VALIDATION REPORT

RODEIO BONITO SMALL HYDRO POWER PROJECT IN BRAZIL

REPORT NO. 2008-1120

REVISION NO. 02

DET NORSKE VERITAS

VALIDATION REPORT

DET NORSKE VERITAS
CERTIFICATION AS

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Approved by: Michael Lehmann	Organisational unit: Climate Change & Environmental Services
Client: Rodeio Bonito Hidrelétrica S/A	Client ref.: Mr. Ruiter Netto Campos

Project Name: Rodeio Bonito Small Hydro Power Project
Country: Brazil
Methodology: AMS-I.D
Version: 15
GHG reducing Measure/Technology: Electricity generation through renewable hydro power
ER estimate: 15 041 tCO_2e per year.
Size
☐ Large Scale
☒ Small Scale
Validation Phases:
☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues
Validation Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

This validation report summarizes the findings of the validation. In summary, it is DNV's opinion that the "Rodeio Bonito Small Hydro Power Project" in Brazil, as described in the PDD of 1 December 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology AMS-I.D, version 15. Hence, DNV will request the registration of the project as a CDM project activity.

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Rodeio Bonito Small Hydro Power Project in Brazil

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Abbreviations

ANEEL	Agência Nacional de Energia Elétrica (Brazilian National Electricity Agency)
BM	Build Margin
BNDES	Brazilian Bank for Development
CAR	Corrective Action Request
CCEE	Câmara de Comercialização de Energia Elétrica (Brazilian Chamber of Electricity Commercialization)
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CM	Combined Margin
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COFINS	Contribuição para o financiamento da seguridade social (Contribution to the Social Security Financing)
CSLL	Contribuição Social sobre o Lucro Líquido (Social contribution on revenues)
DNV	Det Norske Veritas
DOE	Designated Operation Entity
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
ICMS	Imposto sobre circulação de mercadorias e serviço (tax on transport of goods and services)
IPCC	Intergovernmental Panel on Climate Change
MAE	Mercado atacadista de energia (Energy wholesale market)
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
ONS	Brazilian National Electric System Operator
PDD	Project Design Document
PIS	Programa de integração social (Social integration program)
UNFCCC	United Nations Framework Convention on Climate Change

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1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the "Rodeio Bonito Small Hydro Power Project", located in Santa Catarina 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 Rodeio Bonito Hidrelétrica S/A of Brazil. The host Party Brazil meets all relevant participation requirements. No participating Annex I Party is yet identified.

The project activity is a run-of-river hydroelectric power plant with 14.637 MW of installed capacity.

The project applies the approved simplified baseline and monitoring methodology, AMS-I.D, i.e. "Grid connected renewable energy generation" (version 15). The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound.

By generating electricity from hydropower and displacing electricity from the grid that is partly generated from fossil fuels, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The monitoring methodology has been correctly applied. The monitoring plan sufficiently specifies the monitoring requirements of the main project indicators. Adequate training and monitoring procedures have been implemented.

Local stakeholders, such as the municipal government, the state and municipal environmental 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 7 of the Brazilian DNA.

In summary, it is DNV's opinion that the "Rodeio Bonito Small Hydro Power Project" in Brazil, as described in the PDD of 1 December 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology, AMS-I.D, version 15. Hence, DNV will request the registration of the project as a CDM project activity.

Rio de Janeiro and Oslo, 6 December 2010

Michael Lehmann

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Det Norske Veritas Certification AS

2 INTRODUCTION

Rodeio Bonito Hidrelétrica S/A has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the "Rodeio Bonito Small Hydro Power Project" in Brazil (hereafter called "the project"). This report summarises the findings of the validation, performed 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 simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, 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).

2.2 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 simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology. The validation team has, based on the recommendations in the validation and verification manual /31/ conducted the validation.

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.

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the validation:

/1/ Rodeio Bonito Hidrelétrica S/A: Project design document for the "Rodeio Bonito Small Hydro Power Project", version 01 of 25 March 2008, version 02 dated 21 September 2009 and final version 03 dated 1 December 2010.

/2/ ANEEL: Authorization 226 for the exploration of the Rodeio Bonito SHP for 30 years dated 5 May 2004, authorization 1.002 dated 7 August 2007 for the generation of 14 MW at Rodeio Bonito SHP, and authorization 4.720 dated 18 December 2008 for the capacity increase to 14.637 MW.

/3/ Rischbieter Engineering: Energetic studies for Rodeio Bonito dated September 2007.

/4/ Velcan: Minute of Board Meeting dated 18 June 2007 in which the project is approved considering CDM benefits.

/5/ Contract between Velcan and Seta for civil works dated 20 August 2007.

/6/ Generators purchase contract with Weg dated 2 September 2007.

/7/ Turbines purchase contract with Rischbieter dated 8 January 2008.

/8/ Turbines purchase contract with HISA dated 5 December 2007.

/9/ Newspaper "Diário da Manhã" dated 14 March 2008: "Social Compensation of 400,000 BRS".

/10/ Velcan: Consolidated Financial Statement dated 31 December 2006.

/11/ BNDES: project financing rules (www.bndes.gov.br)

/12/ Brazilian central bank: monthly SELIC rate.

/13/ ANEEL: Rodeio Bonito technical spreadsheet dated 28 September 2007.

/14/ Aline Sacchi Homrich (UFSC) and Nelson Casarotto Filho (UFSC): "Investment comparison analysis in the electrical sector", 9 October 2006.

/15/ Impacto Assessoria Ambiental: Proposal for environmental monitoring dated 6 July 2007.

/16/ Brazilian Government: Decree 3 000 dated 26 March 1999.

/17/ Chan Jee Quim: "Small Hydroelectric Power Plants" – University of Sao Paulo, 7 December 2007.

/18/ Arthur Octávio Pinto Barreto de Mello: "Investments at electrical sector" – University of Rio de Janeiro, May 2008.

/19/ Velcan: IRR calculation spreadsheet dated 24 November 2010.

/20/ Eletrobras: 3rd National Conference of Science, Technology and Innovation dated 17 November 2005.

/21/ ANEEL: Auction 004/2006 and other auctions from 2006 / 2007 available at http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=b01b9f733d60b010VgnVCM1000005e01010aRCRD

/22/ ANEEL: List of small hydropower plants that started operation in the South of Brazil from 2005 to 2007. (http://www.aneel.gov.br/aplicacoes/capacidadebrasil/GeracaoTipoFase.asp?tipo=5&fase=3)

/23/ List of power plants with Proinfa's incentive: http://www.eletrobras.com/elb/gestaofinanceira/data/Pages/LUMISABB61D26PTBRIE.htm

/24/ Small hydropower plants considering CDM benefits: http://cdm.unfccc.int/Projects/Validation/index.html

/25/ MCT (Brazilian DNA): Brazilian grid official emission factor. http://www.mct.gov.br/index.php/content/view/74689.html

/26/ Santa Catarina State Environmental Foundation: Environmental installation license for Rodeio Bonito dated 19 March 2007.

/27/ Velcan: stakeholders consultation letters.

/28/ *"Appendix B of the "Simplified modalities and procedures for small-scale CDM project activities"* - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities: AMS-I.D – "*Grid connected renewable electricity generation"* for Type I – *Renewable Energy Projects*. Version 15

/29/ CDM-EB: "Tool to calculate the emission factor for an electricity system", version 02

/30/ CDM-EB: Attachment A to the "Appendix B of the "Simplified modalities and procedures for small-scale CDM project activities" - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities. Version 06 of September 2005.

/31/ CDM-EB: Validation and Verification Manual, version 01.2

/32/ Comissão Interministerial de Mudança Global do Clima (DNA of Brazil): *Letter of Approval*. 7 April 2010 http://www.mct.gov.br/index.php/content/view/57967.html

/33/ State Attorney General of Santa Catarina State: Letter 298/08/9aPJ/M dated 23 July 2008

/34/ Tokyo Marine Insurance Company: Insurance 05 67 102577 dated 18 July 2007

/35/ Contracs for the substation, transformers and transmission lines:
- Contract with “Indústria de Postes Indaial” dated 23 January 2008;
- Contract with “Trafo Equipamentos Elétricos S.A.” dated 13 November 2007;
- Contract with Tecniwer dated 17 October 2007;
- Contracts with Eletrowatt dated 6 September 2007 and 3 March 2008

/36/ CDM-EB: “Guidelines for the reporting and validation of plant load factors”, version 01

Main changes between the version published for the 30 days stakeholder commenting period and the final version submitted for registration:

- Corrective actions related to the CAR’s/CL’s described in Appendix A of this report.
- PDD updating for AMS-I.D version 15.
- Corrections as per UNFCCC Secretariat’s incompleteness message

3.2 Follow-up Interviews with Project Stakeholders

The Validation and Verification Manual /31/ paragraph 60 determines that for proposed CDM project activities in existing facilities or utilizing existing equipments, the DOE shall conduct a physical site inspection to confirm that the description in the PDD reflects the proposed CDM project activity for non-bundled small scale projects with emission reductions exceeding 15,000 tonnes per year. Considering that the project activity was a greenfield project at the time of start of the validation process, DNV did not perform a site visit. Besides that, all relevant documentation was made available such as technical studies, licenses, stakeholders comments, excel sheets, evidences to input parameters, among others /3/ - /35/. Project stakeholders /37/ were interviewed by phone and e-mail, and were able to provide all information required to evidence the statements of the PDD.

The main topics of the interviews are summarized in the table below.

