VALIDATION REPORT

Salto Jauru Energética S.A.

Ecoinvest Carbon Brasil Ltda.

Salto Small Hydro Power Plant Project – A Brascan Energética S/A Project Activity

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Summary

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

The project activity consists of the installation of a small hydroelectric plant with a capacity of 19 MW, located in Jauru River, in the municipality of Jauru and Indiavaí/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 219,026tCO_2e.

The SGS will request the registration of the Salto Small Hydro Power Plant 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

Salto Jauru Energética S.A. has commissioned SGS to perform the validation of the project: Salto Small Hydro Power Plant 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 Salto Small Hydro Power Plant Project, performed on the basis of UNFCCC criteria. The validation has been performed as a desk review of the project documents presented by Brascan Energética and Ecoinvest and a site visit, located in Curitiba/PR, Brazil. During site visit, managers and Ecoinvest consultant were interviewed.

According to Brascan the SHPs have, by force of the regulation of the sector, an installed power maximum of 30 MW, and are destined to supply local demands of energy. An advantage of the SHPs, is to contribute for the mitigation of the emission of GHG, when substituting the polluting sources used currently, having therefore the right of carbon credits through the CDM.

The purpose of the project activity is to help meet Brazil's rising demand for energy due to economic growth and to improve the supply of electricity. The plant was built in a remote and non developed area.
The Salto hydroelectric consists of the installation of a small hydro power plant with a capacity of 19 MW, located in Jauru River.
The project activity is helping the country to fulfill its goals of promoting sustainable development.
The hydro power plant has two sets of equipments (horizontal Kaplan S type turbine).

Total amount of emission reductions estimated for the first crediting period is 219,026 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 19 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 previous license (LP); and the installation license (LI).
It was verified during the site visit that the plant obtained the previous and installation. 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.

(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.

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: SHP Salto with 19 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 South Southeast Midwest 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 uses the "Tool" version 2 to demonstrate additionality. To revise the PDD using the most recent version of the "Tool" (version 3).
Step 1b: the alternatives shall be in compliance with all mandatory applicable legal and regulatory requirements taking into account the enforcement in the region or country and EB decisions.
Step 4: It's required to analyse other activities similar to the proposed project activity. Project are considered similar if they are in the same country/region or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.
The Tool v3, sub-step 1a require the alternatives to be included:
- The proposed project activity undertaken without being registered as a CDM project activity;
- Other realistic and credible alternative scenario to the proposed CDM 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;

- If applicable, continuation of the current situation.
It is not clearly described which alternatives will be considered in the barrier analysis. CAR 3 was raised.
The revised version 3 of the PDD follows the Tool version 3, the barrier analysis was correctly applied. CAR 3 was closed out.

In the discussion of additionality more information were requested:

Lack of infrastructure barrier: to present more detail. What was necessary specifically; evidences. NIR 4 was raised. More detail was added in the revised PDD. Copy of the internal monitoring report made by TD Engenharia was provided. The report issued by TD Engenharia describes the infrastructure barriers faced: roads without infrastructure to access the plant, because of that road were built, and maintenance control of the road was established. NIR 4 was closed out.

Institutional barrier: to present the source of the electricity values presented. NIR 5 was raised.

As described in the PDD version 2, the government electricity market has been changing in Brazil, but this condition does not prevent the project implementation. The institutional barrier was not considered in the PDD version 3. NIR 5 was closed out.

“Tool” Step 1: the project defines some alternatives as the continuation of current situation (common practice in Brazil) of electricity supplied by thermal plants and large hydro; and the proposed project activity undertaken without being registered as a CDM project activity

Verified that both alternatives are in compliance with regulation. There is no obligation to build the SHP and Brascan group has activities in other markets.

“Tool” Step 2: not applicable in this project.

“Tool” Step 3: barrier analysis.

Two barriers were faced by the project activity.

A summary of the Brazilian electricity market was presented to explain the regulatory uncertainty in the sector.

Investment barrier: verified the financial analysis (investment spreadsheet). Brascan considered the return of 20% to invest in new projects. The IRR of the SHP Salto is 17.5% without carbon credits.

Verified the contract to implement the SHP Salto (between Salto Jauru Energética and Consórcio Construtor Salto, 20/12/2005). It was possible to confirm the investment to build the SHP.

When the decision to build the SHP Salto, the energy tariff expected was R$ 127.00 in 2005, at this time the tariff was corrected (with taxes and inflation) to obtain the expected tariff in 2007 (corrected value calculated until 2007 is R$ 140.83). During project implementation one additional barrier was faced related to the energy tariff. The PPA signed between Salto Jauru Energética S/A and Centrais Elétricas Matogrossenses S.A on 13/03/206 the energy tariff is R$ 120.00.

A comparison between PPA tariff and Proinfa was presented. The Proinfa program is an incentive to the sector and a proof that incentives are necessary to promote the construction of energy projects in Brazil. SHP Salto is not assessing this incentive because the Proinfa finished on May 2004.

The IRR with carbon credit is 20.3%, this increase would compensate the risk. The inclusion of revenues from CERs makes the project IRR surpass the return defined internally (20%).

