RINA

VALIDATION REPORT

FINAL

"Pipoca Small Hydropower Plant Project Activity"
in
Brazil

REPORT NO. 2009-BQ-110-ME
REVISION NO. 1.2

RINA

VALIDATION REPORT

Project Title: "Pipoca Small Hydropower Plant Project Activity"	**Country:** Brazil	**Estimated CERs (tCO_2e):** 17,051 *(annual average)*
Client: Hidrelétrica Pipoca S.A.	**Client contact:** Mr. Bruno Macedo	
Report No.: 2009-BQ-110-ME	**Revision:** 1.2	**Date of this report:** 16/01/2012
Approved by (Final Report – DCI Director approval): Roberto Cavanna		**Date of approval:** 20/01/2012

Methodology

Number:	**Version:**	**Title:**	**Scale**	**SS(s):**
ACM0002	version 12.2.0 of 25/11/2011	"Consolidated baseline methodology for grid connected electricity generation from renewable sources "	Large	1

RINA Services S.p.A. (RINA), commissioned by Hidrelétrica Pipoca S.A., has performed the validation of the project activity "Pipoca Small Hydropower Plant Project Activity" in Brazil, with regard to the relevant requirements for CDM activities.

In conclusion, it is RINA's opinion that the project activity "Pipoca Small Hydropower Plant Project Activity" in Brazil, as described in the PDD version 5 of 13/01/2012, 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 12.2.0 of 25/11/2011 .

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: Geisa Maria Príncipe Branco Saettoni, Américo Varkulya Junior, Thaís de Lima Carvalho, Cintia Mara Miranda Dias and Tiago Mendonça de Oliveira	☒ No distribution without permission from the Client or organizational unit responsible ☐ Strictly confidential ☐ Unrestricted distribution
Work verified by (Final Report – CRT person responsible approval) Paolo Teramo	**Keywords:** Climate Change, Kyoto Protocol, Clean Development Mechanism, Validation

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Abbreviations

ANEEL	"*Agência Nacional de Energia Elétrica*" - Brazilian Electric Energy Agency
BE	Baseline Emissions
BM	Build Margin
BNDES	"Banco Nacional do Desenvolvimento" – Brazilian Developement Bank
CAPM	Capital Assets Pricing Model
CAR	Corrective Action Request
CCEE	"*Câmara de Comercialização de Energia Elétrica*" - Electric Power Commercialization Chamber.
CDM	Clean Development Mechanis
CDM M&P	Modalities and Procedures CDM
CEMIG	"*Companhia Energética de Minas Gerais*" – Energy Company of Minas Gerais State
CER(s)	Certified Emission Reduction(s)
CERPCH	*"Centro Nacional de Referencia em Pequenas Centrais Hidrel*étricas" - Brazilian National Reference Center on Small Hydro Power Plants
CH_4	Methane
CIMGC	"*Comissão Interministerial de Mudança Global do Clima*" - Interministerial Commission on Global Climate Change
CL	Request for Clarification
COFINS	*"Contribuição para o Financiamento da Seguridade Social"* - Contribution to Social Security Financing
COPAM	"*Conselho Estadual de Política Ambiental*" - Environmental Police Council of Minas Gerais State
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
EMBI	Emerging Markets Bond Index
EPC	Engineering, Procurement and Construction
FAR	Forward Action Request
FEAM	"*Fundação Estadual do Meio Ambiente*" – State Environment Foundation (Minas Gerais)
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
IPEA	*"Instituto de Pesquisa Econômica Aplicada"* - Institute of Applied Economic Research
LI	Installation License
LoA	Letter of Approval
MoV	Means of Verification
ODA	Official Development Assistance
ONS	"Operador Nacional do Sistema Elétrico" – Brazlian Electric system Operator

PDD	Project Design Document
PE	Project Emission
PIS	"*Programa de Integração Social*" - Social Integration Program
PLD	"*Preço de Liquidação da Diferença*" - Energy Spot Price
PP(s)	Project Participant(s)
PPA	Power Purchase Agreement
PROINFA	"*Programa de Incentivo às Fontes Alternativas de Energia Elétrica*" - Programme of Incentives to the Alternative Sources of Electric Energy
Ref.	Document Reference
RINA	RINA Services Spa
SEMAD	"*Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável*" - State Secretariat for the Environment and Sustainable Development of Minas Gerais State
SHP	Small hydropower plant (Pequena Central Hidrelétrica - PCH)
SS(s)	Sectoral Scope(s)
SUPRAM	"*Superintendencia Regional de Meio Ambiente e Desenvolvimento Sustentável*" – Regional Superintendence of Environment and Sustainable Development (Minas Gerais)
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual
WCD	World Commission on Dams

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Appendix A: Validation Protocol

VALIDATION REPORT

1 INTRODUCTION

Hidrelétrica Pipoca S.A. has commissioned RINA to carry out the validation of the "Pipoca Small Hydropower Plant Project Activity" 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 validation 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 1 of 07/10/2009, the PDD version 2 of 01/09/2010, the PDD version 3 of 28/01/2011, the PDD, version 4 of 19/09/2011/1/, in particular the applicability of the methodology ACM0002 "Consolidated baseline methodology for grid connected electricity generation from renewable sources " version 12.2.0 of 25/11/2011 /12/, 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, "Pipoca_Estimated CERs_2011.02.18.xls" version 03 of 18/02/2011 /2/, the financial analysis spreadsheet "Valuation_Pipoca_v3_en_29_03.xlsx" version 4 of 29/03/2010 /3/ and WACC spreadsheet Ke_ElectricGen_2010.09.01.xls", version 2 of 01/09/2010 /4/ were assessed as part of the validation.

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

/1/	Ecopart: CDM-PDD for the "Pipoca Small Hydropower Plant Project Activity", version 01 of 07/10/2009. Ecopart: CDM-PDD for the "Pipoca Small Hydropower Plant Project Activity", version 2 of 01/09/2010; Ecopart: CDM-PDD for the "Pipoca Small Hydropower Plant Project Activity", version 3 of 28/01/2011; Ecopart: CDM-PDD for the "Pipoca Small Hydropower Plant Project Activity", version 4 of 19/09/2011. Ecopart: CDM-PDD for the "Pipoca Small Hydropower Plant Project Activity", version 5 of 13/01/2012
/2/	Ecopart: Spreadsheet with CERs calculations of "Pipoca Small Hydropower Plant Project Activity" - "*Pipoca_Estimated CERs_2009.10.07.xls*",, version 1 of 07/10/2009 Ecopart: Spreadsheet with CERs calculations of "Pipoca Small Hydropower Plant Project Activity" "Pipoca_Estimated CERs_2010.09.01.xls" version 02 of 01/09/2010 Ecopart: Spreadsheet with CERs calculations of "Pipoca Small Hydropower Plant Project Activity" "Pipoca_Estimated CERs_2011.02.18.xls" version 03 of 18/02/2011
/3/	Ecopart: Spreadsheet with Investment Analysis of "Pipoca Small Hydropower Plant Project Activity" - "*Valuation_Pipoca.xls*", version 1 of 07/10/2009 Ecopart: Spreadsheet with Investment Analysis of "Pipoca Small Hydropower Plant Project Activity" "Valuation_Pipoca_2010.09.01.xls", version 2 of 01/09/2010; Ecopart: Spreadsheet with Investment Analysis of "Pipoca Small Hydropower Plant Project Activity" "Valuation_Pipoca_v2_en.xlsx" version 3 of 18/02/2010; Ecopart: Spreadsheet with Investment Analysis of "Pipoca Small Hydropower Plant Project Activity" "Valuation_Pipoca_v3_en_29_03.xlsx" version 4 of 29/03/2010
/4/	Ecopart: Spreadsheet with WACC calculation of "Pipoca Small Hydropower Plant Project Activity" - "*Ke ElectricGen_2008.08.29.xls*", version 1 of 29/08/2008; Ecopart: Spreadsheet with WACC calculation of "Pipoca Small Hydropower Plant Project Activity" " Ke_ElectricGen_2010.09.01.xls", version 2 of 01/09/2010
/5/	CDM Executive Board: "CDM Validation and Verification Manual", version 01.2 of 30/07/2010.
/6/	**SHP Pipoca** - Environmental Licenses Environmental Foundation of Minas Gerais State (FEAM) and the Secretary of Environmental and Sustainable Development and of Minas Gerais State (SEMAD) - Construction License (LI) number 006/2005 2a. Via, conferred to Hidrelétrica Pipoca S/A. (ex HP2 do Brasil Ltda.), dated 13/04/2007 and valid until 20/01/2008; Extension of Construction License expiration date from 20/02/2008 to 20/01/2010, obtained from Environmental Foundation of Minas Gerais State (FEAM) and the Secretary of Environmental and Sustainable Development and of Minas Gerais State (SEMAD), dated 19/02/2008. "*Ad Referendum*" Extension of Construction License expiration date from 20/01/2010 to 20/01/2011, obtained from Environmental Foundation of Minas Gerais State (FEAM) and the Secretary of Environmental and Sustainable Development and of Minas Gerais State (SEMAD) and Environmental Police Council of Minas Gerais State (COPAM), dated 15/01/2010. OF LIMIAR E-DE-2054/09 - Operation License Formalization Process SHP Pipoca; Process number 302/2000/002/2004, submitted to Regional Superintendence of Environment and Sustainable Development (Minas Gerais) (SUPRAM Leste Mineiro), dated 10/11/2009
/7/	**SHP Pipoca** - **ANEEL** Documents ANEEL Resolution number 474 dated 06/03/2006 – transfers from company HP2 do Brasil Ltda to company Hidrelétrica Pipoca S.A. the authorization to the implementation and operation of SHP Pipoca (as per ANEEL Resolution number 388, dated 10/09/2001); ANEEL Resolution number 388 dated 10/09/2001 – authorizes HP2 do Brasil Ltda to be established as Electric Energy Independent Producer - coordinates 19°46' S & 41°48' W; ANEEL Normative Resolution number 65 dated 25/05/2004 - Defines the assured energy of

	Pipoca SHP, corresponding to 104,244 MWh/year; ANEEL Dispatch number 78 dated 10/01/2005 - approval of basic project and defines a reservoir area of 0.855 km^2.
/8/	CIMGC: Manual for Submitting CDM Projects to the Interministerial Commission on Global Climate Change.
/9/	CDM Executive Board: "Guidelines for completing the project design document (CDM-PDD) and the proposed new baseline and monitoring methodologies (CDM-NM)", version 7 of 02/08/2008.
/10/	EPC Contract of SHP Pipoca (Engineering, Procurement and Construction), dated 20/10/2008, between Hidrelétrica Pipoca S.A and Consórcio Construtor Pipoca.
/11/	Technical proposal n° 25/1118 rev B, dated 12/ 07/2007 (this document is part of EPC contract).
/12/	CDM Executive Board: ACM0002 "Consolidated baseline methodology for grid connected electricity generation from renewable sources " version 12.2.0 of 25/11/2011 .
/13/	CDM Executive Board: Tool for the demonstration and assessment of additionality, version 6.0, Annex 21, dated 25/11/2011
/14/	CDM Executive Board: Tool to calculate the emission factor for an electricity system, version 2.2.1 EB 63, Annex 19, dated 20/09/2011.
/15/	"*Encaminhamento de Cronograma de Implantação*" (Implementation chronogram), dated 28/11/2008 – Document informing the Schedule of Project implementation sent to ANEEL.
/16/	Minutes of Meeting "CEMIG Administration Board's 58th meeting minutes" held on 27/08/2008 and published on 29/08/2008 – Resolution Communication of CEMIG Administrative Council.
/17/	CDM Executive Board: Glossary of CDM terms, version 5, dated 19/08/2009.
/18/	CDM Executive Board: "Guidelines on the Demonstration and assessment of Prior Consideration of the CDM" (EB 62 - Annex 05), version 05, dated 15/07/2011.
/19/	ANEEL: Technical Note number 464 2009/SGH/ANEEL – Evaluation of Adjustments on Consolidated Basic Project SHP Pipoca, dated 31/12/2009.
/20/	Minute of Meeting occurred on 29/11/2007 and published on 30/11/2007 – Resolution Communication of CEMIG Administrative Council.
/21/	- PPA contracts between Hidrelétrica Pipoca SA and Stola do Brazil Ltda, dated 26/11/2008. - PPA contracts between Hidrelétrica Pipoca SA and CEMIG Geração e Transmissão S.A, dated 14/04/2009 and 20/05/2009.
/22/	Ecoinv Global First Advisory Proposal - Carbon Credit Project to Ômega Energia – Pipoca SHP, dated 02/09/2008. Ecoinv Global Second Advisory Proposal - Carbon Credit Project to Ômega Energia – Pipoca SHP, dated 18/02/2009.
/23/	Contract referent to the development of the CDM Project "Pipoca Small Hydropower Plant Project Activity", dated 26/06/2009.
/24/	Receiving Acknowledgment Receipts (ARs) referent to the writing notification sent by project participants to local stakeholders, as per the Brazilian DNA requirements., • ARs of Syndicate of Rural Worker of Caratinga dated 08/09/2009; • AR of Syndicate of Rural Worker of Ipanema dated 09/09/2009; • All others stakeholders received the letters on 12/08/2009.
/25/	Contract between Hidrelétrica Pipoca S.A and Ecoinv Global Ltda, dated 26 June 2009.
/26/	SPEC – Planejamento, Engenharia e Consultoria Ltda.: Consolidated basic project technical data spreadsheet, August 2007 – evidence of reservoir area.
/27/	Formal constitution of Pipoca PCH, dated 20/05/2008 - CEMIG Geração e Transmissão S/A bought 49% shares of Pipoca's project from Hydro Partners do Brasil Empreendimentos e Participações Ltda. (Document called in Portuguese "Ata da Assembléia Geral Extraordinária realizada em 20 de

	Maio de 2008")
/28/	CDM Executive Board: Guidelines on the assessment of investment analysis, version 5 EB 62 annex 05, dated 15/07/2011.
/29/	ANEEL: Resolution N° 652, issued on 09/12/2003. website: http://www.aneel.gov.br/cedoc/res2003652.pdf , accessed on 01/05/2010. – Defines the criteria referent to hydroelectric exploitation of Small Hydropower Plants.
/30/	CDM Executive Board: "Tool to calculate project or leakage CO_2 emissions from fossil fuel", version 2, dated 02/08/2008.
/31/	Companhia Energética de Minas Gerais – CEMIG "Memorandum of Understanding", dated 14/11/2005.
/32/	ANEEL: Dispatch # 3024, dated 07/10/2010 available in Portuguese at http://www.aneel.gov.br/cedoc/dsp20103024.pdf , accessed on 20/10/2011.
/33/	ANEEL: Dispatch # 3072, dated 15/10/2010, available in Portuguese at http://www.aneel.gov.br/cedoc/dsp20103072.pdf , accessed on 20/10/2011.
/34/	ANEEL: Dispatch # 3275, dated 28/20/2010, available in Portuguese at http://www.aneel.gov.br/cedoc/dsp20103275.pdf , accessed on 20/10/2011.
/35/	GE Energy Motors (GEVISA); "Letter demonstrating the generator´s lifetime" from Mr. Luis Ricardo Evangelista (Contract Manager of GE), dated 28/07/2010, indicating the life time of Pipoca SHP´s generators.
/36/	Pipoca SHP: Picture of generators nameplates (file: DSC09910.jpg).
/37/	Andritz Hydro Brasil Ltda: "e-mail describing the lifetime of turbines to be employed by Pipoca SHP", sent by Mr. Joel de Almeida (Commercial Director of Andritz Hydro Brasil Ltda), dated 03/05/2011.
/38/	ANEEL Dispatch # 1695, dated 14/06/2010, available in Portuguese at http://www.aneel.gov.br/cedoc/dsp20101695.pdf accessed on 20/10/2011.
/39/	Omega Energia Renovável S/A and Hydro Partners do Brasil Empreendimentos e Participações Ltda. "Purchase and Sale of Shares and Other Covenants Contract", dated 30/06/2008.
/40/	CEEE Spreadsheet with Results of 3rd New Energy Auction, dated 10/10/2006 "Resultado_3_nova_completo.xls". available in Portuguese at http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=054f163c9124d010VgnVCM1000005e01010aRCRD, accessed on 20/10/2011.
/41/	ANEEL document for assured energy ("ANEEL Cadernos Temáticos: Energia Assegurada") available at http://www.aneel.gov.br/arquivos/pdf/caderno3capa.pdf accessed on 20/10/2011 and available only in a Portuguese version.
/42/	ANEEL Resolution # 169, dated 03/05/2001.
/43/	CDM Executive Board "Guidelines for the reporting and validation of plant load factors", EB 48 – annex 11 – version 1.
/44/	Investment Contracts: • Amendment of EPC Contract, dated 15/01/2010; • Contract for Service of Owner Engineering, date 19/11/2008; • Contract Service for the Implementation and Enforcement of Environmental Control Plans of Pipoca SHP; • Land acquisition – Document of Land Purchase, dated. 23/03/2011; • Letter sent to Ecopart Assessoria em Negócios Empresariais Ltda describing the relation of land acquisition related to project´s implementation, dated 05/05/2011; • Second Amend of EPC Contract, dated 15/01/2010; • Contract for Services - Leisure area, dated 19/03/2010; • Service Provision Contract - Execution of Road, dated 14/10/2009; • Amendment of Service Provision Contract - Execution of Road, dated 12/07/2010;