	Date	Name	Organization	Topic
/37/	August 2008 to September 2009	Nicolas Thouverez – Project Manager	Velcan	• Additionality of the project • Monitoring plan • Feasibility study • Baseline determination • Environmental licenses/legal compliance • Stakeholders consultation process

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation is to resolve any outstanding issues which need be clarified prior to DNV’s positive conclusion on the project design. In order to ensure transparency a validation protocol is customised for the project. The protocol shows in

transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, 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 two tables. The different columns in these tables are described in the figure below. The completed validation protocol for the "Rodeio Bonito Small Hydro Power Project" is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM 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 and/or methodology specific 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.

A request for clarification (CL) 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***
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.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	*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 c**orrective 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 and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a CAR or a CL, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the CAR or CL 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

3.4 Internal Quality Control

The final validation report including the validation findings underwent a technical review before being submitted to the project participants. The technical reviews were performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation Team

The validation team consisted of the following personnel:

				Type of involvement					
Role/Qualification	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Sectoral competence
CDM validator / technical team leader	Antunes	Felipe	Brazil	x	x	x	x		X
GHG auditor	Ratton	Marco	Brazil	x	x				
CDM Validator / sector knowledge	Huang	Peng	China	x					x
Technical reviewer	Yang	Weidong	USA					x	

The qualification of each individual validation team member is detailed in Appendix B to this report.

4 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.

4.1 Participation Requirements

The project participant is Rodeio Bonito Hidrelétrica S/A from the host country Brazil. The host country Brazil meets all the relevant participation requirements and has provided written approval of voluntary participation in the project /32/. DNV confirmed from the DNA webpage /32/ the authenticity of the letter provided by the project proponent (PP) and considers that the letter complies with paragraphs 45-48 of the Validation and Verification Manual /32/.

The implementation of project activity is expected to contribute to sustainable development through the decrease in the dependence on fossil fuels, diversification of the supply of electricity, increase in employment opportunities, creating better revenue distribution, development of technological capacity, and regional integration and connection with other sectors. The contribution of the project to the sustainable development needs to be confirmed by the DNA of Brazil.

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

4.2 Project Design

The project activity is a run-of-river hydroelectric power plant with 14.637 MW of installed capacity, located on the Irani River, in the municipality of Chapecó, Santa Catarina State, Brazil. Five turbines/generators are installed, three with a 4.667 MW capacity each and two with a 0.318 MW capacity each. DNV could confirm the capacities by checking the turbines purchase contracts /7//8/. According to the Brazilian National Electricity Agency, ANEEL, the hydropower plant is considered small hydropower plant as the installed capacity is below 30 MW. The plant is connected to the grid of Brazil. The relevant energy authorizations from ANNEL were checked /2/.

The project design engineering reflects current good practice. The essential equipment consists of three Francis turbines and two Kaplan turbines connected to three 3-Phase synchronous brushless turbines and two submersible hydro turbines respectively. A Kaplan turbine is a propeller-type water turbine that has adjustable blades. It is an inward flow reaction turbine, which means that the working fluid changes pressure as it moves through the turbine and gives up its energy. This kind of turbine, which is an evolution of the Francis turbine, allows efficient power production in low head applications that was not possible with Francis turbines. The proposed power plant has an estimated yearly generation of about 77 059 MWh, corresponding to a plant load factor (PLF) of 60%. DNV could confirm that this PLF was determined by a third party contracted by the company /3/; thus, the PLF is determined as per the requirement in the “Guideline for the reporting and validating of plant load factors” /36/ para 3b.

The project proponent has not registered any small scale CDM projects in the last 2 years and the project boundary is not within 1 km radius of any other proposed small scale CDM project. Hence, the project activity is not a de-bundled component of a larger project activity.

The starting date of the project activity is declared as 20 August 2007, which is the date of the contract for the construction work /5/. This date corresponds to the project activity's first commitment on expenditures.

The expected operational lifetime of project activity is 25 years /2/. The project proponent has selected a renewable crediting period of 7 years with the starting date of 1 June 2010 or the date of registration, which ever is later.

As a renewable energy project, the proposed project activity will be expected to achieve 15 041 tCO_2e GHG emission reductions annually through displacing part of the electricity generated by the Brazilian grid, which is partly generated by fossil fuels.

The project description is to the consideration of DNV complete and accurate.

4.3 Baseline Determination

The approved baseline methodology AMS-I.D, version 15 – "Renewable electricity generation for a grid" /28/, has been applied for the proposed project activity. The baseline methodology chosen is applicable and justified for the project, as the project is a grid connected renewable energy generation unit. The installed capacity of the proposed project is 14.637 MW, which is within the 15 MW limit specified for type I small scale activities. DNV could confirm the installed capacity through the ANEEL authorization /2/, the energetic studies /3/ and the turbines purchase contracts /7//8/. AMS-I.D is applicable also because the project activity results in a new reservoir with power density 17.5 W/m^2, therefore higher than the 4 W/m^2 lower limit. The reservoir area of 0.838 km^2 was confirmed in the ANEEL authorization /2/.

The project activity is not a debundled component of a larger project activity since the project participants have not registered another project using the same technology within 1 km radius of the project during the past two years.

According to AMS-I.D, the baseline is the electricity generated by the proposed project activity times the emission coefficient of the grid calculated as per the "Tool to calculate the emission factor for an electricity system" /29/. In the absence of proposed project activity, the same amount of electricity would have been generated by power plants connected to relevant electric power system.

The project boundary for the project is the physical, geographical site of the renewable generation source. The grid boundary is the spatial extent of the power plants that can be dispatched without significant transmission constraints in the relevant electric power system. The selected sources and gases are justified for the project activity.

The application of the baseline methodology is transparent and conservative.

4.4 Additionality

The project proponent refers to the attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities /30/ to demonstrate the additionality of the project through an analysis of the following barriers: (a) investment barriers, (b) barriers due to prevailing practice and (c) other barriers for the two scenarios: i) continuation of current activities (produce energy by thermal sources) and ii) construction of new renewable energy plants.

While the continuation of current activities does not face any barriers, the construction of new renewable energy plants faces an investment barrier, a barrier due to prevailing practice and other barriers.

4.4.1 CDM consideration and continued action to secure CDM status

The serious consideration of CDM prior to project start was demonstrated through the Board Meeting Minutes dated 18 June 2007 in which the project is approved to be implemented as a CDM project /4/.

The starting date of the project activity is 20 August 2007 which is the date of signing the contract for the construction works /5/. DNV confirms that this date corresponds to the project's first commitment on expenditures, since that was before the procurement of generators in 2 September 2007 /6/ and the procurement of turbines in 8 January 2008 and 5 December 2007 /7//8/.

Real action to secure CDM registration were undertaken in parallel, as DNV issued its first proposal for the validation of the project activity in 26 December 2007, six months after the project approval. The validation process started on 5 April 2008.

4.4.2 Investment barriers

There is lack of long-term debt financing from commercial banks to small and medium investors. DNV could confirm that financing from BNDES /11/ is only available to companies willing to offer corporate or real guarantees in excess of total amount borrowed. According to the consolidated financial statement /10/, the project participant was created in 2005 and had no such guarantees.

An investment analysis was performed to demonstrate that the project is not financially attractive and thus faces investment barriers.

4.4.2.1 Investment analysis: Choice of approach

Since the proposed project generates financial and economic benefits through the sales of electricity other than CDM-related income and the alternative does not involve any investment, a benchmark analysis is applicable.

4.4.2.2 Investment analysis: Benchmark selection

The Brazilian interest rate (SELIC) is appropriately selected as the benchmark for Project IRR after tax. The project proponent considered the average value of 2 years before the investment decision (from July 2005 to June 2007), which corresponds to 15.5% /12/.

4.4.2.3 Investment analysis: Input parameters

DNV has validated all input values to the investment analysis based on appropriate evidence, as described below. The input parameters used in the financial analysis were compared with the data reported for other similar registered CDM projects developed in Brazil, regarding plant load factor, investment costs per MW, percentage of O&M costs relative to total investment costs, administrative costs as following Table 1. It shows that the project parameters are in a reasonable range.

Table 1 Hydropower projects developed in Brazil

Ref No.	Project	MW	PLF	investment per MW (BRS/MW)	O&M/ Investment	Adm cost/investment
0968	Incomex Hydroelectric Project	2.1	75%	3 962,797	1.02%	-
1526	Saldanha Small Hydroelectric Project	5	68%	5 668,042	2%	-
2793	Santana I SHP CDM Project	14.758	59%	2 825,376	4.17%	2%
	Rodeio Bonito	14.637	60%	3 924.675	2.7%	0.4%

Investment costs:

The project sponsor has provided the technical spreadsheet /13/ submitted to ANEEL for the authorization process, which describes the total investment of 57 418 000 BRS, of which 22 791 000 BRS corresponds to the civil works, 14 510 000 corresponds to the electrical equipment and 7 882 250 BRS corresponds to substation, transformers and transmission lines. DNV compared these values with the real ones defined in the signed contracts, and the real costs of both civil works /5/, electrical equipment /6//7//8/, and the substation, transformers and transmission lines /35/ were found to be exactly the same as the budgeted ones. Since these values correspond to 78.7% of the total investment, DNV considers these contracts representative for the estimated value of the total investment.

O&M costs:

The operating and management costs were estimated as 2.7% of the total investment. It is DNV's opinion that this is reasonable for this kind of projects and similar to other hydro projects in Brazil. Besides that, the sensitivity analysis will demonstrate that this parameter is not critical, since even with a 85% reduction of O&M costs the project IRR would not reach the benchmark.

