RINA

VALIDATION REPORT

"Cachoeirao CDM Project (JUN1092)" in Brazil

REPORT NO. 2009-BQ-ME-106

REVISION NO. 00

RINA

VALIDATION REPORT

Project Name:	Country:	Estimated CERs
"Cachoeirao CDM Project (JUN1092)"	Brazil	164,108

Client:	Client contact:
Carbotrader Assessoria e Consultoria em Energia Ltda.	Mr. Arthur Moraes Phone: + 55 11 4522-7180

Report title:	Report No.:	Rev. No.	Date of this report:
"Cachoeirao CDM Project (JUN1092)" in Brazil	2009-BQ-ME-106	00	22/09/2010

Approved by: *(Final Report – DCI Director approval)*	Organizational Unit:	Date:

Methodology

Reference:	Version:	Title:	Sectoral Scope:
ACM0002	Version 11 of 26/02/2010	"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"	1

RINA Services S.p.A. (RINA), commissioned by Carbotrader Assessoria e Consultoria em Energia Ltda., has performed the validation of the project activity "Cachoeirao CDM Project (JUN1092)" in Brazil, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

In conclusion, it is RINA's opinion that the project activity "Cachoeirao CDM Project (JUN1092)" in Brazil, as described in the PDD version 3 of 10 September 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 11 of 26/02/2010.

RINA thus requests the registration of the project as a CDM project activity.

Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development.

Work carried out by:
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Work verified by: *(CRT Responsible approval)*

Keywords:

Abbreviations

ANEEL	"Agência Nacional de Energia Elétrica" - Brazilian Electricity Regulatory Agency
BOVESPA	"Bolsa de Valores de São Paulo" - São Paulo Stock Exchange
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER(s)	Certified Emission Reduction(s)
CCEE	"Camara de Comercialização de Energia Elétrica"- Electric Power Commercialization Chamber
CIMGC	"Comissão Interministerial de Mudança Global do Clima" (Interministerial Commission on Global Climate Change)
CL	Request for Clarification
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
EB	Executive Board
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IGP-M	"Indice Geral de Preços - Mercado" - General Index of Market Prices
NTN-C	"Notas do Tesouro Nacional, série C" - National Treasury Notes**,** Series C
ODA	Official Development Assistance
ONS	"Operador Nacional do Sistema"- National Grid Operator
PDD	Project Design Document
PROINFA	"Programa de Incentivo às Fontes Alternativas de Energia Elétrica" - Programme of Incentives to the Alternative Sources of Electric Energy
PP	Project Participants
Ref.	Document Reference
RIMA	"Relatório de Impacto Ambiental" - Environmental Impact Report
RINA	RINA Services S.p.A.
SHP	Small Hydroelectric Plant (Pequena Central Hidrelétrica - PCH)
SS(s)	Sectoral Scope(s)
SIN	"Sistema Interconectado Nacional" - National Interconnected System
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

Carbotrader Assessoria e Consultoria em Energia Ltda. has commissioned RINA to carry out the validation of the "Cachoeirao CDM Project (JUN1092)" project in Brazil.

This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria for CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The objective of the Validation is to have an independent evaluation of a project activity by a designated operational entity against the requirements of the CDM as set out in decision 3/CMP.1, its annex and relevant decisions of the COP/MOP, on the basis of the project design document. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC requirements and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 Scope

The verification scope is to review the PDD against the UNFCCC criteria for CDM.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

Validation is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

2 METHODOLOGY

Validation was conducted using RINA procedures in line with the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Manual, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The validation consisted of the following three phases:

* Document review;
* Follow-up actions;
* The resolution of outstanding issues and the issuance of the final validation report.

The following sections outline each step in more detail.

2.1 Document Review

The PDD, version 3 of 10 September 2010 /1/, in particular the applicability of the methodology, the baseline determination, the additionality of the project activity, the starting date of the project, the monitoring plan, the emission reduction calculations provided in the form of a spreadsheet, *"CERs JUN1092_v3.xls"*, version 3 of 10/09/2010 /2/, the financial analysis spreadsheet *"IRR_Cachoeirao_v3.xls"*, version 3 of 10 September 2010 /3/ were assessed as part of the validation.

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The following table lists the documentation that was reviewed during the validation.

/1/ Carbotrader Assessoria e Consultoria em Energia Ltda. and Hidrelétrica Cachoeirão S.A. CDM-PDD for the project "Cachoeirao CDM Project (JUN1092)", version 3 of 10 September 2010, Version 2 of 18 May 2010, Version 1 of 16 November 2009.

/2/ Carbotrader Assessoria e Consultoria em Energia Ltda. and Hidrelétrica Cachoeirão S.A. CERs spreadsheet:
"CERs JUN1092_v3.xls" (revised crediting period and emission factor), version 3 of 10/09/2010
"CERs JUN1092_v2.xls" (revised crediting period), version 2 of 25/05/2010
"*CERs_JUN1092_v1.xls*", version 1 of 16/11/2009

/3/ Carbotrader Assessoria e Consultoria em Energia Ltda. and Hidrelétrica Cachoeirão S.A. financial analysis spreadsheet:
"IRR_Cachoeirao_v3.xls", version 3 of 10 September 2010
"IRR_Cachoeirao_v2_1.xls", version 2 of 18 May 2010
"*IRR_Cachoeirao.xls*", version 1 of 16 November 2009

/4/ CDM Executive Board CDM Validation and Verification Manual – Version 01.2, EB 55 annex 1 dated 30 July 2010.

/5/ ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" Version 11 of 26/02/2010.

/6/ CDM Executive Board "Tool to calculate the emission factor for an electricity system" (version 2).

/7/ CDM Executive Board "Tool for the demonstration and assessment of additionality" (version 5.2).

/8/ MCT Emission Factor "CO2 emission factors for electricity generation in Brazil"s National Interconnected System - Base Year 2008" and "CO2 emission factors for electricity generation in Brazil"s National Interconnected System - Base Year 2009" http://www.mct.gov.br/index.php/content/view/307492.html (Brazilian DNA web site).

/9/ ANEEL Documents
* ANEEL Resolution # 282, dated 26 July 2000 - authorizes Empresa de Luz e Força Santa Maria SA-ELFSM (27.00 MW) to implement and explore Cachoeirão SHP; ("*RES2000282.pdf*")
* ANEEL Resolution 557, dated 15 October 2002 - transfers the authorization to implement and explore Cachoeirão SHP from ELFSM to Santa Maria Energética SA.; ("*res2002557.pdf*")
* ANEEL Dispatch # 1,214, dated 23 April 2007 - approves the Cachoeirão basic project (27.0 MW) and defines a reservoir area of 1.021 km2 and coordinates 19º 26' 12" S 41º 36' 51" W; ("*Desp 1214_23042007_Rev_projbas.pdf*")
* ANEEL Authorization Resolution # 908, dated 8 May 2007 - transfers the authorization to implement and explore Cachoeirão SHP from Santa Maria Energética S.A. to Hidrelétrica Cachoeirão S.A.; ("*rea2007908.pdf*")
* ANEEL Decree # 18, dated 25 May 2007 - defines a 16.37 MW (average) assured energy for the Cachoeirão SHP; ("*Port_18_25052007_Aprov_Energia_Asseg.pdf*")
* ANEEL Dispatch # 4,830, dated 30 December 2008 - authorizes 9,000 kW generator unit # 1 to start operation; ("*dsp 4830 30.12.2008.pdf*")
* ANEEL Dispatch # 559, dated 11 February 2009 - authorizes 9,000 kW generator

unit # 2 to start operation; ("*dsp 559 11.02.2009.pdf*")

* ANEEL Dispatch # 714, dated 27 February 2009 - authorizes 9,000 kW generator unit # 3 to start operation. ("*dsp 714 27.02.2009.pdf*")

/10/ ANEEL Resolution # 407, dated 19 October 2000, establishes that if the present/real installed capacity is greater than +/- 5 % of the authorized (granted) installed capacity, a revision of the authorized installed capacity should be requested. ("*RES2000407.pdf*")

/11/ COPAM (Conselho Estadual de Política Ambiental) Operation license (LO), dated 10/10/2008 valid for five years. ("*LO_027_10102008.pdf*")

/12/ COPAM (Conselho Estadual de Política Ambiental) Installation License (LI) dated 13/07/2007 (hard copy)

/13/ ANEEL Resolution # 652, dated 9 December 2003, establishes the definitions for SHPs in Brazil. ("*res2003652.pdf*")

/14/ Limiar Engenharia Ambiental Relatório Hidrelétrica Cachoeirão nº 003/2009, reference month September 2009. ("*Limiar Engenharia Ambiental - Estudo Socioeconômico .pdf*")

/15/ CEMIG Meters calibration certificates ("*Relatório Especificação Medidores atualizado.pdf*"):

* calibration certificate CCM 522/2008, calibration conducted on 11/12/2008 (principal/main);

*calibration certificate CCM 523/2008, calibration conducted on 11/12/2008 (backup/rearguard).

/16/ Energisa document: "Equipe da Energisa Soluções Ambientais S/A": Staff responsible for the Operation of SHP Cachoeirão (training list). (hard copy)

/17/ http://www.mct.gov.br/index.php/content/view/307492.html (Brazilian DNA web site).

/18/ Santa Maria Energética S/A Service order to start plant construction, dated 09/03/2007 ("Ordem de Serviço PCH Cachoeirão.pdf")

/19/ Documents related to the CDM consideration:

* 14/11/2005: minutes of meeting considering several issues about the SHP, including the studies for carbon credits (item [i] page 3). CEMIG and Santa Maria Energética SA participants; *("Agreem_ProjSponsors_p1.jpeg"; "Agreem_ProjSponsors_p3.jpeg"; Agreem_ProjSponsors_p11.jpeg"*)

* 17/03/2006: proposal from Ecoinvest Carbon to carbon credits development under Kyoto Protocol; (hard copy)

* 10/04/2007: email from Carbotrader to CEMIG with attachment "Estudo PCH Cachoeirão", which describes studies from CERs selling for the SHP Cachoeirão ("*Projeto MDL PCH Cachoeirão.outlook item*" and pdf annex named "*Estudo PCH Cachoeirão.pdf*");

* 22/08/2007: email from PP requesting a validation proposal to one DOE; ("*RES Orçamento SGS.outlook item*")

* 07/05/2008: email from PP requesting a validation proposal to another DOE. ("*Re RES Proposta de Validação.outlook item*")

/20/ Letter and ARs (local stakeholders consultation). ("*Cartas_stakh.rar*")

/21/ Carbotrader Assessoria e Consultoria em Energia Ltda. and Hidrelétrica Cachoeirão S.A. benchmark calculation spreadsheet:

"Benchmark_v3.xls", version 3 of 10 September 2010
"Benchmark_v2.xls", version 2 of 18 May 2010
"Government bond rates.xls", version 1of 16 November 2009

/22/ Hidrelétrica Cachoeirão S.A. spreadsheet "Quadro Usos e Fontes.xls" (financial analysis).

/23/ Document from CEMIG: "Comitê de Gerenciamento de riscos de Energia-CGRE". (Comite de gerenciamento de riscos- energy price.pdf")

/24/ Comitê de Priorização de Investimento – CPO- Parecer de Projeto de Investimento – Projeto nº1714/07 SPE Guanhães (Meeting report discussing the investment of the Guanhães (4 SHPs) project, conducted on 16/10/2008, mentioning that some parameters, as O&M and energy prices, are the same from SHP Cachoeirão). ("*Benchmark CEMIG_Preço Energia.jpeg*"; "*Benchmark CEMIG_valores financeiros.jpeg*")

/25/ Document "Quadro Usos e Fontes de Recursos" protocoled in the BNDES (registered in the 5th "Oficial de Registros de Titulos e documentos" Microf. under number 01252177). (hard copy)

/26/ CDM Executive Board "Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM)", version 7 - EB 41 annex 12.

/27/ ANEEL website, Total of electricity generated in Brazil, checked on 01/04/2010.

/28/ CDM Executive Board "Guidelines on the demonstration and assessment of prior consideration on the CDM", version 3, EB 49 annex 22.

/29/ CDM Executive Board "Glossary of CDM terms", version 5.

/30/ CDM Executive Board "Guidelines on the assessment of investment analysis", version 3.

/31/ Minutes of Hidrelétrica Cachoeirão S.A. shareholders annual general meeting (on 24/04/2008), mentioning Santa Maria Energética S/A and CEMIG Geração e Transmissão S/A as shareholders, registered in the Minas Gerais State Board of Trade in 08/01/2009 ("*AGO 24 04 2008 Registrada.pdf*")

/32/ ANEEL guidelines "*Estudo de Vida Útil Econômica e Taxa de Depreciação*", dated November 2000 (lifetime of SHPs) available at: <http://www.aneel.gov.br/aplicacoes/audiencia/arquivo/2006/012/documento/relatorio_vida_util_volume_2.pdf> accessed on 06/08/2010

/33/ CDM Executive Board "Guidelines for the reporting and validation of plant load factors", EB 48 – annex 11 – version 1.

/34/ ANEEL Resolution # 169, dated 3rd May 2001

/35/ EPE- Empresa de Pesquisa energética (Energy Research Company) release press, dated 18/06/2007 ("*Preço Energia_135 Reais_Leilao fontes alternativas energia.pdf*")

/36/ Energisa Soluções Ambientais S/A and Hidrelétrica Cachoeirão S.A. contrat number CT 014/08 ("*CT 014-08 Energisa Soluções - O&M.pdf*")

2.2 Follow-up actions

On 09 and 10/02/2010, RINA visited the SHP Cachoeirão to resolve questions and issues identified during the document review and to perform interviews with relevant stakeholders in the host country.

The key personnel interviewed and the main topics of the interviews are summarized in the table below.

	Date	Name and Role	Organization	Topic
/a/	09 and 10/02/2010	Arthur Moraes- consultant	Carbotrader Assessoria e Consultoria em Energia Ltda.	- Clarifications on establishment of baseline, monitoring plan and emission reduction calculations - Resources, training needs and procedures for operation and maintenance - Monitoring Plan / Records (backups) - Maintenance program (calibration) - Project boundaries - Baseline and project emissions - Emissions reductions calculations - Environmental Licenses - Local stakeholders (invitations, confirmations)
/b/	09 and 10/02/2010	Robson Gomes da Cunha- Administrative/ Financial manager	Hidrelétrica Cachoeirão S.A.	
/c/	09 and 10/02/2010	Diana da Silva Oliveira- Environmental manager	Hidrelétrica Cachoeirão S.A.Carbotrader Assessoria e Consultoria em Energia Ltda.	

2.3 Resolution of outstanding issues

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

To guarantee transparency a validation protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of validation and the results from validating the identified criteria. The validation protocol consists of four tables; the different columns in these tables are described in the figure below (see Figure 1). The completed validation protocol is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM requirements have not been met;
- There is a risk that the emission reductions cannot be monitored or calculate.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration. CARs, CLs and FARs identified are included in the validation protocol in Appendix A of this report.

Figure 1 Validation protocol tables

VALIDATION REPORT

Validation Protocol, Table 1 - Mandatory requirement		
Requirement	**Reference**	**Conclusion**
The requirements the project must meet.	Makes reference to the documents where the answer to the requirement is found.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) if a requirement is not met. A request for clarification (CL) is used when the validation team has identified a need for further clarification.

Validation Protocol, Table 2 - Requirement checklist					
Checklist Question	**Ref.**	**MoV**	**Comments**	**Draft Conclusion**	**Final Conclusion**
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in seven different sections.	Makes reference to documents where the answer to the checklist question or item is found.	Explain how conformance with the checklist question is investigated. Examples are document review (DR), interview or any other follow-up actions (I), cross checking (CC) with available information relating to projects, (N/A) means not applicable.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with checklist question so far.	OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. For CAR, CL and FAR see the definitions above.	OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements.

Validation Protocol, Table 3 - Resolution of Corrective Action Requests and Clarification			
Corrective action requests and/or clarification requests	**Reference to Table 2**	**Response by project participants**	**Validation Conclusion**
The CAR and/or CLs raised in table 2 are repeated here.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants to address the CARs and/or CLs.	The validation team's assessment and final conclusion of the CARs and/or CLs.

Validation Protocol, Table 4 - Forward Action Requests		
Forward action request	**Reference to Table 2**	**Response by project participants Validation Conclusion**
The FAR raised in table 2 is repeated here.	Reference to the checklist question number in Table 2 where the FAR is explained.	Response by the project participants on how forward action request will be addressed prior to first verification.

2.4 Internal quality control

All the revisions of the validation report before being submitted to the client were subjected to an independent internal technical review to confirm that all validation activities had been completed according to the pertinent RINA instructions.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for CDM validation and verification.

2.5 Validation team and the technical reviewer(s)

The validation team and the technical reviewers consist of the following personnel:

Role/Qualification	Last Name	First Name	Country
Team Leader CDM	Principe Branco Saettoni	Geisa Maria	Brazil
CDM Validator	De Lima Carvalho	Thaís	Brazil
CDM Validator	Poll Herrmann	Lilian Cristine	Brazil
Financial Expert	Mendonça de Oliveira	Tiago	Brazil
Technical Reviewer			

2.6 Resolution of Clarification and Corrective Action Requests

The initial validation of the project identified some findings to be followed-up. These were presented to the project participant(s) through the interview process. The project participant's responses to RINA's preliminary findings, which also included the submission of the revised PDDs version 3 of 10 September 2010 and version 2 of 18 May 2010, addressed all preliminary findings to RINA's satisfaction.

To guarantee the transparency of the validation process, the concerns raised and responses given are summarized and documented in more detail in Table 3 of the validation protocol, in Appendix A.

3 VALIDATION FINDINGS

Where RINA identified issues that needed clarification or that could represent a risk to the fulfillment of the project objectives, Clarification or Corrective Action Requests, respectively, have been issued. The validation requirements, means of validation, reporting requirements and the results from validating the identified criteria are documented in more detail in the Validation Protocol in Appendix A.

The validation findings relate to the project design, as documented and described in the PDD version 3 of 10 September 2010 /1/.

3.1 Approval and Participation

The project's host Party, Brazil, fulfills the requirements to participate in the CDM. No Annex I party has yet been identified.

Brazil ratified the Kyoto Protocol on 23/08/2002 and established, as its Brazilian Designated National Authority for the CDM, the "Comissão Interministerial de Mudança Global do Clima" (CIMGC).

The project participant(s) are Carbotrader Assessoria e Consultoria em Energia Ltda. and Hidrelétrica Cachoeirão S.A. from Brazil and all participants are private entities. The PDD version 2 was revised and the project participants are correctly listed in table A.3 of the PDD and the information is consistent with the contact details provided in Annex 1 of the PDD /1/.

