VALIDATION REPORT

CACHOEIRA ENCOBERTA AND TRIUNFO SMALL HYDROELECTRIC POWER PLANTS - BRASCAN ENERGÉTICA MINAS GERAIS S.A (BEMG) PROJECT ACTIVITY IN BRAZIL

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DET NORSKE VERITAS

VALIDATION REPORT

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Approved by: Einar Telnes Technical Director	Organisational unit: DNV Certification, Climate Change Services
Client: Brascan Energética Minas Gerais S.A.	Client ref.: Decio Yoshimoto

DET NORSKE VERITAS AS

DNV Certification

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 945 748 931 MVA

Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity" (hereafter called "the project") in Brazil on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. This validation report summarizes the findings of the validation.

In summary, it is DNV's opinion that the "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity", as described in the revised PDD of 23 September 2005, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002. Hence, DNV will request the registration of the "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity" as a CDM project activity. Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of the DNA of Brazil, including confirmation that the project assists in achieving sustainable development.

Report No.: 2005-0647	Subject Group: Environment
Report title: Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity in Brazil	
Work carried out by: Luis Filipe Tavares, Cintia Dias, Vicente San Valero	
Work verified by: Michael Lehmann	

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Abbreviations

ANEEL	"Agência Nacional de Energia Elétrica" (Brazilian Electric Energy Agency)
BEMG	Brascan Energética Minas Gerais S.A.
BM	Build margin
BNDES	"Banco Nacional de Desenvolvimento Econômico e Social" (Brazilian Bank for Economic and Social Development)
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
FEAM	"Fundação Estadual do Meio Ambiente do Estado de Minas Gerais" (Environmental State Agency of Minas Gerais)
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
ONS	Brazilian National Electric System Operator
PCH	"Pequena Central Hidrelétrica" (Small Hydroelectric Power Plant)
PDD	Project Design Document
PPA	Power Purchase Agreement
S-SE-CO	South-Southeast-Midwest grid
SELIC	"Sistema Especial de Liquidação e de Custódia" (Overnight Interest Rate)
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

Brascan Energética Minas Gerais S.A. (BEMG) have commissioned Det Norske Veritas Certification Ltd. (DNV) to validate the "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity" consisting of the following hydroelectric power plants in the state of Minas Gerais in Brazil:

- Cachoeira Encoberta (Ormeo Junqueira Botelho) – 22,7 MW, Muriaé municipality;
- Triunfo (Ivan Botelho III) – 24,4 MW, Guarani municipality;

The original project design document (PDD) for this project, titled "Nova Sinceridade, Palestina, Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants (the CatLeo Project Activity)", also included the Nova Sinceridade (Benjamim Baptista) and Palestina (Ivan Botelho II) hydroelectric power plant and was proposed by CatLeo Energética S.A (CatLeo). In December 2004 the share control of the involved hydroelectric power plants was transferred to Brascan Energética Minas Gerais S.A. Consequently, Brascan changed the project design of the CatLeo Project activity and removed the Nova Sinceridade and Palestina hydroelectric power plants. The project name was in the revised PDD changed to "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity". The Nova Sinceridade and Palestina hydroelectric plants were developed as separate small-scale CDM projects and presented in individuals PDDs ("Palestina Small Hydroelectric Power Plant - Brascan Energética Minas Gerais S.A. (BEMG) Project Activity" and "Nova Sinceridade Small Hydroelectric Power Plant - Brascan Energética Minas Gerais S.A. (BEMG) Project Activity".

This report summarizes the initial findings of the validation of the project, performed based on UNFCCC and host Party criteria's for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Mr. Luis Filipe Tavares	DNV Rio de Janeiro	Team leader,
Ms. Cintia Dias	DNV Rio de Janeiro	CDM auditor
Mr. Vicente San Valero	DNV Rio de Janeiro	CDM auditor
Mr. Michael Lehmann	DNV Oslo	Energy sector expert, Technical reviewer

1.1 Validation Objective

The purpose of a validation is to have an independent third party assessing the project design. In particular, the project's baseline, the monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakesh Accords and relevant decisions by the CDM Executive Board, including the baseline and monitoring methodology ACM 0002. The validation team has employed, based on the recommendations in the Validation and Verification Manual /6/ a risk-based approach, 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 project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design..

1.3 Description of Proposed CDM Project

The "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity" includes two small hydropower run-of-river plants that supply electricity to the grid from renewable sources and thereby reduces greenhouse gas emissions. The project activity consists of 47.1 MW installed capacity divided into two hydroelectric power plants. As a typical run-of-river scheme that involves a low-level diversion dam and is usually located on swift flowing streams, these hydroelectric power plant projects consist of only small reservoirs (total reservoir areas is less than 3 km^2), which store water in order to generate electricity for short periods of time. Run-of-river projects do not include significant water storage, and must therefore make complete use of the water flow.

All these plants deliver energy to the same interconnected grid: The South-Southeast-Midwest grid (S-SE-CO of Brazil).