Administrative costs:

The administrative costs were estimated as BRS 250 000 per year, considering the price of commercialization, and the necessity to have one lawyer, one engineer, and management part time on the follow up of the operation. It is DNV's opinion that this is reasonable for this kind

of projects and similar to other hydro projects in Brazil. Insurance costs were estimated as 0.8% of total investment per year based on previous insurance policies for other projects /35/.

Transmission & Distribution costs:

The transmission and distribution costs were estimated as 2% of the electricity turnover. This estimation is supported by a paper presented at ENEGEP congress /14/, in which it is analyzed the average investment for small hydro power plants in Brazil (up to 30 MW).

Electricity tariff:

The electricity tariff is 135 BRS/MWh. This value was conservatively established based on the ANEEL auction 04/2006 /21/, in which ANEEL presents the tariffs for some projects. The presented tariffs vary from 112.68 BRS/MWh to 135 BRS/MWh. The project proponent selected the highest tariff.

Environmental costs:

The environmental costs of 10 000 BRS/year were considered based on the consultant proposal /15/.

Taxes and depreciation:

DNV could also confirm that the values of 25% for ICMS, 0.65% for PIS, 3.00% for Cofins, 15% for income tax and 9% for CSLL, and a linear depreciation in 25 years were established accordingly to the Brazilian legal requirements /16/. The MAE, CCEE and ANEEL taxes were supported by academic studies /17//18/.

4.4.2.4 Investment analysis: Calculation and conclusion

The IRR calculations were provided in a spreadsheet /19/. The calculations were verified and found to be correct by DNV. The assumptions used in the calculations were deemed to be correct by DNV. The project-IRR without CDM revenues is 13.32%, which confirms that the project in the absence of CDM benefits and compared to the benchmark is not financially attractive.

4.4.2.5 Investment analysis: Sensitivity analysis

The sensitivity analysis considering variations in the total investments, O&M costs, tariff prices and electricity generated demonstrates the following:

- Total investments: If the total investment decreases by 15%, the project IRR will reach the benchmark. However, considering the Eletrobras study that analyzes the average data of invested value in hydropower plants per MW /20/, the result is found to be BRS 4 425/MW. Besides, considering that both civil works /5/ and electrical equipment /6//7//8/ real costs are the same as the budget ones, and that these components correspond to 78.7% of the total investment, a 15% decrease is not likely.
- Operation and maintenance (O&M) cost: If reducing the O&M cost by 85%, the project IRR can be equal to the benchmark. However, this is very unlikely to happen.
- Electricity tariff: To reach the benchmark, the electricity tariff must increase 15%, which is not likely to happen. According to the tariffs presented in the ANEEL auction 04/2006 /21/, its variation is from 112.68 BRS/MWh to 135 BRS/MWh. As the project activity conservatively took the highest tariff, it is not likely for the tariff to increase by 15%. DNV also cross-checked all other ANEEL auctions from 2006 to 2007 /21/: there is only one tariff higher than 135 BRS/MWh among a total of 40

projects – and this tariff is 135.98 BRS/MWh.

- Electricity generation: To reach the benchmark, the electricity generation must increase 18%, which is not likely to happen. The energetic studies for Rodeio Bonito /3/ considered 35 years (from 1970 to 2005) of historical Irani river flow data. Such an increase of 18% compared to the 35 historical average in the annual flow river is highly unlikely.

The sensitivity analysis shows that even with substantial variation of the key indicators, the IRR of the proposed project is lower than the benchmark.

4.4.3 Prevailing practice barriers

The project proponent analyzed other activities similar to the proposed project activity and that have occurred by the time of the project decision phase in the South region of Brazil. All small hydropower plants that started operation from 2005 to 2007 were analyzed /22/.

The project proponent could successfully demonstrate that from the 19 small hydropower plants that started the operation in this period, 12 of them had either Proinfa's incentives /23/ or were considered as CDM project activities /24/. The remaining 7 power plants have a much smaller capacity than Rodeio Bonito – the highest capacity is 5.6 MW, which shows that they are not similar to the proposed project activity. Therefore, it is demonstrated that the project activity faces prevailing practice barriers.

4.4.4 Other barriers

The transmission line which will have to be built between the project activity and the substation of the grid goes 5 km through the city of Chapeco. This could create a barrier which represents a risk for the development of the project. DNV could confirm /9/ that in March 2008 the company had to compensate financially the Chapecó city hall. However, it was demonstrated that this barrier was not mitigated by this payment, in line with VVM para 116: in August 2008 Velcan was intimated by the State Attorney General of Santa Catarina State /33/ because of the community complaining that they didn't want a transmission line passing by their neighborhood. CDM could alleviate this barrier by demonstrating to the community that the project activity does have an important contribution to environmental sustainability by reducing carbon dioxide emissions that would have occurred otherwise.

In conclusion, the assessment of the arguments presented above is deemed to sufficiently demonstrate that the project is not a likely alternative, and that emission reductions resulting from the project are additional.

4.5 Monitoring

The approved small scale monitoring methodology AMS-I.D, version 15 /28/, "Renewable electricity generation for a grid", has been adopted for the proposed project activity. The choice of methodology is justified as the project activity is the generation of electricity using hydro potential and supplying to the relevant electric power system.

The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions. According to AMS-I.D, no indicators have been defined regarding project emissions.

Leakage accounting has not been considered for the project since the renewable energy technology equipment is not transferred from another activity or to another activity.

Monitoring of sustainable development indicators is not required by the Brazilian DNA.

4.5.1 Parameters determined ex-ante

The following parameters are determined *ex-ante* and were confirmed by the ANEEL authorization /2/:

- Reservoir Surface Area: 0.838 Km^2
- Installed Capacity: 14.637 MW

4.5.2 Parameters monitored ex-post

The monitoring plan allows for collection and archiving of the following key parameters related to the determination of emission reductions resulting from the project activity:

- EG_y: Annual net electricity supplied by the project to the grid, monitored by a calibrated cumulative meter. Data collected by the project developer will be cross checked with the electricity sales receipts obtained from the grid operator.
- EF_y: Brazilian official grid emission factor. This parameter is validated and will be updated yearly from the Brazilian DNA webpage (http://www.mct.gov.br/index.php/content/view/74689.html) /25/.

4.5.3 Management system and quality assurance

Responsibilities and authorities for project management, monitoring and reporting activities, measurement, training and reporting techniques and QA/QC procedures are defined in the PDD /1/.

The electrical meters used are to be maintained and calibrated as per the manufacturer specifications which are considered appropriate. The meter readings at the site are compared to the sale receipts provided by the grid operator on the project electricity delivered into their system. All electricity measuring instruments are calibrated by the distribution concessionaire.

The application of the monitoring methodology is transparent and DNV considers the project participants able to implement the monitoring plan.

4.6 Estimate of GHG Emissions

The project involves hydro power generation, which partly displaces fossil fuel based power from the relevant electric power system.

In accordance with the simplified baseline methodology AMS-I.D, version 15, no leakage effects or project emissions have been considered.

The emissions reductions are equal to the baseline emissions and are calculated as the electricity delivered to the grid times an emission factor for the relevant electric power system. The emission factor is calculated yearly by the Brazilian DNA according to the "Tool to calculate the emission factor for an electricity system" /29/, and it will be updated ex-post. The Operating Margin emission factor is calculated using option c from the tool – "Dispatch data analysis", since detailed hourly information on energy dispatched by each power plant is available. The sample group of power units m used to calculate the build margin consists of the set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. This option was used as this set of power units comprises the larger annual generation. For the ex-ante estimation of emissions reduction, the electricity generated is estimated to be 77 059 MWh, the electricity supplied to the grid considering 3% line losses and 0.53% auto consumption is estimated to be 74 351 MWh, and the grid emission factor of 2006, which was the most recent one at the time of the validation start, is considered, corresponding to 0.2023 tCO_2/MWh.

The project is estimated to result in 15 041 tCO_2 of emission reductions annually through out the 7 year renewable crediting period. The baseline emission estimate can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration. The data sources mentioned have been verified by DNV.

In summary, the GHG calculations are complete and transparent, and their accuracy has been verified. No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been found.

4.7 Environmental Impacts

A Simplified Environmental Impact Assessment was conducted for the project as a prerequisite for applying for the Preliminary License (LP) and the Construction License (LI) which are required by the Brazilian Environmental Regulation (Resolution CONAMA - *Conselho Nacional do Meio Ambiente* (National Environmental Council) n° 237/97) as a prerequisite for initiating the project construction phase (currently in progress). By assessing such documents /26/, DNV was able to confirm that negative environmental impacts arising from the project construction and operation are regarded as reduced and not relevant.

4.8 Comments by Local Stakeholders

As part of local stakeholders consultation, Rodeio Bonito Hidrelétrica S/A has sent letters inviting the following entities for comments on the project in accordance with the requirements of Resolution 7 of the Brazilian DNA:

- City council of Arvoredo municipality;
- City council of Chapecó municipality;
- City hall of Arvoredo municipality;
- City hall of Chapecó municipality;
- The local environmental NGOs "Verde Vida Programa Oficina Educativa";
- Environmental authority of Chapecó municipality (FUNDEMA);

- Environmental authority of Santa Catarina State (FATMA);
- State Attorney General of Santa Catarina State;
- Brazilian Forum of NGOs and Social Movements for the Environment and Development (FBOMS)
- Federal Attorney General.

No comments have been received. DNV has checked all the stakeholders letter of invitation /27/. DNV considers the local stakeholder consultation carried out adequately.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD of 25 March 2008 was made publicly available on DNV´s climate change website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 5 April 2008 to 4 May 2008.