The proposed project does not involve any public funding from an Annex I Party, and the validation did not reveal any information that indicated that the project could be seen as a diversion of official development assistance (ODA) funding towards the host country.

Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development.

3.2 Project design document

The PDD for the project activity "Cachoeirao CDM Project (JUN1092)" in Brazil, PDDs version 3 of 10 September 2010, version 2 of 18 May 2010 and version 1 of 16 November 2009 submitted by Carbotrader Assessoria e Consultoria em Energia Ltda. and Hidrelétrica Cachoeirão S.A. have been the basis for the validation process.

RINA confirms that the above PDD is based on the currently valid PDD template and is completed in accordance with the applicable guidance document "Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM) /26/

3.3 Project Design

The "Cachoeirao CDM Project (JUN1092)" is located in Pocrane and Alvarenga cities, Minas Gerais state, Brazil in the following Geographical Coordinates: 19º 26' 12´´ S and 41º 36´ 51´´ W. Coordinates were cross checked against ANEEL Dispatch # 1,214, dated 23 April 2007 /9/, and found to be correct.

The category of the project activity was not presented in the PDD version 1, dated 16 November 2009 and it was correctly included in the PDD version 2, dated 18 May 2010: "Grid-connected electricity generation from renewable sources" and Sectoral Scope 1- Energy industries (renewable/non-renewable sources).

The project is a renewable electricity generation project activity displacing grid electricity that is partly generated based on fossil fuels, with electricity generated from renewable sources and thus resulting in the reduction of emissions of greenhouse gases in the energy sector.

The Cachoeirão SHP is a project classified as Small Hydro Power Plant according to the ANEEL Resolution # 652, dated 09/12/2003 /13/, that establishes that in Brazil, to be classified as a SHP, the reservoir area must be less than 3 Km^2 (300 ha) and the total installed capacity must be between 1 MW to 30 MW. In the PDD version 1 the installed capacity presented was 27.9 MW, based on turbines' specification. However, PPs were addressed to present the installed capacity as per definitions of the applied methodology ACM0002: *The installed power generation capacity of a power unit is the capacity, expressed in Watts or one of its multiples, for which the power unit has been designed to operate at nominal conditions. The installed power generation capacity of a power plant is the sum of the installed power generation capacities of its power units.* Therefore, the installed capacity of 28.05 MW was correctly presented in the PDD version 3, as per the generators' plate verified during site visit. The ANEEL's Resolution # 407, dated 19 October 2000 /10/, requires the PP to revise the authorized installed capacity of

the SHP if the present/real installed capacity is greater than +/- 5 % of the authorized/granted installed capacity. The authorized installed capacity of the SHP Cachoeirão is 27 MW, defined in ANEEL Resolution # 282, dated 26 July 2000 /9/. As it is inside the rage of the Resolution # 407, it is still valid for the project activity. The project activity has a reservoir area of 1.021 km^2, confirmed through the ANEEL Dispatch # 1,214, dated 23 April 2007 /9/.

At the time of the site visit, the project was implemented and operational. Rina verified the following equipments during the site visit:

3 Generators: GE Motors (model 271R640 - Nominal power 11,000 kVA, Power factor 0.85), serial numbers 227001530, 227001531 and 227001532;

3 Turbines: Voith Siemens (Francis - Nominal power 9,300 kW, Flow 22.45 m^3/s), serial numbers 19,453, 19,454 and 19,455;

2 Meters: ION 8,600, serial number PT-0801A126-01 (principal/main) and ION 8,600 serial number PT-0801A128-01 (backup/rearguard).

The project design engineering reflects current good practice.

The starting date of the project activity is 09/03/2007, based on the Santa Maria Energética S.A. service order to start the plant construction. EPC contract between Santa Maria Energética S.A. and Consórcio Construtor Cachoeirão mentions, in its item 48.1.5, that the EPC contract is valid after the emission of the service order. The shareholders minutes of meeting of Hidrelétrica Cachoeirão S.A. (annual general meeting, dated 24/04/2008), mentions Santa Maria Energética S.A. and CEMIG Geração e Transmissão S/A as shareholders, and was registered in the Minas Gerais State Board of Trade on 08/01/2009. In light of the provided evidences, the earliest date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity is 09/03/2007, as per Glossary of CDM terms, version 5 /29/.

The commissioning of Cachoeirão SHP was revised in the PDD version 2 and it was confirmed in the ANEEL documents /9/ as follows:

* ANEEL Dispatch # 4830, dated 30 December 2008 - authorizes 9,000 kW generator unit # 1 to start operation (30/12/2008);

* ANEEL Dispatch # 559, dated 11 February 2009 - authorizes 9,000 kW generator unit # 2 to start operation (12/02/2009);

* ANEEL Dispatch # 714, dated 27 February 2009 - authorizes 9,000 kW generator unit # 3 to start operation (28/02/2009).

The expected operational lifetime of the project is 30 years (0 months), the same period for which the ANEEL's Authorization Resolution number 282, dated 26 July 2000 is valid. As per Rina request, PPs provided evidence of the operational lifetime of the equipments of the project activity is according to ANEEL guidelines "*Estudo de Vida Útil Econômica e Taxa de Depreciação*", dated November 2000 /32/. Therefore, the operational lifetime of the project activity of 30 years is correctly defined in the PDD and deemed reasonable.

The crediting period starting date was initially defined as 01/07/2010 (published PDD) and 01/01/2011 in the PDD version 2. The PDD version 3 establishes that a renewable crediting period of 7 years has been chosen for the project, starting from 01/05/2011, or the date in which occurs the UNFCCC registration, the one that occurs later.

According to the PDD version 3 (after revising the emission factor), the total GHG emission reductions from the "Cachoeirao CDM Project (JUN1092)" are estimated to be 164,108 tCO_2e during the first renewable 7 years crediting period, resulting in an annual average emission reductions of 23,444 tCO_2e / year.

The project has an Assured Energy[1] equal to 16.37 MW (average), (resulting in a Plant Load Factor of 58.4 % = 16.37 MW / 28.05 MW) that was confirmed in the ANEEL Decree # 18, dated 25 May 2007 /9/, that defined the a assured energy for the Cachoeirão SHP . Therefore, the average energy generated per year is forecasted to be 143,401 MWh/year (16.37 MW*365 days*24 hours).

The Assured Energy of an hydroelectric plant is issued by ANEEL (Brazilian Electric Energy Agency), and serves essentially two purposes:

(i) to establish an upper limit for energy supply contracts (PPAs), and

(ii) to define the share of each generating plant on the total amount of energy generated in the system by hydro plants.

The Assured Energy of the Brazilian electric system is defined as the maximum energy production that can be delivered almost continuously by hydroelectric plants throughout the years, simulating the occurrence of each one of the thousands of possibilities of statistically created flow sequences, admitting certain risk of not attendance to the load, that is, in determined percentile of the simulated years some rationing is allowed up to a limit considered acceptable by the system. The determination of the Assured Energy is associated to the conditions in the long term that each plant can supply to the system assuming an specific risk criteria of non-attendance to the market (risk of deficit), considering mainly the hydrologic variability to which the plant is submitted.

RINA was able to verify all the documented evidence listed above during the validation process and can confirm that data and considerations are complete and accurate.

RINA confirms that the description of the proposed CDM project activity, as contained in the PDD sufficiently covers all relevant elements, is accurate and complete and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity.

3.4 Application of selected baseline and monitoring methodology

The project activity correctly applies the approved baseline and monitoring methodology ACM0002, “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, Version 11 of 26/02/2010 /5/. The published PDD (version 1) applied the version 10 of the approved consolidated baseline methodology, that was updated to version 11 in the PDD version 2 The PP applied is using the valid version of methodology.

The following tool are applicable to the project activity and are the latest approved versions:

- "Tool to calculate the emission factor for an electricity system" (version 2);
- "Tool for the demonstration and assessment of additionality" (version 5.2).

Each applicability criteria condition listed in the approved methodology was assessed against criteria contained in the PDD.

The project activity does not involve switching from fossil fuels to renewable energy at the site(s) of the project activity.

The PDD version 1 mentioned wrongly: “*The ACM0002 methodology is applicable to grid-connected renewable power generation project activities that involve electricity capacity additions under the following conditions:…*”. The applicability definition of ACM0002 was corrected in the PDD version 2.

[1] http://www.aneel.gov.br/aplicacoes/capacidadebrasil/energiaassegurada.asp

The proposed project activity does not involve capacity additions, a retrofit of an existing plant or a replacement of existing plant.

In line with ACM0002 version 11, the proposed project activity complies with item a) of the methodology's applicability - "*install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant)".* Cachoeirão SHP is a new power plant, installed in a site where no renewable power plant was operated prior to the project implementation. This information was confirmed at site assessment and through environmental licenses /12/ and ANEEL documents /9/.

Moreover, the project activity complies with the methodology's following condition: "*The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m²*". The power density of the Cachoeirão SHP was revised in the PDD version 3, due to the revision in the installed capacity of the SHP. Power density = 28,500,000 W/ 1,021,000 m^2 = 27.47 W/m^2. Thus, the power density of the power plant is greater than 10 W/m^2 and the project emissions from the reservoir(s) are considered as equal to zero (PE_y=0). Reservoir area was confirmed through the ANEEL Dispatch # 1,214, dated 23 April 2007 /9/ and installed capacity was confirmed during the site visit.

Emission sources which are not addressed by the applied methodology and which are expected to contribute more than 1% of the overall expected average annual emissions reduction have not been identified.

RINA hereby confirms that the selected baseline and monitoring methodology has been previously approved by the CDM Executive Board, and is applicable to the Project, which complies with all the applicability conditions therein.

3.5 Project boundary and baseline identification

3.5.1 Project boundary

According to the approved baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 11 of 26/02/2010 /5/ the proposed project's boundaries (spatial extent) encompass the project power plant and all power plants physically connected to the national electricity system (SIN-National Interconnected System) that the proposed project activity is connected to. The PDD version 1 did not present the diagram of the project boundary as per the applicable CDM requirements for completing PDDs, EB 41 annex 12. The PDD version 2 included the National Interconnected System in the boundary of the project activity and presented the gases included in the project boundary and monitoring variables, as per EB 41, annex 12 requirements.

RINA assessed the physical delineation of the project activity through ANEEL documents, environmental licenses and site assessment.

The following emissions sources are included in the project boundary:

Baseline emissions

Source	Gas	Included?	Justification / Explanation
CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO_2	Yes	Emissions from fossil fuel power plants connected to the national grid.

Project Activity Emissions

Source	Gas	Included?	Justification / Explanation
For hydro power plants, emissions of CH_4 from the reservoir.	CO_2	No	There is no increase of fossil fuel or electricity consumption due to the project activity.
	CH_4	No	Power density is greater than 10 W/m^2.
	N_2O	No	Minor emission source.

The PDD version 1 included the CH_4 emissions from the reservoir; however, as power density of the project activity is greater than 10 W/m^2, the CH_4 emissions were excluded in the PDD version 2.

Leakage is not applicable to the project activity.

By assessing the above information and the project site, RINA can confirm that the project boundary and emission sources described in the PDD are accurate and complete, and also that the selected sources and gases are justified for the proposed project activity.

3.5.2 Baseline identification

According to the approved baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 11 of 26/02/2010 /5/, the project activity is the installation of a new grid-connected renewable power plant/unit, hence, the baseline scenario is the following: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants (mostly large hydro and thermal power plants) and by the addition of new generating sources, as reflected in he combined margin (CM) from "Tool to calculate the emission factor for an electricity system".

As per Ministry of Science and Technology – MCT, the National Interconnected System is defined as a single electricity system to calculate the CO_2 emission factor. The grid emission factor is provided by Brazilian DNA and will be calculated *ex-post* during the crediting period.

In the PDD version 1, the baseline emissions were estimated *ex-ante* using the latest available at the time of the start of the validation (PDD published on 10/12/2009) emission factor of the Brazilian grid system for 2008 (= 0.3112 tCO_2/MWh). During the validation process a most recent data was published by the Brazilian DNA for the year 2009 and PP updated the CERs spreadsheet *("CERs JUN1092_v3.xls"*) /2/ and the PDD version 3 /1/: EF= 0.163483 tCO_2/MWh - average OM= 0.2476 tCO_2/MWh and BM= 0.0794 tCO_2/MWh. All data used to calculate the emission factor provided in the PDD was cross-checked with credible sources provided by Brazilian DNA. Therefore, the identified baseline scenario presented in the PDD is correctly applied, in accordance with the Approved Methodology ACM0002, Version 11 of 26/02/2010 /5/.

3.6 Additionality

According to the approved baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 11 of 26/02/2010 /5/, the additionality of the project has been established applying the tool "Tool for the demonstration and assessment of additionality", version 5.2 /7/.

RINA's opinion regarding the additionality of the proposed project is further explained in the following steps.

3.6.1 Prior consideration of the clean development mechanism

It has been demonstrated that CDM was seriously considered before the decision to go ahead with the proposed project by the following activities in accordance with the "Guidelines on the demonstration and assessment of prior consideration of the CDM"/28/.

The following timeline and related evidences shows the development of the project.The timeline has been reviewed and considered to be valid and realistic.

Date	Event/ issue
26/07/2000*	ANEEL Resolution # 282, authorizes Empresa de Luz e Força Santa Maria SA-ELFSM to implement and explore Cachoeirão SHP;
15/10/2002	ANEEL Resolution 557, - transfers the authorization to implement and explore Cachoeirão SHP from ELFSM to Santa Maria Energética SA.;
14/11/2005	Minutes of meeting conducted by CEMIG and Santa Maria Energética SA considering several issues about the SHP Cachoeirão, including the studies for carbon credits (item [i] page 3). **Prior CDM consideration**.
17/03/2006	proposal from Ecoinvest Carbon to carbon credits development under Kyoto Protocol
09/03/2007	Starting date of the project activity- service order
23/04/2007	ANEEL Dispatch # 1,214, approves the Cachoeirão basic project (27.0 MW) and defines a reservoir area of 1.021 km2 and coordinates 19º 26' 12" S 41º 36' 51" W;
10/04/2007	email from Carbotrader to CEMIG with attachment "Estudo PCH Cachoeirão", which describes studies from CERs selling for the SHP Cachoeirão
8/05/2007	ANEEL Authorization Resolution # 908, transfers the authorization to implement and explore Cachoeirão SHP from Santa Maria Energética S.A. to Hidrelétrica Cachoeirão S.A.;
13/07/2007	Installation License (LI) issued by the environmental agengy (COPAM)
22/08/2007	email from PP requesting a validation proposal to one DOE
07/05/2008	email from PP requesting a validation proposal to another DOE
10/10/2008	Operation License, issued by the environmental agency (COPAM)
30/12/2008	ANEEL Dispatch # 4830, authorizes 9,000 kW generator unit # 1 to start operation
11/02/2009	ANEEL Dispatch # 559, authorizes 9,000 kW generator unit # 2 to start operation;
27/02/2009	ANEEL Dispatch # 714, authorizes 9,000 kW generator unit # 3 to start operation.
10/12/2009	Start of the validation, PDD published for global stakeholder consultation

**ANEEL grants permission for a project to be built, but the authorization alone is no guarantee that a project will be actually built).*

The starting date of the project activity is 09/03/2007, based on the Santa Maria Energética S.A. service order to start the plant construction. EPC contract between Santa Maria Energética S.A. and Consórcio Construtor Cachoeirão mentions, in its item 48.1.5, that the EPC contract is valid

after the emission of the service order. The shareholders minutes of meeting of Hidrelétrica Cachoeirão S.A. (annual general meeting, dated 24/04/2008), mentions Santa Maria Energética S.A. and CEMIG Geração e Transmissão S/A as shareholders, and was registered in the Minas Gerais State Board of Trade in 08/01/2009. In light of the provided evidences, the earliest date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity is 09/03/2007, as per Glossary of CDM terms, version 5 /29/.

Since the Project is an existing project activity (project activity with a start date before 02/08/2008) and the identified start date is prior to the date that the PDD was published for global stakeholder consultation (10/12/2009), the PP is required to demonstrate that the CDM was seriously considered in the decision to implement the project activity, that the benefits of CDM were a decisive factor in the decision to proceed with the project and that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation.

RINA has assessed and verified the evidences related to the timeline for serious CDM consideration and real and continuing actions to attain CDM status of the project activity, presented in the table above. RINA was able to check the above documents (reliable evidences) and considers that satisfactory actions were undertaken to secure CDM status in parallel with the physical implementation of the project activity, according to EB49 Annex 22 /28/.

3.6.2 Identification of alternatives

The alternative scenarios for the project activity consistent with all applicable and enforced legislation have been identified, as shown below:

Alternative 1: the project activity undertaken without being registered as a CDM project activity;

Alternative 2: the continuation of the current situation: electricity generation by the Brazilian National Interconnected System (SIN).

RINA can confirm that the alternatives identified in the PDD are credible and complete.

3.6.3 Investment analysis

3.6.3.1 Choice of approach

The benchmark analysis was done in accordance with the "Tool for demonstration and assessment of additionality" (version 5.2) and Guidelines on the assessment of investiment analysis, version 3. Among the three options available for investment analysis as discussed in the "Tool for the demonstration and assessment of additionality", project participants have chosen the benchmark analysis since the other two are not applicable. The simple cost analysis is not applicable because the project will generate financial and economic benefits (from electricity sales) other than CDM related income. The investment comparison analysis is not applicable either because the only alternative to the project activity is the supply of electricity from a grid, which is not to be considered a similar investment project.

3.6.3.2 Benchmark selection

The PDD version 1 presented the discussion about the benchmark in the "Sub-step 2c: *Calculation* and comparison of financial *indicators*" and in the PDD version 2 the explanation was moved to the correct section, *"Sub-step 2b: Option III. Apply benchmark analysis".*

In Brazil there is not a widely accepted benchmark for SHPs projects nor does the Government require a minimum profitability in projects of this kind. The project IRR (internal rate of return)

was compared with the yield on Government Bonds. Project participants have chosen a Brazilian Government Bond named National Treasury Notes, Series C (NTN-C), with maturity for January 1st, 2031. It is placed on the market by the Brazilian National Treasury by a Public Offering and its profitability is linked to Inflation by the IGP-M Index.

In the PDD version 1, it was considered as the yield of paper the value quotation in one day for one year (11/11/2009). Project participants added to the paper day quotation the average IGPM between 1999 and 2008. PP were addressed that this represents a misalignment of information, with sums of values that do not represent the same period of time. Moreover, dates of NTC-N and IGP-M were after the starting date of the project activity. In addition, taking into account that Brazil does not have a fully stabilized economy and some inflation, an index like IGP-M (that is linked to the profitability of the NTN-C) had a non-linear behavior in the last ten years, project participants were requested to consider a longer period for the calculation of yield average, considering yearly averages and not quotation for specific days.