Information on the technology, starting dates of the projects and the main components of both plants are as follows:

- Cachoeira Encoberta Plant (Ormeo Junqueira Botelho) (22.7 MW) has been operational since 01 January 2004. Its turbine system consists of two 11.35 MW units, and a generator of 13.5 MVA, 450 rpm at 6.9 kV. Its reservoir size is 0.294 km²;
- Triunfo (Ivan Botelho III) (24.4 MW) has been operational since 30 October 2004. Its turbine system consists of two 12.2 MW units, and a generator of 13.5 MVA, 450 rpm at 6.9 kV. Its reservoir size is 1.39 km².

Emission reductions are claimed from displacement of fossil-fuel based grid electricity with electricity generated by the hydroelectric power plants and supplied to the grid. The estimated amount of GHG reduction from the project is 335 059 tCO_2e during the first crediting period (7 years), resulting in estimated average annual emission reductions of 47 865 tCO_2e.

2 METHODOLOGY

The validation consisted of the following three phases:

i) a desk review of the project design and the baseline and monitoring methodology;
ii) follow-up interviews with project stakeholders;
iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customized for the project, according to the Validation and Verification Manual /6/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity" is enclosed in Appendix A to this report.

Findings established during the validation can be seen as either a non-fulfilment of validation criteria or where a risk to the fulfilment of project objectives is identified. *Corrective Action Requests* (CAR) are issued, where:

i) mistakes have been made with a direct influence on project results;
ii) CDM or host Party 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 certified.

The term *Clarification* may be used where additional information is needed to fully clarify an issue.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

Validation Protocol Table 2: Requirement Checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*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 (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below).A request for **Clarification (CL)** is used when the validation team has identified a need for further clarification.*

Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification			
Draft report corrective action requests and requests for clarifications	***Ref. to Table 2***	***Summary of project participants' response***	***Final conclusion***
If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Validation protocol tables

2.1 Review of Documents

The original PDD, titled "Nova Sinceridade, Palestina, Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants (the CatLeo Project Activity)" (version of 23 March 2005) /1/ and the final PDD, titled "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity" (version of 23 September 2005) /2/ and submitted by Brascan Energética Minas Gerais S.A. and Ecoinvest, was reviewed by DNV.

In addition, a spreadsheet containing calculations of the Combined Margin (ONS Emission Factor SSECO 2002-2004) /3/ and the Environmental Impact Assessment, Environmental Licenses and license requirements and ANEEL resolutions were assessed.

2.2 Follow-up Interviews

On 5 July 2005, DNV performed interviews with Brascan Energética Minas Gerais S.A. and Ecoinvest during the site visit in the control centre for the two hydroelectric power plants at the Curitiba Municipality, to confirm and to resolve issues identified in the document review.
The main interview topics were:

- Environmental licenses / installed capacity and owners;
- IRR calculations;
- Local Stakeholders invitation to comments;
- Monitoring / Calibration requirements – QA / QC procedures;
- ANEEL authorizations.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which need to be clarified for DNV's positive conclusion on the project design.

The initial validation of the project identified 02 (two) *Corrective Action Requests* and 04 (four) requests for *Clarification*. These were presented to the project participant in the form of a draft validation report (rev. 0 dated 13 May 2005). The project participant's response to DNV's initial findings, which also included the submission of a revised PDD in 23 September 2005, addressed the raised *Corrective Action Requests* and requests for *Clarifications* to DNV's satisfaction. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in Table 3 of the validation protocol in Appendix A.

3 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the PDD of 23 September 2005.

3.1 Participation Requirements

The project participants are Brascan Energética Minas Gerais S.A. of Brazil. The host Party Brazil meets all relevant participation requirements. No participating Annex I Party is yet identified.

3.2 Project Design

The Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity is a renewable electricity project activity that displaces fossil fuel based electricity generation in the S-SE-CO grid, resulting in a reduction of emissions of greenhouse gases.

The project consists on two hydroelectric power plants that use Francis turbines and characterized as run-of river hydroelectric power plants with only small reservoirs (total reservoir areas is less than 3 km^2),

Electricity generated will be dispatched to the regional S-SE-CO grid trough BEMG, which is in charge to commercialize the generated electricity.

The following starting dates for the two hydroelectric power plants were confirmed through reviewing ANEEL documents / authorizations:

- Cachoeira Encoberta plant – ANEEL Dispatch nº 1033, dated 30/12/03 - start up on 31/12/2003;
- Triunfo plant – ANEEL Dispatch nº 312, dated 30/12/03 - start up on 30/10/2004;

A renewable 7 years crediting period is selected, starting on 01 January 2004. The starting date of the project activity is 01 January 2004, i.e. the starting date of Cachoeira Encoberta. The expected operational lifetime of the project is 25 years.

The project is expected to bring social (employment), environmental (fauna and flora preservation) and economic benefits, thus contributing to sustainable development objectives of the Brazilian Government.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.

3.3 Project Baseline

The project applies the approved baseline methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” /7/

ACM0002 is applicable to grid-connected run-of-river hydroelectric power plants without significant reservoir size like the two hydroelectric power plant units Cachoeira Encoberta and Triunfo of BEMG.

The baseline scenario is represented by the addition of new grid-connected generation sources which will supply an equivalent of electricity to the grid in the absence of the project activity. In accordance with ACM0002, a corresponding electricity baseline emission factor is calculated ex-ante as the combined margin (weighted average), which consists of the combination of operating margin (OM) and build margin (BM) emission factors (see section 3.6).