No comments have been received.

APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion
About Parties		
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
The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
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	OK
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
In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	No public funding is involved, and the validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima.

Requirement	Reference	Conclusion
The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	Brazil ratified the Kyoto Protocol on 23 August 2002. The United Kingdom ratified the Kyoto Protocol on 31 May 2002.
The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	No Annex I Party is yet identified.
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	No Annex I Party is yet identified.
About additionality		
Reduction in GHG emissions shall be additional to any that would occur in the 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
About forecast emission reductions and environmental impacts		
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
About small-scale project activities (if applicable)		
The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK
The proposed project activity shall confirm to one of the project	Simplified Modalities and	OK

Requirement	Reference	Conclusion
categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category.	Procedures for Small Scale CDM Project Activities §22e	
If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK
About stakeholder involvement		
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
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	The project design document was published on the UNFCCC CDM website and Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment during a 30 days period from 5 April 2008 to 4 May 2008. No comments have been received.
Other		
The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
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
The baseline methodology shall exclude to earn CERs for decreases in	CDM Modalities and	OK

Requirement	Reference	Conclusion
activity levels outside the project activity or due to force majeure.	Procedures §47	
The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
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 Requirements Checklist

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	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 boundaries (geographical) clearly defined?	/1/	DR	Yes. GPS coordinates are given.		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	The project boundary for the project is the physical, geographical site of the renewable generation source. The grid boundary is the spatial extent of the power plants that can be dispatched without significant transmission constraints in the relevant power system. Information regarding the definition of the Brazilian connected electricity system, as well as assumptions, method and values adopted for calculation of the grid Operating Margin (OM) and Build Margin (BM) for the grid emission factor by the Brazilian DNA are not updated. Project participant is requested to amend all related sections of the PDD with up-to-date information and also follow all guidance and procedures available in the "Tool *to calculate the emission factor for an electricity system"* for determining and	~~CAR 2~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			monitoring the Emission Factor for the applicable connected electricity system. DNV highlights that according to the "Tool to calculate the emission factor for an electricity system", "(…) the calculation *of the operating margin and build margin emission factors should be documented electronically in a spreadsheet that should be attached to the CDM-PDD. This should include all data used to calculate the emission factors, including:* *• For each grid-connected power plant / unit the following information:* *o Information to clearly identify the plant;* *o The date of commissioning,* *o The capacity (MW);* *o The fuel type(s) used;* *o The quantity of net electricity generation in the relevant year(s);* *o If applicable: the fuel consumption of each fuel type in the relevant year(s);* *o In case where the simple OM or the simple adjusted operating margin is used: information whether the plant*		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			/ unit is a low-cost / must-run plant / unit; *• Net calorific values used;* *• CO2 emission factors used;* *• Plant efficiencies used;* *• Identification of the plants included in the build margin and the operating margin during the relevant time year(s);* *• In case the simple adjusted operating margin is used: load data (typically in MW) for each hour of the year y;* *• In case the dispatch data operating margin is used: for each hour h where the project plant is displacing grid electricity:* *o The dispatch order of all grid-connected power plants;* *o The total grid electricity demand;* *(…)"*		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Due to the requirements above, project participants are requested to amend the following sections of the PDD accordingly: B.6.1, B.6.2, B.6.3, B.6.4, B.7.1 and Annex 3. *DNV highlights that, in* accordance to the applicable CDM rules and procedures, any applicable deviation of the guidance and procedures provided by the "Tool *to calculate the emission factor for an electricity system"* should be proposed and justified by project participant or the DNA in question via a formal consultation to the CDM EB via an appropriate communication modality.		
A.2. Participation Requirements *Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.*					
A.2.1. Which Parties and project participants are participating in the project?	/1/	DR	The project participant is Rodeio Bonito Hidrelétrica S/A from the host country Brazil.		OK
A.2.2. Have all involved Parties provided a	/1/	DR	The DNA of Brazil confirmed that the		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/32/		project assists in achieving sustainable development.		
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/	DR	The host Party, Brazil has ratified to the Kyoto protocol and established a DNA, Comissão Interministerial de Mudança Global do Clima and ratified the Kyoto Protocol on 23 August 2002.		OK
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/	DR	The validation of the project activity did not reveal any information indicating that the project can be seen as diversion of any ODA funding towards Brazil.		OK
A.3. 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.3.1. Does the project design engineering reflect current good practices?	/1/	DR	The project design reflects current good practice through the use of a Francis and Kaplan type turbines. According to the PDD the installed capacity of the project is 14.637 MW. However, ANEEL's authorization 1002 is related to a 14	~~CL 6~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			MW project. DNV requests clarification on that. Also, as per the "Guideline for the reporting and validating of plant load factors" (http://cdm.unfccc.int/EB/048/eb48_repan11.pdf), the pp is requested to provide evidence of the 0.6 plant load factor.		
A.3.2. 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/	DR	The Kaplan turbine, which is an evolution of the Francis turbine, allows efficient power production in low head applications that was not possible with Francis turbines. All equipment is produced in Brazil.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	Yes		OK
A.4. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/	DR	The DNA of Brazil confirmed that the project assists in achieving sustainable development.		OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The implementation of project activity is expected to contribute to sustainable development through the decreasing in the dependence on fossil fuels, increasing of	~~CL 2~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			employment opportunities, creating better revenue distribution developing of technological capacity, and regional integrating and connecting with other sectors. The contribution of the project to the sustainable development needs to be confirmed by the DNA of Brazil.		
A.5. Small scale project activity *Tit is assessed whether the project qualifies as small-scale CDM project activity*					
A.5.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	Yes, the project qualifies as a small scale CDM project activity, since the total installed capacity of the project is 14.637 MW which is less than the 15 MW qualifying capacity under type I, AMS ID for small-scale CDM project activities respectively.		OK
A.5.2. Is the small scale project activity not a debundled component of a larger project activity?	/1/	DR	The project activity is not a debundled component of a larger project activity since the project participants have not registered another project using the same technology within 1 km radius of the project during the past two years.		OK
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
represents a likely baseline scenario.					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/	DR	The project activity correctly applies the approved baseline methodology AMS ID, version 13 – "Grid connected renewable electricity generation" proposed for the small scale project activity under category I – energy industry (renewable/non renewable).		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/	DR	The baseline methodology is applicable to the project activity as the project is a grid connected renewable energy project with an installed generation capacity of 14.637 MW which is less than the limit of 15 MW as per the methodology.		OK
B.2. Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.*					
B.2.1. What is the baseline scenario?	/1/	DR	The baseline scenario is that in the absence of the project activity the same amount of electricity would have been	~~CAR 2~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			generated by power plants connected to the relevant power system. Information regarding the definition of the Brazilian connected electricity system, as well as assumptions, method and values adopted for calculation of the grid Operating Margin (OM) and Build Margin (BM) for the grid emission factor by the Brazilian DNA are not updated. Project participant is requested to amend all related sections of the PDD with up-to-date information and also follow all guidance and procedures available in the "Tool *to calculate the emission factor for an electricity system"* for determining and monitoring the Emission Factor for the applicable connected electricity system. DNV highlights that according to the "Tool to calculate the emission factor for an electricity system", "(…) the calculation *of the operating margin and build margin emission factors should be documented electronically in a spreadsheet that should be attached to the CDM-PDD. This should include all data used to calculate the emission factors, including:* *• For each grid-connected power plant / unit the following information:* *o Information to clearly identify the plant;* *o The date of commissioning,*		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			o The capacity (MW); *o The fuel type(s) used;* *o The quantity of net electricity generation in the relevant year(s);* *o If applicable: the fuel consumption of each fuel type in the relevant year(s);* *o In case where the simple OM or the simple adjusted operating margin is used: information whether the plant / unit is a low-cost / must-run plant / unit;* *• Net calorific values used;* *• CO2 emission factors used;* *• Plant efficiencies used;* *• Identification of the plants included in the build margin and the operating margin during the relevant time year(s);* *• In case the simple adjusted*		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			operating margin is used: load data (typically in MW) for each hour of the year y; • *In case the dispatch data operating margin is used: for each hour h where the project plant is displacing grid electricity:* *o The dispatch order of all grid-connected power plants;* *o The total grid electricity demand;* *(…)"* *Due to the requirements* above, project participants are requested to amend the following sections of the PDD accordingly: B.6.1, B.6.2, B.6.3, B.6.4, B.7.1 and Annex 3. *DNV highlights that, in* accordance to the applicable CDM rules and procedures, any applicable deviation of the guidance and procedures provided by the "Tool *to calculate the emission factor for an electricity system"*		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			should be proposed and justified by project participant or the DNA in question via a formal consultation to the CDM EB via an appropriate communication modality.		
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR	The other scenario considered is the continuation of current activities. Electricity generation in the grid is predominantly based in diesel fueled thermoelectric plants with internal combustion technology or fuel oil fueled thermoelectric plant with one combined cycle. Also, a small share of the electricity is generated by hydroelectric plants.		OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/	DR	Yes, the baseline scenario has been selected in accordance with the baseline methodology AMS ID. While AMS I.D. Version 13 establishes that the combined margin emission coefficient be calculated according to the procedures prescribed in the "Tool *to calculate the emission factor for an electricity system"*, the PDD refers to ACM0002 for such calculation. Project participant is requested to amend the PDD accordingly.	~~CAR 3~~	OK
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Yes		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	Yes, national and sectoral policies have been taken into consideration for selecting the baseline scenario.		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	All literature and sources have been referenced and checked by DNV.		OK
B.2.7. Have the major risks to the baseline been identified?	/1/	DR	No major risks to the baseline were identified.		OK
B.3. Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*					
B.3.1. Is the project additionality assessed according to the methodology?	/1/	DR	The project proponent refers to *"Tool for demonstration and assessment of additionality"* to demonstrate the additionality of the project through an analysis of the following barriers: (a) investment barriers, (b) technological barriers, (c) barriers due to prevailing practice for the two scenarios: i) continuation of current activities (produce energy by thermal sources) and ii)	~~CAR 1~~ ~~CL 1~~ ~~CL 2~~ ~~CL 4~~ ~~CL 5~~	OK