	• Contract of Equipments Supply, dated 15/10/2009; • Contract for services, dated 08/02/2010; • Contract for Service – Topography Survey, dated 07/10/2008; • Contract For service - Substation Construction and equipment, dated 07/12/2009; • Insurance # 1.40.4000127, dated 11/09/2009.
/45/	Ernest & Young Terco: Contract "Energy Sales for Elétrica Stola SA of Brazil" dated 27/10/2010.
/46/	Ecopart Assessoria em Negócios Empresariais Ltda: Proposal for Development and Commercialization of Carbon Credit Project, dated 17/03/2006

/47/	Brazilian Central Bank: "*Histórico de Metas para a Inflação no Brasil*" (Brazil Inflation Targets Historical) – "TabelaMetaseResultados.pdf", no date.
/48/	ANEEL Resolution #0002, dated 24/12/1997.
/49/	ANEEL: Resolution nº 652, dated 9/12/2003 - defines as SHPs, projects that have an installed capacity equal or less than 30 MW).
/50/	Brazilian Energy Ministry Decree (Portaria) # 483, issued on 22/04/2010 , available at <http://www.mme.gov.br/mme/galerias/arquivos/noticias/2010/Port_483_Sistemxtica_Reserva.pdf>.
/51/	Brazilian Energy Ministry Decree (Portaria) # 555, issued on 31/05/2010, available at http://www.mme.gov.br/mme/galerias/arquivos/noticias/2010/Port_555_Diretrizes_Leilxo_de_Fontes_Alternativas.pdf.
/52/	Ecopart Assessoria em Negócios Empresariais Ltda: spreadsheet with PLD prices "CAR5_PLD Prices CCEE_original.xls" obtained from CCEE, available in Portuguese at http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=39aca5c1de88a010VgnVCM100000aa01a8c0RCRD.
/53/	ONS website procedures (Modulo 12, sub-module 12.2) available in Portuguese at http://www.ons.org.br/download/procedimentos/modulos/Modulo_12/Submodulo%2012.2_Rev_1.0.pdf., accessed on 20/10/2011.
/54/	Interministerial Commission on Global Climate Change (CIMGC) Resolution 7 for the Local stakeholder consultation, 05/03/2008.
/55/	Financing Contract Through BNDES' number 02/04536-0, dated 14/09/2009.
/56/	Eletrobrás Guidelines for SHPP Projects, Chapter 6 – Basic Studies; Lifetime of the plant available in Portuguese at http://www.eletrobras.com/elb/data/Pages/LUMIS4AB3DA57PTBRIE.htm accessed on 30/11/11.
/57/	IPEA - Institute of Applied Economic Research Data referent EMBI+brazil available in Portuguese at http://www.ipeadata.gov.br/Default.aspx.
/58/	CDM Executive Board "Guidelines on Common Practice" EB 63-Annex 12 version 01.0.
/59/	ANEEL: *Banco de Informações de Geração* (Generation information data bank) – provides the assured power (*Garantia Física* – average MW) of grid connected power plants - http://www.aneel.gov.br/aplicacoes/capacidadebrasil/energiaassegurada.asp, accessed on 20/10/2011.
/60/	CDM Executive Board: "Combined tool to identify the baseline scenario and demonstrate additionality", version 03.0.1, dated 11/08/2011.
/61/	UNFCCC website with the identification of National Authorities, available in English on http://cdm.unfccc.int/DNA/index.html accessed by RINA on 26/12/2011
/62/	CEMIG: "Minutes of 95th Meeting of CEMIG´s Bord", dated 05/08/2009 available in Portuguese on http://cemig.infoinvest.com.br/ptb/6865/Extratodaatada95RCA_GT_por.pdf accessed by RINA on 26/12/2011
/63/	Brazilian DNA: "Data of grid emission factor" available in English on: http://www.mct.gov.br/index.php/content/view/73318.html accessed by RINA on 26/12/2011
/64/	ONS – Maps of Brazilian Interconnected System available in Portuguese on http://www.ons.com.br/conheca_sistema/mapas_sin.aspx accessed by RINA on 26/12/2011
/65/	WCD – World Commission on Dams: Dams and Development – A New Framework for Decision-Making, November 2000
/66/	CERPCH – Brazilian National Reference Center on Small Hydro Power Plants website in Portugeuse: http://www.cerpch.unifei.edu.br/francis.php accessed by RINA on 28/12/2011(CERPCH is associated to Brazilian Education Ministry)
/67/	Brazilian Presidency of the Republic: Law # 10637, dated 31/12/2002 available in Portuguese at http://www.planalto.gov.br/ccivil_03/Leis/2002/L10637.htm accessed by RINA on 11/12/2012

/68/	CEMIG: Operational and Maintenance Costs for SHPs Pipoca, Areia Branca and Cachoeirão, no dated.
/69/	Brazilian Presidency of the Republic; Law # 10,833, dated 29/12/2003 available in Portuguese at http://www.receita.fazenda.gov.br/legislacao/leis/2003/lei10833.htm, accessed by RINA on 12/12/2012

2.2 Follow-up actions

On 01/03/2010 and 02/03/2010, RINA visited Pipoca SHP site, located at Minas Gerais State, in the Municipalities of Caratinga and Ipanema 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/	01/03/2010	Bruno Gonçalves Macedo / Implementation Manager	Hidrelétrica Pipoca S.A.	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/	02/03/2010	Marco Antonio M. Almeida / Environmental Manager	Hidrelétrica Pipoca S.A.	
/c/	02/03/2010	Melissa H. Hirschheinmer / CDM Project Coordinator	Ecopart Assessoria em Negócios Empresariais Ltda	
/d/	02/03/2010	Gustavo de Melo Ribeiro / CDM Technician	Ecopart Assessoria em Negócios Empresariais 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 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.	Makes 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.	Makes 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.

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	Varkulya Junior	Américo	Brazil
CDM Validator/Technical Expert	De Lima Carvalho	Thaís	Brazil
CDM Validator/Technical Expert	Miranda Dias	Cintia Mara	Brazil
Technical Reviewer	Valoroso	Rita	Italy
Financial Expert	Mendonça De Oliveira	Tiago	Brazil

3 VALIDATION FINDINGS

The validation findings relate to the project design, as documented and described in the PDD version 1 of 07/10/2009 the PDD version 2 of 01/09/2010, the PDD version 3 of 28/01/2011, the PDD version 4 of 19/09/2011 and PDD version 5 of 13/01/2012 /1/, and are discussed in more detail in Table 3.

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.

3.1 Approval and Participation

The project's host Party is Brazil. No Annex I party has yet been identified.

Brazil fulfill the requirements to participate in the CDM and has ratified the Kyoto Protocol on 23/08/2002 and established as DNA the Interministerial Comission on Climate Change "(CIMGC), as per the UNFCCC website /61/

The project participants are Hidrelétrica Pipoca S.A. and Ecopart Assessoria em Negócios Empresariais Ltda from Brazil, and all participants are private entities. 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/.

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.

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. This information is in line with Minutes of 95th Meeting of CEMIG´s Bord, dated 05/08/2009, which describes the documents required to SHP Pipoca obtain from BNDES the financing for its implementation /62/ and also in line with Financing Contract Through BNDES' number 02/04536-0, dated 14/09/2009 /55/.

3.2 Project design document

The PDD for the project activity "Pipoca Small Hydropower Plant Project Activity" in Brazil, version 5 of 13/01/2012 (PDD version 01 07/10/2009, PDD version 2 of 01/09/2010, PDD version 3 of 28/01/2011 and

PDD version 4 of 19092011) submitted by Ecopart Assessoria em Negócios Empresariais Ltda has 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) /9/.

The main differences between PDD version 5 dated 13/01/2012 submitted for registration and published PDD version 01 dated 07/10/2009 are the following:

* Grid emission factor – in PDD version 1, project participants applied a value based on an average of Brazilian grid emissions factors from years 2006, 2007 and 2008 on CER calculation. In PDD version 5 the grid emission factor is referent to year 2009, the latest available data when the PDD was concluded.
* Equipments employed - the turbine's manufacturer was corrected in PDD version 5, now mentioning Andritz Hydro Brasil Ltda instead of Vatech, as it was described on PDD version 1. Also the nominal power of 7.33 MVA of each generator, presented in PDD version 1, was modified in PDD version 5 to 7.41 MVA /36/.
* Amount of CERs – considering the changes on applied value of grid emission factor, the total amount of CERs (168,574 tCO_2e) presented in PDD version 1 for the first crediting period, were changed to 119,354 tCO_2e on PDD version 5. Also the starting date of crediting period was changed from 01/07/2010 (PDD version 1) to 01/07/2012 (PDD version 5).
* Geographical area (common practice analysis) – changed from Minas Gerais State (PDD version 1) to Southeast and Center-west Brazil's Regions (PDD version 5), comprising Espírito Santo, São Paulo, Rio de Janeiro, Minas Gerais, Mato Grosso, Mato Grosso do Sul and Goiás States.
* The benchmark provided in published PDD (version 1) of 15.75% was recalculated (see **CAR 7**) in order to be coherent with the Prior Consideration event (CEMIG Board's meeting held on 29/11/2007), resulting in the benchmark of of 18.13%, presented on PDD version 5.

3.3 Project Design

The project activity consists on the generation and delivery of renewable electric energy (Pipoca Small Hydroelectric Plant) to the Brazilian National Interconnected System and thereby reducing greenhouse gas emissions. The Pipoca SHP is located at Minas Gerais State, in the Municipalities of Caratinga and Ipanema and it will use the hydraulic potential of Manhuaçu River. The project's geographical coordinates, as ANEEL Dispatch # 1.695, dated 14/06/2010 /38/ are:

- Dam: 19º46'10,2'' S and 41º 47'20,3'' W;
- Power house: 19º 45' S and 41º 46' W.

The total installed capacity of turbines used in Pipoca SHP are 21,09 MW (3 * 7.03 MW) and the generators presents a installed capacity of 20,45 MW /36/ . The authorized installed capacity of Pipoca SHP on documents issued by ANEEL is 20 MW /38/. This difference in line with ANEEL Resolution # 407, dated 19/12/2000, which states that capacity must be revised only if this difference is greater than 5 %. Based on that, as the reservoir are of Pipoca SHP is area is 0.855 km^2 /7/, the resulting power density is 24.06 W/m^2

Pipoca SHP presents 20.45 MW of installed capacity, with 0.855 km^2 of reservoir area, resulting in a power density of 24.06 W/m^2.

As per report from WCD /65/ and validated during the site visit, Pipoca SHP is considered as "run of river" hydro power, once it does not present a storage reservoir and have limited daily pondage. This type of hydro power plant creates a hydraulic head in the river to divert the required amount of water to the adduction canal and then to power house.

The Francis turbines applied by this project activity, consist on reaction turbines with radial flow (normal and slow) and mixed flow (fast). It operates in medium flow and medium-sized falls and the flow control is performed by a Distributor or system of movable blades /66/.

The starting date of the project activity is 20/05/2008, when Pipoca SHP was bought by CEMIG Geração e Transmissão S.A. as verified in document "Formal constitution of Pipoca PCH /27/. It was verified during the site visit that the valid EPC contract of Pipoca SHP is dated 20/10/2008, however, as demonstrated by project participants during the validation of this project activity, the document "Memorandum of Understanding", dated 14/11/2005 /31/ demonstrates that the participation of CEMIG as shareholder, with 49% of shares, is a condition to the implementation and explotation of Pipoca SHP and thus to make the EPC contract valid. This information is also confirmed in document "CEMIG Administration Board's 58th meeting minutes" /16/, which in its item (xi) states the following: "..*the order of service for the start of construction of major works will only occur after the subscription by CEMIG GT of 49% of the shares of Hidrelétrica Pipoca S.A.*".

It has been verified by RINA that the starting date of 20/05/2008, supported by document "Formal constitution of Pipoca PCH" /27/, is 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, as per the "Glossary of CDM Terms" /17/.

The project activity was not in operation at the site visit and the commercial operation starting dates of Pipoca SHP´s generators are:

- Generation unit 1 – 08/10/2010 as per ANEEL Dispatch # 3024, dated 07/10/2010 /32/;
- Generation unit 2 – 16/10/2010, as per ANEEL Dispatch # 3072, dated 15/10/2010 /33/;
- Generation unit 3 – 28/10/2010, as per ANEEL Dispatch # 3275, dated 28/20/2010 /34/.

The expected operational lifetime of the project activity, as per section C.1.2. of PDD version 5, is 35 years. This period is in line with Eletrobras Guidelines for SHPP Projects /56/, that recommends 35 years as the period to be employed on investment analysis of SHPs in Brazil, as applied on investment spreadsheet of this project activity /3/.

In case of generators employed by this project activity, it was provided a letter from GE Energy Motors (the manufacturer of generators), dated 28/07/2010 /35/, describing that the generators to be employed by SHP Pipoca present a lifetime of 25 years. This letter provides the following description for the generators, that was crosschecked with generator nameplates (file DSC09910.jpg) /36/:

- Generator type ATI .
- Installed capacity of 7,410 kVA.
- Model 217R117, 6900 V-IP23.

In case of turbine's lifetime, it was provided an e-mail, dated 03/05/11 sent by Mr. Joel de Almeida (Commercial Director of turbine manufacturer) /37/, which clearly indicates that the lifetime of turbines to be employed by Pipoca SHP is 25 years.

The lifetime period of 25 years, as demonstrated by equipments manufacturers, do not exceed the time defined by Eletrobras and contemplates the total crediting period of this project activity of 21 years (7 years, renewable twice).

Emission reductions are claimed from displacing grid electricity with the estimated electricity that will be generated by the hydroelectric power plants and supplied to the grid.

A renewable crediting period of 7 years has been chosen for the project, starting from 01/07/2012, or the date of registration, whichever is later.

As per PDD version 5, the total GHG emission reductions from the "Pipoca Small Hydropower Plant Project Activity" are estimated to be 119,354 tCO_2e during the first renewable of 7 years crediting period (with the potential of being renewed twice), resulting in an annual average emission reductions of 17,051 tCO_2e / year

The project assured power (*Garantia Física* – average MW), defined by ANEEL, is equal to 11.90 MW /59/, resulting in a Plant Load Factor of 59.50% (= 11.90 MW / 20 MW).

The total estimated generation of the project activity is 104,244 MWh/year, corresponding to the value of assured energy, as defined in ANEEL Normative Resolution number 65, dated 25/05/2004 /7/.