The PDD version 2 was revised accordingly. PP provided the benchmark based on average of 4 entire years before the starting date of the project activity (January 2003 to December 2006). The reports are publicity available by the Brazilian Government (http://www.tesouro.fazenda.gov.br/tesouro_direto/download/balanco/2003/balanco_1203.pdf; http://www.tesouro.fazenda.gov.br/tesouro_direto/download/balanco/2004/balanco_1204.pdf; http://www.tesouro.fazenda.gov.br/tesouro_direto/download/balanco/2005/balanco_1205.pdf; http://www.tesouro.fazenda.gov.br/tesouro_direto/download/balanco/2006/balanco_1206.pdf[2]). The performed calculation resulted in an average yield of 23.30% per year. PPs provided all the evidences in the spreadsheet *"Benchmark_v2.xls"*.

In the PDD version 1, PPs also considered a Market Risk Premium. The Market Risk Premium chosen for the benchmark was based in the study *"Uma Análise de Risco do Segmento de Energia Elétrica"* – A risk analysis of the Electricity segment, which was presented in the Administration Seminars at the School of Economics, Business and Accounting at the University of São Paulo (USP). The PPs considered a value of 1.27%, which is the average return of investment on the Electrical Segment Index versus IBOVESPA index (main index of BOVESPA – São Paulo Stock Exchange). RINA considered that the risk premium used was not appropriate to the project activity because it was calculated in a different base from the benchmark. In the PDD version 2, the risk premium was revised to 1.3% and it derived from the BNDES article "*O Papel do BNDES na Expansão do Setor Elétrico Nacional e o Mecanismo de Project Finance*", from March 2009 (available at: http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/conhecimento/bnset/Set2901.pdf). PP also provided an email from an author of this article and a chart explaining the calculation methodology, which was not presented in the mentioned article. However, RINA addressed the document presented in the PDD version 2 is more recent than the investment decision date of the project project activity. Thus, in the PDD version 3 /1/, IRR spreadsheet version 3 ("*IRR_Cachoeirao_v3.xls*") /3/ and spreadsheet "*Benchmark_v3.xls*" /21/, as a corservative approach, the risk premium was not longer considered.

The summary of the values of the benchmark applied through the different versions of the PDD is presented in the table below:

PDD version	NTN-C	Risk Premium	Value of the benchmark	Related Documents
1 of 16 November 2009	17.68 %	1.27 %	18.95 %	a) "*IRR_Cachoeirao.xls*"

[2] Accessed on 13/09/2010

				b) *"Government bond rates.xls"*
2 of 18 May 2010	23.30 %	1.3 %	24.60 %	a) *"IRR_Cachoeirao_v2_1.xls"* b) *"Benchmark_v2.xls"*
3 of 10 September 2010	23.30 %	--	23.30 %	a) *"IRR_Cachoeirao_v3.xls"* b) *"Benchmark_v3.xls"*

3.6.3.3 Input parameters

Revenues (Electricity Tariff *Generation)

The estimated net electricity generation supplied by the project plant to the grid was calculated based on the assured energy (16.37 MW average) provided by ANEEL (ANEEL Decree # 18, dated 25 May 2007) /9/.

The "Guidelines for the reporting and validation of plant load factors" parag. 3 (a) states: *The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval* /33/. As already commented (report item 3.3), the Assured Energy of an hydroelectric plant is issued for each plant by ANEEL (Brazilian Electric Energy Agency), and serves essentially two purposes: (i) to establish an upper limit for energy supply contracts (PPAs), and (ii) to define the share of each generating plant on the total amount of energy generated in the system by hydro plants.

The Assured Energy of the Brazilian electric system is defined as the maximum energy production that can be delivered almost continuously by hydroelectric plants throughout the years, simulating the occurrence of each one of the thousands of possibilities of statistically created flow sequences, admitting certain risk of not attendance to the load, that is, in determined percentile of the simulated years some rationing is allowed up to a limit considered acceptable by the system. The determination of the Assured Energy is associated to the conditions in the long term that each plant can supply to the system assuming an specific risk criteria of non-attendance to the market (risk of deficit), considering mainly the hydrologic variability to which the plant is submitted (information taken from http://www.aneel.gov.br/arquivos/pdf/caderno3capa.pdf - accessed on 28/07/2010 and available only in a Portuguese version). It important to highlight that the calculations for the assured energy was established by the ANEEL Resolution nº 169, of 3rd May 2001 /34/. Therefore, as the project has an Assured Energy equal to 16.37 MW (average), confirmed in the ANEEL Decree # 18, dated 25 May 2007 /9/, the resulting Plant Load Factor is equal to 58.4 % (=16.37 MW / 28.05 MW). It is in line with Guidelines for reporting and validation of plan load factor, version 1 /33/. The average energy generated per year is forecasted to be 143,401 MWh/year (16.37 MW*365 days*24 hours).

The document "Comitê de Gerenciamento de riscos de Energia-CGRE" from CEMIG, establishes the value of 140.00 R$/MWh for the period from 2011 to 2013 (bloco 1-block 1, 97% of the energy generated), and the value of 76.44 R$/MWh for the year 2009 and the value of 97.27 R$/MWh from 2010 on (bloco 2 - block 2, 3% of the energy generated, to be sold in the free market), however, in the financial analysis version 1 and PDD version 1, the values of 140.00 R$/MWh and 76.44 R$/MWh were applied for all the period of the investment analysis. In the PDD version 2, the energy values were adjusted as per the values definided in the CEMIG document. Moreover, Rina requested to PP to clarify the index used to adjust the energy prices. The inflation index (IGP-M) was correctly applied on energy prices over the years in the financial spreadsheet version 2 (*"IRR_Cachoeirao_v2_1.xls"*).

The energy prices used in the financial spreadsheet are compatible with energy prices practiced in energy market, for example, the Auction of Alternative Energy that occurred in June 2007, which was, in average, equal to R$ 135.00/MWh for Small Hydro Power plants, and that was confirmed in a press release issued by the Energy Research Company (Empresa de Pesquisa Energética - EPE) /35/ and the average value of R$ 144.60/MWh for the energy sold in the CCEE public energy auction occurred in 2009 (Edital # 002/2009- ANEEL) (<http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Leiloes/8_energia%20nova/Resultado%20planilha%20completa.xls> accessed on 15/09/2010). Regarding the energy price (sold) in the free market (Block 2), Rina verified in the CCEE web site (information available at the CCEE web site <http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=6e6596f102913210VgnVCM1000005e01010aRCRD> accessed on 15/09/2010) that the average of the prices in the period of 2003 until March 2007 (starting date) is R$ 34.37/ MWh. The short-term market reflects the operation optimization in the National Interconnected System, through the relation between the moment benefit of using this water from the reservoirs contained in the large hydroelectric plants and the future benefit of its storage; as the prevailing practice in Brazil, there are a preponderance of large hydro power plants interconnected to the system, so the oscillation of reservoirs level, energy demand, fuel prices, among others, directly influence those prices.

Investment costs

The Cachoeirão Small Hydropower Plant is an R$ 103.959 millions investment. The investment is divided in 4 years, 7.9% in the year 0, 25.7% in the year 1, 64.8% in the year 2 (the first year of operation) and 1.6% in the year 3. Project participants provided the whole detail of this investment in the spreadsheet "Quadro Usos e Fontes.xls" /22/. The investment of R$ 103,959 millions was confirmed in the document protocoled in the BNDES (registered in the 5th Oficial de Registros de Titulos e documentos" Microf. under number 01252177) /25/.

The total initial amount of R$ 103,959 millions is very reasonable considering the magnitude of such investments (average of R$ 3,691,393.00/kW installed) is in line with the average of similar projects. The investment costs were compared to the average construction costs of SHPs in Brazil, and the project activity has a proper and conservative correspondence with the R$ 5 million/ installed MW to R$ 5.5 million/ installed MW found in the literature[3].

Operational Costs

In relation to Costs, for Management Costs after Start of the operation, it's defined a fixed tariff of R$ 1.88 per MWh and for O&M costs it's defined a fixed tariff of R$ 7.56 per MWh. Both tariffs were confirmed in the document *Comitê de Priorização de Investimento – CPO- Parecer de Projecto de Investimento –Projeto nº1714/07 SPE Guanhães* (Meeting report discussing the investment of the Guanhães (4 SHPs) project, conducted on 16/10/2008) /24/, that mentions that the same values of SHP Cachoeirão will be used in the referred project. Other Costs were presented as 2% of Management Costs and O&M. The group Insurances and another fees and taxes paid for government and some regulatory agencies in the electricity sector were presented, some of them have fixed values and others are a percentage of revenues. These are also confirmed in the reference /24/. Rina addressed PP to provide evidences and clarifications on how the cost will be adjusted over the years. Project participants provided the annex "*CT 014-08 Energisa Soluções - O&M.pdf*" /36/ with the contract between PCH Cachoeirão and

[3] http://www.portalpch.com.br/index.php?option=com_content&view=article&id=2749:08092009-crescimento-do-pre-sal-nao-reduzira-o-papel-das-fontes-alternativas-de-energia-afirma-mauricio-tolmasquim&catid=1:ultimas-noticias&Itemid=98 OR http://www.olade.org/electricidad/Documents/ponencias/Dia%2026%20de%20mayo/Sesion%203/PCH%20Diagnostico_TFilho.pdf < Accessed on 13/09/2010>

Energisa (workforce supplier) setting the indexes and the formula to be used over the years. All formulas in the spreadsheet "*IRR_Cachoeirao_v2_1.xls*" are aligned with this document. The tariffs were annualy adjustment through the IGP-M and INPC indexes.

The evidences presented are considered suitable to the project activity. In the sensitivity analysis the impact of operational costs is not relevant (the project would continue to be additional even if these costs are neglected).

Taxes

The inflation on prices and costs was considered and the references can be confirmed at:

* IGP-M: http://www.portalbrasil.net/igpm.htm[4], and for the index forecast: http://www4.bcb.gov.br/pec/GCI/PORT/readout/R20100108.pdf[5] ;

* INPC: http://www.portalbrasil.net/inpc.htm[6]. To the index forecast was kept the 2009 value.

* PIS/COFINS/Income Tax and Social Contribution:

The Brazilian law 10.637 from 30 December 2002 and the law 9.718 from 27 November 1998 defined that company with Gross revenue less than R$ 48 million can aplicate the Brazilian System of tax "Presumed tax profit". So, the following taxes are applied in the gross revenue:

* COFINS (from the portuguese: Contribuição para o Financiamento da Seguridade Social) – 3% over the Profit;

* PIS/PASEP (from the portuguese: Programa de Integração Social/ Programa de Formação de Patrimônio do Servidor Público) – 0,65% over the Gross Revenue;

* Income tax – 25% over 8% of the Gross revenue;

* Social contribution – 9% over 12% of the Gross revenue.

* TUSD fee: Resolution N° 310, from 6 April 2006

* TUST fee: ANEEL Resolution number 281/1999, ANEEL Resolution n. 77/2004- reduction and ANEEL Resolution n. 81/2004 - Charges (Encargos).

In the first version of the financial analysis, PP considered the CPMF sale tax. As this tax was extinct since 2007, PP revised the financial analysis to exclude the CPMF tax from the analysis.

3.6.3.4 Calculation and conclusion

Regarding the prices and costs evolution over the years presented in the version 1 of the IRR spreadsheet, Project Participants had presented flat values for all years. RINA addressed to PPs the necessity to demonstrate in P&L and Cash Flow the evolution for all lines, in accordance with contracts or the most appropriate inflation index. This evolution can be different for any line and this can represent a significant impact on the EBITDA evolution. The inflation on prices and costs has to be considered because in the benchmark choosen the return of the investment includes the inflation. Also related to the indexes, inflation, interest rates and also foreign exchange rates, PPs were requested to demonstrate the sources of the information, prioritizing the sources of the Brazilian Government or some large financial institutions, as normally those institutions provide a forecast for next few years.

PP provided to Rina the spreadsheet version 2 (*"IRR_Cachoeirao_v2_1.xls"*) and further the version 3 ("*IRR_Cachoeirao_v3.xls*"). Rina confirmed that all taxes are correctly applied in the version 3 of the financial analysis (see information above).

[4] Accessed on 13/09/2010
[5] Accessed on 13/09/2010
[6] Accessed on 13/09/2010

The summary of the values of the IRR calculation presented in the different versions of the PDD is presented in the table bellow:

PDD version	IRR	Related Documents
1 of 16 November 2009	14.38 %	"*IRR_Cachoeirao.xls*", version 1
2 of 18 May 2010	18.67 %	*"IRR_Cachoeirao_v2_1.xls"*, version 2
3 of 10 September 2010	18.67 %	*"IRR_Cachoeirao_v3.xls"*, version 3

The difference among the versions is due mainly by the correction of financial analysis to consider the inflation, in order to be coherent with the choosen benchmark that also considers inflation.

It is possible to conclude that the benchmark (23.30 %) is higher than the project's IRR (18.67 %).

3.6.3.5 Sensitivity analysis

The PDD version 1, considered the following parameters in the sensitivity analysis: (i) Energy Price; (ii) Investment and (iii) Plant Load Factor. In the PDD version 3, PPs also included the analysis of the (iv) Operational Costs as it is the main cash out value over the years, after the investment. For the sensitivity analysis, projects participants calculated how large should these variations be to make the projects' NPV equal zero or, in other words, to make their IRR equal the benchmark (breakeven point). Their results are shown below.

	Energy Price (R$/MWh)	Investment (R$)	Plant Load Factor (MW)	O&M (R$/MWh)
% of deviation	+ 28.64 %	- 24.5 %	+ 31.15 %	Not sensible

As can been seen, for all parameters it was necessary a high value of deviation to achieve the benchmark. For instance, the Plant Load Factor can not increase (it is limited by the defined ANEEL's Assured Energy /9/); the energy price is not likely to increase 28.64 %, as the average value of R$ 144.60/MWh for the energy sold in the CCEE public energy auction occurred in 2009 (Edital # 002/2009- ANEEL) (<http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Leiloes/8_energia%20nova/Resultado%20planilha%20completa.xls> accessed on 15/09/2010); the investment was based on Eletrobrás Standard Buget /25/, which considers reliable source of data and it is not likely to decrease 24.5% and for the O&M costs, project would continue to be additional even if these costs are neglected. In all scenarios, the project's IRR is unlikely to reach the benchmark.

3.6.4 Barrier analysis

Not applicable.

3.6.5 Common practice analysis

In the PDD version 1, PPs presented the common practice analysis (comparing others activities that are operational and that are similar to the proposed project activity) considering the SHPs located in Brazil (geographical area) with installed capacity between 15MW to 30MW (upper limit for SHPs in Brazil).

Comparing others activities that are operational and that are similar to the proposed project activity, RINA took into consideration that it should be more appropriate to compare the proposed project activity to similar projects with a capacity range of +/- 50% of the proposed project's mentioned installed capacity (28.05 MW), i.e. 14 MW - 42 MW. However, according to ANEEL's Resolution nº 652, dated 9/12/2003 (defines as SHPs, projects that have an installed capacity equal or less than 30 MW), the common practice analysis should be limited to 30 MW (~14 MW to 30 MW).

The different regulations and market opportunities between SHPs and other Hydro Power Plants in Brazil are evidenced particularly through electric energy auctions. The auctions promoted for the acquisition of "*energia de reserva*" (reserve power), as defined on Brazilian Energy Ministry Decree (*Portaria*) # 483, issued on 22/04/2010[7], defines on its Annex Section 1 – Definitions and Abbreviation, the type of hydropower plants eligible to participate in the mentioned auctions on item "VIII – *EMPREENDIMENTO HIDRELÉTRICO*: "*Pequena Central Hidrelétrica*" (VIII - Hydroelectric Enterprise: Small Hydro Power plant).

Also, the Brazilian Energy Ministry Decree (Portaria) # 555, issued on 31/05/2010[8] , defines, on its Article #1 that ANEEL (Brazilian Electric Energy Agency) shall promote, directly or indirectly, the Auction of Alternative Energy Sources specific to Small hydropower Plants and other generation enterprises that uses as energy source biomass or wind power on August 19th 2010. (from Portuguese: *Art. 1º A Agência Nacional de Energia Elétrica - ANEEL deverá promover, direta ou indiretamente, Leilão de Fontes Alternativas específico para Pequenas Centrais Hidrelétricas - PCH e empreendimentos de geração que tenham como fontes biomassa e eólica, no dia 19 de agosto de 2010*).

Based on RINA's analysis, the proposed project activity has been compared with similar projects that have become operational between 2005 (Brazil's Kyoto protocol ratification) and 2009 (May (first of global stakeholders consultation)).

Other CDM projects activities (registered and published in the UNFCCC website) are not included in the analysis, as well as similar SHPs that received other type of incentives like PROINFA - *Programa de Incentivo às Fontes Alternativas de Energia Elétrica*.

During the first analysis RINA found that the 2 SHPs (Porto Góes-SP and Graça Bernnand-MT) that did not receive any incentive, however PPs provided evidences that Porto Góes SHP is an expansion project (Resolution n° 255, dated 06/05/2003) and Graça Bernand SHP is a CDM project (http://cdm.unfccc.int/Projects/Validation/DB/N68XFRKNR58M29GRSJGR81NCMFT7KJ/view.html), therefore, they can not be compared to the project activity. Based on this analysis, it was found out the following figures for similar projects that have become operational between 2005 and 2009 (May):

N° of SHPs with capacity between 14 to 30 MW	N° of SHPs with CDM incentives	N° of SHPs with PROINFA incentives	SHP expansion of the installed capacity
56	18	37	1
	32.14 %	66.07 %	1.79 %

[7] Accessed on 15/09/2010, at 10:30 (Brazilian time) available on http://www.mme.gov.br/mme/galerias/arquivos/noticias/2010/Port_483_Sistemxtica_Reserva.pdf

[8] Accessed on 15/09/2010, at 11:15 (Brazilian time) available on http://www.mme.gov.br/mme/galerias/arquivos/noticias/2010/Port_555_Diretrizes_Leilxo_de_Fontes_Alternativas.pdf

It can be concluded that similar activities are not diffused in the Host country all similar plants to the project activity (excluding Porto Góes that is an expansion) considered some kind of incentives (CDM and/or PROINFA).