The project's boundaries are the limits of the two hydroelectric power plants, connected to the S-SE-CO regional Brazilian grid. The project (electricity) system's boundary is limited to the S-SE-CO regional Brazilian grid, to which both hydroelectric plants are connected by transmission lines.

3.4 Additionality

The additionality of the project is demonstrated by applying the "Tool for demonstration and assessment of additionality" as required by ACM0002 as follows:

Step 0 - -Preliminary screening based on the starting date of the project activity: The starting date of the CDM project activity, i.e. 01 January 2004, falls between 1 January 2000 and the date of the registration of the first CDM project activity (November 2004). The starting date of the first unit, Cachoeira Encoberta, of 31 December 2003 was evidenced through the ANEEL resolution 1033 issued on 30 December 2003. Evidence that that the CDM was seriously considered in the decision to implement the project was evidenced in the form of a document named "*CatLeo meeting report results 2001*" /4/ which is publicly available on the internet and which comments on the participation of CatLeo in the Chicago Climate Exchange CCX. Moreover, a document related to sale of the hydroelectric power plants from CatLeo to Brascan issued on February 2003 /5/ states that projects are suitable as a CDM project. In DNV's opinion, the presented documentary evidence sufficiently demonstrates that the CDM was seriously considered in the decision to implement the project.

Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations: The possible baseline scenarios considered are: a) the continuation of the current situation with the national electricity grid being supplied by large hydro projects and by fossil fuel power plants and b) to invest in and install a new electricity generator as a run-of-river facility in order to supply electricity to the grid. Both scenarios are in compliance with all applicable legal and regulatory requirements.

Step 2 - Investment analysis: Not applicable (Only Step 3 is selected).

Step 3 - Barrier analysis: Investment, technological (lack of infrastructure) and institutional barriers are presented.

a) Investment barriers: DNV has been able to confirm that the open Brazilian market lacks availability of long-term capital. None of the plants of the project are participants of the PROINFA program. To finance the construction the project sponsor (Brascan Energética Minas Gerais S.A) got, through a financing line of BNDES, a financial support that covers on average for the two projects 70% of the project costs with 14,75% of TJLP* interest rate (BNDES Long

* TJLP is the BNDES long term and reference interest rate for the Bank financing.

Term Interest Rate) rate of 9.75% plus a 5% spread risk for a term of 10 years and 2 years grace period, on average, for the two project components. DNV was able to confirm that despite this loan the IRR of the Cachoeira Encoberta (Ormeo Junqueira Botelho) was 13.2 % without CER revenues and 13.9 % considering CER revenues. For Triunfo (Ivan Botelho III) the IRR was 12.9 % without CER revenues and 13.6 % considering the CER revenues. This IRR analysis considers the cost of investment, the energy production capacity assured by technical studies or by the authorization of ANEEL as "assured energy" and the price given in the PPAs signed on start-up of each of the hydroelectric power plants. This average project IRR is lower than the SELIC rate in effect at the time of financing, i.e. 19.75% as of July 2005. Hence, it is demonstrated that project is not financially attractive and thus faces investment barriers.

Moreover, DNV was able to confirm that the Brazilian market lacks availability of long-term capital and that the CER revenues are likely to provide the necessary incentive for the project, which is deemed a riskier investment than investing in the financial market or large hydro and thermal plants.

b) Technological barriers: The regions where the project is located are isolated and underdeveloped. There is a lack of infrastructure such as roads, reliable electricity, communication and transportation. The project sponsor had to develop these facilities before the implementation of the project. Although the mentioned lack of infrastructure will increase the cost of the project, this barrier is to be considered when calculating the IRR and designing/developing the project.

c) Institutional barriers: DNV was also able to confirm that the regulatory environment for the electricity sector undergoes frequent changes in Brazil, which causes uncertainties for investors and developers of similar projects, which could be evidenced by the low number of small hydroelectric power plants implemented in the electric market of Brazil.

Step 4 - Common practice analysis: Small hydro-electricity projects are not common practice in Brazil. The BAU on the Brazilian electricity market is to continue with large hydro and thermal power projects, which represent the majority of the installed capacity. The project proponent doesn't participate in the PROINFA program mainly because all units started-up before the first period of the program (January 2006).

Step 5 - Impact of CDM registration: It is demonstrated that the sale of CERs will provide the incentives for the project to overcome the presented barriers.

Given the above and in particular the investment and institutional barriers that the project faces, it is sufficiently demonstrated that the project is not a likely baseline scenario.

3.5 Monitoring Plan

The Brascan Energética Minas Gerais (BEMG) Project Activity applies the approved monitoring methodology ACM0002 "Consolidated monitoring methodology for zero-emissions grid connected generation from renewable sources" /8/.

The methodology ACM0002 is applicable to run-of-river hydropower plants without significant reservoir size like the two hydroelectric power plants of Cachoeira Encoberta and Triunfo of BEMG.

The monitoring plan based on monitoring the amount of electricity supplied to the grid. The reliability of this monitoring parameter is assured through two-party verification of the amount

of electricity sold to the S-SE-CO grid. The electricity baseline emission factor is determined *ex-ante* and will only be updated at renewal of the crediting period.