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

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

It is important to highlight that the plant load factor is based in the Assured Energy (and Assured Power) defined by ANEEL (Brazilian Electric Energy Agency), and its calculations were established in the Resolution nº 169, of 03/05/2001. Historical data is used in the calculus and the resulting plant load factor is specific for each power plant. Thus, the "Guidelines for the reporting and validation of plant load factors" /43/ 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*". As the assured energy value is defined by ANEEL (government Agency), the Plant Load Factor was considered in line with paragraph 3(a) of "Guidelines for the Reporting and Validation of Plant Load Factor".

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 correctly applies the approved baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid connected electricity generation from renewable sources ", version 12.2.0 of 25/11/2011 /12/.

The following tools are applicable to the project activity:

- "Tool to calculate the emission factor for an electricity system" /14/;
- "Tool for the demonstration and assessment of additionality" /13/.

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

The proposed project activity meets the criteria defined in the baseline methodology as it ensures that:

- Proposed project is a new power plant of 20.45 MW of installed capacity, as per ANEEL Dispatch # 1695 dated 14/06/2010 /38/, installed in a site where no renewable power plant was operated prior to the project implementation and thus does not involve capacity additions, a retrofit of an existing plant or a replacement of existing plant. This information was confirmed at site assessment and through environmental licenses /6/ and ANEEL documents.(/7/, /32/ /33/ /34/ /42/ /48/ /49/)
- The proposed project activity results in new single reservoir and the power density of the power plant is 24.06 W/m^2 (greater than 4 W/m^2): Power density = 20.45 MW/ 0.855 m^2 = 24.06 W/m^2. Reservoir area was confirmed through the ANEEL Dispatch number 78 dated 10/01/2005 /7/;

- As verified during the site visit the proposed activity is a Greenfield project, thus it does not involve switching from fossil fuels to renewable energy at the project site;
- The proposed project activity substitutes Brazilian grid electricity, which is partly based in fossil fuel generation, thus the OM, BM and CM is estimated applying the methodological tool to calculate the emission factor of an electricity system when calculating the baseline emissions.

The project is connected to the national electricity system, Brazilian Integrated Grid System (SIN); the delineation of the project electricity system and connected electricity systems are clearly identified and information on the characteristics of the grid is made available by the Brazilian DNA /63/ and by Brazilian Electrical System Operator – ONS /64/.

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 12.2.0 of 25/11/2011 /12/ 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 diagram of the project boundary presented in the PDD, includes the project power plant and all the power plants connected physically to SIN, and describes the gases included in the project boundary and monitoring variables. The defined project boundary is in line with the approved methodology ACM0002 version 12.2.0 of 25/11/2011 . RINA assessed the physical delineation of the project activity through ANEEL documents (/7/, /32/ /33/ /34/ /42/ /48/ /49/), environmental licenses /6/ and site assessment.

Emissions sources included in the project boundary are shown in the table below:

	GHGs involved	Description
Baseline emissions	CO_2	Emissions from electricity generation in fossil fuel power plants connected to the national grid that are displaced due to the project activity
Project emissions	NA	Since the power density of the project activity is 24.06 W/m^2, greater than 10 W/m^2, project emission is regarded zero according to the approved methodology ACM0002
Leakage	NA	There is no leakage that needs to be considered in applying this methodology.

By checking the 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 12.2.0 of 25/11/2011 /12/, 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 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"*, as stated in section B.4 of PDD version 5

RINA was able to verify all the documented evidence and can confirm that:

- Regarding the applied grid emission factor, 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 monitored *ex-post* during the crediting period. The baseline emissions were estimated *ex-ante* using the average of Brazilian emission factor published by DNA referent to years 2006, 2007 and 2008, resulting in 0.3636 tCO_2/MWh (in PDD version 1). During the validation (PDD version 5), project participants applied the most recent data of Brazilian emission factors (see below), published by the Brazilian DNA, referent to year 2009, which was the available data at the time PDD was developed.
- The value of the grid emission factor applied on updated CERs spreadsheet *("Pipoca_Estimated CERs_2011.02.18.xls"*) /2/ and the PDD version 5 is : EF= 0.1635 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.

The approved baseline methodology ACM0002 version 12.2.0 of 25/11/2011 has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

3.6 Additionality

According to the approved baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid connected electricity generation from renewable sources ", version 12.2.0 of 25/11/2011 /12/. As the project activity is not a retrofit or replacement of existing grid-connected renewable power plant/unit(s) at the project site, the additionality is demonstrated and assessed using the latest version of the "Tool for the demonstration and assessment of additionality" (version 6.0) /13/.

Project participants provided the assessment on additionality based on "tool for the demonstration and assessment of additionality" sub step 2b "Option III. Apply benchmark analysis" /13/.

The financial/economic indicator used by project participants is the equity IRR that was confronted to cost of equity of electric sector, which was calculated according to Capital Asset Price Model (CAPM), as analyzed on spreadsheet "*Ke EletricGen_2008.xls*" /4/ provided by project participants.

The proposed project is considered to be additional since the calculated value of benchmark of 18.13% is higher than the calculated IRR of this project equal to 14.30%.

RINA's opinion regarding the additionality of the proposed project is further explicitly 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, in accordance with the "Guidelines on the demonstration and assessment of prior consideration of the CDM" (EB 62- Annex 05) /18/.

The timeline of implementation of the project illustrated below has been reviewed and considered to be valid and realistic.

Date	Activity	Evidence
14/11/2005	Letter of intent signed between Hydro Partners and CEMIG	CEMIG "Memorandum of Understanding" /31/
13/04/2007	Construction License issuance	Construction License (LI) number 006/2005 2a. Via, conferred to Hidrelétrica Pipoca S/A. (ex HP2 do Brasil Ltda.), dated 13/04/2007 and valid until 20/01/2008; /6/
05/10/2007	EPC contract signed (conditioned to the Service Order issuance, until 15/04/2008)	EPC Contract of SHP Pipoca (Engineering, Procurement and

		Construction), dated 20/10/2008 – this contract states on its item "Consideration" (ii) that the previous EPC contract (dated 05/10/2007) was terminated, because Pipoca SHP did not issue (explicit condition to the continuation of this contract) the agreed Service Order until 15/04/2008 /10/
29/11/2007	CEMIG Board's meeting held to decide the feasibility of Pipoca project implementation considering carbon credits commercialization	Minute of Meeting occurred on 29/11/2007 and published on 30/11/2007 – Resolution Communication of CEMIG Administrative Council. /20/
15/04/2008	The service order was not issued, and the EPC contract had to be renegotiated.	EPC Contract of SHP Pipoca (Engineering, Procurement and Construction), dated 20/10/2008 – this contract states on its item "Consideration" (ii) that the previous EPC contract (dated 05/10/2007) was terminated, because Pipoca SHP did not issued (explicit condition to the continuation of this contract) the agreed Service Order until 15/04/2008 /10/
20/05/2008	CEMIG Geração e Transmissão S/A bought 49% share of Pipoca project from Hydro Partners do Brasil Empreendimentos e Participações Ltda.	Formal constitution of Pipoca PCH /27/
30/06/2008	Omega Energia Renovável S/A bought 51% share of Pipoca project from Hydro Partners do Brasil Empreendimentos e Participações Ltda.	"Purchase and Sale of Shares and Other Covenants Contract" /39/
27/08/2008	CEMIG Board's meeting held to decide the feasibility of Pipoca project implementation considering changes in the project investments and IRR. A second IRR was presented with the inclusion of carbon credits commercialization	CEMIG Administration Board's 58th meeting minutes" held on 27/08/2008 and published on 29/08/2008 /16/
20/10/2008	EPC renegotiated contract signature	EPC Contract of SHP Pipoca (Engineering, Procurement and Construction), dated 20/10/2008 /10/
14/04/2009	PPA signature	PPA contracts between Hidrelétrica Pipoca SA and CEMIG Geração e Transmissão S.A /21/
14/09/2009	Financing contract signature	Financing Contract Through BNDES' number 02/04536-0 /5//55/

Thus the proposed project starting date is 20/05/2008, when the document "Formal constitution of Pipoca PCH" /27/ was signed, as it is 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 as per the "Glossary of CDM Terms" /17/.

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 29/12/2009, when the PDD was published for global stakeholder consultation, the PP needs 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 evidence related to the timeline for serious CDM consideration and the real and continuing actions to attain CDM status of the project activity, in line with EB 49 - Annex 22 as follows:

Dates	Activity	Evidence
17/03/2006	EcoInvest sent a CDM advisory proposal regarding SHP Pipoca	Proposal for Development of Carbon Credit Projects /46/
29/11/2007	CEMIG Board's meeting held to decide the feasibility of Pipoca project implementation considering carbon credits commercialization	Minute of Meeting occurred on 29/11/2007 and published on 30/11/2007 /20/
27/08/2008	CEMIG Board's meeting held to decide the feasibility of Pipoca project implementation considering changes in the project investments and IRR. A second IRR was presented with the inclusion of carbon credits commercialization	Minutes of Meeting ""CEMIG Administration Board's 58th meeting minutes" held on 27/08/2008 and published on 29/08/2008 /16/
02/09/2008	Issuance of the first Ecopart's advisory proposal to develop the CDM process for Pipoca project	First Advisory Proposal, /22/
18/02/2009	Issuance of the second Ecopart's advisory proposal to develop the CDM process for Pipoca project	Second Advisory Proposal /22/
26/06/2009	Signature of the contract between Hidrelétrica Pipoca S/A and Ecopart Assessoria em Negócios Empresariais Ltda.	Contract between Hidrelétrica Pipoca S.A and Ecoinv Global Ltda, /25/
10/08/2009	Ecopart sent letters to local stakeholders for the CDM project consultation as requested by the Brazilian DNA	Receiving Acknowledgment Receipts (ARs) referent to the writing notification sent by project participants to local stakeholders, /24/

RINA was able to check the above documents and considers that satisfactory actions were undertaken to secure CDM status in parallel with the physical implementation of the project activity, according to EB 62-Annex 05.

In conclusion, in accordance with the requirements of the "Guidelines on the demonstration and assessment of prior consideration of the CDM" and VVM, RINA can confirm that the CDM was seriously in considered in the decision to implement the project activity.

3.6.2 Identification of alternatives

According to the VVM v.1.2 para. 105 "The PDD shall identify credible alternatives to the project activity in order to determine the most realistic baseline scenario, unless the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario and no further analysis is required."

Based on this information, the prescribed baseline scenario as per ACM0002 "Consolidated baseline methodology for grid connected electricity generation from renewable sources " version 12.2.0 of 25/11/2011 /12/ is: *Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected 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", therefore, no additional analysis is required for identification of alternatives, as defined by Paragraph 105 of Clean Development Mechanism Validation and Verification Manual, version 01.2 /5/. Nevertheless project participants provided two alternative scenarios to the project activity, also considering the paragraph 16 of "Tool for the demonstration and assessment of additionality" /13/:

- Scenario 1: The alternative to the project activity is the continuation of the current (previous) situation of electricity supplied by the existing power plants from the interconnected system;

- Scenario 2: The proposed project activity undertaken without being registered as a CDM project activity

The selected baseline scenario complies with the National requirements of ANEEL (Brazilian Electricity Regulatory Agency), ONS (National Grid Operator) and FEAM (Minas Gerais environmental agency).

RINA can confirm that the baseline scenario identified in the PDD is credible and complete.

3.6.3 Investment analysis

3.6.3.1 Choice of approach

Project participants applied the Option III Benchmark Analysis, in line with "tool for the demonstration and assessment of additionality" sub step 2b "Option III. Apply./13/ . 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.

The financial/economic indicator used by the project participants is the IRR, which was confronted, as presented on published PDD version 5 /1/ with WACC (Weighted Average Capital Cost) of electricity sector. The spreadsheet with investment analysis provided by the project participants, "Valuation_Pipoca_v3_en_29_03.xls" /3/ and WACC spreadsheet "Ke_ElectricGen_2010.09.01" /4/ indicates that the IRR obtained is equal to 14.30% while the value of WACC (Benchmark) is of 18.13%.

3.6.3.2 Benchmark selection

The formula applied on calculation of Benchmark, which consists on a equity and not post fixed benchmark is described below and it is commonly applied on investment analysis and the assumptions and sources provided on "Ke_ElectricGen_2010.09.01.xls",/4/ were checked.

Ke = [(1+Rf)/(1+π)-1] + β*Rm + Rc where:

Ke - represent the suggested rate of return for equity investments.

Rf stands for the risk free. – 20 years U.S Treasury Coupon Bond Yield

(π) – expected inflation

(Rm) – Market risk – S&P500 vs 10-year T.Bond Yield

(Rc) – Brazil risk – EMBI + Brazil

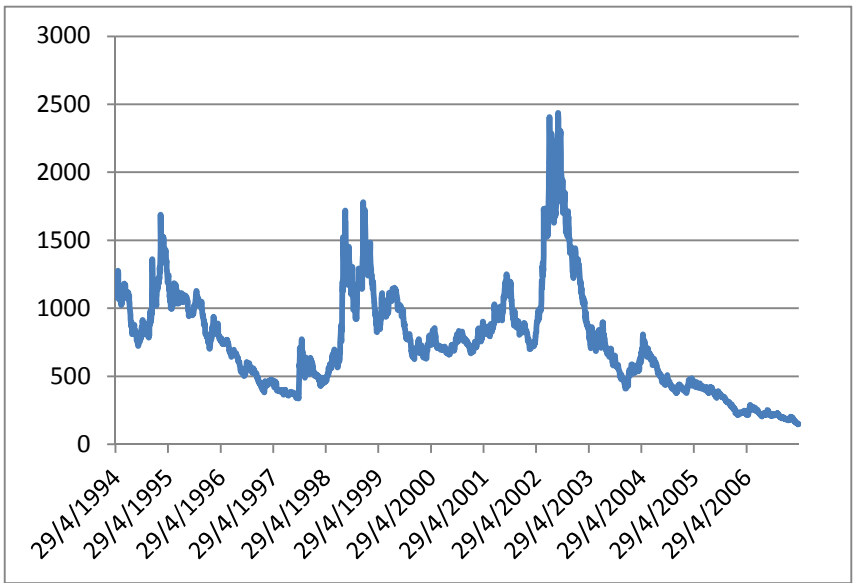
B - average sensitivity of comparable companies in that industry to movements in the underlying market – Average beta US electric generation re-levered to Brazilian leverage

The benchmark provided in published PDD (version 1) of 15.75% was recalculated (see **CAR 7**) in order to be coherent with the Prior Consideration event (CEMIG Board's meeting held on 29/11/2007), resulting in the benchmark of of 18.13%, presented on PDD version 5.

The model CAPM (Capital Assets Pricing Model) applied by project participants is in line with Guideline on the Assessment of Investment Analysis /28/**,** once it considers the same paramenters presented by the mentioned Guideline: a risk free rate of return, an equity risk premium, a risk premium for the host country and an adjustment factor to reflect the risk of projects**.**

On CAPM, several variables are used for its calculation, such as: Risk free rate, Market return rate, Premium risk rate and Beta. However, it may not be realistic to consider an investment remuneration of

11.75% (Guidance default) in a “non-specified” year, since the macro and micro economic factors, as risks associated, vary from time to time. This is demonstrated by graphic below, which shows the risk to invest in Brazil from 1994 to 2007. As can be seen, the curve is very volatile which means that investors were investing (and looking for different returns) with different risk perception during this period.



