants were built by the govern, 74 small hydro plants were built for own consumption.

The common is the construction of large hydro plants and recently thermal plants. Most of the recently small hydro power plants under construction have included the carbon credit revenue in the feasibility studies.

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

3.3 Application of Baseline methodology and calculation of emission factors

As defined in the ACM0002, the baseline emission factor is calculated as a combined margin, consisting of the combination of operating margin and the build margin factors. The calculation of the emission factor of Brazilian S-SE-CO grid is based on data from the National Electric System Operator (ONS – Operador Nacional do Sistema Elétrico) covering years 2003 -2005.

The emissions factor used to determine the emissions reductions was revised. It was used the most recent value available. The emission factor calculated was 0.2611 tCO_2e/MWh.

3.4 Application of Monitoring methodology and Monitoring Plan

Methodology ACM0002 (version 6) is applicable to grid-connected renewable power generation project activities which include among other conditions “new hydro plant with small reservoir”. (Installed power generation capacity divided by the surface area at full reservoir level greater than 4 W/m²). The project has currently power density = 29.83 W/m2.

Verified:

Reservoir area = 0.603 Km2

Installed capacity = 18 MW

Power density = 29.83 W/m2

The power density is greater than 4W/m², project emissions is not applicable according ACM0002 methodology. Project emission is dependent on the reservoir area and capacity installed of the plant. The project has a small reservoir area. The power density is greater than 10 W/m2. PE is not applicable.

The emissions factor used to determine the emissions reductions was revised. ER = net electricity generated and delivered to the grid * 0.2611 (EF).

The PDD version 1 does not show all parameters that are available at validation. It’s necessary to include the parameters 5, 6, 7, 9, 10, 11, 12a and b. CAR 3 was raised.

The PDD was revised and version 2 presents all parameters. See section B.6.2 of the PDD. CAR 3 was closed out.

3.5 Project design

The project’s starting date: 01/05/2000 (start of construction). It was assumed a renewable crediting period which will start on 01/10/2007. The operational lifetime exceeds the crediting period.

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

3.6 Environmental Impacts

The environmental impact of the project activity is considered not significant by host country definition of small hydro plants.

The project sponsors obtained all licenses required by Brazilian Environmental Regulation. The following documents were verified during site visit:

PRDA – Program for Recovering of Degraded Areas, issued by TD Engenharia, December 2004;

Installation license nº 149/2000, issued by FEMA, 20/09/2000;

Operation license nº 1907/2007 issued by SEMA, 19/01/2007.

The reservoir was visited and a document was provided to confirm the area. Verified the map prepared by TD-Engenharia (PCH-Baruíto). The Reservoir area is 60,30ha.

3.7 Local stakeholder comments

List of stakeholders was presented in the PDD. Verified the letters sent in local language to local stakeholders. List of stakeholders was presented in the PDD and comply with Resolução n°1. Copy of the letters and delivery receipt was provided. The summary of comments received and how the comments have been taken were provided.

4. Comments by Parties, Stakeholders and NGOs

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

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

The PDD and the monitoring plan for this project were made available on the SGS website http://cdm.unfccc.int/Projects/Validation/DB/131EY6OU2R1A33XG40INQ0IW6M8TKV/view.html and were open for comments from 15 Feb 07 until 16 Mar 07. Comments were invited through the UNFCCC CDM homepage.

4.2 Compilation of all comments received

Comment number	*Date received*	*Submitter*	*Comment*
0			

4.3 Explanation of how comments have been taken into account

No comment received.

5. Validation opinion

Steps have been taken to close out 3 findings.

SGS has performed a validation of the project: Baruíto Hydroelectric Project.
The Validation was performed on the basis of the UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. Using a risk based approach, the review of the project design documentation and the subsequent follow-up interviews have provided SGS with sufficient evidence to determine the fulfilment of the stated criteria.

By the displacement of fossil fuels by renewable energy sources in the generation of electricity, the project results in reductions of greenhouse gas emissions that are real, measurable and give long-

term benefits to the mitigation of climate change. A review of the financial analysis presented demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. If the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

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

6. List of persons interviewed

Date	***Name***	***Position***	***Short description of subject discussed***
08/03/2007	Carlos Antonio de Borges Garcia	President – Global Energia	FINANCIAL ANALYSIS, PROJECT DESCPTION, ADDITIONALITY
08/03/2007	Leandro Schwartz Noel	Consultant - EcoSecurities	Baseline, additionality, monitoring, validation process and findings
08/03/2007	Marcos Luis Figueiredo	Engineer – Global Energia	Operational issues
08/03/2007	Heriberto de Souza	Maintenance coordinator – Global Energia	Technical issues, operational procedures
08/03/2007	Pedro Augusto Silva	Financial Director – Global Energia	Financial analysis, additionality

7. Document references

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

/1/ Project Design Document, Baruíto Hydroelectric Projec, version 1, 07/02/2007; version 2, 12/03/2007.

/2/ ACM0002- Consolidated methodology for grid-connected electricity generation from renewable sources, version 6, 19 May 2006.

/3/ Tool for the demonstration and assessment of additionality, version 3, 16 February 2007.

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/ ANEEL: Resolution nº 99, 22/02/2002; Despacho nº 114, 01/03/2002.

/5/ Internal monitoring reports (electricity generation).

/6/ PPA nº 1712/AJU/2001 beteween Global Energia Elétrica S/A and Centrais Elétricas Matogrossenses S.A., 01/09/2001.

/7/ Financial contract between Eletrobrás and Global Energia Elétrica S.A., nºECF-1900-C/2002.

/8/ PRDA – Program for Recovering of Degraded Areas, issued by TD Engenharia, December 2004.

/9/ Installation license nº 149/2000, issued by FEMA, 20/09/2000.

/10/ Operation license nº 1907/2007 issued by SEMA, 19/01/2007.

/11/ Financial analysis worksheet and CER.

/12/ Emission Factor worksheet.

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