Details of the data to be collected, the frequency of data recording, its certainty, and format and storage location are described. The recording frequency of the data seems appropriate for the project. Algorithms and formulas used have also been clearly established. The period for which data will be archived is established according monitoring methodology ACM0002.

Brascan is responsible for the project management, monitoring and reporting project activities as well as for organising and training of the staff in the appropriate monitoring, measurement and reporting techniques. During the site visit in the operation centre for all plants in Curitiba municipality, the framework of operation control and the registration of electricity generation and other control parameter transmitted from each plant to the control centre by a satellite was audited.

3.6 Calculation of GHG Emissions

Baseline emissions due to displacement of electricity are calculated by multiplying the electricity supplied by the project activity to the S-SE-CO regional Brazilian grid with the combined margin emission coefficient determined for this grid. The project is not expected to result in project GHG emissions.

The combined margin emission coefficient for the S-SE-CO grid is determined *ex-ante* in accordance with ACM0002. The calculations were based on electricity generation data provided by the Brazilian Electricity Agency (ANEEL) and the National Electricity System Operator (ONS) for the electricity generated in the South-Southeast-Midwest (S-SE-CO) regional Brazilian grid in the years 2002-2004. The ONS dataset does not include power plants that dispatch locally. Data for the years 2002-2004 are the most recent statistics available and the data was verified against the data published on the ONS website.

It is justified to only include plants dispatched by ONS although these represent only about 80% of the total installed capacity. Data for the remaining plants is not publicly available, as these remaining plants operate either based on power purchase agreements, which are not under control of the dispatch authority, or are located in non-interconnected systems to which ONS has no access. Hence, these plants are not likely to be affected by a CDM project and the power plants dispatched by ONS are thus representative for the operating margin.

The simple-adjusted operating margin (OM) emission coefficient is calculated to be 0.4310 tCO_2e/MWh (applying an average λ of 0.4961) and build margin (BM) emission coefficient of 0.1256 tCO_2e/MWh, resulting in a combined margin emission coefficient of 0.2783 tCO_2e/MWh (weighted average of the build and operating margin).

It is recognised that in the absence of actual fuel consumption data, the calculated plant specific emission coefficients are sensitive to the assumed plant efficiency for each plant. Nonetheless, the applied average plant efficiencies for different power plant types established in the IEA study on the Brazilian grid /9/ are deemed to represent the best data that is currently available.

The build margin emission coefficient calculated for only power plants dispatched by ONS is 0.1256 tCO_2e/MWh and thus more conservative than the emission coefficient calculated based on IEA data (0.421 tCO_2e/MWh) or the combination of IEA and ONS data (0.205 tCO_2e/MWh).

The λ was calculated by interpolating daily dispatch data for thermal power plants and daily dispatch data for hydropower plants. The λ calculations were transparently presented in spreadsheets /3/submitted to and verified by DNV. The selected approach for calculating λ is in accordance with ACM 0002.

3.7 Environmental Impacts

The hydroelectric power plants Cachoeira Encoberta and Triunfo have been granted an Operational Environmental License issued by the Environmental State Agency (FEAM) after all possible impacts were analyzed like geological and soil, hydrological, flora and fauna impacts. As the project use small reservoirs and can be considered run-of-river, no significant impact were identified. Additionally, besides all environmental mitigation measures and programs, as usually required by the Environmental Agencies, environmental programs (education) for all communities involved are implemented as part of the project.

The Hydroelectric Power Plants of the project have the following Environmental Licenses:

- Cachoeira Encoberta Plant (22.7 MW) – FEAM/MG/666, dated 09/12/03 valid until 09/12/09, issued to CatLeo Energia S.A, with installed capacity of 22 MW but it was communicated to FEAM by Brascan Energética Minas Gerais S.A. that the actual capacity is 22.7 MW in the letter BESA-COGS/CWB 081/05 on 27/09/05;
- Triunfo Plant (24.4 MW) – FEAM/MG/763, dated 26/11/04 valid until 26/11/08, issued to CatLeo Energia S.A, with installed capacity of 23 MW but it was communicated to FEAM by Brascan Energética Minas Gerais S.A. that the acutal capacity is 24.4 MW in the letter BESA-COGS/CWB 080/05 on 27/09/05;

3.8 Comments by Local Stakeholders

Local stakeholders were invited initially trough public discussion during the environmental license issuing process. No comment was received.

Complementary, local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. DNV could verify the evidence for letters sent. No comments were received.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

DNV published the original PDD of 23 March 2005 (also including the Nova Sinceridade and Palestina hydroelectric power plants) on the DNV Climate Change web site (http://www.dnv.com/certification/ClimateChange) and stakeholders were, through the UNFCCC CDM web site, invited to provide comments within a 30 days period from 01 May 2005 to 31 May 2005. One comment was received in this period. The comment received (in unedited form) is given in the below text box.

Comment by:	Axel Michaelowa, Hamburg Institute of International Economics (HWWA)
Inserted On:	2005-05-30
Subject:	Bundle larger than 15 MW threshold
Comment:	
The PDD bundles four plants with a capacity of more than 15 MW. However, the maximum threshold for bundling of renewable electricity projects is 15 MW according to the small-scale project rules. Thus separate PDDs would have to be submitted.	