Source: EMBI+ Brazil ; www.ipeadata.gov.br /57/

The factors applied on the calculation of cost of equity are presented below:

- Risk Free rate: The Guidance and the PPs consider long-term average returns of US treasury bonds. The Guidance uses a value of 3% and the PPs utilize 4.82%. The difference is that PPs calculated the 2006 average, the previous year to the period of time (2007) when PPs decided in investing on the project and, on the other hand, the Guidance uses a post 2007 data, when Brazil macro-economic variables were different.
- Equity risk premium: The Guidance and the PPs consider the data derived from the long-term historical returns on equity in the US market relative to the return on Bonds. The Guidance uses a value of 6.5% while the PPs considered a value of 5.92% (period = 1928 to 2006). The results are close and PPs preferred being more conservative regarding this variable.
- Risk Premium for host country: The guidance uses the Moody´s rating while PPs used values from EMBI+ (Emerging Markets Bond Index) Brazil, which is a widely used index in Brazil and those values are publicly available on IPEADATA (www.ipeadata.gov.br), which is the government agency for economic research. PPs considered a 5-years average period (2002 to 2006) to calculate the Risk Premium for host country (6.78%) and used data that was publicly available previously to the period of time when PPs decided to invest in the project.
- Beta: For risks of projects in different sectoral scopes, the used index is the Beta. On the Guidance, this index is calculated taking into consideration the following sectors: Energy Industries, Energy Distribution, Energy Demand and Waste handling and disposal – The Beta calculated by the PPs (1.55) specifically considers the Electricity Generation industry.

The RINA´s conclusion is that project participants correctly applied the benchmark to this project activity and properly discussed in the provided document “Default Answer Ke Guidance_v2.pdf” the differences between the PPs calculation and the Guideline on the Assessment of Investment Analysis.
Project participants prepared a comparison of all variables of Cost of Equity (Ke) in order to justify the differences between the Guideline value (11.75%) and PPs value (18.13%).

The main differences are in the determination of Country Risk Premium and Sectorial Risk, project participants are using a 5-year average of Country Risk Premium based on EMBI+ (Emerging Markets Bond Index) Brazil instead of Moody's Rating and for the Sectorial Risk project participants are using the "Average Beta US electric-generation re-levered to Brazilian leverage" arguing that the index that is being used in the Guideline does not reflect specifically the industry the project is inserted.

3.6.3.3 Input parameters

RINA validated the input values for financial analysis as per the paragraph 111 (a), (b), (c), (d) and (e) of on the basis of this RINA conduct a thorough assessment of the parameters and assumptions used in the financial analysis and cross checked the parameters against third party or publicly available resources. The input parameters used in the financial analysis have been assessed as presented below:

- The assessment of the sources and input parameters used in the financial analysis has been carried out against third party or publicly available (independent) sources as detailed in the following paragraphs;
- The parameters used in the financial analysis and included in the PDD version 5 have been compared with the parameters stated in the third party sources and RINA can confirm that the values applied are consistent with the values stated in those sources;

As detailed in the following paragraphs the data used in the financial analysis were available at the time of the investment decision. As discussed in CL 6 and CL 10, project participants were requested to modify the investment analysis, once the focus date of first analysis was 27/08/2008 and the investment decision is dated 29/11/2007 (Minutes of Meeting of CEMIG Administrative Council).

Paragraph 111 (a): For more transparency the following assessment has been conducted. All parameters and assumptions applied on investment analysis, as well as their respective cross-checking are summarized on table below:

Topic	Value	Document /Crosschecking
Price of Energy	144.20 R$/MWh	"Minute of Meeting occurred on 29/11/2007 and published on 30/11/2007" /20/; 3rd New Energy Auction occurred on 10/10/2006/40/.
Assured Energy	104,244 MWh/year	ANNEL Normative Resolution # 65, 25/05/2004 /7/
Investment	R$ 111,000,000	Investment Contracts /44/
Operational and Maintenance Costs	6.90 R$/MWh	Based on similar projects proived by project participants /68/
PIS	0.65%	"Energy Sales for Elétrica Stola SA of Brazil" /45/ and Brazilian Law 10.637/2002 /67/ Brazilian Law 10,833/2003 /69/
COFINS	3.00%	Brazilian Law 10.637/2002 and 9.718/1998 /67/ Brazilian Law 10,833/2003/69/
Inlfation rate	4.5%	Brazil Inflation Targets Historical" document from Brazilian Central Bank /47/
Depreciation (average)	3.3%	ANEEL Resolution #0002, dated 24/12/1997 /48/

Paragraph 111 (b): All the indicated input parameters used in the financial analysis have been cross-checked as described below:

Revenues (Electricity Tariff *Generation)

The net generated electric energy of this project activity was defined based on values of assured energy of 104,244 MWh/year, as per ANNEL Normative Resolution # 65, 25/05/2004 /7/. The assured installed capacity considered in investment analysis was calculated trough the quotient between the value of

assured energy and the yearly operation time, considered as 8,760 hours/year, resulting in 104,244 (MWh/year)/8760 (hour/year) = 11.90 MW (Assured Power).

The price of energy price considered in the investment analysis of 144.20 R$/MWh was based in document “Minute of Meeting occurred on 29/11/2007 and published on 30/11/2007” /20/ and is the same value verified on the 3rd New Energy Auction, occurred on 10/10/2006, and presented on spreadsheet “Resultado_3_nova_completo.xls” /40/.

The value of the Assured Energy /7/ applied in the plant load factor calculation, 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 ANEEL /41/ .

It is important to highlight that the calculations for the assured energy were established by the ANEEL Resolution nº 169, of 03/05/2001 /42/. In case of this project activity, the plant load factor of 59.50% (104,244 MWh/y of Assured Energy), as previously mentioned, is in line with Guidelines for the “Reporting and Validation of Plant Load Factor”, version 1 /43/.

The value of energy price was based on energy prices verified in the Brazilian energy market, based on CCEE - Electric Power Commercialization Chamber data /40/ /52/. The sources used in the financial analysis assessment (input values cross checks) are independent, credible sources and the values applied are consistent with the values stated in those sources. Input values used are considered valid and applicable at the time of the investment decision taken by the project participants.

Investment

The investment value of R$ 100,361,000 is in line with document “Minute of Meeting occurred on 29/11/2007” and published on 30/11/2007” /20/.

The value of Pipoca SHP´s investment was crosschecked with the real values of the main contracts provided by project participants, which represents an investment value around R$ 111,000,000, thus demonstrating that the investment value applied on analysis was conservative /44/ :

- EPC Contract, considering the contractual amendments (R$ 99.071 million);
- Land Acquisition (R$ 2.8 million);
- Owner's engineer (R$ 2.57 million);
- Environmental control plan (R$ 1.88 million);
- Social improvement (R$ 0.46 million);
- Road considering the contractual amendments (R$ 1.30 million);
- Equipments for the connection line (R$ 0.35 million);
- Bridge construction (R$ 0.28 million);
- Topography survey for the connection line construction (R$ 0.11 million);
- Substation Construction and equipment(R$ 0.65 + 0.36 million);
- Insurance (R$ 1.8 million).

Operational and Maintenance Costs

The values of operational and maintenance costs of 6.90 R$/MWh, adopted in spreadsheet with investment analysis at the time of decision investment was based on the previous experience of project participants on SHPs implementation. RINA crosschecked the estimated value with the document “Operational and Maintenance Costs” /68/ to Pipoca SHP , Cachoeirão SHP, (28,05 MW of installed

capacity) and Areia Branca SHP (19,80 MW of installed capacity) and verified that value of Pipoca SHP O&M on this document is 7.56 R$/MWh (R$ 815,000.00 / 104,244 MWh) , thus the cost presented investment spreadsheet "Valuation_Pipoca_v3_en_29_03.xls" /3/ is conservative.

Taxes

The following taxes were verified on investment analysis provided by project participants:

- PIS/COFINS – in line with C.3 of contract "Energy Sales for Elétrica Stola SA of Brazil" /45/ - these taxes are in line with Brazilian Government Laws 10,833/2003 /69/ and 10,637/2002./67/ PIS is equal to 0,65% and COFINS is equal to 3.00%;
- The value of inflation of 4.5 % was crosschecked and confirmed in the "Brazil Inflation Targets Historical" document from Brazilian Central Bank /47/;
- Depreciation (average) – 3.3%, in line with ANEEL Resolution #0002, dated 24/12/1997 /48/.

Paragraph 111 (c): the main document verified during the validation, as mentioned on item "Paragraph 111 (b)", was the Minute of Meeting occurred on 29/11/2007 and published on 30/11/2007" /20/ that corresponds to an official standard document provided by project owner and approved by Board of Hidrelétria Pipoca S.A , which states the investment values, the corporate composition of Pipoca SHP and presents the parameters of investment decision date. Other relevant documents related to the proposed CDM project activity and the project participants are already mentioned in the above item, "Paragraph 111 (b)".

Paragraph 111 (d): Based on the assessment described in the previous paragraphs RINA found valid and correct the computations carried out and documented for the financial analysis, by the project participants.

3.6.3.4 Calculation and conclusion

Revisions on original (PDD version 1) IRR calculation spreadsheets occurred due to DOE required corrections on Income Tax and Social Tax and also due to the correction of parameters according to the time of investment decision to proceed with the project activity (CEMIG Board's meeting) /20/.

The WACC calculations and the justifications in the PDD are in accordance with the "Tool for the demonstration and assessment of additionality" and th e "Guidance on the Assessment of Investment Analysis". The provided spreadsheet with WACC calculation "Ke_ElectricGen_2010.09.01.xls" /4/ presents all parameters of calculation and the sources of information.

Project participants properly discussed in the attached "Default Answer Ke Guidance_v2.pdf" the differences between the PPs calculation and the "Guideline on the Assessment of Investment Analysis". Project participants prepared a comparison of all variables of Cost of Equity (Ke) in order to justify the differences between the Guideline (default) value of 11.75% and PPs value (18,13%).

For the Risk Free and Equity Risk Premium project participants are using more conservative values than the Guideline. The main differences are in the determination of Country Risk Premium and Sectorial Risk, as project participants are using a 5-year average of Country Risk Premium based on EMBI+ (Emerging Markets Bond Index) Brazil instead of Moody's Rating. For the Sectorial Risk project participants are using the "Average Beta US electric-generation re-levered to Brazilian leverage" as the index that is being used in the Guideline does not reflect specifically the industry the project is inserted.

Project participants prepared a consistent discussion and clarified all differences between these two indexes.

As the project activity could be developed by another entity than the project participant, it was used the cost of debt of the Brazilian financial system, the country specific equity return and a default value to determine the percentage of debt financing and equity financing.

The IRR calculation was properly executed and the main parameters: investments, maintenance costs, operation costs and taxes were analyzed by RINA financial expert.

A sensitivity analysis is carried out for determining under what conditions variations in the result would occur and the likelihood of these conditions

3.6.3.5 Sensitivity analysis

Paragraph 111 (e): A sensitivity analysis is carried out for determining under what conditions variations in the result would occur and the likelihood of these conditions. Based on sensitivity analysis provided in PDD version 5, dated 13/01/2012, project participants were requested to provide another analysis, demonstrating how large should these variations be to make the projects IRR equal the benchmark.

The table below demonstrates the sensitivity analysis provided by project participants:

Parameter	IRR	Benchmark
Original Project's IRR	**14.30%**	**of 18.13%**
Increase in energy price	**17.04%**	
Increase in the energy generation/ plant load factor	**16.89%**	
Reduction in operation cost	**14.57%**	
Reduction in project investments	**16.33%**	

To achieve the of 18.13% benchmark value, the parameters of sensitivity analysis should present the following variations:

Energy price – increase of 12.95% - as already mentioned on section 3.6.3.3 of this report, the energy price considered in the investment analysis of 144.20 R$/MWh was based on document "Minute of Meeting" occurred on 29/11/2007 and published on 30/11/2007 /20/ and it the same value verified on 3rd New Energy Auction, occurred on 10/10/2006, presented on spreadsheet "Resultado_3_nova_completo.xls" /40/. As per latest government's energy auctions for new projects (in a free translation from Portuguese: *Leilão de Energia Nova*) the price of BRL 162.87 R$/MWh, that allows the project activity to reach the benchmark is not likely to occur as the highest price in the energy auctions (2010) was 154.59 R$/MWh (average = 137.62 R$/MWh);

Energy generation/plant load factor – increase – as already discussed, energy generation (assured energy) and plant load factor are defined by ANEEL/7/ and excess generation cannot be sold in the Spot market, therefore an increase to reach the benchmark is not feasible/possible;

Operational costs - reduction – variations in the operational costs (even costs = 0) will not reach the benchmark;

Project investments – decrease 17.3 % - the EPC contracts of Pipoca SHP /10/ already considered all costs and investments (increase is not expected), thus a decrease on investment (of 17.3%) to reach the benchmark is not likely to occur.

3.6.4 Barrier analysis

Not applicable.

3.6.5 Common practice analysis

The PDD version 5 of "Pipoca Small Hydropower Plant Project Activity" assessed the Common Practice Analysis, based on the "Tool for the demonstration and assessment of additionality" /13/ and on the "Guidelines on Common Practice" /58/.

The "Tool for the demonstration and assessment of additionality" /13/ defines on its step 4a (1):

"*Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. Other CDM project activities (registered project activities and project activities which have been published on the UNFCCC*

website for global stakeholder consultation as part of the validation process) are not to be included in this analysis".

Based in above assumptions (Tool/Guideline), the following steps were considered:

Step 1: ***Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity*** – project participants analyzed project activities with installed capacity from 10 MW to 30 MW. The limit of 30 MW is in line with ANEEL's Resolution nº 652, dated 9/12/2003 /49/ that defines SHP in Brazil as power plants with installed capacity until 30 MW. A total of 60 SHPs were found within this defined range

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 /50/, 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 /51/ , 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 t 19/08/2010.

Step 2: ***In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Registered CDM project activities shall not be included in this step -*** project participants considered in PDD version 5 power plants in Brazil (within the defined range from 10 MW to 30 MW) that started operations from April 2004 to December 2010, located in the Southeast and Center-west Brazil's Regions (applicable geographical area), that is the electrical submarket where Pipoca is located. The applicable geographical area was demonstrated in the file "CAR5_PLD Prices CCEE_original" /52/ which presents data obtained from CCEE, demonstrating that the PLD's price (energy spot price) presents considerable differences between the four Brazilian energy submarkets. Thus, the applicable geographical area (Southeast and Center-west Brazil's Regions), was considered appropriate and a total of 60 power plants within the defined range were found in the electrical submarket where Pipoca is located. From this total of 60 SHPs, just 24 will not receive CDM incentives, resulting in a $N_{all} = 24$.

Step 3: ***Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity***

From the total of 60 SHPs (without CDM incentives), the plants that obtained (or will obtain) incentives from PROINFA (considered a promotional policy / *E- Policy/regulation: National and/or sectoral policies or regulations that give comparative advantages to less emissions-intensive technologies*) were considered as applying different technology than Pipoca SHP, resulting in a $N_{diff} = 24$.

Step 4: ***Calculate factor F=1-Ndiff/Nall representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity*****:**

$F = 1 - N_{diff} / N_{all}$, $F = 1 - 24/24$, $F = 0$.

$N_{all} - N_{diff} = 24 - 24 = 0$.

Outcome: ***The proposed project activity would be a common practice within a sector in the applicable geographical area if the factor F is greater than 0.2 and $N_{all} - N_{diff}$ is greater than 3***

As demonstrated above, the project activity is not common practice in the applicable geographical area. Moreover, the common practice in Brazil is the installation and operation of large hydro power plants, and Natural Gas Thermo Power plants that represent the majority (~95%) of present Brazil's installed capacity. Thus, "Pipoca Small Hydropower Plant Project Activity" project activity is not the business-as-usual type scenario in Brazil. .

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 12.2.0 of 25/11/2011 has been correctly applied.

The monitoring plan is in accordance with the monitoring methodology; the monitoring plan 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; no deviations relevant to the project activity have been found in the plan.

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):

- A_{BL} - Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full;
- Cap_{BL} - Installed capacity of the hydro power plant before the implementation of the project.

As per applied baseline methodology ACM0002 "Consolidated baseline methodology for grid connected electricity generation from renewable sources " version 12.2.0 of 25/11/2011 /10/, A_{BL} and Cap_{BL} for new hydro power plants are considered 0, which is the situation of this project activity.

3.7.2 Parameters monitored ex-post

- $EG_{facility,y}$ - Net Electricity supplied by the SHP to the grid in hour *h*;
- $EF_{grid,CM,y}$ - Brazilian grid emission factor;
- $EF_{grid,OM\text{-}DD,y}$ - 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 single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.