SHP Salto is asking financing for BNDES. To obtain the financing some guaranties are required, as signed PPA and the potential CER revenue (verified “Consulta Prévia” sent to BNDES).

Infrastructure barrier: the project is located 411 Km from Cuiabá (state capitol) in a non developed state. Verified the internal monitoring report, January 2006 that demonstrates the lack of infrastructure problems faced by the project.

"Tool" Step 4: the common practice in Brazil is not the construction or operation of small hydro plants. The common is the construction of large hydro plants and recently thermal plants. Most of the 14 small hydro power plants (Brascan's plants) had included the carbon credit revenue in the feasibility studies. 11 small hydro plants are CDM projects.

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

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 South Southeast Midwest 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 ex-anti 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/m^2). The project has currently power density = 24.05 W/m2.

Verified:

Reservoir area = 0.79 Km2

Installed capacity = 19 MW

Power density = 24.05 W/m2

The power density is greater than $4W/m^2$, 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 ex-ante emissions factor used to determine the emissions reductions was revised. ER = net electricity generated and delivered to the grid * 0.2611 (ex-ante EF according monitoring plan presented in the PDD).

The PDD version 1 does not show all parameters that are available at validation.

PDD section B.6.2: to present the parameters available at validation that is used to calculate the ex-ante emission reduction. The EF operating margin is a monitored parameter and is not applicable under section B.6.2. CAR 6 was raised.

The parameters available at validation were included in the PDD version 2. It was defined that the EF is ex-ante. CAR 6 was closed out.

Section B.7.1: the PDD is not according methodology. To include items, according methodology ACM0002. The recording frequency of the parameters EF, EF operating margin, EF build margin, and lambda is yearly. The recording frequency of the parameter EG is hourly measurement and monthly recording. CAR 8 was raised.

The revised version 3 of the PDD presents the monitored parameters according to methodology. CAR 8 was closed out.

3.5 Project design

It was assumed a renewable crediting period which will start on 20/09/2007. 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.

According to the PDD Guidelines to present the information under section A.2 maximum one page. CAR 1 was raised. Verified the new version 2 of the PDD, the information under section A.2 is correct. CAR 1 was closed out.

Section A.4 of the PDD describes the project as a run-of-river, Verified during site visit that the project is a new hydro plant with small reservoir. CAR 2 was raised. The information that the SHP is a new hydro plant with reservoir was included in the PDD version 2. CAR 2 was closed out.

Section D: the information about the CDM letter of approval requirement is not applicable in the PDD section D. This is the information that will be sent to Brazilian DNA. CAR 9 was raised. The PDD was revised (version 2). CAR 9 was closed out.

Table 5 of the PDD presents the share of hydroelectricity in the country from 1999-2003. To include the data of the years 2004 and 2005. NIR 7 was raised. It was included all data available in the PDD version 2. NIR 7 was closed out.

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:

Preliminary environmental assessment (Diagnóstico Ambiental Prévio da PCH Salto issued by TD Engenharia on July 2000).

Environmental project (Projeto Básico Ambiental PCH Salto issued by SOMA on December 2005.The reservoir was visited and a document was provided to confirm the area.

Licenses issued (previous and installation): LP nº088/2000 issued by FEMA on 25/09/2000; LI nº250/2002 issued by FEMA on 25/07/2002; LI nº188/2003 issued by FEMA on 02/09/2003; LI nº466/2004 issued by FEMA on 12/01/2002; LI nº857/2006 issued by SEMA on 07/12/2006 valid until 07/12/2007.

Verified the map of the reservoir and technical report issued by SEMA (state environmental agency) that defines the reservoir area (79 ha).

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/LFPCDGLWQ6VE8CUNRTV9675SLH2VSB/view.html and were open for comments from 02 Mar 07 - 31 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 9 findings.

SGS has performed a validation of the project: Salto Small Hydro Power Plant 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 barriers 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*
02/03/2007	Julien Dias	Financial manager/Project responsible – Brascan	TECHNICAL ISSUES, FINANCIAL ANALYSIS, PROJECT DESCPTION, ADDITIONALITY, INTERNAL PROCEDURES.
02/03/2007	Maria Leopoldina	Project assessor - Brascan	Operational issues
02/03/2007	Karen Nagai	Consultant - Ecoinvest	Baseline, additionality, monitoring, validation process and findings

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, Salto Small Hydro Power Plant Project – A Brascan Energética S/A Project Activity:
Version 1, 09/01/2007;
Version 2, 22/03/2007;
Version 3, 18/05/2007;
Version 4, 28/05/2007.

/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/ Financial analysis spreadsheet.

/5/ CER spreadsheet.

/6/ Letter sent to BNDES (Consulta Prévia).

/7/ ANEEL Despacho nº 1079, 21/12/2004 that approves the project SHP Salto with an installed potency of 19 MW.

/8/ ANEEL Portaria nº 103, 03/03/2005 that defines the capacity factor of the SHP Salto (72%).

/9/ Emission Factor worksheet.

/10/ SHP Salto data sheet.

/11/ Reservoir map.

/12/ Installation license nº 857/2006, issued by SEMA, 07/12/2006.

/13/ Operation training plan (Roteiro de treinamentos operacionais básicos).

/14/ PPA VPMI nº 011/2006, 13/03/2006.

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