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

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			construction of new renewable energy plants. While the PDD refers to the "Tool *for demonstration and assessment of additionality"* (Version 4, EB 36) in the assessment and demonstration of additionality of the project, the Simplified Modalities and Procedures for CDM small-scale project activities does not refer to this tool. Due to that, project participants are encouraged to refer and follow the guidance of "Attachment *A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories"* for demonstrating and assessing project additionality. While the continuation of current activities does not face any barriers, the construction of new renewable energy plants faces an investment barrier and a barrier due to prevailing practice. DNV's assessment of the presented investment barriers and barriers due to prevailing practice is as follows:		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Investment Barrier: While the PDD refers to the Brazilian program to encourage alternative energy sources (PROINFA) in (i) the description of the small scale project activity (Section A.2.) and in (ii) the assessment and demonstration of project additionality (Section B.5); project participant is requested to further explain and justify how relevant the raised particular aspects of PROINFA are in the context of the proposed CDM project activity given that it is not being financed under such government financing program. While considering that on 16 November 2006 project participant has signed contract assuming/buying the rights to explore the hydraulic power generation potential of Rodeio Bonito project (of which operation license was obtained in 2004), the declared project starting date and also taking into account that the project has been financed with own resources of project participant, DNV request project participant to confirm and further substantiate how all raised particular aspects/situation of the Brazilian economy, its credit market and its power sector along the years 2000 to 2008 represents investment barriers applicable to the proposed		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			project. Such substantiation should take into account *inter alia* the date/period of project decision phase vis-à-vis the occurrence/influence period of such uncertainty or risk factors as well as their influence in the particular context of the decision to implement the project. DNV also highlights that, in a first view, the presented investment barrier is substantiated by aspects, facts and news regarding the Brazilian credit market and its power sector which are dated (have occurred) of a time after the project decision phase (e.g: announcement of Minister of Mines and Energy of government decisions of reviewing the role of Eletrobras within the power sector in March 2008) or dated significant time before the date of project decision phase (e.g. high inflation levels in 2002 and depreciation of the Brazilian Real in the periods 1999-2000 and 2002-2003, regulatory instability during the first phase of the reform of the energy sector in Brazil, high energy price volatility during the rationing period in 2001, etc.). Project participants are thus requested to further justify how such aspects could represent		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			investment barriers in the context of the proposed CDM project activity. In addition, project participant is also requested to further substantiate how CDM revenues were instrumental to alleviate such barriers. *Barrier due to prevailing practice:* Considering the dynamics of the energy markets in Brazil, project participant is requested to conduct the prevailing practice analysis under the assessment and demonstration of additionality by analyzing other activities similar to the proposed project activity that has occurred by the time of the project decision phase. DNV highlights that figures available by the time of project decision phase are the ones to be considered. Project participants are requested to provide evidences that the benefits of the CDM were seriously considered in the decision to proceed with the project as part of the project decision phase.		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	/1/	DR	See B.3.2	~~CAR 1~~ ~~CL 1~~ ~~CL 2~~ ~~CL 4~~	OK

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

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
				~~CL 5~~	
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	See B.3.2		OK
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/	DR	The starting date of the project activity is declared as 20 August 2007, which is the date of when construction work has started. While considering that project starting date is declared as 21 August 2007 and also taking into account the definition of project start date in the CDM Glossary of Terms and also taking into account that the project has been financed with own resources of project participant, DNV request project participant to provide evidences for the declared project starting date and justify why the date of 20 August 2007 (date of signature of the contract between VELCAN and SETA Engenharia S/A for the execution of Rodeio Bonito construction services) can not be regarded as project starting date.	~~CL 3~~	OK
B.4. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
whether the argumentation for the choice of default factors and values – where applicable – is justified.					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	The project activity involves generation of electricity using hydro resources and does not involve construction of a reservoir or a dam for storing water for the project activity, there is no submergence involved. Hence no project emissions are envisaged due to the implementation of the project activity.		OK
B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Not applicable.		OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Not applicable.		OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Baseline emissions have been estimated as the product of electricity generated by the project activity per year and grid emission factor of the relevant power system. The	~~CAR 2~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			installed capacity of project plant is 14.637 MW and it is expected that the project plant will generate an average of 42 991 MWh electricity to the grid per year. Information regarding the definition of the Brazilian connected electricity system, as well as assumptions, method and values adopted for calculation of the grid Operating Margin (OM) and Build Margin (BM) for the grid emission factor by the Brazilian DNA are not updated. Project participant is requested to amend all related sections of the PDD with up-to-date information and also follow all guidance and procedures available in the "Tool *to calculate the emission factor for an electricity system"* for determining and monitoring the Emission Factor for the applicable connected electricity system. DNV highlights that according to the "Tool to calculate the emission factor for an electricity system", "(…) the calculation *of the operating margin and build margin emission factors should be documented electronically in a spreadsheet that should be attached to the CDM-PDD. This should include all data used to calculate the emission factors, including:* *• For each grid-connected power plant / unit the following information:*		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			o Information to clearly identify the plant; *o The date of commissioning,* *o The capacity (MW);* *o The fuel type(s) used;* *o The quantity of net electricity generation in the relevant year(s);* *o If applicable: the fuel consumption of each fuel type in the relevant year(s);* *o In case where the simple OM or the simple adjusted operating margin is used: information whether the plant / unit is a low-cost / must-run plant / unit;* *• Net calorific values used;* *• CO2 emission factors used;* *• Plant efficiencies used;* *• Identification of the plants included in the build margin and the operating margin during the*		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			relevant time year(s); • *In case the simple adjusted operating margin is used: load data (typically in MW) for each hour of the year y;* • *In case the dispatch data operating margin is used: for each hour h where the project plant is displacing grid electricity:* *o The dispatch order of all grid-connected power plants;* *o The total grid electricity demand;* *(…)"* *Due to the requirements* above, project participants are requested to amend the following sections of the PDD accordingly: B.6.1, B.6.2, B.6.3, B.6.4, B.7.1 and Annex 3. *DNV highlights that, in* accordance to the applicable CDM rules and procedures, any		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			applicable deviation of the guidance and procedures provided by the "Tool *to calculate the emission factor for an electricity system"* should be proposed and justified by project participant or the DNA in question via a formal consultation to the CDM EB via an appropriate communication modality.		
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	See B.5.1.	~~CAR 2~~	OK
B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	See B.5.1		OK
B.6. Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Not applicable		OK
B.7. Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	Yes.		OK
B.8. Monitoring Methodology *It is assessed whether the project applies an appropriate monitoring methodology.*					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	Yes, the monitoring plan is in accordance with the approved baseline and monitoring methodology AMS-I-D.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	Yes.		OK
B.9. Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas	/1/	DR	The project activity is renewable electricity generation and hence no project emissions are expected to result from the project activity.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
emissions within the project boundary during the crediting period?					
B.10. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	For baseline calculations, electricity generated by the project activity is to be monitored. The monitoring plan correctly includes the monitoring of the electricity delivered to the grid.		OK
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	Information regarding the definition of the Brazilian connected electricity system, as well as assumptions, method and values adopted for calculation of the grid Operating Margin (OM) and Build Margin (BM) for the grid emission factor by the Brazilian DNA are not updated. Project participant is requested to amend all related sections of the PDD with up-to-date information and also follow all guidance and procedures available in the "Tool *to calculate the emission factor for an electricity system"* for determining and monitoring the Emission Factor for the applicable connected electricity system. DNV highlights that according to the "Tool to calculate the emission factor for an electricity system", "(…) the calculation *of the operating*	~~CAR 2~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			margin and build margin emission factors should be documented electronically in a spreadsheet that should be attached to the CDM-PDD. This should include all data used to calculate the emission factors, including: *• For each grid-connected power plant / unit the following information:* *o Information to clearly identify the plant;* *o The date of commissioning,* *o The capacity (MW);* *o The fuel type(s) used;* *o The quantity of net electricity generation in the relevant year(s);* *o If applicable: the fuel consumption of each fuel type in the relevant year(s);* *o In case where the simple OM or the simple adjusted operating margin is used: information whether the plant / unit is a low-cost / must-run plant / unit;* *• Net calorific values used;*		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			• *CO2 emission factors used;* • *Plant efficiencies used;* • *Identification of the plants included in the build margin and the operating margin during the relevant time year(s);* • *In case the simple adjusted operating margin is used: load data (typically in MW) for each hour of the year y;* • *In case the dispatch data operating margin is used: for each hour h where the project plant is displacing grid electricity:* *o The dispatch order of all grid-connected power plants;* *o The total grid electricity demand;* *(…)"* *Due to the requirements* above,		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			project participants are requested to amend the following sections of the PDD accordingly: B.6.1, B.6.2, B.6.3, B.6.4, B.7.1 and Annex 3. *DNV highlights that, in* accordance to the applicable CDM rules and procedures, any applicable deviation of the guidance and procedures provided by the "Tool *to calculate the emission factor for an electricity system"* should be proposed and justified by project participant or the DNA in question via a formal consultation to the CDM EB via an appropriate communication modality.		
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR	Yes. As per the revised PDD, the dispatched electricity will be monitored continuously using calibrated electricity meters.		OK
B.10.4. Is the measurement *equipment* described and deemed appropriate?	/1/	DR	PDD describes the equipment to be used for monitoring purposes.		OK
B.10.5. Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR	Collected data has low uncertainty levels and to guarantee its accuracy it will be cross checked with the electricity sales receipts.		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10.6. Is the measurement *interval* for baseline data identified and deemed appropriate?	/1/	DR	Electricity generation will be measured on continuously. Hourly data will is expected to be available for the project activity.		OK
B.10.7. Is the registration, *monitoring*, *measurement* and *reporting* procedure defined?	/1/	DR	Yes.		OK
B.10.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR	Yes.		OK
B.10.9. 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/	DR	Yes.		OK
B.11. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	Not applicable		OK