Project participants included the parameter TEGy (Total electricity produced by the project activity) in section B.7.1 of PDD version 1 /1/. According to ACM0002 /10/, this parameter is only applicable to hydro

power project activities with a power density of the project activity (PD) greater than 4 W/m^2 and less than or equal to 10 W/m2. Thus, this parameter was removed from monitored parameters.

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 QA/QC procedures for the monitoring of the energy delivered to the grid described in the PDD 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 /53/.

The parameter Cap_{PJ} will be monitored throughout the technical specifications of the installed equipment, installed plaques in the equipment 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.

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

Hidrelétrica Pipoca S.A. will be responsible for the maintenance of the equipment' monitoring, for dealing with possible monitoring data adjustments and uncertainties, for review of reported results/data, for internal audits of GHG project compliance with operational requirements and for corrective actions.

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 12.2.0 of 25/11/2011 . Neither project's emissions nor leakage are accounted for 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 104,244 MWh/year ANEEL Normative Resolution number 65 dated 25/05/2004 /7/. The 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" /14/. In the PDD version 1, the baseline emissions were estimated *ex-ante* using an average of Brazilian emission factor published by DNA referent to years 2006, 2007 and 2008, resulting in 0.3636 tCO_2/MWh. During the validation, project participants applied the most recent data of Brazilian emission factor, published by the Brazilian DNA, referent to year 2009, which was the available data at the time when PDD was developed: EF= 0.1635 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 and the environmental aspects of the project activity were analyzed by the environmental agency (FEAM). 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 Environmental Licenses were issued. The project is in line with environmental licenses /6/ and ANNEL requirements /7/.

The conclusion of the analysis has been described in the PDD, and no significant environmental impacts are expected from the project activity.

3.10 Local stakeholders consultation

Prior to the publication of the PDD on the UNFCCC website, from 29/12/2009 to 27/01/2010, the Project owner carried out the local stakeholder consultation 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) /54/.

The following local stakeholders were invited for comments:

- Caratinga city hall;
- Caratinga city council;
- Environment Secretary of Caratinga;
- Syndicate of rural worker of Caratinga;
- Ipanema city hall;
- Ipanema city council;
- Environment Secretary of Ipanema
- Syndicate of rural worker of Ipanema
- State Secretariat for the Environment and Sustainable Development of Minas Gerais State (SEMAD);
- Minas Gerais State Attorney Office;
- Brazilian Forum of NGOs and Environmental and Development Social Movements – FBOMS;
- Federal Attorney Office.

Excluding the Syndicate of Rural Worker of Caratinga letter receival confirmation AR dated 08/09/2009 and Syndicate of Rural Worker of Ipanema letter receival confirmation dated 09/09/2009, all others stakeholders received the letters on 12/08/2009.

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

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD version 01 of 29/12/2009 /1/ was made publicly available on the CDM UNFCCC website (http://cdm.unfccc.int/Projects/Validation/DB/9BI2OS2W0E56VV53D3Z9OQQN7FI0XG/view.html) and Parties, stakeholders and NGOs were invited to provide comments during a 30 days period from 29/12/2009 to 27/01/2010.

No comments were received during that period.

5 VALIDATION OPINION

RINA Services Spa (RINA) has performed the validation of the project activity “Pipoca Small Hydropower Plant Project Activity” 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 participants are Hidrelétrica Pipoca S.A. and Ecopart Assessoria em Negócios Empresariais Ltda, 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 12.2.0 of 25/11/2011 .

By generating renewable energy from 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 “Pipoca Small Hydropower Plant Project Activity” are estimated to be 119,354 tCO_2e during the first renewable of 7 years crediting period, resulting in an annual average emission reductions of 17,051 tCO_2e / year. The forecasted emission reductions have been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

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 “Pipoca Small Hydropower Plant Project Activity” in Brazil, as described in the PDD version 5 of 13/01/2012, 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 12.2.0 of 25/11/2011 .

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.

APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reductions commitment under Art. 3.	Kyoto Protocol Art.12.2	**OK**	Table 2, Section, B.6.3, B.6.4 No Annex I party has yet been identified.
2. The project shall assist non Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, 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**	Table 2, Section B.6.3, B.6.4 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 A.4.4, B.6.3, B.6.4
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 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.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	**OK**	Table 2, Section A.4.5 No Annex I party has yet been identified.
8. Parties participating in the CDM shall designate a national	Marrakech Accords, CDM	**OK**	The Brazilian designated national authority for the CDM is the "Comissão Interministerial de Mudança

Requirement	Reference	Conclusion	Cross Reference / Comment
authority for the CDM.	Modalities §29		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, Section B
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 B.7
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		The PDD of 07/10/2009 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 29/12/2009 to 27/01/2010. No comments were received during that period. http://cdm.unfccc.int/Projects/Validation/DB/9BI2OS2W0E56VV53D3Z9OQQN7FI0XG/view.html

Requirement	Reference	Conclusion	Cross Reference / Comment
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/ /9/	DR/I	The title of Project activity is "Pipoca Small Hydropower Plant Project Activity", as per PDD version 01, dated 07/10/2009.		**OK**
A.2. Description of project activity.					
A.2.1. Is the purpose of the project activity included?	/1/ /5/ /9/ /19/	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 project activity consists on the renewable energy generation trough the construction, installation and operation of Pipoca run-off-river Small Hydroelectric plant, located at Manhuaçu River, on the municipalities of Caratinga and Ipanema on Minas Gerais State, with 20 MW of installed capacity, and reservoir area of 0.855 Km^2 as per the Technical Note number 464, dated 31/12/2009. Reservoir area and installed capacity were confirmed through ANEEL Dispatch number 78 and ANEEL Resolution number 388, respectively. It is considered that, in the absence of the project activity, the electric energy would be supplied by the Brazilian National Interconnected (SIN). Concerning the references stated in the section A.2 of the PDD (version 1): * Word Comission Dam website is not working properly (http://www.dams.org//docs/report/wcdintro.pdf); * UNEP-LAC -2002 – no evidence provided; * Provide evidence to the statement "One the solutions the government provided was flexible	~~**CAR 1**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			legislation…..specially hydropower projects".		
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 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.		**OK**
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/ /5/ /6/ /7/ /9/ /11/	DR/I	The proposed project activity is in line with the Brazilian and local regulations. The project obtained the following environmental licenses, assessed by RINA: • Environmental Foundation of Minas Gerais State (FEAM) and the Secretary of Environmental and Sustainable Development and of Minas Gerais State (SEMAD) - Construction License (LI) number 006/2005 2a. Via, conferred to Hidrelétrica Pipoca S/A. (ex HP2 do Brasil Ltda.), dated 13/04/2007 and valid until 20/01/2008; • Extension of Construction License expiration date from 20/02/2008 to 20/01/2010, obtained from Environmental Foundation of Minas Gerais State (FEAM) and the Secretary of Environmental and Sustainable Development and of Minas Gerais State (SEMAD), dated 19/02/2008; • "*Ad Referendum*" Extension of Construction License expiration date from 20/01/2010 to 20/01/2011, obtained from Environmental Foundation of Minas Gerais State (FEAM) and the Secretary of Environmental and Sustainable Development and of Minas Gerais State		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			(SEMAD) and Environmental Police Council of Minas Gerais State (COPAM), dated 15/01/2010; • OF LIMIAR E-DE-2054/09 - Operation License Formalization Process SHP Pipoca; Process number 302/2000/002/2004, submitted Superintendence of Environmental and Sustainable Development of east of Minas Gerais State (SUPRAM Leste Mineiro), dated 10/11/2009. The following ANEEL (Brazilian Electricity Regulatory Energy Agency) documents were assessed: • ANEEL Resolution number 474 dated 06/03/2006 – transfers from company HP2 do Brasil Ltda to company Hidrelétrica Pipoca S.A. the authorization to the implementation and operation of SHP Pipoca (as per ANEEL Resolution number 388, dated 10/09/2001); • ANEEL Resolution number 388 dated 10/09/2001 – authorizes HP2 do Brasil Ltda to be established as Electric Energy Independent Producer - coordinates 19°46' S & 41°48' W; • ANEEL Normative Resolution number 65 dated 25/05/2004 - Defines the assured energy of Pipoca SHP, corresponding to 104,244 MWh/year; • ANEEL Dispatch number 78 dated 10/01/2005 - approval of basic project and defines a reservoir area of 0.855 km^2. The Construction License described on Section D.1, page 47 of PDD version 1, emitted on 13/04/2007 to Hidrelétrica Pipoca S.A replaced the Construction License emitted to HP2 do Brasil (previous owner of SHP Pipoca) and it was valid until 20/01/2008. The PDD shall explain the steps	~~CAR 2~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			referent to the renewal of the Construction license and include the number, the validity and entity responsible by the issuance of the current license. Moreover, clarify the current stage of the Operation License request. According to ANNEL Resolution number 474, dated 06/03/2006 the installed capacity of SHP is 20 MW, this value is different from the technical proposal n° 25/1117 rev B specifications, which mentions 3 generators of 7.33 MVA MW, totalizing 22 MVA (19.8 MW, as per mentioned power factor = 0.9), as well as in the PDD (version 1) – section A.4.3, table 2. PPs are requested to clarify this different values of installed capacity.	~~CL 1~~	
A.2.3.2. Is the project in line with host-country specific CDM requirements?	/1/ /5/ /8/	DR	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?	/1/ /5/ /8/	DR	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.2.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /5/	DR	The project activity, besides its contribution to the reduction of greenhouse gas emissions by avoiding power generation from fossil fuel sources, also avoids the construction of larges reservoirs required by larges hydropower plants and it increases the local economy and life quality.		**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/ /25/	DR	Two private entities are defined as project participants: Hidrelétrica Pipoca S.A. and Ecopart		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Assessoria em Negócios Empresariais Ltda. Hidrelétrica Pipoca S.A. is composed by two stakeholders: CEMIG Geração e Transmissão S.A. (49%) and OMEGA Energia Renovável S.A. (51%).		
A.3.2. Is the contact information provided in Annex 1 of the PDD, using the (proper table) tabular format?	/1/ /9/	DR	The contact information in the annex 1 shall be filled according to EB 41 annex 12. Include in Annex 1 the Postfix/ZIP of Hidrelétrica Pipoca S.A.	~~CAR 3~~	**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/ /5/	DR	SHP Pipoca is located in Minas Gerais State, at municipalities of Caratinga and Ipanema, on Manhuaçu River. As per the registered PDD, the project's GPS coordinates are: Powerhouse: 19° 45' S and 41° 46' W; Dam: 19° 46' S and 41° 47' W. According to ANEEL Dispatch # 78, the coordinates of the dam (*"eixo de barramento"*) are 19º 46' 11" S 41º 47' 18" W and ANEEL Resolution # 388 mentions the coordinates 19° 46' S 41° 48' W (dam). PPs are requested to provide the correct and precise project's geographic coordinates (evidences).	~~CAR 4~~	**OK**
A.4.2. Is (are) the category (ies), type(s) and sectoral scope(s) of the proposed project activity specified?	/1/ /5/ /9/ /12/	DR	The project activity falls under Project category "Grid-connected electricity generation from renewable sources" and Sectoral Scope 1 - Energy industries (renewable/non-renewable sources).		**OK**
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.*					
A.4.3.1. Does the project design engineering reflect current good practices?	/1/ /5/ /7/	DR	The project design engineering reflects current good practices in Brazil. The turbines and generators employed in the project activity present the following the technical parameters:		**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>/9/
/11/</td><td></td><td>
<table>
<tr><th></th><th>Description</th><th>SHP Pipoca</th></tr>
<tr><td rowspan="4">Turbines</td><td>Type</td><td>Francis - horizontal axis</td></tr>
<tr><td>Quantity</td><td>3</td></tr>
<tr><td>Nominal Power (MW)</td><td>7.03</td></tr>
<tr><td>Manufacturer</td><td>VATECH</td></tr>
<tr><td rowspan="4">Generator</td><td>Type</td><td>Triphasic, Brushless</td></tr>
<tr><td>Quantity</td><td>3</td></tr>
<tr><td>Nominal Power (MVA)</td><td>7.33</td></tr>
<tr><td>Nominal Voltage (kV)</td><td>6.9</td></tr>
<tr><td>Manufacturer</td><td>GEVISA</td></tr>
</table>

According to ANNEL Resolution number 474, dated 06/03/2006 the installed capacity of SHP is 20 MW, this value is different from the technical proposal n° 25/1117 rev B specifications, which mentions 3 generators of 7.33 MVA MW, totalizing 22 MVA (19.8 MW, as per mentioned power factor = 0.9), as well as in the PDD (version 1) – section A.4.3, table 2. PPs are requested to clarify this different values of installed capacity.

The section A.4 of published PDD indicates the text: (ERRO! Fonte de referencia não encontrada). The PDD shall be revised.</td><td><s>CL 1</s>

<s>CL 17</s></td><td></td></tr>
<tr><td>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?</td><td>/1/</td><td>DR</td><td>The employed technology is considered as state-of-art.</td><td></td><td>OK</td></tr>
<tr><td>A.4.3.3. Is the project technology likely to be substituted by other or more efficient technologies within the</td><td>/1/</td><td>DR</td><td>No.</td><td></td><td>OK</td></tr>
</table>