How DNV has considered the comment(s) received:

It must be noted that this is not a case of bundling projects as per the simplified modalities and procedures for small-scale CDM project activities. Hence the capacity threshold of 15 MW for bundling renewable electricity projects does not apply.

5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity" at Minas Gerais State, Brazil. The validation was performed on the basis of UNFCCC criteria for CDM project activities and relevant Brazilian criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The project participant is Brascan Energética Minas Gerais S.A. of Brazil. The host Party Brazil meets all relevant participation requirements. No participating Annex I Party is yet identified.

The project is a renewable electricity generation project activity. The project consists of two run-of river hydroelectric power plants with only small reservoirs. Each plant provides local electricity generation and distribution, providing site-specific reliability, transmission and distribution to the S-SE-CO Brazilian grid. The total installed capacity of the project is 47.1 MW.

By promoting renewable energy, the project is in line with the current sustainable development priorities of Brazil.

The project applies the approved consolidated baseline methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources". The baseline methodology has been applied correctly and the assumptions made for the selected baseline scenario are sound. It is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are additional to any that would occur in the absence of the project activity.

A combined margin emission coefficient of 0.2783 tCO_2e/MWh is calculated in accordance with ACM0002, i.e. the average of the approximate operating margin and the build margin. The determination of this combined margin emission coefficient is based on actual electricity generation data provided by the National Electricity System Operator (ONS) for the years 2002-2004 for the South-Southeast-Midwest grid.

The monitoring methodology ACM0002 has been applied correctly. The monitoring plan sufficiently specifies the monitoring requirements of the main project indicators.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

Local stakeholder comments were invited according to the Brazilian DNA Resolution 1. No comments were received. Public stakeholder input has also been invited via the UNFCCC web-site. One comment has been received and taken into account in the validation.

In summary, it is DNV's opinion that the "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity" as described in the revised project design document of 23 September 2005, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology for ACM0002. Hence, DNV will request the

registration of the "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity" as CDM project activity.

Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of the DNA of Brazil, including confirmation that the project assists in achieving sustainable development.

REFERENCES

Documents provided by the project proponent that relate directly to the project:

/1/ Ecoinvest: Project Design Document for the "Nova Sinceridade, Palestina, Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants (the CatLeo Project Activity)". Version 1 of 23 March 2005

/2/ Ecoinvest: Project Design Document for the "Cachoeira Encoberta and Triunfo Small Hydroelectric Power Plants - Brascan Energética Minas Gerais S.A (BEMG) Project Activity". Version 5 of 23 September 2005.

/3/ Spreadsheet of Calculation of Combined Margin (ONS Emission Factor SSECO 2002-2004 v 2005-09-23).

/4/ CatLeo meeting report results 2001. Accessed in September 2005 on:

http://www.cataguazes.com.br/corporativo/relacao/relatorios/mensagens/cflcl/mensagem_2001_CFLCL.htm

/5/ Cat-Leo Energia S/A: Cataguazes Leopoldina Group: Cat-Leo Energia S/A, GFC: Version February 2003.

Background documents related to the design and/or methodologies employed in the design or other reference documents:

/6/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/7/ Approved Consolidated Baseline Methodology ACM0002*: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".* Version 01 of 03 September 2004

/8/ Approved Consolidated Monitoring Methodology ACM0002*: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".* Version 01 of 03 September 2004

/9/ Bosi, M., A. Laurence, P. Maldonado, R. Schaeffer, A. F. Simoes, H. Winkler and J.-M. Lukamba: *Road testing baselines for greenhouse gas mitigation projects in the electric power sector*. OECD and IEA information paper, October 2002.

Persons interviewed during the validation, or persons contributed with other information that are not included in the documents listed above:

/10/ Julien Dominic Dias – Brascan – Finance Superv

/11/ Osmar Orman Filho – Brascan – Operation Superv.

/12/ Gilson A. Brunetto – Brascan – Maintenance Eng.

/13/ Carla Oberdiek – Brascan – Environment Manag.

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APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK	Table 2, Section E.4 No Annex I party has yet been identified.
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	-	Table 2, Section A.3 Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written confirmation by the DNA of Brazil that the project assists in achieving sustainable development
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a,CDM Modalities and Procedures §40a	--	Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of the participating Party.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c,CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Decision 17/CP.7	OK	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil

Requirement	Reference	Conclusion	Cross Reference / Comment
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	Brazil ratified the Kyoto Protocol on 23 August 2002
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	No participating Annex I Party
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	No participating Annex I Party
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
16. 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	CDM Modalities and Procedures §40	OK	The PDD has been published on the UNFCCC CDM website www.dnv.com/certification/ClimateChange, and Parties, stakeholders and NGOs

Requirement	Reference	Conclusion	Cross Reference / Comment
			have been invited to provide comments on the validation requirement during a period of 30 days, from 01 May until 31 May 2005. One comment was received and this is addressed in the validation report.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	PDD is in accordance with CDM-PDD (version 02 of 1 July 2004).