The common practice in Brazil is the installation and operation of large power plants, such as large Hydropower and Natural Gas Thermo Power plants that represent the majority (~95%) of present Brazil's installed capacity, and thus the "Cachoeirao CDM Project (JUN1092)" project activity is not the business-as-usual type scenario in Brazil, where large Hydropower and Natural Gas Thermo Power plants represent the majority (~95%) of present installed capacity.

3.6.6 Conclusion

RINA can confirm that all data, rationales, assumptions, justifications and documentation provided by the project participants to support demonstration of additionality are credible and reliable.

By assessing the evidences presented and cross-checking the information, RINA considers that the reasoning for the proposed project additionality demonstration is credible and reasonable, i.e. the proposed project activity has the ability to reduce anthropogenic emissions of greenhouse gases by sources below those that would have occurred in the absence of the proposed CDM project activity.

3.7 Monitoring Plan

The approved baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 11 of 26/02/2010 /5/ has been correctly applied.

The monitoring plan is in accordance with the monitoring methodology and will give opportunity for real measurement of achieved emission reductions.

RINA has checked all the parameters presented in the monitoring plan against the requirements of the methodology and no deviations relevant to the project activity have been found.

RINA confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the means of implementation of the monitoring plan are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported *ex post* and verified.

3.7.1 Parameters determined ex-ante

The following parameters are available at validation (not monitored):

* $\boldsymbol{A_{BL}}$ - Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full;

* $\boldsymbol{Cap_{BL}}$ - Installed capacity of the hydro power plant before the implementation of the project.

As per ACM0002, A_{BL} and Cap_{BL} for new hydro power plants are considered 0.

The PDD version 1, presented in the section B.6.2 the parameter Default emission factor for emissions from reservoirs (EF_{Res}), however, as power density is greater than 10 W/m^2, this parameter was excluded in the PDD version 2.

3.7.2 Parameters monitored ex-post

* $\boldsymbol{EG_{facility,y}}$ - Net Electricity supplied by the SHP to the grid in hour *h*;
* $\boldsymbol{EF_{grid,CM,y}}$ - Brazilian grid emission factor;
* $\boldsymbol{EF_{grid,OM\text{-}DD,y}}$ - CO_2 Operating Margin emission factor of the grid, in a year *y*;

* $EF_{grid,BM,y}$ - CO_2 Build Margin emission factor of the grid, in a year *y*;

* Cap_{PJ} - Installed capacity of the hydro power plant after the implementation of the project activity;

* A_{PJ} - Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.

3.7.3 Management system and quality assurance

The energy delivered to the grid will be measured and recorded continuously (hourly reading and recorded monthly) through electricity meters that complies with national standards. The National Grid Operator (ONS) and Electric Power Commercialization Chamber (CCEE) are responsible for the definition of the technical requirements of energy measurements for billing. The indicated QA/QC procedures are in line with the applied methodology. The electricity supplied to the grid will be monitored by electronic calibrated and inviolable (sealed) energy meters. The data from the energy meters will be cross checked with the invoices of energy sales or with the CCEE databank.

Meters' calibration procedures (frequency) will follow the ONS "*Grid Procedures*": Module 12, Sub-module12.3. The project owners shall always follow the rules of the relevant bodies (e.g. ONS and CCEE), in the case of changes in calibration procedures. The PDD version 2 was revised to present the correct link to the ONS website (Modulo 12, sub-module 12.2) http://www.ons.org.br/download/procedimentos/modulos/Modulo_12/Submodulo%2012.2_Rev_1.0.pdf (accessed on 05.07.2010).

The following energy meters calibration certificates /15/ were assessed during the site visit:

* ION 8600 meter, serial number PT-0801A126-01 (principal/main) - calibration certificate CCM 522/2008, issued by CEMIG, calibration conducted on 11/12/2008;

* ION 8600 meter, serial number PT-0801A128-01 (backup/rearguard) - calibration certificate CCM 523/2008, issued by CEMIG, calibration conducted on 11/12/2008.

Moreover, during the site visit it was verified that a third party company makes the operation of the Cachoeirão SHP: Energisa Soluções Ambientais S/A. Energisa is responsible for the trainings provided to the operational personnel. PP provided to RINA a list from Energisa with all personnel responsible for the operation of the SHP and the training received /16/.

In the PDD version 1, section B.7.2 and Annex 4 did not mention the monitoring of the parameters Cap_{PJ} (Installed capacity of the hydro power plant after the implementation of the project activity) and A_{PJ} (Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full). The monitoring of both parameters was included in the PDD version 2. Cap_{PJ} will be monitored through out the technical specifications of the installed equipments, installed plaques in the equipments and factsheets.

Additionally, if available, the new authorizations of the regulatory agency will be checked. A_{PJ} will be determined through topographical surveys, maps, satellite pictures, etc. Moreover, as the Cachoeirão SHP has to monitor the level of the reservoir due to National requirements, data used for this purpose can be used to determine the reservoir area and will be also a measurement procedure to be considered to the project activity.

The combined margin emission factor ($EF_{grid,CM,y}$) will be calculated *ex-post* using the CO_2 emission factors for the build margin and the operational margin that are provided by the Brazilian DNA. CO_2 emission factors for the build margin and the operational margin for electricity generation in Brazil's National Interconnected System (SIN) are calculated, according to the dispatch analysis, from generation records of plants dispatched in a centralized manner by the National Electric System Operator (ONS).

Monitoring plan establishes that all data will be stored during the crediting period plus two years, as per the Executive Board requirements.

Regarding the responsabilities, the PDD version 2 included that the Hidrelétrica Cachoeirão S.A. is responsible for the maintenance and calibration of the monitoring equipments, compliance to operational requirements and corrective actions related to the functionality of the project activity. Moreover, the PP has authority and responsibility for registration, monitoring, and measurement as well as managing the project, organizing staff training to use appropriated techniques in those procedures. Carbotrader Assessoria e Consultoria em Energia Ltda. is responsible to report the results of the baseline, project emissions (if applicable) and emissions reductions calculations.

3.8 Estimation of GHG emissions

The formulas and factors used in the project's emissions calculations are in accordance to the approved baseline and monitoring methodology ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 11 of 26/02/2010. Neither project's emissions nor leakage are applicable to the project activity.

All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD and supporting files submitted for registration, and the mentioned data sources have been verified by RINA.

***Ex-ante* calculation of emission reductions**

The estimated net electricity generation supplied by the project plant to the grid was calculated based on the assured energy (16.37 MW) provided by ANEEL (ANEEL Decree # 18, dated 25 May 2007 /9/). Moreover, the *ex-ante* estimative for the emission factor was calculated using the emission factor provided by the Brazilian DNA, and considering a single electricity system to calculate the CO_2 emission factor - calculated according to the Tool to calculate the emission factor for an electricity system /6/. In the PDD version 1, the estimated *ex-ante* used the latest emission factor of the Brazilian grid system for 2008 (= 0.3112 tCO_2/MWh) available at the time of the start of the validation. During the validation process a most recent data was published by the Brazilian DNA for the year 2009 and PP updated the CERs spreadsheet and the PDD version 3: EF= 0.163483 tCO_2/MWh - average OM= 0.2476 tCO_2/MWh and BM= 0.0794 tCO_2/MWh. The grid emission factor will be updated *ex-post* during the verification process.

***Ex-post* calculation of emission reductions**

The combined margin emissions factor ($EF_{grid,CM,y}$) will be calculated *ex-post* using the CO_2 emission factors for the build margin and the operational margin that are provided by the Brazilian DNA. CO_2 emission factors for the build margin and the operational margin for electricity generation in Brazil's National Interconnected System (SIN) are calculated, according to the dispatch analysis, from generation records of plants dispatched in a centralized manner by the National Electric System Operator (ONS).

3.9 Environmental Impacts

The project complies with all applicable laws and regulations. The environmental aspects of the project activity were analyzed by the environmental agency (COPAM). An Environmental Impact Assessment - EIA (which results in a RIMA- Environmental Impact Report) is requested by the environmental agency to issue the licenses. Therefore, an EIA was approved and then the project's Operation License was issued. The project obtained the following environmental

license, assessed by RINA: Operation license (LO) issued by COPAM dated 10/10/2008 valid for five years /11/.

No transboundary impacts are foreseen.

Moreover, the following ANEEL (Brazilian Electricity Regulatory Energy Agency) documents were assessed:

* ANEEL Resolution # 282, dated 26 July 2000 - authorizes Empresa de Luz e Força Santa Maria SA-ELFSM (27.00 MW) to implement and explore Cachoeirão SHP. (Observation: the ANEEL's Resolution # 407, dated 19 October 2000 /10/, requires the PP to revise the authorized installed capacity of the SHP if the present/real installed capacity is greater than +/- 5 % of the authorized/granted installed capacity. The authorized installed capacity of the SHP Cachoeirão is 27 MW, defined in ANEEL Resolution # 282, dated 26 July 2000 /9/. As it is inside the rage of the Resolution # 407, it is valid for the project activity.)

* ANEEL Resolution 557, dated 15 October 2002 - transfers the authorization to implement and explore Cachoeirão SHP from ELFSM to Santa Maria Energética SA.;

* ANEEL Dispatch # 1,214, dated 23 April 2007 - approves the Cachoeirão basic project (27.0 MW) and defines a reservoir area of 1.021 km^2 and coordinates 19º 26' 12" S 41º 36' 51" W;

* ANEEL Authorization Resolution # 908, dated 8 May 2007 - transfers the authorization to implement and explore Cachoeirão SHP from Santa Maria Energética S.A. to Hidrelétrica Cachoeirão S.A. (Observation: The shareholders minutes of meeting of Hidrelétrica Cachoeirão S.A. (annual general meeting, dated 24/04/2008), mentions Santa Maria Energética S.A. and CEMIG Geração e Transmissão S/A as shareholders, and was registered in the Minas Gerais State Board of Trade in 08/01/2009.)

* ANEEL Decree # 18, dated 25 May 2007 - defines a 16.37 MW (average) assured energy for the Cachoeirão SHP;

* ANEEL Dispatch # 4830, dated 30 December 2008 - authorizes 9,000 kW generator unit # 1 to start operation (30/12/2008);

* ANEEL Dispatch # 559, dated 11 February 2009 - authorizes 9,000 kW generator unit # 2 to start operation (12/02/2009);

* ANEEL Dispatch # 714, dated 27 February 2009 - authorizes 9,000 kW generator unit # 3 to start operation (28/02/2009).

3.10 Local stakeholders consultation

Prior to the publication of the PDD on the UNFCCC website, from 10 December 2009 to 08 January 2010, the Project owner performed the local stakeholder consultation as per required by the Interministerial Commission on Global Climate Change (CIMGC) and in accordance to the Resolution 7 of the Brazilian DNA (05 March 2008). Letters are dated 09/01/2009 and 21/05/2009 and ARs (Aviso de Recebimento = "Receiving acknowledgment receipt") /20/ dates are described bellow:

Stakeholder	**AR**
Alvarenga City Hall	27/01/2009
Alvarenga City Council	19/01/2009
Alvarenga Environmental Secretary	16/01/2009
Alvarenga Community Association	19/01/2009

Pocrane City Hall	16/01/2209
Pocrane City Council	16/01/2009
Pocrane Environmental Secretary	25/05/2009
Cachoeirão Community Development Association	17/02/2009
FEAM – State environmental body	25/05/2009
Brazilian Forum of NGOs	15/01/2009
Minas Gerais State Prosecutors Office	25/05/2009
National Prosecutors Office	26/05/2009

It was verified that the letters sent to the stakeholders followed the Brazilian DNA Resolution nº 7. Letters were sent in Portuguese and PDD was made publicly available in Portuguese in the following web link: http://www.carbotrader.com/jun1092dcp.pdf. No comments were received.

RINA can confirm that the process is adequate and credible for local stakeholder consultation.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD version 1 of 16 November 2009 was made publicly available on the CDM UNFCCC website (http://cdm.unfccc.int/Projects/Validation/DB/78OP65KL77FPXKCETGR7GNY2RLTK2J/view.html) and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 10 December 2009 to 08 January 2010.

No comments were received.

5 VALIDATION OPINION

RINA Services Spa (RINA) has performed validation of the project activity "Cachoeirao CDM Project (JUN1092)" in Brazil, with regard to the relevant requirements for CDM activities.

The review of the project design document and the subsequent follow-up interviews have provided RINA with sufficient evidence to determine the fulfillment of the stated criteria.

The host Party, Brazil, fulfills the requirements to participate in the CDM. No Annex I party has yet been identified.

The project participant(s) are Carbotrader Assessoria e Consultoria em Energia Ltda. and Hidrelétrica Cachoeirão S.A., from Brazil.

The project correctly applies the approved baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 11 of 26/02/2010 /5/.

By generating renewable energy from small hydropower plant the project results in reduction 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 total GHG emission reductions from the "Cachoeirao CDM Project (JUN1092)" are estimated to be 164,108 tCO_2e during the first renewable 7 years crediting period, resulting in an annual average emission reductions of 23,444 tCO_2e / year.

Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions during the selected 7 years crediting period.

The monitoring plan sufficiently specifies the monitoring requirements for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is RINA's opinion that the project participants are able to implement the monitoring plan.

In conclusion, it is RINA's opinion that the project activity "Cachoeirao CDM Project (JUN1092)" in Brazil, as described in the PDD version 3 of 10 September 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 11 of 26/02/2010 /5/.

RINA thus requests the registration of the project as a CDM project activity.

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APPENDIX A

CDM VALIDATION PROTOCOL

This document contains a generic Validation Protocol for CDM projects, which must be seen in conjunction with the CDM Validation and Verification Manual and the Validation Report Template. The entries in the protocol should be adjusted and amended as appropriate to prepare for the validation of a particular project.

This validation protocol serves the following purposes:

- *It organizes, details and clarifies the requirements a CDM project is expected to meet; and*
- *It ensures a transparent validation process by inducing the Validator to document how a particular requirement has been validated and which conclusions have been reached;*

This protocol contains two tables with generic requirements for validation projects. Table 1 shows the requirements that the GHG emission reduction project will be validated against. Table 2 consists of a checklist with validation questions related to one or more of the requirements in Table 1. The checklist questions may not be applicable for all investors, and should not be viewed as mandatory for all projects. Where a finding is issued, a corrective action request or clarification request are stated. The resolution and final conclusions of these requests should be described in Table 3 of this protocol.

Before this generic validation protocol can be applied to validate a specific project, the Validator must review and adjust/amend the protocol to make it applicable to individual project characteristics and circumstances as well as individual investor criteria. The application of the Validator's professional judgment and technical expertise should ensure that checklist amendments cover all necessary specific project requirements that have impact on project performance and acceptance of the project. Given the above, the checklist part of the protocol is neither exhaustive nor prescriptive.

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

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reductions commitment under Art. 3.	Kyoto Protocol Art.12.2		No Annex I party has yet been identified. Table 2, Section, B.6.3, B.6.4
2. The project shall assist non Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	-	Table 2, Section A.2.3 Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development.
3. The project shall assist non Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	**OK**	No Annex I party has yet been identified.
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved.	Kyoto Protocol Art.12.5a, Marrakesh Accords, CDM Modalities §40a, § 28	-	Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	**OK**	Table 2, Section B.6.1.1 and B.6.3.1
6. Reductions in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43 and § 44	**OK**	Table 2, Section B.5
7. In case public funding from Parties included in Annex	Decision 17/CP.7, CDM	**OK**	Table 2, Section A.4.5

Requirement	Reference	Conclusion	Cross Reference / Comment
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 (ODA) and is separate from and is not counted towards the financial obligations of these Parties.	Modalities and Procedures Appendix B, § 2		
8. Parties participating in the CDM shall designate a national authority for the CDM.	Marrakech Accords, CDM Modalities §29	**OK**	The Brazilian Designated National Authority for the CDM is the "Comissão Interministerial de Mudança Global do Clima" (CIMGC).
9. The host country and the participating Annex I Party shall be a Party to the Kyoto Protocol.	Marrakech Accords, CDM Modalities §30	**OK**	Brazil has ratified the protocol on 23 August 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	**OK**	No Annex I party has yet been identified.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	**OK**	No Annex I party has yet been identified.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	Marrakech Accords, CDM Modalities §37b	**OK**	Table 2, Section E As required by the Interministerial Commission on Global Climate Change (CIMGC) and in accordance to the Resolution 7 of the Brazilian DNA (05 March 2008), the project participants sent letters, inviting for comments, to local stakeholders/City authorities.
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	Marrakech Accords, CDM Modalities §37c	**OK**	Table 2, Section D
14. Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel.	Marrakech Accords, CDM Modalities §37e	**OK**	Table 2, SectionB.2

Requirement	Reference	Conclusion	Cross Reference / Comment
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	Marrakech Accords, CDM Modalities §37f	**OK**	Table 2, Section A.4.5
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	Marrakech Accords, CDM Modalities, §40	**OK**	The PDD of 16 November 2009 was made publicly available on the UNFCCC CDM website and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 10 December 2009 to 08 January 2010. http://cdm.unfccc.int/Projects/Validation/DB/78OP65KL77FPXKCETGR7GNY2RLTK2J/view.html No comments were received.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	Marrakech Accords, CDM Modalities, §45 b, c, d, e	**OK**	Table 2, Section B.4
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	Marrakech Accords, CDM Modalities, §47	**OK**	Table 2, Section B.4
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	**OK**	PDD is in accordance with CDM-PDD (version 03 of 28 July 2006).