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

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	It has been confirmed that the host country laws do not require for the monitoring of sustainable development indicators / environmental impacts for the project activity.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	Same as above.		OK
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR	Same as above.		OK
B.13. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR	Yes.		OK

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

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR	Yes		OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Yes.		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR	Yes.		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	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 evidenced?	/1/	DR	The starting date of the project activity is 20 August 2007, which is the date of when construction work has started and when it was published the ANEEL's Authoritative Resolution nº 1.002 which authorizes the implementation of the project.	~~CL 3~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			. The operational lifetime of the project activity is 25 years. While considering that project starting date is declared as 21 August 2007 and also taking into account the definition of project start date in the CDM Glossary of Terms and also taking into account that the project has been financed with own resources of project participant, DNV request project participant to provide evidences for the declared project starting date and justify why the date of 20 August 2007 (date of signature of the contract between VELCAN and SETA Engenharia S/A for the execution of Rodeio Bonito construction services) can not be regarded as project starting date.		
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	The project has chosen a renewable crediting period of 7 years with the start date of the crediting period being 1 June 2010 or the date of registration, which ever is later.		OK
D. 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.*					
D.1.1. Does host country legislation require an analysis of the environmental impacts	/1/	DR I	Yes.		OK

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

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
of the project activity?					
D.1.2. Does the project comply with environmental legislation in the host country?	/1/	DR	Yes.		OK
D.1.3. Will the project create any adverse environmental effects?	/1/	DR	No adverse environmental impacts are identified, which seems reasonable given the nature of the project design. Transboundary environmental impacts are not foreseen.		OK
D.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	Yes.		OK
E. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*					
E.1.1. Have relevant stakeholders been consulted?	/1/	DR I	Yes, As part of local stakeholders consultation, Rodeio Bonito Hidrelétrica S/A has sent letters inviting the following entities for comments on the project in accordance with the requirements of Resolution 7 of the Brazilian DNA:	~~CAR 4~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			- City council of Arvoredo municipality - City council of Chapecó municipality - City hall of Arvoredo municipality - City hall of Chapecó municipality - The local environmental NGOs "Verde Vida Programa Oficina Educativa", - Environmental authority of Chapecó municipality (FUNDEMA) - Environmental authority of Santa Catarina State (FATMA) - State Attorney General of Santa Catarina State No comments have been received. Project participant has not provided evidences that local stakeholder consultation has been fully conducted as required by the Brazilian DNA (Resolution no. 7, of March 5, 2008). DNV has not received evidences that the following entities were invited for comments: - Brazilian Forum of NGOs and		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Social Movements for the Environment and Development (FBOMS) - Federal Attorney General. Project participant is thus requested to take the applicable measures.		
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	The stakeholders were consulted through letters to invite comments to the project. Project participant has not provided evidences that local stakeholder consultation has been fully conducted as required by the Brazilian DNA (Resolution no. 7, of March 5, 2008). DNV has not received evidences that the following entities were invited for comments: - Brazilian Forum of NGOs and Social Movements for the Environment and Development (FBOMS) - Federal Attorney General. Project participant is thus requested to take the applicable measures.	~~CAR 4~~	OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in	/1/	DR I	See E.1.2	~~CAR 4~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
accordance with such regulations/laws?					
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	No comments have been received.		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	See E.1.4.		OK

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

Table 2b: Additional requirements checklist for VVM version 1 (EB 44)

A.1. Letter of approval					
A.1.1 Is the LoA received directly from the DNA or through the project participant.	/1/	DR	The copy of the LoA from Brasil DNA was provided by the project participant.		OK
A.2. Project design					
A.2.1 Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?	/1/	DR	Yes. See A.3		OK
A.2.2 Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment?	/1/	DR	The CDM project activity was under construction at the start of the validation.		OK
A.2.3 Is the project a large scale project, a small scale project with average annual emission reductions above 15 000 tonnes or a bundled small scale project? Has on-site visit been carried out?	/1/	DR	The project is a small scale project. A site visit was not carried out.		OK
A.2.4 Does the project activity involved alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/	DR	No, the project activity involves the installation of a new small hydropower plant.		OK
A.3. Project emissions not addressed by the methodology					
A.3.1 Does the methodology describe all project emission source for the project activity that contributes all 1% of the emission reductions? Sources that the methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants).	/1/	DR	Yes. See B.5		OK
A.4. Documentation of baseline emissions					
A.4.1 Documentation of the baseline determination: a. All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. b. All documentation is relevant as well as correctly	/1/	DR	Yes. See B.1.1, B.2.1, B.2.2 and B.5.		OK

quoted and interpreted. c. Assumptions and data can be deemed reasonable d. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. e. The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity					
A.5. Documentation of the calculations					
A.5.1 Algorithms and/or formulae used to determine emission reductions a. All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced b. All documentation is correctly quoted and interpreted. c. All values used can be deemed reasonable in the context of the project activity d. The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.	/1/	DR	Yes. See B.4 and B.5.		OK
A.6. Implementation of the monitoring plan					
A.6.1 How were the plans for implementation of the monitoring plan, data management, QA/QC procedures assessed? To what extent can the emission reductions achieved by the project by monitored ex-post and verified later by a DOE?	/1/	DR	Yes. See B.8, B.9 and B.10.		OK
A.7. CDM consideration prior to starting date					
A.7.1 The prior consideration of CDM for the project activity complies with EB41 annex 46	/1/	DR	Yes. See B.3.4		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR 1 While the PDD refers to the "*Tool for demonstration and assessment of additionality*" (Version 4, EB 36) in the assessment and demonstration of additionality of the project, the Simplified Modalities and Procedures for CDM small-scale project activities does not refer to this tool. Due to that, project participants are encouraged to refer and follow the guidance of "*Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*" for demonstrating and assessing project additionality.	B.3.1	Changes have been made to the PDD accordingly. The PDD now refers and follow the guidance of "*Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*" for demonstrating and assessing project additionality.	The revised PDD now applies the "*Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*" for demonstrating and assessing project additionality. Therefore this CAR is closed.
CAR 2 Information regarding the definition of the Brazilian connected electricity system, as well as assumptions, method and values adopted for calculation of the grid Operating Margin (OM) and Build Margin (BM) for the grid emission factor by the Brazilian DNA are not updated. Project participant is requested to amend all related sections of the PDD with up-to-date information and also follow all guidance and procedures available in the "*Tool to calculate the emission factor for an electricity system*" for determining and monitoring the Emission Factor for the applicable connected electricity system.	A.1.2 B.2.1 B.5.1 B.5.2 B.10.2	Changes have been made to the PDD accordingly. Information regarding the definition of the Brazilian connected electricity system, as well as assumptions, method and values adopted for calculation of the grid Operating Margin (OM) and Build Margin (BM) for the grid emission factor by the Brazilian DNA has been updated.	The final version of the PDD was updated to consider the use of the *ex-post* official Brazilian emission factor published by the Brazilian DNA. Therefore this CAR is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
DNV highlights that according to the "*Tool to calculate the emission factor for an electricity system*", "*(…) the calculation of the operating margin and build margin emission factors should be documented electronically in a spreadsheet that should be attached to the CDM-PDD. This should include all data used to calculate the emission factors, including:* • *For each grid-connected power plant / unit the following information:* *o Information to clearly identify the plant;* *o The date of commissioning,* *o The capacity (MW);* *o The fuel type(s) used;* *o The quantity of net electricity generation in the relevant year(s);* *o If applicable: the fuel consumption of each fuel type in the relevant year(s);* *o In case where the simple OM or the simple adjusted operating margin is used: information whether the plant / unit is a low-cost / must-run plant / unit;* • *Net calorific values used;*			

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
• *CO_2 emission factors used;* • *Plant efficiencies used;* • *Identification of the plants included in the build margin and the operating margin during the relevant time year(s);* • *In case the simple adjusted operating margin is used: load data (typically in MW) for each hour of the year y;* • *In case the dispatch data operating margin is used: for each hour h where the project plant is displacing grid electricity:* *o The dispatch order of all grid-connected power plants;* *o The total grid electricity demand;* *(…)"* Due to the requirements above, project participants are requested to amend the following sections of the PDD accordingly: B.6.1, B.6.2, B.6.3, B.6.4, B.7.1 and Annex 3. DNV highlights that, in accordance to the applicable CDM rules and procedures, any			