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/ /2/	DR	The project consists of two hydroelectric power plants and has as boundaries the limits of the units located on: • Cachoeira Encoberta: Muriaé municip. • Triunfo:Guarani municipality, All municipalities are in Minas Gerais state, Brazil.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/ /2/	DR	The project system's boundaries are limited to the geographic area of the sites that include the two hydroelectric power plants and the electricity generation system that supplies electricity to the South- Southeast-Midwest Brazilian grid.		OK
A.2. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.2.1. Does the project design engineering reflect current good practices?	/1/ /2/	DR	The technology with Francis turbines for run-of-river hydroelectric power plant		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			appears good practices.		
A.2.2. 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?	/1/ /2/	DR	The technology is common used in run-of-river small hydroelectric power plants.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/ /2/	DR	The project is unlikely to be substituted by other more efficient technologies.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/ /2/	DR	The project will require minimal additional training for project maintenance. Moreover, support from the manufacturer is also assured.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/ /2/	DR	See A.2.4		OK
A.3. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/ /2/	DR/I	Yes, the two small hydroelectric power plants have an Environmental Operation Licence issued by environmental state agency (FEAM) according licensing law and corresponding EIA. However DNV request evidence foe the licences for all units Both units are authorized by ANEEL • Cachoeira Encoberta – Res.508/2003 • Triunfo - Res.504/2003	~~CL 1~~	OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/ /2/	DR/I	The consultation of local stakeholders was carried out according Resolution 1 of Brazilian DNA, however the letters were not presented to DNV.	~~CL 2~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/ /2/	DR	The project is in line with current sustainable development priorities in Brazil.		OK
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /2/	DR	The project is likely contributing to improve the number of jobs on each region of each unit and could contributing to improvement of flora and fauna conditions on the rivers where each unit is installed		OK
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*			-		
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/ /2/	DR	The project applies the baseline methodology ACM0002 " Consolidated baseline methodology for grid-connected electricity generations from renewable sources"		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/ /2/	DR	Yes, ACM0002 is applicable to two grid-connected run-of-river hydro power plants without a significant reservoir size The interconnected grid is also properly identified (S-SE-CO regional Brazilian grid).		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
B.2. Baseline Determination *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/ /2/	DR	The baseline for cogeneration considers the operation margin calculated with Simple Adjusted Operation Margin, according to generation data provided by ONS. The calculations don't consider the Build Margin as required by AM0002. The Combined Margin is calculated using the weights w_{om} = 1 and w_{bm} = 0. This alternative weight was proposed to the CDM-EB, but not approved until now.	~~CAR 1~~	OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/ /2/	DR	The project uses data get from ONS for the 120 generation units dispatched centralized by ONS. ACM0002 define the project electricity system for calculating the operation margin and build margin shall be defined by the spatial extent of the power plants that can be dispatched without significant transmissions constrains. DNV request that the OM and BM are calculated as established in ACM0002 or that the conservativeness of the alternative approach is justified.	~~CAR 2~~	OK
B.2.3. Has the baseline been established on a project-specific basis?	/1/ /2/	DR	Yes, the baseline is according electricity would otherwise been generated by		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			operation of grid-connected power plants and by addition of new generation sources.		
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /2/	DR	All the national and/or sectoral policies implemented during the initial phase were considered.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/ /2/	DR	The project uses generation data for the years 2002 to 2004 obtained from ONS. Data from 2005 is not available yet.		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/ /2/	DR	The most likely baseline scenario is the continuation of the current situation, i.e. the national electricity grid being supplied by large hydro projects and by fossil fuel power plants.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's legislation/regulations)?	/1/ /2/	DR/I	The project applies the "Tool for the demonstration and assessment of additionality". The step 0 demonstrates that CDM was considered on the decision of project implementation. However, the evidence of the described contact with the CDM project advisor in 2002 must be verified. Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations: The possible baseline scenarios considered are: a) the continuation of the current situation with the national electricity grid being supplied by large hydro projects and by fossil fuel power plants and b) to invest in and install a new	~~CL 3~~	OK

[*] TJLP is the BNDES long term and reference interest rate for the Bank financing.

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			electricity generator as a run-of-river facility in order to supply electricity to the grid. Both scenarios are in compliance with all applicable legal and regulatory requirements. Step 2 - Investment analysis: Not applicable (Only Step 3 is selected). Step 3 - Barrier analysis: Investment, technological (lack of infrastructure) and institutional barriers are presented. a) Investment barriers: DNV has been able to confirm that the open Brazilian market lacks availability of long-term capital. None of the plants of the project are participants of the PROINFA program. To finance the construction the project sponsor (Brascan Energética Minas Gerais S.A) got, through a financing line of BNDES, a financial support that covers on average for the two projects 70% of the project costs with 14,75% of TJLP* interest rate (BNDES Long Term Interest Rate) rate of 9.75% plus a 5% spread risk for a term of 10 years and 2 years grace period, on average, for the two project components. DNV was able to confirm that despite this loan the IRR of the Cachoeira Encoberta (Ormeo Junqueira Botelho) 13.2 % is , without CER revenues and 13.9 % considering CER revenues, and for Triunfo (Ivan Botelho III) 12.9 % without CER revenues and 13.6 % considering the CER revenues. This IRR analysis considers the cost of investment, the energy		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			production capacity assured by technical studies or by the authorization of ANEEL as "assured energy" and the price given in the PPAs signed on start-up of each hydroelectric power plant. This average project IRR is lower than the SELIC rate in effect at the time of financing, i.e. 19.75% as of July 2005. Hence, it is demonstrated that project is not financially attractive and thus faces investment barriers. Moreover, DNV was able to confirm that the Brazilian market lacks availability of long-term capital and that the CER revenues are likely to provide the necessary incentive for the project, which is deemed a riskier investment than investing in the financial market or large hydro and thermal plants. b) Technological barriers: The regions where the project is located are isolated and underdeveloped. There is a lack of infrastructure such as roads, reliable electricity, communication and transportation. The project sponsor had to develop these facilities before the implementation of the project. Although the mentioned lack of infrastructure will increase the cost of the project, this barrier is to be considered when calculating the IRR and designing/developing the project. c) Institutional barriers: DNV was also able to confirm that the regulatory environment for the electricity sector undergoes frequent changes in Brazil, which causes		