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. General Description of Project Activity. *The project design is assessed.*					
A.1. Title of the project activity.					
A.1.1. Title of the project activity, version number and date of document (PDD).	/1/ /26/	DR	The title of the project activity is "Cachoeirao CDM Project (JUN1092)", as per PDD Version 1 dated 16 November 2009.	**OK**	**OK**
A.2. Description of project activity.					
A.2.1. Is the purpose of the project activity included?	/1/ /9/ /10/ /26/	DR	Yes. The project activity contains a clear description of the proposed project activity. Section A.2 of the PDD (version 1) is in accordance with the latest template of PDD and Guidelines for completing the PDD (EB 41- annex 12). The installed capacity was revised in the PDD version 3. The project activity consists on the installation of a new small hydropower plant with an installed capacity of 28.05 MW, located in the Manhuaçu river, in the cities of Pocrane and Alvarenga, Minas Gerais state, Brazil. The reservoir area is 1.021 km^2 and power density of 27.47 W/m^2. Equipments were verified during the site visit (See section A.4.3.1).	**OK**	**OK**
A.2.2. Is it explained how the project activity reduces greenhouse gas emissions, i.e. technology, measures?	/1/	DR	The project is a renewable electricity generation project activity displacing grid electricity that is partly generated based on fossil fuels, with electricity generated from renewable sources and thus resulting in the reduction of emissions of greenhouse gases in	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			the energy sector. Emission reductions are claimed from displacing grid electricity with the estimated electricity that will be generated by the project power plant (SHP) and supplied to the Brazilian grid.		
A.2.3. Contribution to Sustainable Development. Table 1 - 2					
A.2.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/ /9/ /11/ /26/	DR	The proposed project activity is in line with the Brazilian and local regulations. The project obtained the following environmental license, assessed by RINA: -Operation license (LO) issued by COPAM in 10/10/2008, valid for five years. The following ANEEL (Brazilian Electricity Regulatory Energy Agency) documents were also assessed: * ANEEL Resolution # 282, dated 26 July 2000 - authorizes Empresa de Luz e Força Santa Maria SA-ELFSM (27.00 MW) to implement and explore Cachoeirão SHP; * ANEEL Resolution 557, dated 15 October 2002 - transfers the authorization to implement and explore Cachoeirão SHP from ELFSM to Santa Maria Energética SA.; * ANEEL Dispatch # 1,214, dated 23 April 2007 - approves the Cachoeirão basic project (27.0 MW) and defines a reservoir area of 1.021 km^2 and coordinates 19º 26' 12" S 41º 36' 51" W;	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			* ANEEL Authorization Resolution # 908, dated 8 May 2007 - transfers the authorization to implement and explore Cachoeirão SHP from Santa Maria Energética S.A. to Hidrelétrica Cachoeirão S.A.; * ANEEL Decree # 18, dated 25 May 2007 - defines a 16.37 MW (average) assured energy for the Cachoeirão SHP; * ANEEL Dispatch # 4830, dated 30 December 2008 - authorizes 9,000 kW generator unit # 1 to start operation (30/12/2008); * ANEEL Dispatch # 559, dated 11 February 2009 - authorizes 9,000 kW generator unit # 2 to start operation (12/02/2009); * ANEEL Dispatch # 714, dated 27 February 2009 - authorizes 9,000 kW generator unit # 3 to start operation (28/02/2009).		
A.2.3.2. Is the project in line with host-country specific CDM requirements?	-	-	Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development.	-	
A.2.3.3. Is the project in line with sustainable development policies of the host country?	-	-	Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development.	-	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /14/	DR	The PDD version 1 mentions that the project activity will contribute to better working conditions and increases the employment in the region of the project activity. It was verified that social benefits are mentioned in the environmental report sent to the environmental agency.	**OK**	**OK**
A.3. Project participants. Annex 1					
A.3.1. Are Party (ies) and private and / or public entities involved in the project activity listed?	/1/	DR	The project participants (private entities) are: -Carbotrader Assessoria e Consultoria em Energia Ltda. and Hidrelétrica Cachoeirão S.A.	**OK**	**OK**
A.3.2. Is the contact information provided in Annex 1 of the PDD, using the (proper table) tabular format?	/1/ /26/	DR	The contact information is properly provided using the proper table (tabular format). The table in the Annex 1 of the PDD shall be filled with all mandatory fields, as required by Guidelines for completing the PDD (EB 41 annex 12). The Zip Code is not mentioned in the annex 1.	~~**CL 8**~~	**OK**
A.4. Technical description of the project activity.					
A.4.1. Is the location of the project activity clearly defined, including details of the physical location and information allowing the unique identification of this project activity(ies)?	/1/ /9/ /26/	DR	The project activity is located in Pocrane and Alvarenga cities, Minas Gerais state, Brazil in the following Geographical Coordinates: 19º 26' 12´´ S and 41º 36´ 51´´ W. Coordinates were cross checked against ANEEL Dispatch 1,214, dated 23 April 2007, and found to be correct.	**OK**	**OK**
A.4.2. Is (are) the category (ies), type(s) and sectoral scope(s) of the proposed project activity specified?	/1/ /26/	DR	The proposed project activity falls under Project category "Grid-connected electricity generation from renewable sources" and Sectoral Scope 1- Energy industries		**OK**

<table>
<tr><th>Checklist Question</th><th>Ref.</th><th>MoV*</th><th>Comments</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td></td><td></td><td></td><td>(renewable/non-renewable sources).

PPs are requested to include in the PDD the category of the project activity.</td><td><s>CL 1</s></td><td></td></tr>
<tr><td>A.4.3. Technology to be employed.
Validation of the project technology focuses on the project engineering, choice of technology competence/ maintenance needs. The Validator should ensure that environmentally safe and sound technology and know how is used / transferred.</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>A.4.3.1. Does the project design engineering reflect current good practices?</td><td>/1/
/15/
/26/</td><td>DR
CC</td><td>The project design engineering reflects current good practices in Brazil.
The PDD version1 presents the following equipments:
<table><tr><th>Turbines</th><th>Francis, horizontal</th></tr><tr><td>Quantity</td><td>3</td></tr><tr><td>Power (kW)</td><td>9,300</td></tr><tr><td>Flow Rate (m3/s)</td><td>22.45</td></tr><tr><td>Rotation (rpm)</td><td>360</td></tr><tr><th>Generator</th><th>Synchronous, horizontal</th></tr><tr><td>Quantity</td><td>3</td></tr><tr><td>Nominal Power (kVA)</td><td>11,000</td></tr><tr><td>Effective Power (kW)</td><td>9,350</td></tr><tr><td>Voltage (kV)</td><td>13.8</td></tr><tr><td>Load Factor</td><td>0.85</td></tr><tr><td>Frequency (Hz)</td><td>60</td></tr></table>
The following equipments were checked during the site visit:
Generators: GE Motors (model 271R640 - Nominal power 11,000 kVA, Power factor</td><td></td><td>OK</td></tr>
</table>

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			0.85), serial numbers 227001530, 227001531 and 227001532; Turbines: Voith Siemens (Francis - Nominal power 9,300 kW, Flow 22.45 m^3/s), serial numbers 19,453, 19,454 and 19,455; Meters: ION 8,600, serial number PT-0801A126-01 (principal/main) and ION 8,600 serial number PT-0801A128-01 (backup/rearguard). The three generator's plate data (Nominal power 11,000 kVA, Power factor/Cosine φ 0.85), show that the total installed capacity of Cachoeirão SHP is to be 28.05 MW (as also mentioned in the PDD-footnote 1). ANEEL's definition of installed capacity is: "The *nominal active electric power of a generating unit (in kW) is defined by the product of the apparent nominal electric power (in kVA) at rated power factor of the electric generator, considering a continuous operation of the system and nominal operating conditions."* Based on that and on the requirements of ANEEL's Resolution # 407, dated 19 October 2000, PPs are requested to explain/justify the following: * the difference among the figures of installed capacity of PDD (27.90 MW), ANEEL Resolution # 282 (27.00 MW) and Generator's specifications (28.05 MW); * if a request to revise the authorized installed capacity was, or not, required to ANEEL (ANEEL's Resolution # 407 - present/real installed capacity is greater than +/- 5 % of the	~~CAR 14~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			authorized/granted installed capacity).		
A.4.3.2. Does the project use the state of the art technology or could the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/ /26/	DR	At this particular time, the technology used can be considered as state of the art.	**OK**	**OK**
A.4.3.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/ /9/ /26/	DR	The expected operational lifetime of the project is 30 years. The project technology is not likely to be substituted by other or more efficient technologies within the project period. PPs should provide evidences regarding the lifetime of equipments (turbines and generators). See C.1.2.1.	~~**CL 2**~~	**OK**
A.4.3.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/ /16/	DR I	Checked during site visit that the operation of the SHP Cachoeirão is made by a third party company, Energisa Soluções Ambientais S/A. Energisa is responsible for the trainings provided to the operational personnel. PP provided to RINA a list from Energisa with all personnel responsible for the operation of the SHP and the training received.	**OK**	**OK**
A.4.3.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	See A.4.3.4.	**OK**	**OK**
A.4.4. Estimated amount of emission reductions over the chosen crediting period. Table 1 - 5					
A.4.4.1. Is the chosen crediting period, total and annual estimated reductions defined and	/1/ /2/	DR	The information was provided in a proper table. According to the PDD version 3 (after revising	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
presented in a (proper table) tabular format? (*check these figures against item B.6.4 figures*)	/26/		the emission factor), the project is expected to reduce CO_2 emissions to the extent of 164,108 tCO_2e (23,444 tCO_2e / year average) over the renewable 7 years crediting period.		
A.4.5. Public funding of the project activity. Table 1 - 7 & Annex 2					
A.4.5.1. Is it indicated whether public funding from Parties included in Annex 1 is involved in the proposed project activity?	/1/ /26/	DR	No public funding is involved in the "Cachoeirao CDM Project (JUN1092)".	**OK**	**OK**
A.4.5.2. If public funding is involved, is information on sources of public funding for the project activity is provided in Annex 2, including an affirmation that such funding does not result on a diversion of official development assistance (ODA) and is separate from and is not counted towards the financial obligations of those Parties?	/1/ /26/	DR	See A.4.5.1.	**OK**	**OK**
B. Project Baseline Application (methodologies). *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.* Table 1 - 14 & Annex 3					
B.1. Baseline Methodology. *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel? *(correctly quoted and interpreted?)*	/1/ /5/ /26/	DR	The project applies the methodology ACM0002 version 10 of 11/06/2009, scope 1, that is in line with the relevant project category. However, considering the grace period (until 25/10/2010) for the submission of project activities for registration, when using a revised approved methodology, and the present validation timeline to submit projects for	~~**CL 3**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			registration, it is recommended to revise the PDD according to ACM0002 version 11, valid from 26 February 2010 onwards.		
B.1.2. Are other methodologies or tools drawn up by the approved methodology mentioned? *(correctly quoted and interpreted?)*	/1/ /6/ /7/	DR	ACM0002 methodology refers to the latest approved versions of the following tools: • Tool to calculate the emission factor for an electricity system; • Tool for the demonstration and assessment of additionality; • Combined tool to identify the baseline scenario and demonstrate additionality; • Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion. The following tools are applicable to the project activity: -"Tool to calculate the emission factor for an electricity system"; -"Tool for the demonstration and assessment of additionality"; Both applied tools versions were/are the latest approved versions.	**OK**	**OK**
B.2. Description of how the methodology is applied in the context of the project activity.					
B.2.1. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/ /5/ /9/ /26/	DR SV	Yes. ACM0002 is applicable to the "Cachoeirao CDM Project (JUN1092)" because the project is a grid-connected renewable power generation project activity that: * installed a new hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir) at a site where no renewable power		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			plant was operated prior to the implementation of the project activity; * the project activity results in a new reservoirs and the power density of the power plant (27.47 W/m^2) is greater than 4 W/m^2. The reservoir area was confirmed through ANEEL Dispatch # 1,214, dated 23 April 2007, which mentions a reservoir area of 1.021 Km^2 and so the mentioned power density presented in the PDD version 3 (27.47 W/m^2) is correct. The PDD mentions in the beginning of section B.2: "The ACM0002 methodology is applicable to grid-connected renewable power generation project activities that involve electricity capacity additions under the following conditions:". This statement (capacity additions) must be corrected as per ACM0002 (new power plant) applicability definitions.	~~CL 4~~	
B.2.2. Background information or documentation, including tables with time series data, documentation of measurement results and data sources are properly addressed? (*check Annex 3*)	/1/	DR	Yes. Additional information about the Brazilian Interconnected System is presented in the Annex 3.	**OK**	**OK**
B.2.3. If comparable information is available from sources other than that used in the PDD, cross check the PDD against the other sources to confirm that the project activity meets the applicability conditions.	/1/ /9/ /11/	DR SV	Yes.	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.3. Description of the sources and the gases included in the project boundary *(physical delineation of the proposed CDM project activity)*.					
B.3.1. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/ /5/ /26/	DR	The proposed project's boundaries (spatial extent) encompass the project power plant and all power plants physically connected to the electricity system (SIN - National Interconnected System) that the CDM project is connected to. Section B.3 of the PDD (version 1) is not in accordance with the applicable CDM requirements for completing PDDs (EB 41 annex 12), because the diagram of the project boundary does not consider the National Interconnected System. The diagram shall present the emissions sources and gases included in the project boundary and the monitoring variables.	~~CAR 1~~	**OK**
B.3.2. Are all emission sources and significant GHGs included in the project boundary clearly identified and described in the appropriate table? Are the demonstration / justification (also for exclusions) adequate and sufficient?	/1/ /5/	DR	In the baseline, the main emission source is the CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology ACM0002 establishes that if the power density of the project activity (PD) is greater than 10 W/m2, project emissions from water reservoirs (tCO2e/yr) is zero (PE = 0). However, the table 3 of the PDD version 1 includes the CH4 emissions as the main emissions in the project activity and section B.6.2 also mentions the emission factor for emissions from the reservoir. The PDD shall	~~CAR 2~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			be revised accordingly.		
B.3.3. If GHG emissions occurring within the proposed CDM project activity boundary (not addressed by the applied methodology), as a result of project's implementation, are expected to contribute more than 1% of the overall expected average annual emissions reductions, are they informed in the PDD?	/1/	DR	Not applicable.	**OK**	**OK**
B.4. Description of how baseline scenario is identified. Baseline Determination. Table 1 - 17, 18 *The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.*					
B.4.1. Is the application of the methodology and the discussion and determination of the chosen baseline scenario transparent?	/1/ /5/ /6/ /17/ /26/	DR	The application of the baseline methodology is transparent and conservative. The proposed project activity consists in the installation of a new grid-connected renewable power plant/unit and the baseline scenario is in accordance with to the methodology: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants (mostly large hydro and thermal power plants) and by the addition of new generating sources, as reflected in he combined margin (CM) from "Tool to calculate the emission factor for an electricity system". Emission reductions were estimated *ex-ante* using the latest available emission factor of the Brazilian grid system for 2008 (= 0.3112	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			tCO_2/MWh - average OM=0.4766 tCO_2/MWh and BM=0.1458 tCO_2/MWh) provided by the Brazilian DNA, and considering all four regions connected (North, Northeast, South and Southeast-Midwest). During the validation process a most recent data was published by the Brazilian DNA for the year 2009 and PP updated the CERs spreadsheet and the PDD version 3: EF= 0.163483 tCO_2/MWh - average OM= 0.2476 tCO_2/MWh and BM= 0.0794 tCO_2/MWh. The grid emission factor will be updated *ex-post* during the verification process.		
B.4.2. Has the baseline been determined using conservative assumptions where possible? *(confirm that any procedure contained in the methodology to identify the most reasonable baseline scenario, has been correctly applied)*	/1/ /17/	DR	Yes, data for the emission factor is made public available by the Brazilian DNA.	**OK**	**OK**
B.4.3. Has the baseline been established on a project-specific basis?	/1/ /5/ /6/	DR	The baseline scenario has been established on a project-specific basis. See B.4.1.	**OK**	**OK**
B.4.4. Does the baseline scenario sufficiently take into account relevant national and / or sectoral policies, macro-economic trends and political aspirations?	/1/ /5/ /6/	DR	National and/or sectoral policies implemented during the initial phase were considered.	**OK**	**OK**
B.4.5. Is the baseline determination compatible with the available data?	/1/ /5/ /6/	DR	Yes. The baseline determination is compatible with available data	**OK**	**OK**
B.4.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/ /5/ /6/	DR	The selected baseline represents the most likely scenario among the two alternative scenarios discussed. The following two alternative baseline	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			scenarios were considered: ***Alternative 1***: the project activity undertaken without being registered as a CDM project activity; ***Alternative 2***: the continuation of the current situation: electricity generation by Brazilian National Interconnected System (SIN). See B.4.1.		
B.4.7. Have the major risks to the baseline been identified? (*Are uncertainties in the GHG emission estimates properly addressed in the documentation?*)	/1/ /5/ /6/	DR	The major risk of the project is not being able to produce the estimated amount of electricity to the grid.	**OK**	**OK**
B.4.8. Is all literature and sources clearly referenced?	/1/ /5/ /6/ /17/	DR	Yes. The Brazilian DNA web site was checked to confirm the values used to calculate the emission factor.	**OK**	**OK**
B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (*Assessment and demonstration of additionality*). Table 1 - 6					
B.5.1. Does the PDD follow all the steps required in the methodology to determine the additionality? (*Is an approved additionality tool required / used? - Note: the guidance in the methodology shall supersede the tool*)	/1/ /7/ /26/	DR	As the project activity is not a retrofit or replacement of existing grid-connected renewable power plant/unit(s) at the project site and the additionality is demonstrated and was assessed using the latest version of the "Tool for the demonstration and assessment of additionality", as indicated in ACM0002 methodology. Guidelines on the assessment on the investment analysis was also applied by PPs and used for the assessment.	**OK**	**OK**
B.5.2. Is the discussion on the additionality clear	/1/	DR	The investment analysis has been used to		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
and have all assumptions been conservative, supported by transparent and documented evidence for all steps?	/3/ /7/ /13/ /21/ /22/ /23/ /24/ /30/		demonstrate the additionality of the proposed project activity. The plant load factor was taken into consideration in the investment analysis and the assured energy (16.37 MW) was used in IRR calculations (spreadsheet "*CERs_JUN1092_v1.xls*"). PDD version 1, mentions that the benchmark analysis was done in accordance with the "Tool for demonstration and assessment of additionality" (version 5.2). ***Determine the appropriate analysis method*** Among the three options available for investment analysis as discussed in the "Tool for the demonstration and assessment of additionality", project participants have chosen the benchmark analysis since the other two are not applicable. The simple cost analysis is not applicable because the project will generate financial and economic benefits (from electricity sales) other than CDM related income. The investment comparison analysis is not applicable either because the only alternative to the project activity is the supply of electricity from a grid, which is not to be considered a similar investment project. ***Apply benchmark analysis*** In Brazil there is not a widely accepted benchmark for SHP projects nor does the Government require a minimum profitability in projects of this kind. The project IRR (internal rate of return) was compared with the yield on Government Bonds plus a Market Risk Premium. Project participants have chosen a		