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
applicable deviation of the guidance and procedures provided by the "*Tool to calculate the emission factor for an electricity system*" should be proposed and justified by project participant or the DNA in question via a formal consultation to the CDM EB via an appropriate communication modality.			
CAR 3 While AMS I.D. Version 13 establishes that the combined margin emission coefficient be calculated according to the procedures prescribed in the "*Tool to calculate the emission factor for an electricity system*", the PDD refers to ACM0002 for such calculation. Project participant is requested to amend the PDD accordingly**.**	B.2.3	Changes have been made to the PDD accordingly. The combined margin emission coefficient has been calculated according to the procedures prescribed in the "*Tool to calculate the emission factor for an electricity system*".	The revised PDD correctly refers to the "*Tool to calculate the emission factor for an electricity system*". Therefore this CAR is closed.
CAR 4 Project participant has not provided evidences that local stakeholder consultation has been fully conducted as required by the Brazilian DNA (Resolution no. 7, of March 5, 2008). DNV has not received evidences that the following entities were invited for comments: - Brazilian Forum of NGOs and Social Movements for the Environment and Development (FBOMS) - Federal Attorney General. Project participant is thus requested to take the applicable measures.	E.1.1 E.1.2 E.1.3	The following entities were invited for comments: - Brazilian Forum of NGOs and Social Movements for the Environment and Development (FBOMS) - Federal Attorney General. The receipts of the letter received and signed by both entities have been provided to DNV.	Evidences were provided for DNV satisfaction. Therefore this CAR is closed.
CL 1	B.3.1	In section A.2., we refer to PROINFA	Clarifications were provided for DNV

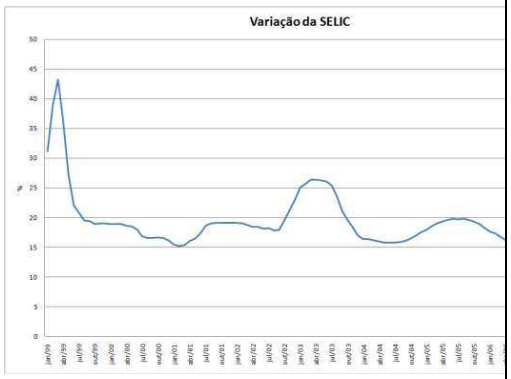
Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
While the PDD refers to the Brazilian program to encourage alternative energy sources (PROINFA) in (i) the description of the small scale project activity (Section A.2.) and in (ii) the assessment and demonstration of project additionality (Section B.5); project participant is requested to further explain and justify how relevant the raised particular aspects of PROINFA are in the context of the proposed CDM project activity given that it is not being financed under such government financing program.		because this program presents some socio-economic criteria with which the project activity is compliant. This clearly indicates that the project activity contributes to sustainable development. In Section B.5, reference to PROINFA is relevant because it highlights the need for incentives for project developers and it shows that even with a solid support from the federal state, private promoters face financial barriers while developing their projects. Moreover, the Brazilian Government enacted a decree in 2006 establishing that all PROINFA CERs would belong to the Federal Government. Rodeio Bonito SHP did not participate to this program because the developer considered BNDES guarantees requirement for project financing rather excessive and beacuse the developer considers the incentive of carbon credits as part of its business model.	satisfaction. The project proponent successfully demonstrated the importance of considering PROINFA in analyzing other similar projects in the region. Therefore this CL is closed.
CL 2 While considering that on 16 November 2006 project participant has signed contract assuming/buying the rights to explore the hydraulic power generation potential of Rodeio	B.3.1	Changes have been made in the PDD in order to focus on all particular aspects that represented investment barriers in the context of the proposed CDM project activity at the particular period of the	The project proponent is required to demonstrate more specific barriers to the project activity: i) As per the PDD, the financial / economic barriers for

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Bonito project (of which operation license was obtained in 2004), the declared project starting date and also taking into account that the project has been financed with own resources of project participant, DNV request project participant to confirm and further substantiate how all raised particular aspects/situation of the Brazilian economy, its credit market and its power sector along the years 2000 to 2008 represents investment barriers applicable to the proposed project. Such substantiation should take into account *inter alia* the date/period of project decision phase vis-à-vis the occurrence/influence period of such uncertainty or risk factors as well as their influence in the particular context of the decision to implement the project. DNV also highlights that, in a first view, the presented investment barrier is substantiated by aspects, facts and news regarding the Brazilian credit market and its power sector which are dated (have occurred) of a time after the project decision phase (e.g: announcement of Minister of Mines and Energy of government decisions of reviewing the role of Eletrobras within the power sector in March 2008) or dated significant time before the date of project decision phase (e.g. high inflation levels in 2002 and depreciation of the Brazilian Real in the periods 1999-2000 and 2002-2003, regulatory instability during the first phase of the reform of the energy sector in Brazil, high energy price volatility during the rationing period in		project decision. Rodeio Bonito has been authorized by ANEEL in 2004 but the previous promoter had kept the licence inactive for 3 years. This highlights the difficulty fo finance such projects. In the context of the decision to implement the project, access to long-term credit lines for renewable energy projects was not possible for the project participant and the developer was exposed to financial and economical risks. When long series data have been considered (inflation, regulatory instability), the objective was to show the instability of corresponding data, resulting in uncertainties for the project participant. In this context of financial/economical barrier, the incentive of carbon credits first provided the project participant with the required level of confidence on the viability of the project. In a second step, the incentive of carbon credits provided the project participant with a visibility which allows us to raise the required funds on the market. Along with the direct financial support of CDM for project implementation, which is part of all	alternative 2 represent lack of funds and lack of long-term debt financing that make the project activity not attractive enough for a private investor; the pp is requested to provide evidence that faced this barrier for Rodeio Bonito project; ii) The PDD also states that without CDM revenues the attractiveness of the company for private placements would not be high enough to have sufficient funds availability. An investment analysis of Rodeio Bonito project is required to demonstrate this. iii) DNV requires evidence that Rodeio Bonito project faced "Not in my backyard" effects in Chapecó, and how CDM benefits could alleviate this barrier. Therefore this CL remains opened.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
2001, etc.). Project participants are thus requested to further justify how such aspects could represent investment barriers in the context of the proposed CDM project activity. In addition, project participant is also requested to further substantiate how CDM revenues were instrumental to alleviate such barriers.		projects developed by Velcan Energy group, we consider CDM also as a support in funds rising. To further substantiate the fact that Rodeio Bonito project faced "Not in my backyard" (point iii) effects in Chapecó, the project participant provided evidence that he had to compensate financially the fact that one third of the total length of the transmission line is in urban area, through the city of Chapecó, over a distance of approximately 5 kilometers. To demonstrate project participant faced economic barrier of lack of long-term debt financing, one should remind that financing from BNDES is only available to companies willing to offer corporate or real guarantees in excess of total amount borrowed. Project participant was created in 2005 and had no such guarantees. In other words, project participant will have to use its own balance sheet and capital to raise funds from BNDES. In case project underperform or become unfeasible, BNDES would call project participant's guarantees and real assets up to their initial credit exposure. In addition to leveraging their balance sheet with sizeable borrowings, project participant would face	The project participant provided the following evidences that confirm that the project activity faces some barriers: - BNDES requirements for financing and evidence that the project participant was created in 2005; - IRR calculation spreadsheet demonstrating that the project IRR is below the benchmark; - Evidence of financial compensation to the community of Chapecó. Therefore this CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		completion risk of the project. Completion risk is mitigated by guarantees pledged by the construction company; which are however, of limited recourse. These necessary guarantees, costs and risks associated were considered very excessive by the project participant and understood as a barrier. As required for ii), the project participant provided an investment analysis of Rodeio Bonito project. Shareholders IRR will be used as project financial indicator and as reference to represent the standard returns in the market the Brazilian interest rate will be used, known as *SELIC* (Special System of Clearance sale and of Custody). SELIC is a great computerized system, under the responsibility of the Central Bank of Brazil and of the National Association of the Institutions of the Open Markets, since 1980, when it was created. The Committee of National Monetary Politics (COPOM) stipulates SELIC Target that can be defined as the average rate of the daily financings, with ballast in federal titles, select in the Selic System, which is in force for the whole period among ordinary meetings of the Committee.	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		The SELIC rate is cleaned in the SELIC System and obtained by the calculation of the considered and adjusted medium tax of the financing operations by one day, ballasted in federal public titles and studied in referred him system or in clearing house and clearance sale of assets. The operators of the institutions transfer SELIC, on line, the relative businesses to public titles involving banks that buy and that you/they sell those titles. Therefore, the Selic rate is the rate that remunerates the investors in the purchase business and sale of public titles. The qualified financial institutions, such as banks, savings banks, society's brokers of titles and values furniture, distributing societies of titles are capable to make this kind of operation. The most liquid government bond is the LFT (floating rate bonds based on the daily reference rate of the Central Bank of Brazil). As of January 2006, 37% of the domestic federal debt was in LFTs and had duration of one day (Source: Tesouro Nacional; www.tesouro.fazenda.gov.br). This bond rate almost follows the CDI rate, which is influenced by the SELIC rate, defined by COPOM.	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		The SELIC rate has been oscillating since 1999, from a minimum of 11.73% a.a. in July 2007 up to a maximum of 43.25% a.a. in January 2003 (see here below) .  **(Source: Banco Central do Brasil)** In order to be conservative, it will be considered the the average value of 2 years before the investment decision. From July 2005 to June 2007, the average value for the SELIC was 15,5 %. The investment	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		decision date considered is the one of the "Board of directors", 18th of June of 2007. At this date the project investment analysis was finalised. The cash flow provided by the project participant was verified by external auditors and present an IRR value of 13,3% without carbon credits revenues. This value is 2,2 % inferior to the benchmark value. This shows that without CER revenues, the project would reach lower rates of return than the benchmark rate, concluding that the project activity *cannot be considered as financially attractive*.	
CL 3 While considering that project starting date is declared as 21 August 2007 and also taking into account the definition of project start date in the CDM Glossary of Terms and also taking into account that the project has been financed with own resources of project participant, DNV request project participant to provide evidences for the declared project starting date and justify why the date of 20 August 2007 (date of signature of the contract between VELCAN and SETA Engenharia S/A for the execution of Rodeio Bonito construction services) can not be regarded as project starting date.	B.3.4 C.1.1	Changes have been made in the PDD accordingly. The date of 20 August 2007 (date of signature of the contract between VELCAN and SETA Engenharia S/A for the execution of Rodeio Bonito construction services) is now regarded as project starting date.	The project proponent successfully demonstrated that the date of 20 August 2007 corresponds to the date of the first commitment in expenditures of the project. Therefore this CL is closed.
CL 4	B.3.1	Changes have been made in the PDD	The project proponent is required to