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			uncertainties for investors and developers of similar projects, which could be evidenced by the low number of PCH implemented in the electric market of Brazil. Step 4 - Common practice analysis: Small hydro-electricity projects are not common practice in Brazil. The BAU on the Brazilian electricity market is to continue with large hydro and thermal power projects, which represent the majority of the installed capacity. The project proponent doesn't participate in the PROINFA program mainly because all units started-up before the first period of the program (January 2006). Step 5 - Impact of CDM registration: It is demonstrated that the sale of CERs will provide the incentives for the project to overcome the presented barriers.		
B.2.8. Have the major risks to the baseline been identified?	/1/ /2/	DR	Yes, the volatility on open market of electricity on Brazil.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/ /2/	DR	Yes		OK
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/ /2/	DR	The project's starting date is 1. January 2004. The expected operation lifetime of the project is 25 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period	/1/ /2/	DR	A renewable 7 years crediting period starting in 1. January 2004 has been chosen		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
of 10 years with no renewal)?					
D. Monitoring Plan *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).*					
D.1. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/ /2/	DR	The project applies the monitoring methodology ACM0002 "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources"		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/ /2/	DR	Yes, the project meets the applicability criteria of ACM002.		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/ /2/	DR	Yes, comply with parameters establish on monitoring methodology.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/ /2/	DR	Yes.		OK
D.2. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.2.1. Does the monitoring plan provide for the	/1/	DR	The project consists on two run-of-river		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/2/		hydroelectric power plants and does thus not result in any GHG emissions.		
D.3. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /2/	DR	Emissions from constructions and transportation were considered no be not significant. Methane emissions from submerged biomass are not expected to be significant due the project being two run-of-river hydroelectric power plants with only small reservoirs.		OK
D.4. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/ /2/	DR	The electricity delivered to the grid is monitored by the project proponent as well as by the energy buyer and the collection and archiving is establish according to ACM002. The emission factor is calculated as combined margins and is established ex-ante.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/ /2/	DR	See B.2..2		OK
D.4.3. Will it be possible to monitor the specified	/1/	DR	See D.4.1		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
baseline indicators?	/2/				
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/ /2/	DR	Neither ACM0002 nor the Brazilian DNA requires monitoring of sustainable development indicators.		OK
D.6. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/ /2/	DR/I	No operational and management structure was identified. DNV requests more information about e.g. control measurements and calibration.	~~CL 4~~	OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/ /2/	DR/I	See D.6.1.		OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/ /2/	DR/I	See D.6.1.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/ /2/	DR/I	See D.6.1.		OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/ /2/	DR/I	See D.6.1.		OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/ /2/	DR/I	See D.6.1.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/ /2/	DR/I	See D.6.1.		OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/ /2/	DR/I	See D.6.1.		OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/ /2/	DR/I	See D.6.1.		OK
D.6.10. Are procedures identified for review of reported results/data?	/1/ /2/	DR/I	See D.6.1.		OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/ /2/	DR/I	See D.6.1.		OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/ /2/	DR/I	See D.6.1.		OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/ /2/	DR/I	See D.6.1.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					
E.1. Predicted Project GHG Emissions *The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.*					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/ /2/	DR	The project consists on two run-of-river hydroelectric power plants and does not result in any GHG emissions.		OK
E.2. Leakage *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.*					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/ /2/	DR	No leakage from these activities was identified. See D.3.1.		OK
E.3. Baseline Emissions *The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.*					
E.3.1. Have the most relevant and likely operational	/1/	DR	See.B.2.2		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
characteristics and baseline indicators been chosen as reference for baseline emissions?	/2/				
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/ /2/	DR	See.B.2.2		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/ /2/	DR	See.B.2.2		OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/ /2/	DR	See.B.2.2		OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/ /2/	DR	See.B.2.2		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/ /2/	DR	There are not foreseen project emissions. See B.2.2		OK
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/ /2/	DR	Emission reductions are claimed from displacing grid electricity with electricity generated by the hydroelectric power plants and supplied to the grid. The estimated amount of GHG reduction from the project is 335 059 tCO_2e during the first crediting period (7 years), resulting in estimated average annual emission reductions of 47 865 tCO_2e.		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /2/	DR/I	The project has received an Operational Environmental Licence by the environmental state agency (FEAM), which was issued after analysing each EIA. As the projects use small reservoirs and operate as run-of-river, no significant impact was evidenced. The PDD only included the Operation Licence of Nova Sinceridade, DNV thus request evidence for the Operation Licence of Cachoeira Encberta and Triunfo.	~~CL 1~~	OK
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /2/	DR	See F.1.1		OK