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Brazilian Government Bond named National Treasury Notes, Series C (NTN-C). It is placed on the market by the Brazilian National Treasury by a Public Offering and its profitability is linked to Inflation by the IGP-M Index. The Market Risk Premium chosen for the benchmark was based on the study *"Uma Análise de Risco do Segmento de Energia Elétrica"* – A risk analysis of the Electricity segment, which was presented in the Administration Seminars in the School of Economics, Business and Accounting at the University of São Paulo (USP). Regarding the benchmark, project participants are working with NTN-C with maturity for January 1st, 2031 as per spreadsheet, "Government bond rates.xls". The web link provided in the PDD (http://www.tesouro.fazenda.gov.br/tesouro_direto/consulta_titulos/consultatitulos.asp) does not have the information presented in the spreadsheet, because values are update frequently. As per spreadsheet, "Government bond rates.xls" it was considered as the yield of paper the value quotation in one day for one year (11/11/2009). Project participants added to the paper day quotation the average IGPM between 1999 and 2008. This represents a misalignment of information, with sums of values that doesn't represents the same period of time. Moreover, dates of NTC-N and IGP-M are after the starting date of the project activity. In addition, taking into account that Brazil does	~~CAR 3~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			not have a fully stabilized economy and some inflation, an index like IGP-M (that is linked to the profitability of the NTN-C) had a non-linear behavior in the last ten years and so project participants shall consider a longer period for the calculation of yield average, considering yearly averages and not quotation for specific days. PPs are requested to revise all calculations accordingly. Regarding to the risk premium, project participants are considering the value of 1.27%, that is the average return of investment on the Electrical Segment Index versus IBOVESPA index (mainly index of BOVESPA – São Paulo Stock Exchange). It is not appropriate to use this Risk Premium because it was calculated in a different base, since the project participants are considering the NTN-C as the benchmark and not the IBOVESPA index.. ***Calculation and comparison of financial indicators.*** Project participants provided the spreadsheets "*IRR_Cachoeirao.xls*" and "*Quadro Usos e Fontes.xls*" with all financial analysis. The installed capacity presented in the PDD version 3 is 28.05 MW and the assured energy is 16.37 MW/hour, totalizing 143.401 MWh/year. 97% of 143.401 MW will be traded by a stabled	~~**CAR 4**~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			price at R$ 140.00/ MWh and 3% of the generation will be traded on the free market and it was considered a price of R$ 76.44/ MWh. The prices (140,00 R$/MWh and 76.44 R$/MWh) and amount of energy (block 1 and block 2) were checked against the document "Comitê de Gerenciamento de riscos de Energia-CGRE" from CEMIG and it was confirmed that the same values were used in another similar projects. The document "Comitê de Gerenciamento de riscos de Energia-CGRE" from CEMIG, mentions a value of 140.00 R$/MWh for the period from 2011 to 2013 (bloco 1-block 1), a value of 76.44 R$/MWh for the year 2009 and a value of 97.27 R$/MWh from 2010 on (bloco 2 - block 2), however the spreadsheet "IRR_Cachoeirao.xls", applies the values of 140.00 R$/MWh and 76.44 R$/MWh for all the period of the investment analysis. PPs are requested to clarify the forecasted value for the energy after 2013 for the block 1 and apply the value 97.27 R$/MWh for the energy block 2, after 2010. Further information about the energy prices and its evolution shall be presented. It should be clear what's the reference date for this prices and which index will be chosen to adjust this prices over the years (For example: *…the price was defined for July/200X as R$ Y MW/h*	~~CAR 5~~ ~~CAR 6~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			and should be adjusted every year by the ZZ index). The Cachoeirão Small Hydropower Plant is a R$ 103.9 millions investment. The investment is divided in 4 years, 7.9% in the year 0, 25.7% in the year 1, 64.8% in the year 2 (the first year of operation) and 1.6% in the year 3. Project participants provided the whole detail of this investment in the spreadsheet "Quadro Usos e Fontes.xls". The investment of R$ 103,959,000.00 was confirmed in the document protocoled in the BNDES (registered in the 5th Oficial de Registros de Titulos e documentos Microf. under number 01252177). Regarding to prices and costs evolution over the years, PPs have presented flat values for all years. It's necessary to demonstrate in the P&L and Cash Flow the evolution for all lines, in accordance to the more appropriate inflation index. This evolution can be different for any line and this can represent a significant impact on the EBITDA evolution. The inflation on prices and costs has to be considered because in the benchmark the return of the investment includes the inflation. Also related to the indexes, inflation and interest rates and also foreign exchange rates, PPs should demonstrate the sources of the information. Furthermore, PPs shall prioritize the sources of the Brazilian Government or some large financial institutions (normally those institutions provide a forecast for next few years). After	~~CAR 7~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			this, the PPs should repeat the last year forecasted for all the project period and the financial spreadsheet and PDD shall be revised accordingly. In relation to Costs, for Management Costs After Start, it's defined a fixed tariff of R$ 1.88 per MWh and for O&M costs it's defined a fixed tariff of R$ 7.56 per MWh. Both tariffs were confirmed in the document *Comitê de Priorização de Investimento – CPO- Parecer de Projecto de Investimento –Projeto nº1714/07 SPE Guanhães* (Meeting report discussing the investment of the Guanhães (4 SHPs) project, conducted on 16/10/2008), that mentions that the same values of SHP Cachoeirão will be used in the referred project, however, it's not clear how both tariffs will be adjusted over the years. Evidences and clarifications regarding the applied values should be provided. Other Costs were presented as 2% of Management Costs and O&M. The group Insurances and another fees and taxes paid for government and some regulatory agencies in the electricity sector were presented, some of them have fixed values and others are a percentage of revenues. These are also confirmed in the reference. Regarding the Sales Tax, the CPMF should be excluded of P&L and Cash Flow analysis once	~~CAR 8~~ ~~CAR 9~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			that this tax was extinct since 2007. PPs are requested to correct the spreadsheet and related documents. The explanation about the benchmark has to be moved from the section "Sub-step 2c: Calculation and comparison of financial indicators" to section "Sub-step 2b: Option III. Apply benchmark analysis". ***Sensitivity Analysis*** The following parameters were taken into account in the combined sensitivity analysis: (i) Investment Value, (ii) Plant Load Factor and (iii) Energy Price. The magnitude of IRR variations will depend on the extent to which these parameters vary. Positive variations of Energy Price and Plant Load Factor are beneficial to the projects' IRR while the opposite holds true for Investments. The sensitivity analysis did not include the Operational Cost and, according to the "Guidelines o the assessment of investment analysis" (Version 03 – EB 51 annex 58) Article 17, *"Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation".* However, project participants should consider to apply a sensitivity analysis in this parameter as this is the main cash out value over the years after the investment.	~~CAR 10~~ ~~CAR 11~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Step 3: Barrier analysis Not selected. ***Step 4: Common practice analysis*** ***Sub-step 4a: Analyze other activities similar to the proposed project activity*** Comparing others activities that are operational and that are similar to the proposed project activity, RINA took into consideration that it should be more appropriate to compare the proposed project activity to similar projects with a capacity range of +/- 50% of the proposed project's mentioned installed capacity (28.05 MW), i.e. ~14.00 MW - 42.00 MW. However, according to ANEEL's Resolution nº 652, dated 9/12/2003 (defines as SHPs, projects that have an installed capacity equal or less than 30 MW), the common practice analysis should be limited to 30 MW (~13.95 MW to 30 MW). Based on RINA's analysis, the proposed project activity has been compared with similar projects that have become operational between 2005 and 2009 (May). Other CDM projects activities (registered and published in the UNFCCC website) are not included in the analysis, as well as similar SHPs that received other type of incentives like PROINFA - *Programa de Incentivo às Fontes Alternativas de Energia Elétrica*. Based on this analysis, it was found out the following figures for similar projects that have become operational between 2005 and 2009		

<table>
<tr><th>Checklist Question</th><th>Ref.</th><th>MoV*</th><th>Comments</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td></td><td></td><td></td><td>(May):

<table>
<tr><td>N° of SHPs with capacity between 14.00 to 30 MW</td><td>N° of SHPs with CDM incentives</td><td>N° of SHPs with PROINFA incentives</td></tr>
<tr><td>56</td><td>17</td><td>37</td></tr>
<tr><td></td><td>30.36 %</td><td>66.07 %</td></tr>
</table>
From this total, only 3.57% of SHPs (operational) in Brazil did not receive any incentive for its implementation. These SHPs are:
<table>
<tr><td>Year</td><td>Name</td><td>Installed capacity MW</td><td>State</td></tr>
<tr><td>2005</td><td>Porto Góes</td><td>14.3</td><td>SP</td></tr>
<tr><td>2008</td><td>Graça Bernnand (Terra Santa)</td><td>27.4</td><td>MT</td></tr>
</table>

Sub-step 4b: Discuss any similar Options that are occurring
Regarding the common practice analysis, as similar activities were found, essential distinctions between them, as per the requirements of the "Tool for the demonstration</td><td><s>CL 5</s></td><td></td></tr>
</table>

Checklist Question		Ref.	MoV*	Comments	Draft Concl.	Final Concl.
				and assessment of additionality" / sub-step 4b, must be further elaborated and explained.		
B.5.3.	Is it demonstrated / justified that the project activity itself is not a likely baseline scenario? (*e.g. through **(a)** a flow-chart or series of questions that lead to a narrowing of potential baseline options, **(b)** a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, **(c)** a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or **(d)** an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's legislation/regulations*)	/1/ /3/ /7/ /21/ /22/ /23/ /24/ /30/	DR	See sections B.4.6 and B.5.2	~~**CAR 3**~~ ~~**CAR 4**~~ ~~**CAR 5**~~ ~~**CAR 6**~~ ~~**CAR 7**~~ ~~**CAR 8**~~ ~~**CAR 9**~~ ~~**CAR 10**~~ ~~**CAR 11**~~ ~~**CL 5**~~	**OK**
B.5.4.	If the . of the project activity is before 2 August 2008, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, evidence to demonstrate that the CDM was seriously considered in the decision to implement the project activity, was provided, adequate and sufficient to justify it? (If starting date is on or after 2 August 2008, see C.1.1.2)	/1/ /4/ /18/ /19/ /23/ /26/ /31/	DR	According to CDM-Glos-05 "…*the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity…".* The registered PDD defines the project starting date as 09/03/2007, based on the Santa Maria Energética S.A. service order to start the plant construction,. EPC contract between Santa Maria Energética S.A. and Consórcio Construtor Cachoeirão mentions, in its item 48.1.5, that the EPC contract is valid after the emission of the service order. The shareholders minutes of meeting of Hidrelétrica Cachoeirão S.A. (annual general meeting, dated 24/04/2008), mentions Santa		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Maria Energética S.A. and CEMIG Geração e Transmissão S/A as shareholders, and was registered in the Minas Gerais State Board of Trade in 08/01/2009. The defined starting date of the project activity is before 02 August 2008, as well as prior to the global stakeholder consultation (started on 10 December 2009). To evidence that the CDM was seriously taken into consideration (prior to project's starting date), PPs presented the following events and actions (evidences) timeline: * 14/11/2005: CEMIG and Santa Maria Energética S.A. minutes of meeting considering several issues about the SHP, including the studies for carbon credits (item [i] page 3); * 17/03/2006: proposal from Ecoinvest Carbon - carbon credits project development under Kyoto Protocol; * 10/04/2007: email from Carbotrader to CEMIG with attachment "Estudo PCH Cachoeirão", which describes studies from CERs selling for the SHP Cachoeirão; * 22/08/2007: email from PP requesting a validation proposal to a DOE; * 07/05/2008: email from PP requesting a validation proposal to another DOE. During the site visit, PPs provided a proposal from a consultant, considering developing the project activity under Kyoto Protocol, dated	~~CL 6~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			17/03/2006. Considering that this document is also an important evidence for CDM consideration, PP is requested to include this evidence in the timeline table (PDD, page 17) of the project activity. Furthermore, PP is requested to clarify and/or correct the commercial operation starting dates (month/year) of the generators units presented in the timeline table as they are not consistent with the starting dates authorizations in their correspondent ANEEL Resolutions, numbers 4830, 559 and 714. Considering the documents listed above, assessed/verified by RINA, it can be concluded that the CDM was seriously considered in the decision to implement the project activity and that continuing and real actions were taken to secure CDM status, as per EB 49, annex 22.		
B.5.5. Is the above evidence based on official, legal and / or other corporate document that was available at, or prior to, the start of the project activity?	/1/ /18/ /19/	DR	See B.5.4.	**OK**	**OK**
B.5.6. If investment analysis has been used to demonstrate the additionality of the proposed CDM project activity, evidences that the proposed CDM project activity would not be: (a) The most economically or financially attractive alternative; or (b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs); were provided?	/1/ /3/ /7/ /21/ /22/ /23/ /24/ /30/	DR	See section B.5.2	~~**CAR 3**~~ ~~**CAR 4**~~ ~~**CAR 5**~~ ~~**CAR 6**~~ ~~**CAR 7**~~ ~~**CAR 8**~~ ~~**CAR 9**~~ ~~**CAR 10**~~ ~~**CAR 11**~~ ~~**CL 5**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
(*"Guidance on the Assessment of Investment Analysis")*					
B.6. Emission Reductions. *Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.*					
B.6.1. Explanation of methodological choices.					
B.6.1.1. Have the project, baseline and leakage emissions and emission reductions been properly explained and determined using the same appropriate methodology and conservative assumptions?	/1/ /2/ /5/ /6/ /17/ /26/	DR	The methodology ACM0002, Version 11 of 26/02/2010 was correctly applied. Leakage is not applicable to the project activity, as the energy generating equipments were not transferred from another activity. Project emissions are not applicable to the project activity because power density is greater than 10 W/m^2. Baseline emissions were estimated using data provided by the Brazilian DNA (publicly available in the Brazilian DNA website). The baseline emissions are calculated according to the methodology ACM0002 using the following formula: $BE_y = EG_{BL,y} * EF_{CO2}$ As reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system", emission reductions were estimated *ex-ante* using the latest available emission factor of the Brazilian grid system for 2008 (= 0.3112 tCO_2/MWh - average OM=0.4766 tCO_2/MWh and BM=0.1458 tCO_2/MWh) provided by the	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Brazilian DNA, and considering all four regions connected (North, Northeast, South and Southeast-Midwest). During the validation process a most recent data was published by the Brazilian DNA for the year 2009 and PP updated the CERs spreadsheet and the PDD version 3: EF= 0.163483 tCO_2/MWh - average OM= 0.2476 tCO_2/MWh and BM= 0.0794 tCO_2/MWh.		
B.6.1.2. Does the proposed project clearly state which equations for the calculation of emission reductions are used, as given by the approved / applied methodology?	/1/ /2/ /5/	DR	The equations used are in line with the applied baseline methodology.	**OK**	**OK**
B.6.1.3. Are the demonstration / justification for the choice of the chosen scenario (for example, in ACM0006) or case, option / method (for example in ACM0002) adequate and sufficient?	/1/ /5/ /6/	DR	The baseline scenario is the following: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants (mostly large hydro and thermal power plants) and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".	**OK**	**OK**
B.6.1.4. Are the demonstration / justification for the chosen default values adequate and sufficient?	/1/ /5/	DR	Yes. As per ACM0002 A_{BL} and Cap_{BL} for new hydro power plants are considered 0.	**OK**	**OK**
B.6.2. Data and parameter those are available at validation. *Data that is calculated with equations provided in the methodology or default values specified in the methodology should not be included in the compilation.*					