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
project period?					
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/ /5/ /10/ /11/	DR	According to EPC contract /10/-/11/ of Pipoca SHP, all the training will be given by the equipment manufacturer. It should be mentioned in PDD's section B.7.2. which are/will be the (initial) training programs, how they will be implemented and who is/will be the responsible for its implementation. Furthermore, procedures for training of monitoring personnel, including emergency preparedness, should be identified.	~~CAR 5~~	**OK**
A.4.3.5. Does the project make provisions for meeting training and maintenance needs?	/1/ /5/ /10/ /11/	DR	See A.4.3.4.	~~CAR 5~~	**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 presented in a (proper table) tabular format? (*check these figures against item B.6.4 figures*)	/1/ /2/	DR	The information was provided in a proper table. The project is expected to reduce CO_2 emissions to the extent of 168,574 tCO_2e 24,082 tCO_2e / year average) over the renewable 7 years crediting period.		**OK**
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/ /5/ /9/	DR	No public funding is provided for the "Pipoca Small Hydropower Plant Project Activity"		**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/ /5/ /9/	DR	See A.4.5.1.		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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/ /9/ /12/	DR	The PDD version 1 applies the approved baseline methodology ACM0002 Version 10 (valid until 25/02/2010 - requests for registration can be submitted until 25/10/2010). Considering the present validation timeline to register projects, it is recommended to revise the PDD according to ACM0002 version 11, valid from 26/02/2010 onwards.	~~**CL 2**~~	**OK**
B.1.2. Are other methodologies or tools drawn up by the approved methodology mentioned? *(correctly quoted and interpreted?)*	/1/ /5/ /12/ /13/ /14/ /30/ /60/	DR	The applied baseline methodology refers to the following tools, which are correctly mentioned (quoted and interpreted) on the PDD: • Tool for the demonstration and assessment of additionality /13/: • Combined tool to identify the baseline scenario and demonstrate additionality /60/ (not applicable to project activity); • Tool to calculate the emission factor for an electricity system /14/; • Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion /30/ (not applicable to project activity).		**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/ /6/ /7/ /9/ /12/	DR/ SV	The project is a grid-connected renewable power generation project activity that is installing a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity. Furthermore, the project activity results in a new reservoir and the power density of		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/19/ /26/		the power plant (23.39 W/m^2) is greater than 4 W/m^2. Thus, ACM0002 is applicable to the project activity. Information confirmed at site inspection, environmental licenses and ANEEL permissions. As per PDD (version 1), the project activity results in a new reservoir area of 0.855 Km^2 with a power density of 23.39 MW/Km² or W/m^2. The PDD mentions in the beginning of section B.2: *"The methodology ACM0002 is applicable to projects consisting of "the installation or modification/retrofit of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit".* PPs are requested to clearly indicate on section B.2. of PDD if SHP Pipoca consists on the installation or modification/retrofit of a power plant/unit.	~~CL 3~~	
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/ /2/ /5/ /12/ /13/	DR	The PP should apply the latest emission factor data available at the date of completion of the baseline study and monitoring methodology of PDD (version 1). Moreover, please indicate on Annex 3 the source/link and data only referent to the latest available data of the Brazilian grid emission factor to be used on emissions reductions calculations.	~~CAR 6~~	**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/ /5/ /7/ /12/	DR	According to ANNEL Resolution number 474, dated 06/03/2006 the installed capacity of SHP is 20 MW, this value is different from the technical proposal n° 25/1117 rev B specifications, which mentions 3 generators of 7.33 MVA MW, totalizing 22 MVA (19.8 MW, as per mentioned power factor = 0.9), as well as in the PDD (version 1) – section A.4.3, table 2. PPs are requested to clarify this different values of installed capacity.	~~CL 1~~	**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/ /9/ /12/ /14/	DR	Yes. The proposed project boundary (spatial extent) encompasses the physical, geographical sites of the renewable power generation sources and all power plants connected physically to the Brazilian interconnected grid.		**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/ /9/ /12/ /14/	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.		**OK**
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**
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/ /2/ /5/ /9/ /12/	DR	The application of the baseline methodology is transparent and conservative. The project activity consists on the renewable energy generation trough the construction, installation, and operation of Pipoca run-off-river Small Hydroelectric. The baseline scenario is in accordance with the applicable 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		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			plants) and by the addition of new generating sources, as reflected in the combined margin (CM) from "Tool to calculate the emission factor for an electricity system". Emission reductions were estimated using an *ex-ante* emission factor for the Brazilian grid system, which was calculated based in the data provided by the Brazilian DNA, referent to years 2006, 2007 and 2008, and applying the "Tool to calculate the emission factor for an electricity system". The amount of CERs to be verified will be calculated based on the grid emission factor that will be determined *ex-post* during monitoring, which will be calculated applying the "Tool to calculate the emission factor for an electricity system". The PP should apply the latest emission factor data available at the date of completion of the baseline study and monitoring methodology of PDD (version 1). Moreover, please indicate on Annex 3 the source/link and data only referent to the latest available data of the Brazilian grid emission factor to be used on emissions reductions calculations.	~~CAR 6~~	
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/ /12/ /14/	DR	Yes, data for the emission factor is made publicly available by the Brazilian DNA. See B.4.1	~~CAR 6~~	**OK**
B.4.3. Has the baseline been established on a project-specific basis?	/1/ /12/ /14/	DR	The baseline scenario has been established on a project-specific basis		**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/ /6/ /7/	DR	Yes. National and/or sectoral policies implemented during the initial phase were considered.		**OK**
B.4.5. Is the baseline determination compatible with the available data?	/1/ /12/	DR	The baseline determination is compatible with available data. See B.4.2.	~~CAR 6~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/14/				
B.4.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/ /5/ /9/ /12/	DR	The selected baseline scenario, which is in line with applied baseline methodology, is the most likely among the two alternative scenarios discussed. Alternative 1 – continuation of current (previous) situation of electricity supplied by the existing power plants from the interconnected system. Alternative 2 – the proposed project activity undertaken without being registered as CDM project activity.		**OK**
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/ /12/ /14/	DR	The major risk of the project is not being able to produce the estimated amount of electricity to the grid.		**OK**
B.4.8. Is all literature and sources clearly referenced?	/1/	DR	PPs shall provide the evidence for the statement in PDD version 1 – section B.4 "…*71.2 % of the Brazil's installed capacity is composed by large hydropower plants which on average present large reservoirs and 24.22 % by thermal power stations.....*	~~**CL 4**~~	**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/ /5/ /9/ /12/ /13/ /28/	DR	Project participants used the "Tool for the demonstration and assessment of additionality version 05.2". Moreover, "Guidelines on the assessment of investment analysis version 3" has been applied. As the project activity is not a retrofit or replacement of existing grid-connected renewable power plant/unit(s) at the project site, the additionality is demonstrated and assessed using the latest version of the "Tool for the demonstration and assessment of additionality" (version 5.2), as defined by the applied baseline methodology.		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.5.2. Is the discussion on the additionality clear and have all assumptions been conservative, supported by transparent and documented evidence for all steps?	/1/ /3/ /4/ /13/ /16/ /28/	DR	Project participants provided the additionality assessment based only on investment analysis: ***Step 1: Identification of alternatives to the project activity consistent with current laws and regulations*** ***Sub-step 1a: Define alternatives to the project activity:*** Two different alternatives were considered by project participants, both in line with Brazilian laws: Alternative 1 – continuation of current (previous) situation of electricity supplied by the existing power plants from the interconnected system Alternative 2 – the proposed project activity undertaken without being registered as CDM project activity. ***Step 2: Investment analysis*** ***Sub-step 2a: Determine appropriate analysis method*** Project participants applied the Option III Benchmark Analysis, in line with the applied additionality tool and with Guidance on the Assessment of Investment Analysis. ***Sub-step 2b: Option III. Apply benchmark analysis*** The financial/economic indicator used by project participants is the equity IRR that was confronted to cost of equity of electric sector, which was calculated according to Capital Asset Price Model (CAPM), as analyzed on spreadsheet "*Ke EletricGen_2008.xls*" provided by project participants. For the Cost of Equity calculation, Project Participants applied the formula: Ke = (Rf-π) + β*Rm + Rc. The Rf is the Risk Free Rate, based on 10-year US Treasury Coupon Bond Yield, the π is the U.S. expected inflation based on 10-year US		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Treasury minus 10-year US TIPS, the Rm is the Equity Risk Premium based on S&P500 vs. 10-year T.Bond Yield, Rc is the Estimated Country Risk Premium based on EMBI+Brazil and the β is the Adjusted Industry Beta based on Average Beta US electric-generation re-levered to Brazilian leverage. The formula presented by project participants in PDD (version 1) differs from the formula applied on the spreadsheet "*Ke EletricGen_2008.xls*". Revise the PDD, Section B.5. sub-step 2b, page 16 in accordance with the formula stated in cell "E9" of the spreadsheet "*Ke EletricGen_2008.xls*". Considering that the project's owner CEMIG and OMEGA have been investing in others SHPs apart from Pipoca project activity, provide evidences that the benchmark used in SHP Pipoca were considered in other SHPs, as per EB51 – Annex 58, parag. 14. As per EB 51 annex 58, "*Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant*". The financial analysis presented by PPs is from June 2008 (for benchmark) and August 2008 (for IRR calculation), therefore not consistent with the time of the investment decision to proceed with the project activity, dated 29/11/2007. ***Sub-step 2c: Calculation and comparison of financial indicators*** The "Valuation_Pipoca.xls" spreadsheet and Minutes of Meeting held on 27/08/2008 and published on 29/08/2008 – Resolution Communication of CEMIG Administrative Council provided by the project participants indicate that the	~~CAR 7~~ ~~CL 5~~ ~~CAR 8~~ ~~CL 6~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			IRR obtained is 13.25%, that is lower than the applied benchmark, equal to 15.75%. However, when the investment decision was taken, the IRR was considered as 15.39% (Minutes of Meeting occurred on 29/11/2007 and published on 30/11/2007 – Resolution Communication of CEMIG Administrative Council). These IRR differences shall be clarified. The prices and costs evolution over the years, provided by project participants on spreadsheet "*Valuation_Pipoca.xls*", presented flat values for all years. As the benchmark (Cost of Equity - Ke) was calculated without considering the inflation impact, it shall be clarified if the energy price, costs and all other lines of P&L have the same behavior over the years. Also the data reference (source) of the energy price and its respective adjusts over the years shall be clarified. Provide the breakdown and the evidences of the values of Operational and Maintenance Costs applied on "*Valuation_Pipoca.xls*". If the operational and maintenance services are regulated by a contract, the start date, prices, inflation and index used on the prices adjustment must be provided. Clarify and justify if the energy distribution costs were discounted from the gross revenue of energy sales. According to document "Encaminhamento de Cronograma de Implantação", dated 28/11/2008, sent to ANEEL, the total investment to SHP Pipoca is R$ 124 million and the applied spread is TJLP (Long Term Interest Tax) + 2.15. The value of the	~~CL 7~~ ~~CL 8~~ ~~CL 9~~ ~~CL 10~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			investment applied on "Valuation_Pipoca.xls" (R$ 114,411 million) is based on a minutes of meeting previous to above mentioned document, dated from 29/08/2008. Moreover, the spread applied on spreadsheet corresponds to TJLP +2.55%. These differences shall be explained/justified.		
			The calculation basis and the percentage of Income Tax and Social Tax are not in line with Brazilian Assumed Income Legislation, please revise accordingly the spreadsheet "Valuation_Pipoca.xls".	~~CAR 9~~	
			Regarding the total project's investment of R$ 114,410,525.00, it is not possible to validate the accuracy of the parameters presented in the calculation. All costs (sources) related to construction, equipments, etc shall be provided.	~~CL 11~~	
			Sub-step 2d: Sensitivity analysis The data provided in the sensitivity analysis contains useful information on how IRR fluctuates when parameters vary in a range of -10% and +10%. It would be more useful to show how large should these variations be to make the projects IRR equal the benchmark. Then a second analysis should be applied to discuss the likelihood of occurrence of these scenarios, also considering in the analysis variation on the plant load factor.	~~CAR 10~~	
			Step 3: Barrier analysis According to project participants, this step is not applicable (optional) as step 2 is considered satisfied.		
			Step 4: Common practice analysis		
			The PPA contract between Hidrelétrica Pipoca S.A. and Stola do Brazil Ltda mentions that the seller	~~CL 15~~	