F.1.3. Will the project create any adverse environmental effects?	/1/ /2/	DR	See F.1.1		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/ /2/	DR	See F.1.1		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/ /2/	DR	See F.1.1		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/ /2/	DR	See F.1.1		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
G. *Stakeholder Comments* *The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.*					
G.1.1. Have relevant stakeholders been consulted?	/1/ /2/	DR/I	Local stakeholders were invited initially trough public discussion during the environmental license issuing process. No comment was received. Complementary, local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. The letters sent to the local stakeholders were verified during site visit.	~~CL 2~~	OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /2/	DR	See G.1.1		OK
G.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?	/1/ /2/	DR	See G.1.1		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/ /2/	DR	No comments were received.		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/ /2/	DR	See G.1.4		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1 The Combined Margin is calculated using the weights w_{om} = 1 and w_{bm} = 0. This alternative weight was proposed to the CDM-EB, but was not approved until now.	B.2.1	Brascan: The corresponding information was corrected in the new PDD version (#5). Requested information submitted to DNV.	Section E and annex 1 of the revised PDD provides the requested clarification on calculation. The correct weight of w_{om} = 0.5 and w_{bm} = 0.5 established by ACM0002 is now applied. This CAR is therefore closed.
CAR 2 The project use data get from ANEEL for the 120 generation units dispatched by ONS. To calculate de operation margin and build margin the project electricity system shall according to ACM0002 be defined by the spatial extend of the power plants that can be dispatched without significant transmissions constrains. DNV request that the OM and BM are calculated as established in ACM0002 or that the conservativeness of the alternative approach is justified..	B.2.2	Brascan: The corresponding information was corrected in the new PDD version (#5). Requested information submitted to DNV.	The combined margin emission coefficient for the S-SE-CO grid is determined ex-ante in accordance with ACM0002. The calculations were based on electricity generation data provided by the Brazilian Electricity Agency (ANEEL) and the National Electricity System Operator (ONS) for the electricity generated in the South-Southeast-Midwest (S-SE-CO) regional Brazilian grid in the years 2002-2004. The ONS dataset does not include power plants that dispatch locally. Data for the years 2002-2004 are the most recent statistics available and the data was verified against the data published on the ONS website. It is justified to only include plants dispatched by ONS although they only represent about 80% of the total installed capacity. Data for the remaining plants is not publicly available as these remaining plants operate either based on power purchase agreements, which are not under control of the dispatch authority, or are located in non-interconnected systems to which ONS has no access. Hence, these plants are not likely to be affected by a CDM project and the power plants dispatched by ONS are thus representative for the operating margin.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
			It is recognised that in the absence of actual fuel consumption data, the calculated plant specific emission coefficients are sensitive to the assumed plant efficiency for each plant. Nonetheless, the applied average plant efficiencies for different power plant types established in the IEA study on the Brazilian grid /9/ is deemed to represent the best data that is currently available. This CAR is therefore closed.
CL 1 As the PDD only includes the Operation Licence of Nova Sinceridade, DNV requests evidence of the Operation Licence for Cachoeira Encoberta and Triunfo	A.3.1 F.1.1	Brascan: Requested information submitted to DNV.	Operation licences were presented. Furthermore the letters issued to Environment Agency communicate the actual installed capacity. This CL is therefore closed.
CL 2 The consultation of local stakeholders was carried out according Resolution 1 of Brazilian DNA. However, the letters were not presented to DNV.	A.3.2 G.1.1	Brascan: Requested information submitted to DNV.	Local stakeholders should be invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. Although evidences of letters sent were received, the PDD mentions that letters will be sent and thus no summary of comments were evidenced. DNV requests clarifications about this inconsistency.
CL2 Continued Local stakeholders should be invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. Although evidences of letters sent were received, the PDD mentions that letters will be sent and thus no summary of comments were evidenced. DNV requests clarifications about this inconsistency.	A.3.2 G.1.1	Brascan: No comments were received.	Section G of the revised PDD and the statement about comments provides the requested clarification. This CL is therefore closed

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
CL 3 Evidences that the CDM was considered in the decision to implement the project like contact with a CDM project advisor in 2002 must be made available to DNV.	B.2.7	Brascan: Requested information submitted to DNV.	Complementary documents were presented /4//5/. This CL is therefore closed.
CL 4 No operational and management structure for monitoring was identified. DNV request more information about how control measurements and calibration.	D.6.1	Brascan: Item D.2 of the PDD informs the procedures to check the power generation, and the company posses a certified data control process (ISO). Also, the company participates in the MAE, which guarantees the monitoring accuracy.	Section D.2 of the revised PDD provides the requested clarification on monitoring procedures. During the site visit, DNV could verify that an operation centre for all plants, located o Curitiba municipality, is implemented. The framework of operation control and the registration of electricity generation and other control parameter transmitted from each plant to the control centre by a satellite was audited.. Also, as the energy is sold through the MAE - Electric Energy Wholesale Market, all information about electricity generation is verified by the grid operator. This CL is therefore closed.

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