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.6.2.1. Is the list of the *ex-ante* data and parameters used by the project -including data from other sources- complete, transparent, documented and available? (*measurements after the implementation of the project activity should not need to be included here but in the tables in section B.7.1*)	/1/ /5/ /26/	DR	The methodology ACM0002 establishes that if the power density of the project activity (PD) is greater than 10 W/m2, project emissions from water reservoirs (tCO2e/yr) is zero (PE = 0). However, the table 3 of the PDD version 1 includes the CH4 emissions as the main emissions in the project activity and section B.6.2 also mentions the emission factor for emissions from the reservoir. The PDD shall be revised accordingly.	~~**CAR 2**~~	**OK**
B.6.2.2. Is the chosen value or, where relevant, the qualitative information for each supporting data or parameter(s) provided in a (proper table) tabular form and the choice for the source of data explained / justified with clear and transparent references or additional documentation? (*check Annex 3*)	/1/ /5/ /26/	DR	Yes. As per ACM0002 A_{BL} and Cap_{BL} for new hydro power plants are considered 0.	**OK**	**OK**
B.6.2.3. If values were measured, a description of measurement methods and procedures (standards), indicating the responsible(s) for carrying out the measurement(s), dates and results of measurement(s) was provided? (*check Annex 3*)	/1/ /5/ /26/	DR	See section B.6.2.2	**OK**	**OK**
B.6.3. *Ex-ante* calculation of emission reductions. Table 1 - 1, 3, 5					
B.6.3.1. Is the *ex-ante* calculation of the expected project, baseline and leakage emissions transparent, conservative, accurate, and documented and as per the approved / applied methodology (equations) of the project activity?	/1/ /2/ /5/ /17/ /26/	DR	Yes. No leakage or project emissions are applicable to the project activity. Calculations are in accordance with the requirements of methodology ACM0002, Version 11 of 26/02/2010. The estimated net electricity generation supplied by the project plant to the grid was calculated based on the assured energy (16.37 MW) provided by	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			ANEEL (ANEEL Decree number 18, dated 25 May 2007) and the estimated emission factor calculation was based in the data published by the Brazilian DNA for the year 2008. Energy delivered to the grid and emission factor(s) will be updated *ex-post* during the verification process.		
B.6.3.2. Sufficient background information and / or data to assess the calculation(s) and enable its reproduction, including electronic files (i.e. spreadsheets), was provided? (*check Annex 3*)	/1/ /17/ /26/	DR	Yes. Data for the grid emission factor is presented in Annex 3.	**OK**	**OK**
B.6.4. Summary of *ex-ante* estimation of emission reductions. Table 1 - 1, 3, 5					
B.6.4.1. Is all *ex-ante* estimation of emission reductions summarized in a (proper table) tabular form for all years of the crediting period? (*Check against A.4.4.1 figures*)	/1/ /2/ /26/	DR	Yes. The emissions reductions are presented in a proper table, on items A.4.4 and B.6.4 of the PDD version 1, totalizing 164,108 tCO_2e for the first 7 years crediting period.	**OK**	**OK**
B.7. Application of monitoring methodology and description of the monitoring plan. *Compliance of the monitoring plan with the approved methodology and Implementation of the plan* Table 1 - 15 & Annex 4					
B.7.1. Data and parameters monitored. *(background documentation in Annex 4)*					
B.7.1.1. Specific information on how the data and parameters that need to be monitored would actually be collected during monitoring for the project activity is provided? (m*easurements after the implementation of the project activity should be included here*)	/1/ /5/ /17/ /26/	DR	The following parameters are mentioned as to be monitored: $EG_{facility,y}$ - Net Electricity supplied by the SHP to the grid in hour *h*; $EF_{grid,CM,y}$ - Brazilian grid emission factor; $EF_{grid,OM-DD,y}$ - CO_2 Operating Margin emission factor of the grid, in a year *y*;	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			$EF_{grid,BM,y}$ - CO_2 Build Margin emission factor of the grid, in a year *y*; Cap_{PJ} - Installed capacity of the hydro power plant after the implementation of the project activity; A_{PJ} - Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full. Measurement methods and procedures are specified. ***Ex-post* calculation of emission reductions** The combined margin emissions factor ($EF_{grid,CM,y}$) will be calculated *ex-post* using the CO_2 emission factors for the build margin and the operational margin that are provided by the Brazilian DNA. CO_2 emission factors for the build margin and the operational margin for electricity generation in Brazil's National Interconnected System (SIN) are calculated, according to the dispatch analysis, from generation records of plants dispatched in a centralized manner by the National Electric System Operator (ONS).		
B.7.1.2. Are all the parameters and its sources of data reliable, specified and documented in a (proper table) tabular form?	/1/	DR	Yes, a proper table was used.	**OK**	**OK**
B.7.1.3. Where data or parameters are supposed to be measured, are measurement methods and procedures, including a specification of which accepted industry standards or national or international standards will be applied, specified?	/1/	DR	Yes. The energy delivered to the grid will be measured trough electricity meters that complies with national standards. The National Grid Operator (ONS) and Electric Power Commercialization Chamber (CCEE) are responsible for the definition of the technical	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			requirements of energy measurements for billing.		
B.7.1.4. Are the measuring instruments / equipments, measurement methods, accuracy and interval, measurement responsible(s) and calibration procedures specified?	/1/	DR	Yes. PPs will follow the ONS procedures (Modulo 12, sub-module 12.2), which were assessed by RINA in the ONS website, at the following link: http://www.ons.org.br/download/procedimentos/modulos/Modulo_12/Submodulo%2012.2_Rev_1.0.pdf . PDD (version 1) link to the ONS website (Modulo 12, sub-module 12.2) is not working correctly. The PDD shall mention the correct link/reference.	~~CAR 12~~	**OK**
B.7.1.5. Are the QA / QC procedures applied described and complying with existing good practice? (*The parameters related to the performance of the project will be monitored using meters and standard testing equipment, which will be regularly calibrated following standard industry practices*)	/1/	DR	The indicated QA/QC procedures are in line with the applied methodology. The electricity supplied to the grid will be monitored by electronic calibrated and inviolable (sealed) energy meters. The data from the energy meters will be cross checked with the invoices of energy sales or with the CCEE databank. The following energy meters calibration certificates were assessed during the site visit: * ION 8600 meter, serial number PT-0801A126-01 (principal/main) - calibration certificate CCM 522/2008, issued by CEMIG, calibration conducted on 11/12/2008; * ION 8600 meter, serial number PT-0801A128-01 (backup/rearguard) -	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			calibration certificate CCM 523/2008, issued by CEMIG, calibration conducted on 11/12/2008.		
B.7.2. Description of monitoring plan. *The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.*					
B.7.2.1. Is the monitoring methodology previously approved by the CDM Methodology Panel?	/1/ /5/ /26/	DR	The project applies the approved consolidated monitoring methodology ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 11 of 26/02/2010.	**OK**	**OK**
B.7.2.2. Is the monitoring methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	The applied monitoring methodology is the one deemed most applicable to the project. The project is a grid-connected renewable power generation, with power density greater than 4W/m^2, which is applicable for ACM0002. See B.2.1.	**OK**	**OK**
B.7.2.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	Yes. Monitoring plan establishes that all data will be stored during the crediting period plus two years.	**OK**	**OK**
B.7.2.4. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	Leakage is not applicable to the project activity.	**OK**	**OK**
B.7.2.5. Is the authority and responsibility of project management clearly described?	/1/	DR	Hidrelétrica Cachoeirão S.A. is responsible for all the project activity issues regarding the SHP's construction. Carbotrader Assessoria e Consultoria em	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Energia Ltda. is responsible for the emissions reductions calculations.		
B.7.2.6. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	The monitoring plan should clearly state the authority and responsibility for registration, monitoring, measurement, and reporting.	~~CL 7~~	OK
B.7.2.7. Are procedures identified for training of monitoring personnel?	/16/	DR I	A third party company is contracted to operate the SHP. This company is responsible for the training of the operational personnel.	OK	OK
B.7.2.8. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/16/	DR I	The emergency procedures related to the project activity operation (for instance: workers' safety and health, dam safety related emergency drills/exercises, etc according to the Brazilian legislation), should be included in the training courses that the specialized third party company contracted is supposed to offer (if applicable).	OK	OK
B.7.2.9. Does the monitoring plan reflect good monitoring and reporting practices?	/1/	DR	Yes. The electricity supplied to the grid will be monitored by electronic calibrated and inviolable (sealed) energy meters.	OK	OK
B.7.2.10. Is the discussion and selection of all required monitoring parameters and / or data variables (for example, project emissions, project electricity generation, baseline grid / captive power emission factor) of the monitoring plan according to the approved / applied methodology transparent?	/1/	DR	Monitoring plan (PDD-section B.7.2) and Annex 4 do not mention the monitoring of the parameters *CapJP and* APJ, addressed in section B.7.1. PPs are requested to revise the monitoring plan accordingly.	~~CAR 13~~	OK
B.8. Date of completion of the application of the baseline and monitoring methodology and the name of responsible person(s) / entity (ies).					
B.8.1. Is the date of completion of the application of	/1/	DR	The date of completion of the application of the	OK	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
the methodology to the project activity provided and mentioned in the format *DD / MM / YYYY*?	/26/		methodology to the project activity provided and mentioned in the PDD is 16/11/2009.		
B.8.2. Is the contact information of the person(s) / entity (ies) responsible for the baseline and monitoring methodology to the project activity provided? If applicable, are they indicated as project participants in Annex 1?	/1/	DR	The responsible for the baseline and monitoring methodology is Mr. Arthur Moraes from Carbotrader Assessoria e Consultoria em Energia Ltda. Carbotrader is identified as project participants in Annex 1	**OK**	**OK**
C. Duration of the Project activity / Crediting Period. *It is assessed whether the temporary boundaries of the project are clearly defined.*					
C.1. Duration of project activity.					
C.1.1. Starting date of project activity.					
C.1.1.1. Is the project's activity starting date (the earliest date at which either the implementation or construction or real action of a project activity begins implementation, construction or real action - *project participant has committed to expenditures related to the implementation or related to the construction of the project activity*) clearly defined and reasonable?	/1/ /18/ /26/ /29/	DR	The project starting date is 09/03/2007 as per service order to start plant construction. The project start date was correctly defined as per Glossary of CDM terms, version 5.	**OK**	**OK**
C.1.1.2. If the project activity started on or after 2 August 2008, were the Host Party DNA and/or the UNFCCC secretariat informed in writing of the commencement of the project activity and of the intention to seek CDM status? (If starting date is before 2 August 2008, see B.5.4)	/1/ /4/ /18/ /19/ /23/ /26/	DR	See section B.5.4	~~**CAR 3**~~ ~~**CAR 4**~~ ~~**CAR 5**~~ ~~**CAR 6**~~ ~~**CAR 7**~~ ~~**CAR 8**~~ ~~**CAR 9**~~ ~~**CAR 10**~~ ~~**CAR 11**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
				CL 5	
C.1.2. Expected operational life time of the project.					
C.1.2.1. Is the project's operational lifetime (mentioned in years and months) clearly defined and reasonable? (*check against crediting period and equipment lifetime*)	/1/ /9/		The expected operational lifetime of the project is 30 years (0 months), deemed reasonable and in line with the validity (30 years) of the ANEEL Resolution 282, dated 26 July 2000. PPs should provide evidences regarding the lifetime of equipments (turbines and generators).	**~~CL 2~~**	**OK**
C.2. Choice of crediting period. *The crediting period may only start after the date of registration of the proposed activity as a CDM project activity.*					
C.2.1. Is the chosen crediting period clearly defined (mentioned in years and months) and its starting date mentioned in the format *DD / MM / YYYY*? (*renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal*)	/1/	DR	As per the PDD version 3, a renewable crediting period of 7 years was selected (with the potential of being renewed twice), starting on 01/05/2011 or the date in which occurs the registration, the one that occurs later.	**OK**	**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.* Table 1 - 13					
D.1. Documents on Environmental impacts, including transboundary impacts.					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /11/	DR	The environmental aspects of the project activity were analyzed by the environmental agency (COPAM).	**OK**	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			The project obtained the following environmental license, assessed by RINA; -Operation license (LO) issued by COPAM dated 10/10/2008 valid for five years		
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /11/	DR	An Environmental Impact Assessment - EIA (which results in a RIMA- Environmental Impact Report) is requested by the environmental agency to issue the licenses. Therefore, an EIA was approved and then the project's Operation License was issued.	**OK**	**OK**
D.1.3. Will the project create any adverse environmental effects?	/1/ /11/	DR	See D.1.1.	**OK**	**OK**
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/ /11/	DR	See D.1.1.	**OK**	**OK**
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/ /11/	DR	See D.1.1.	**OK**	**OK**
D.1.6. Does the project comply with the environmental legislation in the host country?	/1/ /11/	DR	See D.1.1.	**OK**	**OK**
E. Stakeholders' comments. *The Validator should ensure that stakeholders' comments have been invited and that due account has been taken of any comments received.* Table 1 - 12					
E.1. Description of how comments by local stakeholders have been invited and compiled. *The local stakeholder process shall be completed before submitting the proposed project activity to a DOE for validation.*					
E.1.1. Have relevant stakeholders been adequately consulted / invited for comments?	/1/ /20/ /26/	DR	It was verified that the local stakeholders consultation followed the Brazilian DNA Resolution nº 7 requirements. Letters are	**OK**	**OK**

<table>
<tr><th>Checklist Question</th><th>Ref.</th><th>MoV*</th><th>Comments</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td></td><td></td><td></td><td>dated 09/01/2009 and 21/05/2009 and ARs dates are described bellow:
<table>
<tr><th>Stakeholder</th><th>AR</th></tr>
<tr><td>Alvarenga City Hall</td><td>27/01/2009</td></tr>
<tr><td>Alvarenga City Council</td><td>19/01/2009</td></tr>
<tr><td>Alvarenga Environmental Secretary</td><td>16/01/2009</td></tr>
<tr><td>Alvarenga Community Association</td><td>19/01/2009</td></tr>
<tr><td>Pocrane City Hall</td><td>16/01/2209</td></tr>
<tr><td>Pocrane City Council</td><td>16/01/2009</td></tr>
<tr><td>Pocrane Environmental Secretary</td><td>25/05/2009</td></tr>
<tr><td>Cachoeirão Community Development Association</td><td>17/02/2009</td></tr>
<tr><td>FEAM – State environmental body</td><td>25/05/2009</td></tr>
<tr><td>Brazilian Forum of NGOs</td><td>15/01/2009</td></tr>
<tr><td>Minas Gerais State Prosecutors Office</td><td>25/05/2009</td></tr>
<tr><td>National Prosecutors Office</td><td>26/05/2009</td></tr>
</table></td><td></td><td></td></tr>
<tr><td>E.1.2. If a stakeholder consultation process is</td><td>/1/</td><td>DR</td><td>It was verified that the letters sent to the</td><td>OK</td><td>OK</td></tr>
</table>

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
required by regulations / laws in the host country, has the stakeholders' consultation process been carried out in accordance with such regulations / laws?	/20/ /26/		stakeholders followed the Brazilian DNA Resolution nº 7. Letters were sent in Portuguese and PDD was made publicly available in Portuguese in the following web link: http://www.carbotrader.com/jun1092dcp.pdf.		
E.1.3. Was the stakeholders' consultation process conducted, within a reasonable time for comments submission, in an open and transparent manner to facilitate comments and properly described?	/1/ /20/ /26/	DR	See section E.1.2.	**OK**	**OK**
E.2. Summary of comments received.					
E.2.1. Are the stakeholders who made comments identified (addresses provided / available)?	/1/ /26/	DR	No comments were received.	**OK**	**OK**
E.2.2. The summary of the stakeholders' comments received is provided / available?	/1/	DR	No comments were received.	**OK**	**OK**
E.3. Report on how due account was taken of any comments received.					
E.3.1. Has due account been taken of any stakeholders' comments received?	/1/	DR	No comments were received.	**OK**	**OK**
Annex 1. *Contact information on project participants*					
• Are the Names of all organization given? (*as listed in section A.3*)	/1/ /26/	DR	Contact information is correctly provided in Annex 1	**OK**	**OK**
• Name of contact person, Street, City, Post fix / ZIP, Country, Telephone Fax or e-mail mandatory fields are filled?	/1/	DR	The table in the Annex 1 of the PDD shall be filled with all mandatory fields, as required by Guidelines for completing the PDD (EB 41 annex 12). The Zip Code is not mentioned in the annex 1.	~~**CL 8**~~	**OK**
Annex 2. *Information regarding public funding* Table 1 – 7 & Table 2, A.4.5					

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
• Is information from Parties included in Annex I on sources of public funding for the project activity provided?	/1/ /26/	DR	No Annex I party has yet been identified.	**OK**	**OK**
• Does the information provided above include an affirmation that such funding does not result in a diversion of ODA and is separate from and is not counted towards the financial obligation of those Parties?	/1/	DR	The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Brazil.	**OK**	**OK**
Annex 3. *Baseline information* Table 1 - 14, 17, 18 & Table 2, B					
• Is any needed further background information used in the application of the baseline methodology, i.e. tables with time series data, documentation of measurement results and data sources, provided?	/1/ /26/	DR	See section B.	**OK**	**OK**
Annex 4. *Monitoring information* Table 1 - 15 & Table 2, B.7					
• Is any needed further background information used in the application of the monitoring methodology, i.e. tables with time series data, documentation of measurement results and data sources, provided?	/1/ /26/	DR	Monitoring information is provided in the section B.7 and Annex 4 of the PDD.	**OK**	**OK**

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
~~**CAR 1**~~ Section B.3 of the PDD (version 1) is not in accordance with the applicable CDM requirements for completing PDDs (EB 41 annex 12), because the diagram of the project boundary does not consider the National Interconnected System. The diagram shall present the emissions sources and gases included in the project boundary and the monitoring variables.	B.3.1	The diagram and other information's related were revised accordingly in the new PDD version.	PDD version 2 of 18/05/2010 included the National Interconnected System in the boundary of the project activity. Moreover, the gases included in the project boundary and monitoring variables are also included in the diagram. This CAR is closed.
~~**CAR 2**~~ The methodology ACM0002 establishes that if the power density of the project activity (*PD*) is greater than 10 W/m^2, project emissions from water reservoirs (tCO_2e/yr) is zero (PE = 0). However, the table 3 of the PDD version 1 includes the CH_4 emissions as the main emissions in the project activity and section B.6.2 also mentions the emission factor for emissions from the reservoir. The PDD shall be revised accordingly.	B.3.2 B.6.2.1	The PDD was revised accordingly.	PDD version 2 of 18/05/2010 was revised accordingly. The Table 3 of the PDD version 2 is not considering CH_4 emissions in the project activity scenario as the power density (*PD*) is greater than 10 W/m^2 and in section B.6.2 the parameters related to the CH_4 emissions were excluded. This CAR is closed.
~~**CAR 3**~~ Regarding the benchmark, project participants are working with NTN-C with maturity for January 1st, 2031 as per spreadsheet, "*Government bond rates.xls*". The web link provided in the PDD (http://www.tesouro.fazenda.gov.br/tesouro_direto/consulta_titulos/consultatitulos.asp)	B.5.2 B.5.3 C.1.1.2	The NTN-C Yield Average calculation was revised accordingly. Was took in consideration the year's average (4 entire years based on the Brazilian Treasury reports) instead quotation in one day for one year. Also the period covered by the yield average (January 2003 until December	The NTN-C Yield Average calculation was revised accordingly by project participants. This CAR is closed.

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does not have the information presented in the spreadsheet, because values are update frequently. As per spreadsheet, "*Government bond rates.xls*" it was considered as the yield of paper the value quotation in one day for one year (11/11/2009). Project participants added to the paper day quotation the average IGPM between 1999 and 2008. This represents a misalignment of information, with sums of values that doesn't represents the same period of time. Moreover, dates of NTC-N and IGP-M are after the starting date of the project activity. In addition, taking into account that Brazil does not have a fully stabilized economy and some inflation, an index like IGP-M (that is linked to the profitability of the NTN-C) had a non-linear behavior in the last ten years and so project participants shall consider a longer period for the calculation of yield average, considering yearly averages and not quotation for specific days. PPs are requested to revise all calculations accordingly.		2006) are before the starting date of the project activity.	
~~**CAR 4**~~ Regarding to the risk premium, project participants are considering the value of 1.27%, that is the average return of investment on the Electrical Segment Index versus IBOVESPA index (mainly index of BOVESPA – São Paulo Stock Exchange). It is not appropriate to use this Risk Premium because it was calculated in a different	B.5.2 B.5.3 C.1.1.2	It´s not fair to compare the benchmark free risk with the project IRR, that contains much more risks, so one investor in this kind of project asks for an extra profit over the free risk benchmark (the risk premium). The risk percentage adopted was the BNDES* risk premium for the Brazilians electricity projects finance which is	Project participants presented a risk premium that was presented in an article about the Electrical Sector by a large government financial institution (BNDES), they also enclosed an email from an author of this article and a chart explaining better the calculation methodology. However, the document provided has a more recent date than the investment decision date (project's