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			(Hidrelétrica Pipoca S.A.) has received incentives for electricity generation. Project participants are requested to clarify/explain which are the mentioned incentives. The PDD should be revised, extending the common practice analysis to the Brazilian territory and considering "similar" projects in a range of +/- 50% of the installed capacity of the project activity (i.e. from 10 MW to 30 MW), or justify in the PDD why SHP Pipoca can not be compared with similar SHPs located in other regions of Brazil. Data of the complete research results of the common practice analysis shall be provided. Project participants are requested to update the investment analysis based on Guidelines on the Assessment of Investment Analysis, version 5, (EB 62 Annex 5). Also explain if the "Default values for the expected return on equity" defined by this Guidelines are applicable or not to this project activity.	~~CAR 11~~ ~~CAR 18~~	
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/ /4/ /13/ /15/ /16/	DR	See B.5.2	~~CAR 7~~ ~~CAR 8~~ ~~CAR 9~~ ~~CAR 10~~ ~~CAR 11~~ ~~CL 5~~ ~~CL 6~~ ~~CL 7~~ ~~CL 8~~ ~~CL 9~~ ~~CL 10~~ ~~CL 11~~ ~~CL 15~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
B.5.4. If the starting date 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/ /5/ /9/ /10/ /17/ /18/ /20/ /27/	DR	The project's starting date (20/05/2008-date when SHP Pipoca was bought by CEMIG) indicated in PDD version 1 is not in line with the Glossary of CDM terms (version 5) because it does not represent the earliest real date on which project participant has committed to expenditures related to the implementation or related to the construction of the project activity. During the site visit it was provided the EPC (Engineering, Procurement and Construction) contract of SHP Pipoca, dated 20/10/2008, that seems to be the earliest real starting date of the proposed project activity. Based on that, the PP shall clarify if the EPC contract is the earliest date evidence (document) of expenditures related to the implementation or related to the construction of the project activity or provide other evidences in line with the Glossary of CDM terms (version 5) and revise the project's starting date ("Guidelines on the demonstration and assessment of prior consideration of the CDM project activities" / EB 49-annex 22 must be followed) accordingly. Furthermore, the PP shall use the most recent "Guidelines on the demonstration and assessment of prior consideration of the CDM project activities" (EB49 - Annex 22).	~~CAR 12~~	**OK**
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/ /10/ /17/ /18/	DR	See B.5.4.	~~CAR 12~~	**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	/1/ /3/ /4/ /13/ /15/ /16/	DR	Project participants provided the additionality assessment based only on investment analysis. The equity IRR was confronted to cost of equity of electric sector.	~~CAR 7~~ ~~CAR 9~~ ~~CAR 10~~ ~~CL 7~~ ~~CL 8~~ ~~CL 9~~ ~~CL 10~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
reductions (CERs); were provided? (*"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/ /12/	DR	Yes. The methodology ACM0002, version 12.2.0 of 25/11/2011 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: $BE_y = EG_{BL,y} * EF_{CO2}$. Provide evidences of the origin of the value of the energy supplied to internal loads presented (2.17 MWh/day) in the "*Pipoca_Estimated CERs_2009.10.07*" spreadsheet. The PP should apply the latest emission factor data available at the date of completion of the baseline study and monitoring methodology of PDD (version 1). Moreover, please indicate on Annex 3 the source/link and data only referent to the latest	~~CL 12~~ ~~CAR 6~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			available data of the Brazilian grid emission factor to be used on emissions reductions calculations.		
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/ /12/	DR	The equations used by project participants are in line with applied baseline methodology.		**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/ /12/	DR	ACM0002 is applicable to the "Pipoca Small Hydropower Plant Project Activity" because: - The project activity will result in the installation of one hydro power plants/units (with a run-of-river reservoir or an accumulation reservoir); - The project activity will result in new reservoirs and the power density of the power plants, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; - The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available. The baseline scenario, as defined by ACM0002, 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 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**
B.6.1.4. Are the demonstration / justification for the chosen default values adequate and sufficient?	/1/	DR	The chosen default values are adequate and sufficient.		**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.*					
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	/1/ /12/	DR	The project activity consists on the renewable energy generation trough the construction, installation, and operation of one run-off-river Small		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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*)			Hydroelectric Plant, Pipoca SHP, with a power density larger than 10 W/m^2. Thus, according to applied baseline methodology ACM0002 there is not any project emissions neither any ex-parameter associated to this project activity.		
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/ /12/	DR	The PP should apply the latest emission factor data available at the date of completion of the baseline study and monitoring methodology of PDD (version 1). Moreover, please indicate on Annex 3 the source/link and data only referent to the latest available data of the Brazilian grid emission factor to be used on emissions reductions calculations.	~~**CAR 6**~~	**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/ /12/	DR	See B.6.2.2	~~**CAR 6**~~	**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/ /7/ /19/	DR	The *ex-ante* calculations of emission reduction, as provided on spreadsheet "*Pipoca_Estimated CERs_2009.10.07.xls"* was based on assured energy defined by ANEEL, equivalent to 104,244 MWh/year, (as per ANEEL Normative Resolution number 65 dated 25/05/2004). As the power density of Pipoca SHP is higher than 10 W/m^2, there is no project emissions associated to this project activity. Leakage does not need to be considered, as defined by the applied baseline methodology. During the site, it was presented by project participants the Technical Note number 464, dated 31/12/2009, referent to the Adjustment of the Consolidated Basic Project of SHP Pipoca, which configuration corresponds to that described on		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			PDD. This document presents the main follow modifications: - Quantity of turbines – from 2 units in the current configuration to 3 units on proposed consolidated basic project; - Average Energy Generation – from 12.34 MW in the current configuration to 12.12 on proposed consolidated basic project; - Turbines type – Kaplan vertical in current configuration from Francis Horizontal on proposed consolidated basic project; - The average of energy generation on critical periods, equal to 10.91, is the same on current and on proposed consolidated basic project. Clarify if the modifications presented on the *Technical Note, nº 464 2009/CGH ANEEL* project were accepted or their expectation to occur and confirm if the value of assured energy used on emissions reductions calculation is still valid.. The PP should apply the latest emission factor data available at the date of completion of the baseline study and monitoring methodology of PDD (version 1). Moreover, please indicate on Annex 3 the source/link and data only referent to the latest available data of the Brazilian grid emission factor to be used on emissions reductions calculations.	~~CL 13~~ ~~CAR 6~~	
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/ /2/ /12/	DR	The PP should apply the latest emission factor data available at the date of completion of the baseline study and monitoring methodology of PDD (version 1). Moreover, please indicate on Annex 3 the source/link and data only referent to the latest available data of the Brazilian grid emission factor to be used on emissions reductions calculations.	~~CAR 6~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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/ /9/ /12/	DR	The estimation of emission reductions are presented in a proper table.		**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/ /12/	DR	The following parameters are mentioned as to be monitored according to ACM0002 in case of this project activity: • $EG_{facility,y}$ - Quantity of net electricity generation supplied by the project plant/unit to the grid in year y; • $EF_{grid,CM,y}$ - Brazilian grid emission factor; • Cap_{JP} - 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. ***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), in accordance with "Tool to		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			calculate the emission factor for an electricity system". The PP should apply the latest emission factor data available at the date of completion of the baseline study and monitoring methodology of PDD (version 1). Moreover, please indicate on Annex 3 the source/link and data only referent to the latest available data of the Brazilian grid emission factor to be used on emissions reductions calculations. Project participants included the parameter TEGy (Total electricity produced by the project activity) in section B.7.1 of PDD version 1. According to ACM0002, this parameter is applicable to hydro power project activities with a power density of the project activity (PD) greater than 4 W/m2 and less than or equal to 10 W/m2. Thus, this parameter must be removed from PDD.	~~CAR 6~~ ~~CAR 13~~	
B.7.1.2. Are all the parameters and its sources of data reliable, specified and documented in a (proper table) tabular form?	/1/ /12/	DR	The parameters and its sources of data are specified and presented, as required by the applied methodology, in proper tables.		**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/ /12/	DR	In the PDD version 1 is not clear how the electricity delivered to grid by Pipoca SHP will be measured. PPs are requested to revise the PDD including the location of the electricity meters for SHP Pipoca and explaining how this data will be consolidated.	~~CAR 14~~	**OK**
B.7.1.4. Are the measuring instruments / equipments, measurement methods, accuracy and interval, measurement responsible(s) and calibration procedures specified?	/1/ /12/	DR	According to section B.7.2 of PDD version 1, Hidrelétrica Pipoca S.A. is the responsible for the calibration of energy meters. The Project participants are requested to clarify/explain in PDD if the mentioned energy meters are owned by PP or if they belong to the local utility.	~~CL 18~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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/ /12/	DR	See B.7.1.3	~~**CAR 14**~~	**OK**
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/ /12/	DR	The project activity applies the approved consolidated baseline and monitoring methodology ACM0002, version 12.2.0 of 25/11/2011 . The PDD version 1 applies the approved baseline methodology ACM0002 Version 10 (valid until 25/02/2010 - requests for registration can be submitted until 25/10/2010). Considering the present validation timeline to register projects, it is recommended to revise the PDD according to ACM0002 version 11, valid from 26/02/2010 onwards.	~~**CL 2**~~	**OK**
B.7.2.2. Is the monitoring methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/ /12/	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**
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/ /12/	DR	All data collected as part of monitoring will be archived and kept at least for 2 years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later (PDD version 1 - section B.7.1).		**OK**
B.7.2.4. Does the monitoring plan provide for the collection and archiving of all relevant data	/1/ /12/	DR	Leakage does not need to be considered, as defined by the applied baseline methodology.		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
necessary for determining leakage?					
B.7.2.5. Is the authority and responsibility of project management clearly described?	/1/ /12/	DR	According to section B.7.2 of PDD version 1, Hidrelétrica Pipoca S.A. is the responsible by the management of this project activity.		**OK**
B.7.2.6. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/ /12/	DR	Project participants are requested to include in the section B.7.2 of the PDD a description of the procedures for registration, monitoring, measurement and reporting of CER, also indicating the responsible for each activity.	~~**CAR 15**~~	**OK**
B.7.2.7. Are procedures identified for training of monitoring personnel?	/1/ /12/	DR	It should be mentioned in PDD's section B.7.2. which are/will be the (initial) training programs, how they will be implemented and who is/will be the responsible for its implementation. Furthermore, procedures for training of monitoring personnel, including emergency preparedness, should be identified.	~~**CAR 5**~~	**OK**
B.7.2.8. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/ /12/	DR	See B.7.2.7	~~**CAR 5**~~	**OK**
B.7.2.9. Does the monitoring plan reflect good monitoring and reporting practices?	/1/ /12/	DR	PDD section B.7.2 must mention the monitoring frequency of all monitored parameters.	~~**CAR 16**~~	**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/ /12/	DR	Yes, the monitoring parameters are in line with applied baseline methodology.		**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 the methodology to the project activity provided and mentioned in the format *DD / MM / YYYY*?	/1/ /5/ /9/	DR	The date of completion of the application of methodology (18/09/2009) is correctly provided in Section B.8 of PDD.		**OK**
B.8.2. Is the contact information of the person(s) / entity (ies) responsible for the baseline and monitoring	/1/ /5/	DR	The person and contact information is provided. The baseline and monitoring methodology was		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
methodology to the project activity provided? If applicable, are they indicated as project participants in Annex 1?	/9/		developed by Karen M. Nagai, from Ecopart Assessoria em Negócios Empresariais Ltda, which is one of the project participants, correctly indicated in Annex 1.		
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/ /10/ /17/ /18/ /21/ /22/ /23/	DR	The project's starting date (20/05/2008-date when SHP Pipoca was bought by CEMIG) indicated in PDD version 1 is not in line with the Glossary of CDM terms (version 5) because it does not represent the earliest real date on which project participant has committed to expenditures related to the implementation or related to the construction of the project activity. During the site visit it was provided the EPC (Engineering, Procurement and Construction) contract of SHP Pipoca, dated 20/10/2008, that seems to be the earliest real starting date of the proposed project activity. Based on that, the PP shall clarify if the EPC contract is the earliest date evidence (document) of expenditures related to the implementation or related to the construction of the project activity or provide other evidences in line with the Glossary of CDM terms (version 5) and revise the project's starting date ("Guidelines on the demonstration and assessment of prior consideration of the CDM project activities" / EB 49-annex 22 must be followed) accordingly. Furthermore, the PP shall use the most recent "Guidelines on the demonstration and assessment of prior consideration of the CDM project activities" (EB49 - Annex 22). Regarding the evidences mentioned on "Table 5 -	~~**CAR 12**~~ ~~**CAR 17**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			Project starting date" on page 13 of PDD version 1, PPs are requested to revise/explain the following inconsistence: * Pipoca SHP EPC contract is dated 20/10/2008, instead of 25/10/2008.		
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/ /10/ /17/ /18/	DR	See C.1.1.1	~~CAR 12~~	**OK**
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/ /5/	DR	Evidences referent to the mentioned operational lifetime shall be provided.	~~CL 14~~	**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/ /2/	DR	A renewable crediting period of 7 years was selected (with the potential of being renewed twice), starting on 01/07/2010 or on date of the registrations of this project activity, whichever is later.		**OK**
D. Environmental impacts. *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the Validator.* 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/ /6/	DR	According to the Brazilian law, the execution of an Environmental Impact Assessment, including transboundary environmental impacts, is necessary to the project activity to obtain its Previous License		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			(LP) which represents a condition to obtain the Construction License (LI). After obtaining the Construction License, the project activity obtains its Operation License (LO). As Pipoca SHP already obtained its Construction License and it is requesting its Operation License, the environmental impacts were properly considered. See A.2.3.1		
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/ /6/	DR	See D.1.1		**OK**
D.1.3. Will the project create any adverse environmental effects?	/1/ /6/	DR	See D.1.1		**OK**
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/ /6/				
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/ /6/	DR	See D.1.1		**OK**
D.1.6. Does the project comply with the environmental legislation in the host country?	/1/ /6/ /7/	DR	The Construction License described on Section D.1, page 47 of PDD version 1, emitted on 13/04/2007 to Hidrelétrica Pipoca S.A replaced the Construction License emitted to HP2 do Brasil (previous owner of SHP Pipoca) and it was valid until 20/01/2008. The PDD shall explain the steps referent to the renewal of the Construction license and include the number, the validity and entity responsible by the issuance of the current license. Moreover, clarify the current stage of the Operation License request. According to ANNEL Resolution number 474, dated 06/03/2006 the installed capacity of SHP is 20 MW, this value is different from the technical proposal n° 25/1117 rev B specifications, which mentions 3 generators of 7.33 MVA MW, totalizing 22 MVA (19.8 MW, as per mentioned power factor = 0.9), as well as in the PDD (version 1) – section A.4.3, table 2. PPs are requested to clarify this different values of installed capacity.	~~**CAR 2**~~ ~~**CL 1**~~	**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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/ /8/ /24/	DR	Yes. It was verified that the letters sent to the stakeholders followed the Brazilian DNA resolution Resolution nº 7 requirements and letters were sent to the following stakeholders: • Caratinga city hall; • Caratinga city council; • Environment Secretary of Caratinga; • Syndicate of rural worker of Caratinga; • Ipanema city hall; • Ipanema city council; • Environment Secretary of Ipanema • Syndicate of rural worker of Ipanema • State Secretariat for the Environment and Sustainable Development of Minas Gerais State (SEMAD); • Minas Gerais State Attorney Office; • Brazilian Forum of NGOs and Environmental and Development Social Movements – FBOMS; • Federal Attorney Office. Excluding the Syndicate of Rural Worker of Caratinga letter receival confirmation AR dated 08/09/2009 and Syndicate of Rural Worker of Ipanema letter receival confirmation dated 09/09/2009, all others stakeholders received the letters on 12/08/2009.		**OK**
E.1.2. If a stakeholder consultation process is required by regulations / laws in the host country, has the	/1/ /8/	DR	It was verified that the letters sent to the stakeholders followed the Brazilian DNA Resolution		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
stakeholders' consultation process been carried out in accordance with such regulations / laws?	/24/		nº 7. No comments were received. Letters sent to local stakeholders and the web link where the PDD in Portuguese was made publicly available shall be provided.	~~CL 16~~	
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/ /8/ /24/	DR	See E.1.2	~~CL 16~~	**OK**
E.2. Summary of comments received.					
E.2.1. Are the stakeholders who made comments identified (addresses provided / available)?	/1/	DR	No comments were received from stakeholders.		**OK**
E.2.2. The summary of the stakeholders' comments received is provided / available?	/1/	DR	See E.2.1		**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	See E.2.1		**OK**
Annex 1. *Contact information on project participants*					
• Are the Names of all organization given? (*as listed in section A.3*)	/1/	DR	The names of organizations were provided.		**OK**
• Name of contact person, Street, City, Post fix / ZIP, Country, Telephone Fax or e-mail mandatory fields are filled?	/1/ /9/	DR	The contact information in the annex 1 shall be filled according to EB 41 annex 12. Include in Annex 1 the Postfix/ZIP of Hidrelétrica Pipoca S.A.	~~CAR 3~~	**OK**
Annex 2. *Information regarding public funding* Table 1 – 7 & Table 2, A.4.5					
• Is information from Parties included in Annex I on sources of public funding for the project activity provided?	/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**
• 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	See above		**OK**

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
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/	DR	See B.6.2.2, B.6.2.3, B.6.3.1	~~**CAR 6**~~	**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/	DR	See B.7.1.3, B.7.2.6, B.7.2.7	~~**CAR 5**~~ ~~**CAR 14**~~ ~~**CAR 15**~~	**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**~~ Concerning the references stated in the section A.2 of the PDD (version 1): * Word Comission Dam website is not working properly (http://www.dams.org//docs/report/wcdintro.pdf); * UNEP-LAC -2002 – no evidence provided; * Provide evidence to the statement "*One the solutions the government provided was flexible legislation…..specially hydropower projects*".	A.2.1	The World Commission Dam hyperlink was deleted and the referred document follows annexed. The UNEP-LAC – 2002 reference follows annexed. The evidence to the statement was referenced in the PDD´s second version. 2nd Response The UNEP-LAC reference follows annexed. Please refer to page Regarding the statement on page 5 of the PDD, Project Participants (PP) calls the attention to the following paragraph in the "WCD – WORLD COMMISSION ON DAMS (2000). Dams and Development: a new framework for decision-making. UK and USA: Earthscan Publications Ltd", pag 11, at the box (1.2) which adds "Run-of-river dams (weirs and barrages, and run-of-river diversion dams) create a hydraulic head in the river to divert some portion of the river flows to a canal or power station.", the previous statement is coherent with the description presented at the PDD, therefore in order to properly adequate the definition PP revised the document, not presenting it as a citation, please refer to the latest version of Pipoca´s PDD.	Project participants provided the document "WCD – WORLD COMMISSION ON DAMS (2000). Dams and Development: a new framework for decision-making. UK and USA: Earthscan Publications Ltd" and removed its website from list of reference, on Annex 5 of PDD version 2. According to Box 1.2 types of large Dam presented on page 11 of the provided document, Run-of-river dams have no storage reservoir and may have limited daily pondage. Project participants are requested to revise the Section A.4 (page 5) of PDD version 2; The UNEP-LAC reference is still missing; The statement of paragraph One the solutions the government provided was flexible legislation…..specially hydropower projects" was properly included as footnote 2, on page 2 of PDD version 2. (LANDI, 2006) This CAR is still open. Conclusion regarding client's Response # 2 The Section A.4 of PDD version 3, dated 28/01/2011 was revised accordingly. The UNEP-LAC reference was provided This CAR is closed
~~**CAR 2**~~ The Construction License described on Section D.1, page 47 of PDD version 1, emitted on 13/04/2007 to Hidrelétrica Pipoca S.A replaced the Construction License emitted to HP2 do	A.2.3.1 D.1.6	The Minas Gerais Environmental agency (FEAM) extended Pipoca´s Construction License, as can be verified by the letter emitted by FEAM on 19/02/2008, annexed. The extended period was valid until	The FEAM letter dated 03/03/2010 (file Renovação de LI_2010.pdf) describes that the construction license was extended "Ad Referendum" until 20/02/2011 to HP2 do Brasil Ltda. – PCH `Pipoca S.A.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
Brasil (previous owner of SHP Pipoca) and it was valid until 20/01/2008. The PDD shall explain the steps referent to the renewal of the Construction license and include the number, the validity and entity responsible by the issuance of the current license. Moreover, clarify the current stage of the Operation License request.		20/01/2010, which was extended again for one more year until 20/01/2011, as can be checked by the FEAM letter emitted at 03/03/2010 extending Pipoca´s license period, also annexed. The Operation License request was filed within FEAM on 17/11/09, and complementary documents requested by FEAM were added on 26/03/10. FEAM issued the Operation License on 28/07/2010, annexed. 2nd Response The PDD section D. was revised. In Brazil, each Environmental agency has a specific regulation and autonomous procedures, including the formal description of its environmental licenses. The CNPJ number belongs to HP2 do Brasil Ltda. (CNPJ 03.934.032/0001-52) who was the former entrepreneur of Pipoca SHPP and the first environmental license applicant. HP2 do Brasil requested the Previous License in order to proceed with the project´s development, and received COPAM´s approval, than a Special Purpose company was created (Hidrelétrica Pipoca S.A. – CNPJ 06.814.778/0001-10) and the project´s licenses was transferred from PH2 do Brasil to Hidrelétrica Pipoca S.A. The project transference was formally acknowledged by both ANEEL and COPAM and can be checked through ANEEL´s resolution number 474 issued on 06/03/2006	Project participants are requested to clarify why the CNPJ number provided in this document (03.934.032/0001-52) and on document signed by COPAM, dated 28/07/2010, which grates the Operation License "Ad Referendum" to Hidrelétrica Pipoca S.A. corresponds to CNPJ of HP2 do Brasil S.A and not to Hidrelétrica PCH Pipoca S.A. (crosschecked with Brazilian ministry, available on http://www.receita.fazenda.gov.br/pessoajuridica/cnpj/cnpjreva/cnpjreva_solicitacao.asp accessed on 19/10/2010 at 14:55 Brazilian time). Moreover, this CNPJ number differs from the last construction license # 006/2005, valid until 2008 that is addressed to Hiderlétrica Pipoca S.A, (ex PH2 do Brasil Ltda.). Project participants are also requested to revise the PDD version 2 on page 52 that still describes the installation license emitted on 13/04/2007, which was expired. This CAR is still open. Conclusion regarding client's Response # 2 The document "LI_Prorrogacao_2011.pdf", dated 12/02/2010 describes that the extension of Pipoca´s SHP construction license was requested by Hidrelétrica Pipoca S.A, which CNPJ number is 06.814.778/0001/10 and it is in line with Revenue Secretartiat of Minas Gerais (Secretaria de Estado de Fazenda de Minas Gerais) and in line with Secretariat of the Federal Revenue of Brazil (http://www.receita.fazenda.gov.br/pessoajuridica/cnpj/cnpjreva/cnpjreva_solicitacao.asp ,accessed on 26/04/2011 at 08:40 Brazilian