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
Considering the dynamics of the energy markets in Brazil, project participant is requested to conduct the prevailing practice analysis under the assessment and demonstration of additionality by analyzing other activities similar to the proposed project activity that has occurred by the time of the project decision phase. DNV highlights that figures available by the time of project decision phase are the ones to be considered.		accordingly. The common practice analysis has been updated with the most recent data available by the time of project decision. This analysis clearly demonstrates that the trend in addition of generation capacity in Brazil is not in small hydropower plants. Brazil has an extension of 8,514,876.599 square kilometers (source: IBGE) (with over 4,000 km distance in the north-south as well as in the east-west axis) and 6 distinct climate regions: sub-tropical, semi-arid, equatorial, tropical, highland-tropical and Atlantic-tropical (humid tropical). These varieties of climates have obviously strong influence in the technical aspects related to a SHPP implementation. As a result, hydroelectric projects can differ significantly from one to another considering the region where it is implemented, climate, topography, availability of transmissions lines, river flow regularity, etc... For these reasons it is extremely difficult and not reasonable to compare different hydropower potential and plants. However, Project Participants decided to analyze different SHPPs in the South region	analyze if there are similar projects operating without CDM or PROINFA's incentive, and explain which differences are there from those projects to Rodeio Bonito that make this possible. Related evidence is required. Therefore this CL remains opened. The project proponent successfully demonstrated that the project activity is not a common practice in the south of Brazil. Therefore this CL is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		of Brazil, where is implemented the project activity. Then, it can be identified the small hydros that have incentives (Proinfa and/or CDM) or not. Here below Project participant present operations start of SHPPs from 2005 to 2007 (source ANEEL 2007, UNFCCC 2007).	

Started operations in 2005 / South Region (PR, SC, RS)

	Name	State	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	De
1	Cristalino	PR								4				
2	Furnas do Segredo	RS										9,8		
3	Santa Clara I	PR								3,6				
4	Santo Antônio	RS										4,5		
	Partial total		0	0	0	0	0	0	0	7,6	0	14,3	0	0
	Total		21,9											

Started operations in 2006 / South Region (PR, SC, RS)

	Name	State	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Carlos Gonzatto	RS				9,0								
2	Esmeralda	RS												22,2
3	Fundao I	PR												2,5
4	Rio Palmeiras I	SC							1,5					
5	Rio Palmeiras II	SC											1,4	
6	Sao Bernardo	RS								15,0				
	Partial total		0,0	0,0	0,0	9,0	0,0	0,0	1,5	15,0	0,0	0,0	1,4	24,7
	Total		51,6											

Started operations in 2007 / South Region (PR, SC, RS)

	Name	State	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	De
1	Caju	SC						3,2						
2	Contestado	SC												5
3	Coronel Araujo	SC												5
4	Faxinal dos Guedes	SC		4,0										
5	Flor do Sertao	SC							16,5					
6	Ludesa	SC								30,0				
7	Mafras	SC											2,2	
8	Santa Laura	SC										15,0		
9	Salto Santo Antônio	SC									1,7			
	Partial total		0,0	4,0	0,0	0,0	0,0	3,2	16,5	30,0	1,7	15,0	2,2	11
	Total		83,7											

In terms of numbers of SHPPs, there were 19 SHPPs that started operations from 2005 to 2007 in the South region of Brasil, where 12 received some kind of incentives. In

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		terms of installed power, it represents 85% of the total 157.2 MW. For the specific year of 2007, when Rodeio Bonito started construction, among the 9 SHPPs that started operations, 5 received incentives. In terms of installed capacity, it represents 80 % of the total 83.7 MW. The other 4 SHPPs that did not receive incentives have less than 5,6 MW of installed capacity. Then, due to technical characteristics very different, those SHPPs cannot be compared with the proposed project activity with almost 15 MW of installed capacity. As an example, for the project Contestado of 5,6 MW, the height of the dam is 3m (source: www.eletrisa.com.br), which is definitely not comparable with the height of Rodeio Bonito dam which is around 27 m and the investment induced. Considering information above, the majority situation of small hydro projects in Brazil is the implementation of this type of project with some kind of incentives considering that operating units that started operations in the same region of Rodeio Bonito Project in 2007 almost 80% of their installed capacity came from plants implemented with some sort of incentives. The others one do not have characteristics comparable to the project activity.	

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CL 5 Project participants are requested to provide evidences that the benefits of the CDM were seriously considered in the decision to proceed with the project as part of the project decision phase.	B.3.1	Internal documents indicating that the benefits of the CDM were considered in the decision to proceed with the project have been provided to DNV. Moreover, the business model of the project participant is based on the incentive of CDM when developing a project, which can be verified in the following documents. (http://www.velcan.fr/docs/Velcan%20Energy%20Management%20Report%2031%2012%202006.pdf).	Evidences were provided for DNV demonstrating that CDM benefits were seriously considered in the decision to proceed with the project. Therefore this CL is closed.
CL 6 According to the PDD the installed capacity of the project is 14.637 MW. However, ANEEL's authorization 1002 is related to a 14 MW project. DNV requests clarification on that. Also, as per the "Guideline for the reporting and validating of plant load factors" (http://cdm.unfccc.int/EB/048/eb48_repan11.pdf), the pp is requested to provide evidence of the 0.6 plant load factor.	A.3.1	The project participant asked for an amplification of the installed capacity (using the environmental flow to produce energy). ANEEL's document which officially authorized this installed capacity is provided to DOE (despacho 2764). The average energetic production of the power plant will be equivalent to 8,8 MW (see 2 last tables of the "estudos energeticos" document provided, "energias medias" of 8.183 MW and 0,618 MW). With an installed capacity of 14.637, the plant load factor is 0,6.	Related evidences were provided and DNV could confirm that ANEEL authorized the amplification of the installed capacity, as well as the load factor of 0.6 determined by a third party contracted by the company /3/, in line with the "Guideline for the reporting and validating of plant load factors" para 3b requirements. Therefore this CL is closed.

APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Marco Ratton

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes				
Technical Area	***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas					
Renewables — *Hydro power*		Jan 2009			
Renewables — *Wind power*					
Renewables — *Other renewable*					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery					
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency					
N_2O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO_2 recovery					
Transport			Jan 2009		
Non-renewable biomass			Jan 2009		
Biofuel					
Pipeline leakage reduction					
SF_6					

Høvik, 9 January 2009

Michael Lehmann

Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Felipe Antunes

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1)

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas			Sept 2009			
Renewables	*Hydro power*	Jan 2009	Sept 2009		Jan 2009	Jan 2009
	Wind power		Sept 2009			
	Other renewable		Sept 2009			
Biomass		Jan 2009	Jan 2009			
Grid connection of isolated system			Sept 2009			
Cement						
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
Coal mine methane						
Fuel switch						
Manure management		Jan 2009	Jan 2009			
Waste / wastewater treatment		Jan 2009	Jan 2009			
Energy efficiency						
N_2O						
HFCs						
Flare reduction						
PFCs						
Charcoal			Sept 2009			
CO_2 recovery						
Transport						
Non-renewable biomass			Sept 2009			
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 1 September 2009

Michael Lehmann

Michael Lehmann
Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Weidong Yang

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1)

GHG Auditor:	Yes				
Technical Area	***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas					
Renewables — *Hydro power*				Jan 2009	Jan 2009
Renewables — *Wind power*					
Renewables — *Other renewable*					
Biomass					
Grid connection of isolated system					
Cement					
Waste-heat / waste-gas recovery					
Efficiency of thermal power plants					
Coal mine methane					
Fuel switch					
Manure management					
Waste / wastewater treatment					
Energy efficiency					
N_2O					
HFCs					
Flare reduction					
PFCs					
Charcoal					
CO_2 recovery					
Transport					
Non-renewable biomass					
Biofuel					
Pipeline leakage reduction					
SF_6					

Høvik, 9 January 2009

Michael Lehmann
Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Peng (Peter) Huang

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1)

GHG Auditor:						
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Knowledge***	***Sector Expert***	***Technical Reviewer***
Landfill gas						
Renewables	*Hydro power*	Jan 2009	Jan 2009	Nov 2009		
	Wind power	Mar 2009	Jan 2009			
	Other renewable		Sept 2009			
Biomass						
Grid connection of isolated system			Sept 2009			
Cement						
Waste-heat / waste-gas recovery			Jan 2010			
Efficiency of thermal power plants			Jan 2010			
Coal mine methane						
Fuel switch			Jan 2010			
Manure management						
Waste / wastewater treatment						
Energy efficiency			Jan 2010	Nov 2009		
N_2O						
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery			Jan 2010			
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 22 Janauary 2010

Michael Lehmann

Technical Director, Climate Change Services