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
base, since the project participants are considering the NTN-C as the benchmark and not the IBOVESPA index.		related to the sectorial project activity risk and not with the Benchmark index base. *(BNDES has been financing electricity projects for more than 10 year) Evidences in E-mail "ENC: Artigo publicado - O Papel do BNDES na Expansão do Setor Elétrico e o Mecanismo de Project Finance." In 24/06/2010 and "Risk Premium BNDES.pdf" <u>Second Response</u> As a conservative approach the risk premium value was considered zero. This adjustment results the revised spreadsheets: "IRR_Cachoeirao_v3.xls" and "Benchmark_v3.xls" Furthermore the IRR values were adjusted accordingly in PDD version 3 page 11-*sub-step 2c*.	starting date) of the project. Furthermore, IRR values (with and without CER's) presented in PDD version 2 page 11-*sub-step 2c* (19.02% and 19.70%) are different from the IRR values presented in the revised spreadsheet "*IRR_Cachoeirao_v2_1.xls*" (18.67% and 19.35%) and shall be corrected. This CAR remains open. <u>Second Response</u> In the spreadsheets "IRR_Cachoeirao_v3.xls" and "Benchmark_v3.xls" and PDD version 3, the risk premium was considered zero. The IRR values presented in PDD are aligned with the values presented in the spreadsheet "IRR_Cachoeirao_v3.xls. This CAR is closed.
~~**CAR 5**~~ The document "Comitê de Gerenciamento de riscos de Energia-CGRE" from CEMIG, mentions a value of 140.00 R$/MWh for the period from 2011 to 2013 (bloco 1-block 1), a value of 76.44 R$/MWh for the year 2009 and a value of 97.27 R$/MWh from 2010 on (bloco 2 - block 2), however the	B.5.2 B.5.3 C.1.1.2	To the block 1 the 140.00 R$/MWh should be kept because the PPA closed for the SHP Cachoeirão has 10 years as duration time, so the energy price after 2013 remains the same as forecasted in the IRR project spreadsheet (IGP-M is the index for the annual adjustment).	Project participants applied in the revised spreadsheet "*IRR_Cachoeirao_v2_1.xls*" the energy prices values according to the document "Comitê de Gerenciamento de riscos de Energia-CGRE". This CAR is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
spreadsheet "*IRR_Cachoeirao.xls*", applies the values of 140.00 R$/MWh and 76.44 R$/MWh for all the period of the investment analysis. PPs are requested to clarify the forecasted value for the energy after 2013 for the block 1 and apply the value 97.27 R$/MWh for the energy block 2, after 2010.		To the new IRR project spreadsheet the price energy for the block 2 was adjusted accordingly to the document "Comitê de Gerenciamento de riscos de Energia-CGRE" from CEMIG.	
~~**CAR 6**~~ Further information about the energy prices and its evolution shall be presented. It should be clear what's the reference date for this prices and which index will be chosen to adjust this prices over the years (For example: …*the price was defined for July/200X as R$ Y MW/h and should be adjusted every year by the ZZ index*).	B.5.2 B.5.3 C.1.1.2	The price was defined as below: Block 1: 140.00 R$/MWh since 09/06/2006 as in the document "Comitê de Gerenciamento de riscos de Energia-CGRE" from CEMIG. The annual adjustment should be the IGP-M, as already said in the PDD this in the main index for the energy prices and tariffs. For the Block 2: 75.87 R$/MWh in 2008 ;76.44 R$/MWh in 2009 and 97.27 R$/MWh from 2010 as in the document "Comitê de Gerenciamento de riscos de Energia-CGRE" from CEMIG. Is based on the PLD (from the CCEE the "*Preço para Liquidação de Diferenças*" prices deck median projection. As said a possible adjustment for this energy price should be also the IGP-M.	The inflation index (IGP-M) was correctly applied on energy prices over the years in the revised spreadsheet *"IRR_Cachoeirao_v2_1.xls"*. This CAR is closed.
~~**CAR 7**~~ Regarding to prices and costs evolution over the years, PPs have presented flat values for all years. It's necessary to demonstrate in the P&L and Cash Flow the evolution for all lines, in accordance to the	B.5.2 B.5.3 C.1.1.2	The inflation on prices and costs was considered, as said in the CAR 6, the index chosen was the IGP-M and INPC. The references are: IGP-M	The revised spreadsheet (*"IRR_Cachoeirao_v2_1.xls"*) included in the calculations the effects of inflation using the IGP-M for the revenues and the INPC plus IGP-M (according to the formula presented in the annex "*CT 014-08 Energisa Soluções*

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more appropriate inflation index. This evolution can be different for any line and this can represent a significant impact on the EBITDA evolution. The inflation on prices and costs has to be considered because in the benchmark the return of the investment includes the inflation. Also related to the indexes, inflation and interest rates and also foreign exchange rates, PPs should demonstrate the sources of the information. Furthermore, PPs shall prioritize the sources of the Brazilian Government or some large financial institutions (normally those institutions provide a forecast for next few years). After this, the PPs should repeat the last year forecasted for all the project period and the financial spreadsheet and PDD shall be revised accordingly.		http://www.portalbrasil.net/igpm.htm And for the index forecast: http://www4.bcb.gov.br/pec/GCI/PORT/readout/R20100108.pdf INPC http://www.portalbrasil.net/inpc.htm To the index forecast was kept the 2009 value PIS/COFINS/Income Tax and Social Contribution: The Brazilian law 10.637 from 30 December 2002 and the law 9.718 from 27 November 1998 defined that companies with Gross revenue less than R$ 48 million can aplicate the Brazilian System of tax "Presumed tax profit". So, the following taxes are applied in the gross revenue: · COFINS (from the portuguese: Contribuição para o Financiamento da Seguridade Social) – 3% over the Profit; · PIS/PASEP (from the portuguese: Programa de Integração Social/ Programa de Formação de Patrimônio do Servidor Público) – 0.65% over the Gross Revenue; · Income tax – 25% over 8% of the Gross revenue; · Social contribution – 9% over 12% of the Gross revenue. TUSD fee: Resolution N° 310, from 6 April 2006 TUST fee: ANEEL Resolution number	- *O&M.pdf*") for the operational costs. All tax calculations are according to the information presented in the PPs response, except PIS/COFINS that has been correctly calculated in the spreadsheet, *over the Gross Revenue*, and the PPs answer indicates that it was calculated *over the Profit*. PP shall correct the CAR's response and the note presented in the spreadsheet *"IRR_Cachoeirao_v2_1.xls"*. This CAR is still open. Second Response The properly adjustments were done. This CAR is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		281/1999, ANEEL Resolution n. 77/2004- reduction and ANEEL Resolution n. 81/2004 - Charges (Encargos). Second Response The properly adjustments in the CAR's response and the note presented in the spreadsheet "IRR_Cachoeirao_v3.xls" were done.	
~~**CAR 8**~~ In relation to Costs, for Management Costs After Start, it's defined a fixed tariff of R$ 1.88 per MWh and for O&M costs it's defined a fixed tariff of R$ 7.56 per MWh. Both tariffs were confirmed in the document *Comitê de Priorização de Investimento – CPO- Parecer de Projecto de Investimento –Projeto nº1714/07 SPE Guanhães* (Meeting report discussing the investment of the Guanhães (4 SHPs) project, conducted on 16/10/2008), that mentions that the same values of SHP Cachoeirão will be used in the referred project, however, it's not clear how both tariffs will be adjusted over the years. Evidences and clarifications regarding the applied values should be provided.	B.5.2 B.5.3 C.1.1.2	Was adopted to these tariffs the annual adjustment trough the IGP-M and INPC indexes. An evidence for this index can be the Agreement with the Energisa, one of the workforce suppliers.	Project participants provided the annex "*CT 014-08 Energisa Soluções - O&M.pdf*" with the contract between PCH Cachoeirão and Energisa (workforce supplier) setting the indexes and the formula to be used over the years. All formulas in the spreadsheet "*IRR_Cachoeirao_v2_1.xls*" are aligned with this document. This CAR is closed.
~~**CAR 9**~~ Regarding the Sales Tax, the CPMF should be excluded of P&L and Cash Flow analysis once that this tax was extinct since 2007.	B.5.2 B.5.3 C.1.1.2	The IRR spreadsheet was presented as the original but as required and to keep a conservative approach the CPMF was excluded.	The CPMF was deleted from the calculations. This CAR is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
PPs are requested to correct the spreadsheet and related documents.			
~~**CAR 10**~~ The explanation about the benchmark has to be moved from the section "Sub-step 2c: Calculation and comparison of financial indicators" to section "Sub-step 2b: Option III. Apply benchmark analysis".	B.5.2 B.5.3 C.1.1.2	The explanation was moved accordingly.	All necessary changes were made by project participants. This CAR is closed.
~~**CAR 11**~~ The sensitivity analysis did not include the Operational Cost and, according to the "Guidelines o the assessment of investment analysis" (Version 03 – EB 51 annex 58) Article 17, *"Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation".* However, project participants should consider to apply a sensitivity analysis in this parameter as this is the main cash out value over the years after the investment.	B.5.2 B.5.3 C.1.1.2	The Operational Cost parameter was included in the sensitive analysis. Second Response: The information about the Operational Costs was also included in the PDD version 3 - page 12.	Project participants included in the spreadsheet "*IRR_Cachoeirao_v2_1.xls*" the table to calculate the sensitivity analysis of the Operational Cost, however it has to be also included in the PDD. This CAR remains open. Second Response: The information about sensitivity analysis of Operational Costs was properly included in the PDD. This CAR is closed.
~~**CAR 12**~~ PDD (version 1) link to the ONS website (Modulo 12, sub-module 12.2) is not working correctly. The PDD shall mention the correct link/reference.	B.7.1.4	The link/reference was adjusted accordingly.	The PDD version 2 was revised to present the correct link to the ONS web site (Modulo 12, sub-module 12.2) http://www.ons.org.br/download/procedimentos/modulos/Modulo_12/Submodulo%2012.2_Rev_1.0.pdf (accessed on 05.07.2010) This CAR is closed.
~~**CAR 13**~~	B.7.2.10	The monitoring plan was revised	The PDD version 2 included the monitoring

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Monitoring plan (PDD-section B.7.2) and Annex 4 do not mention the monitoring of the parameters Cap_{JP} and A_{PJ}, addressed in section B.7.1. PPs are requested to revise the monitoring plan accordingly.		accordingly.	of the parameters Cap_{PJ} *(*Installed capacity of the hydro power plant after the implementation of the project activity) and A_{PJ} (Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full). The Cap_{PJ} will be monitored through the technical specifications of the installed equipments, installed plaques in the equipments and factsheets. Moreover the authorizations of the regulatory agency will be checked. The A_{PJ} will be determined through topographical surveys, maps, satellite pictures, etc. Moreover, as the SHP Cachoeirão has to monitor the level of the reservoir due to National requirements, data used for this purpose can be used to determine the reservoir area and will be also a measurement procedure to be considered to the project activity. This CAR is closed.
~~**CAR 14**~~ The three generator's plate data (Nominal power 11,000 kVA, Power factor/Cosine φ 0.85), show that the total installed capacity of Cachoeirão SHP is to be 28.05 MW (as also mentioned in the PDD-footnote 1). ANEEL's definition of installed capacity is: "*The nominal active electric power of a*	A.4.3.1	The explanation is below (by topics): - **installed capacity of PDD (27.90 MW)**: The PDD informs that the installed capacity of the turbine is 27.9 MW (so the maximum performance for the generators, besides the greater size of them).	The generators specifications (28.05 MW or rounded, 28 MW) are indeed inside the range of +/- 5 % (ANEEL's Resolution # 407, dated 19 October 2000) of the authorized/granted installed capacity (27 MW). Nevertheless, as per the definitions of applied methodology ACM0002, version 11:

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
generating unit (in kW) is defined by the product of the apparent nominal electric power (in kVA) at rated power factor of the electric generator, considering a continuous operation of the system and nominal operating conditions." Based on that and on the requirements of ANEEL's Resolution # 407, dated 19 October 2000, PPs are requested to explain/justify the following: * the difference among the figures of installed capacity of PDD (27.90 MW), ANEEL Resolution # 282 (27.00 MW) and Generator's specifications (28.05 MW); * if a request to revise the authorized installed capacity was, or not, required to ANEEL (ANEEL's Resolution # 407 - present/real installed capacity is greater than +/- 5 % of the authorized/granted installed capacity).		It´s a conservative approach because this is the bottleneck of the generators capacity (28.05 MW never could be reach since the maximum turbines output are 27.9 MW). The DOE can observe trough other PDDs that the usual are Turbines with capacity greater than the Generators. - **ANEEL Resolution # 282 (27.00 MW):** is based on the project design (the planning phase), ANEEL knows that differentiations can occur between the project planning phase and construction phase, so the ANEEL's Resolution 407 determines how way this deviation should be assessed *. To the SHP Cachoeirao the deviation is under 5% variation (+3.8% above), so to the ANEEL agency no action should be carried out (as the Resolution # 407 already mentioned). - **Generator's specifications (28.05 MW)** are those contained in the generator´s plate. * Resolution # 407: For power generation defines the fixing system to the "Installed capacity" for all purposes regulation, inspection and licensing services. In the Article 6th defines that: at generating stations where the **difference between**	*The installed power generation capacity of a power unit is the capacity, expressed in Watts or one of its multiples, for which the power unit has been designed to operate at nominal conditions. The installed power generation capacity of a power plant is the sum of the installed power generation capacities of its power units*. Therefore, the installed capacity (nominal active electric power - plate data) of the generators, equal to 28 MW, shall be the one to be mentioned in the PDD. This CAR remains open. <u>Second Response:</u> Installed capacity presented in the PDD version 3 (28.05 MW) is according to the definitions of the methodology. This CAR is closed.

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		the maximum active electrical power, measured at terminals of the generator, generator unit operating in continuous and installed power determined in accordance with Art. Second, **exceeds five percent**, whether for climatic, repowering, distortions technical **changes during the acquisition of generating equipment** or limitation of the rated motor equipment, this should be formally declared and justified to the ANEEL for regularization. It´s not the SHP Cachoeirao case. Second Response: The generators specifications (28.05 MW) were mentioned in the PDD version 3.	
~~**CL 1**~~ PPs are requested to include in the PDD the category of the project activity.	A.4.2	The category of the project activity was included in the PDD.	The category of the project activity was included in the PDD version 2. This CL is closed.
~~**CL 2**~~ PPs should provide evidences regarding the lifetime of equipments (turbines and generators).	A.4.3.3 C.1.2	According to the EFEI and CERNE ´s ANEEL studies, the lifetime of equipments Turbines and Generators are above 30 years (easy access on Tables in pages 633 and 635). CERNE - Centro de Estudos em Recursos Naturais e Energia EFEI – Escola Federal de Engenharia de Itajubá http://www.aneel.gov.br/aplicacoes/audie	It was verified that the operational lifetime was defined as per the ANEEL guidelines "*Estudo de Vida Útil Econômica e Taxa de Depreciação*", dated November 2000. This CL is closed.

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		ncia/arquivo/2006/012/documento/relatorio_vida_util_volume_2.pdf	
~~CL 3~~ The project applies the methodology ACM0002 version 10 of 11/06/2009, scope 1, that is in line with the relevant project category. However, considering the grace period (until 25/10/2010) for the submission of project activities for registration, when using a revised approved methodology, and the present validation timeline to submit projects for registration, it is recommended to revise the PDD according to ACM0002 version 11, valid from 26 February 2010 onwards.	B.1.1	The PDD was revised accordingly the ACM0002 version 11.	PDD version 2 was revised as per ACM0002 version 11 methodology. This CL is closed.
~~CL 4~~ The PDD mentions in the beginning of section B.2: "The ACM0002 methodology is applicable to grid-connected renewable power generation project activities that involve electricity capacity additions under the following conditions:". This statement (capacity additions) must be corrected as per ACM0002 (new power plant) applicability definitions.	B.2.1	The statement was revised accordingly.	The revised PDD version 2, describes the applicability criteria as per the methodology ACM0002, version 11. The project activity complies with item a) of the applicability of the methodology "*install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant)".* The project activity is a new small hydropower plant, at the site where the project is located, no renewable power plant was operating before. This information was confirmed through ANEEL documents, environmental licenses and site inspection. Moreover the project activity complies with

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			the following condition: "*The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m²*". The project activity results in a new reservoir area of 1,021,000 m², with 27.47 W/m² Power Density. This CL is closed.
~~**CL 5**~~ Regarding the common practice analysis, as similar activities were found, essential distinctions between them, as per the requirements of the "Tool for the demonstration and assessment of additionality" / sub-step 4b, must be further elaborated and explained.	B.5.2 B.5.3 C.1.1.2	Even with the +- 50% capacity range criteria, the 2 power plants Porto Góes and Graça Brennand cannot be included in the analysis because: **Porto Góes** SHP is a power plant that has done a 14.3MW capacity addition, totaling 24.8MW installed. This capacity addition was authorized in 06 May 2003, by the ANEEL's resolution Nº 255: http://www.aneel.gov.br/cedoc/res2003225.pdf for the Empresa Metropolitana de Águas e Energia S.A. – EMAE. The plant has been operating since 01 December 1982, where the ELETROPAULO - Eletricidade de São Paulo S.A. company had got authorization to produce electricity in this hydro potential, by the Decree Nº 87.884, available at: http://www.aneel.gov.br/cedoc/dec 19827884.pdf. So this is not a similar activity than the proposed project activity considering their different designs.	Confirmed on the ANEEL Resolution n° 255, dated 06/05/2003 that the Porto Góes SHP is an expansion project and Graça Bernand SHP is a CDM project, therefore, they can not be compared to the project activity. The conclusion of the common practice analysis is that there are no similar SHPs to the project activity. All SHPs considered incentives from CDM and/or Proinfa. This CL is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		And **Graça Brennand** SHP is a CDM Project, as per PDD publication in the CDM UNFCCC website: http://cdm.unfccc.int/Projects/Validation/DB/N68XFRKNR58M29GRSJGR81NCMFT7KJ/view.html.	
~~**CL 6**~~ During the site visit, PPs provided a proposal from a consultant, considering developing the project activity under Kyoto Protocol, dated 17/03/2006. Considering that this document is also an important evidence for CDM consideration, PP is requested to include this evidence in the timeline table (PDD, page 17) of the project activity. Furthermore, PP is requested to clarify and/or correct the commercial operation starting dates (month/year) of the generators units presented in the timeline table as they are not consistent with the starting dates authorizations in their correspondent ANEEL Resolutions, numbers 4830, 559 and 714.	B.5.4	The information regarding the CDM consultant proposal was included in the timeline. The commercial operation starting dates in the timeline were adjusted accord to the ANEEL Dispatches.	The timeline table was revised in the PDD version 2. The proposal was included and the commercial operation starting dates of the units UG1, UG2 and UG3 were revised (December 2008, February 2009 and February 2009, respectively) as per ANEEL Resolutions, numbers 4,830, 559 and 714. This CL is closed.
~~**CL 7**~~ The monitoring plan should clearly state the authority and responsibility for registration, monitoring, measurement, and reporting.	B.7.2.6	The authority and responsibility for registration, monitoring, measurement, and reporting were included in the monitoring plan.	PDD version 2 included that the Hidrelétrica Cachoeirão S.A. is responsible for the maintenance and calibration of the monitoring equipments, compliance to operational requirements and corrective actions related to the functionality of the project activity. Moreover, the company has authority and responsibility for registration, monitoring, and measurement as well as managing the project, organizing staff

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			training to use appropriated techniques in those procedures. Carbotrader Assessoria e Consultoria em Energia Ltda is responsible to report the results of the baseline, project emissions (if applicable) and emission reductions calculations. This CL is closed.
~~**CL 8**~~ The table in the Annex 1 of the PDD shall be filled with all mandatory fields, as required by Guidelines for completing the PDD (EB 41 annex 12). The Zip Code is not mentioned in the annex 1.	A.3.2 Annex 1	The table in the Annex 1 was adjusted accordingly.	The zip code was included in the PDD version 2. This CL is closed.