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		and by FEAM´s Construction License Extension issued on 12/02/2010 which states in its introduction: "Trata-se de pedido de Prorrogação de Licença de Instalação formulado por Hidrelétrica Pipoca S.A (Ex. PH2 do Brasil LTDA.), CNPJ 06.814.778/0001/10, para a atividade de geração de energia elétrica na Pequena Central Hidrelétrica Pipoca – PCH PIPOCA, situada nos municípios de Caratinga e Ipanema/MG."[1] PP call the attention to the fact, that all legal requirements were attended and the all environmental licenses were approved by the appropriate governmental agency as confirmed by the provided evidences. 3rd Response As can be checked in all licenses presented (Preliminary, Construction and Operation), the CNPJ shown at the process´s reference table is from its first applicant (HP 2 do Brasil). This description doesn't mean that the environmental agency was not properly informed of the ownership´s change (from HP2 do Brasil do Pipoca S.A.), as can be evidenced by the Construction License Extension (issued on 12/02/2010), in which the environmental agency states that the plant´s belongs to Pipoca S.A. providing its CNPJ. Furthermore the license text, already presented, stress the knowledge of the	time) The ANEEL Resolution # 474, dated 06/03/2006 provides the authorization to HP2 do Brasil Ltda. to transfer to company Hidrelétrica Pipoca S.A. the implementation and operation of Pipoca SHP. Nevertheless, the CNPJ number indicated on document "LO_Pipoca.PDF", which is dated 28/07/2010 corresponds to company HP2 do Brasil Ltda. Project participants are requested to clarify the CNPJ number on this document This Car is still open Conclusion regarding client's Response # 3 Despite the CNPJ number provided in operation License dated 28/07/2010 and valid for 6 years corresponds to Company HP2 do Brasil Ltda, the letter of this License is addressed to Hiderlétrica Pipoca S.A. This CAR is closed

[1] This is a request for Extension of Instalation License made by Hidrelétrica Pipoca SA (EX PH2 LTDA of Brazil.) CNPJ 06.814.778/0001/10 for the activity of electricity generation by small hydroelectric Power plant Pipoca - SHPP Pipoca is located in the districts of Ipanema and Caratinga / MG. "

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		project´s transference indicating the Pipoca´s former owner in brackets after mentioning Pipoca S.A. ´s CNPJ.	
~~**CAR 3**~~ The contact information in the annex 1 shall be filled according to EB 41 annex 12. Include in Annex 1 the Postfix/ZIP of Hidrelétrica Pipoca S.A.	A.3.2	The contact information was included in the PDD´s Annex 1.	The required contact information was correctly included on the Annex 1 and it is in line now it is in accordance with EB 41 annex 12. This CAR is closed
~~**CAR 4**~~ According to ANEEL Dispatch # 78, the coordinates of the dam (*"eixo de barramento"*) are 19º 46' 11" S 41º 47' 18" W and ANEEL Resolution # 388 mentions the coordinates 19° 46' S 41° 48' W (dam). PPs are requested to provide the correct and precise project's geographic coordinates (evidences).	A.4.1	At the time the ANEEL resolution # 388 was issued the Pipoca´s basic design wasn't defined yet. Pipoca´s basic design was only approved by the ANEEL´s resolution # 17. Due new hydrological studies, the project´s basic design suffered few modifications resulting in its final version, that can be checked at the ANEEL´s dispatch nº 1695 issued on 14/06/2010. The dam´s geographic coordinates (19º 46' 09'' S, 41º 47' 20,3'' W) was corrected. 2nd Response The footnote was corrected Please refer to the PDD third version. 3rd Response The footnote was revised.	The Section A.4.1.4 of PDD version 2 was revised and the geographical coordinates of DAM is in line with ANEEL Dispatch # 1.695, dated 14/06/2010 (available on http://www.aneel.gov.br/cedoc/dsp20101695.pdf , accessed on 20/10/2010, at 15:15 Brazilian time). Nevertheless, the reference of dam´s geographical coordinates in this section of PDD (footnote 4) is the ANEEL Technical Note # 464, dated 31/12/2009. Project participants are requested to update this reference. This CAR is still open. Conclusion regarding client's Response # 2 The reference on Section A.4.1.4 ,footnote was revised , however the reference must mention ANEEL Dispacth # 1695, dated 14/06/2010 instead of Technical note # #1695 issued on 14/06/2010. This CAR is still open Conclusion regarding client's Response # 3 The footnote was revised accordingly. This CAR is closed
~~**CAR 5**~~	A.4.3.4	A description of the training programs and	Project participants provided "Training

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
It should be mentioned in PDD's section B.7.2. which are/will be the (initial) training programs, how they will be implemented and who is/will be the responsible for its implementation. Furthermore, procedures for training of monitoring personnel, including emergency preparedness, should be identified.	A.4.3.5 B.7.2.7	M&O procedures were included in section B.7.2, and a copy of the program follows annexed. 2nd Response Please refer to the contract between Hidroelétrica Pipoca S.A. and ENEX O&M annexed.	Schedule" to be implemented by ENEX O&M (file Cópia de Programação de Treinamento e Desenvolvimento 2010 02.pdf). According to this document, the following training, related to CDM project activity equipment, will be implemented: • Basic Training for Operation and Maintenance of SHP; • Contingency Plan; • Turbine and Speed Regulator; • Generator and emergency generator Digital System of Supervision and Control Project participants are requested to provide evidences, demonstrating that ENEX O&M is the company responsible by the Pipoca´s Operation and maintenance, as described on Section B.7.2 of PDD version. This CAR is still open. Conclusion regarding client's Response # 2 Project participants provided the pages of "Contract to Provide Operation and Maintenance Services for Pipoca SHP" (file: Contrato de prestação de serviço de operação e manutenção da PCH Pipoca.pdf), dated 01/05/2010, signed by Hidrelétrica Pipoca S.A and by ENEX O&M de Sistemas Elétricos Ltda. This CAR is closed
~~**CAR 6**~~ The PP should apply the latest emission factor data available at the date of completion of the baseline study and monitoring methodology of PDD (version 1). Moreover, please indicate on Annex 3 the source/link and data only referent to the latest	B.4.1 B.4.2 B.6.1.1 B.6.2.2 B.6.2.3 B.6.3.1B.7.1.1	The latest emission factor data (2009) were considered at the PDD, and the link referring to the Brazilian grid emission factor was included on the PDD. The expected operational start of PCH Pipoca was updated in accordance with the foreseen schedule (01/10/2010).	The PDD version 2 was revised accordingly. The Sections A.4.4; B.6.3 B.6.4; B.7.1 and the Annex 3 reflect the use of the latest available data of the Brazilian grid emission factor. This CAR is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
available data of the Brazilian grid emission factor to be used on emissions reductions calculations.			
~~**CAR 7**~~ The formula presented by project participants in PDD (version 1) differs from the formula applied on the spreadsheet "*Ke EletricGen_2008.xls*". Revise the PDD, Section B.5. sub-step 2b, page 16 in accordance with the formula stated in cell "E9" of the spreadsheet "*Ke EletricGen_2008.xls*".	B.5.2 B.5.3 B.5.6	The benchmark was recalculated in order to be coherent with the new Prior Consideration event (CEMIG Board's meeting held on 29/11/2007) and the formula at the PDD was revised accordingly. The new benchmark calculation spreadsheet follows annexed.	The PDD version 2 was revised accordingly to the spreadsheet "Ke_ElectricGen_ 2010.09.01.xls". This CAR is closed.
~~**CAR 8**~~ As per EB 51 annex 58, "*Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant*". The financial analysis presented by PPs is from June 2008 (for benchmark) and August 2008 (for IRR calculation), therefore not consistent with the time of the investment decision to proceed with the project activity, dated 29/11/2007.	B.5.2 B.5.3	The financial analysis was recalculated in order to be coherent with the new Prior Consideration event (CEMIG Board's meeting held on 29/11/2007. The new IRR calculation spreadsheet follows annexed and all inputs considered in it are consistent with the time of investment decision to proceed with the project activity. 2nd Response The English version of the spreadsheet follows annexed.	The financial analysis was calculated with all inputs consistent with the time of the investment decision. Project participants are requested to provide a version in English of investment analysis spreadsheet "Valuation_Pipoca_2010.09.01.xls". This CAR is still open. Conclusion regarding client's Response # 2 Project participants presented the spreadsheet "Valuation_Pipoca_v2_en.xls" with all information in English language. This CAR is closed
~~**CAR 9**~~ The calculation basis and the percentage of Income Tax and Social Tax are not in line with Brazilian Assumed Income Legislation, please revise accordingly the spreadsheet "*Valuation_Pipoca.xls*".	B.5.2 B.5.3 B.5.6	Please see the new IRR calculation spreadsheet, the percentage of Income Tax and Social Tax are in line with Brazilian Assumed Income Legislation. 2nd Response Although it is not commonly applied in all energy sales, ICMS must be accounted in the	According to the Brazilian Tax Legislation, the Assumed Income Tax should be calculated on the Gross Revenues (before VAT – Value Added Tax). Project Participants should revise the Income Tax calculations. Moreover, in the spreadsheet" Valuation_Pipoca_2010.09.01.xls", project participants are considering in the worksheet "DRE" in the line "Impostos" ("Sales Taxes") the

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		present situation, PP kindly asks the Validation Team to Assess the tributary evaluation specifically developed to Pipoca S.A. by Ernest & Young Terco – Tributary Services attached which confirms the ICMS´s incidence. 3rd Response The Income Tax and Social Contribution were wrongly calculated, the spreadsheet was revised accordingly. The gross revenue calculation was based on a price estimative, that considered the government auctions and the Spot price market, this estimative served as basis at energy price forecast. It doesn't mean that Pipoca´s financial valuation considered that the energy would be sold through government auctions, where the ICMS is not included. Actually, as can be evidenced by CEMIG Administration Board's 58th meeting minutes (item "v"), Project Proponent always took in account that Pipoca S.A. would sell energy for the electrical energy market of incentivized sources, where the ICMS is included. Furthermore its common practice in the referred marked settling energy contracts based on the net electricity prices (discounting the ICMS), because of this practices that the price indicated at the analyses (spreadsheet and meeting minutes) doesn't includes the ICMS value. Moreover, the approach considered is conservative regarding the addionality analyses.	ICMS. This tax is not applied to Small Hydropower Plants in Brazil. Project participants are also requested to revise this calculation This CAR is still open. Conclusion regarding client's Response # 2 Project participants properly considered the ICMS (VAT) in the financial analysis. PCH Pipoca will sell energy to a final customer, for this reason ICMS should be accounted. The price was based in the government auctions (that does not have the ICMS included), but project participants included the ICMS to calculate the project Gross Revenues. The Income Tax and Social Contribution are still being calculated based on Net Sales (after VAT). Project participants should revise the Income Tax and Social Contribution calculations according to Brazilian Tax Legislation. This CAR is still open. Conclusion regarding client's Response # 3 Project participants properly revised the income tax and social contribution calculations according to Brazilian tax legislation. This CAR is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		Due the Tax calculation review and related impact at the investment analyses, the PDD was revised accordingly.	
~~**CAR 10**~~ The data provided in the sensitivity analysis contains useful information on how IRR fluctuates when parameters vary in a range of -10% and +10%. It would be more useful to show how large should these variations be to make the projects IRR equal the benchmark. Then a second analysis should be applied to discuss the likelihood of occurrence of these scenarios, also considering in the analysis variation on the plant load factor.	B.5.2 B.5.3 B.5.6	Please see the details at the sensitivity analysis at section B.5. 2nd Response The IRR presented in the sub-step 2c of the PDD was corrected. The calculation demonstrating the variations on parameters of sensitivity analysis that make the project´s IRR equal to benchmark are described at section B.5., pages 20 to 24 of the PDD. The sensitivity analysis parameters were included at the input´s table in the investment analysis spreadsheet, PP call the attention over the inserted commentaries describing the reasonable variations that would be necessary to make the projects IRR equal the benchmark. Also the energy prices were updated in accordance with the latest energy auctions for new projects.	The presented value of "Original Project's IRR" in the sensitivity analysis table is different from the IRR presented in the sub-step 2c of PDD. The calculation demonstrating the variations on parameters of sensitivity analysis that make the project´s IRR equal to benchmark is still missing. This CAR is still open. Conclusion regarding client's Response # 2 Project participants presented the sensitivity analysis with corrected values and demonstrated the variations on parameters necessary to make the project IRR equal to benchmark. This CAR is closed.
~~**CAR 11**~~ The PDD should be revised, extending the common practice analysis to the Brazilian territory and considering "similar" projects in a range of +/- 50% of the installed capacity of the project activity (i.e. from 10 MW to 30 MW), or justify in the PDD why SHP Pipoca can not be	B.5.2 B.5.3	Regarding common practice analysis, Project Participants would like to clarify that the analysis presented in the PDD (version 1), it is based on the Additionality Tool, which states: "projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable	The limit of 30 MW to installed capacity provided in the sensitivity analysis by project participants was properly justified. According to ANEEL Resolution # 393/98, the precipitation regime is considered during the hydrological inventory studies that is the first steps of SHPs projects implementation in Brazil, thus it is not a particular characteristic of Minas Gerais State.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
compared with similar SHPs located in other regions of Brazil. Data of the complete research results of the common practice analysis shall be provided.		environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc". Although small hydroelectric projects are considered to be the ones with installed capacity from 1 MW to 30 MW according to ANEEL Resolution #652/2003[2], it is not reasonable consider that a power plant with 1 MW is comparable with power plant with 20 MW of installed capacity, as it is the case of Pipoca project. The project scale has influence in many aspects for a small project implementation as costs, investments, financing, environmental studies, and others. Thus, it is evident that a small hydro located in other region of Brazil cannot be compared with the proposed project activity. As mentioned in the PDD (version 1), Brazil has an extension of 8,514,876.599 square kilometers and 6 distinct climate regions. These differences obviously have influence for small hydropower plants implementation (see comparison of the monthly precipitation where the project is located and other regions of the country in the second version of the PDD, figures 5 and 6). Therefore, Minas Gerais State was considered a conservative approach for the common practice analysis. See explanations presented in the new version of PDD (Version 2) and spreadsheet with the common practice analysis attached to this response. 2nd Response Hydro Plants are so bounded to climate	Moreover, the PROINFA (Incentive Program for Alternative Sources of Electric Energy from Portuguese "Programa de Incentivo às Fontes Alternativas de Energia Elétrica") is applicable to all SHPs in Brazil, Project participants are still requested to extend the common practice analysis to all SHP in Brazil. This CAR is still open. Conclusion regarding client's Response # 2 As already mentioned, the hydrological condition is considered during the hydrological inventory studies that is the first steps of SHPs projects implementation in Brazil. Project participants are requested to demonstrate which are the regional regulations and distinct administrative process established by Minas Gerais State. This CAR is still open Conclusion regarding client's Response # 3 The new article provided by project participants "Rain is falling energy prices up to 20% on the open market" (from Portuguese: Chuva faz preço da energia cair ate 20% no mercado livre), dated 19/01/2011 does not specify the region where the project activity is located. It explains the impact of rainfall on the price of energy in Brazil. Moreover, according to this article was already expected: "…The scenarios

[2] Available at: < http://www.aneel.gov.br/cedoc/res2003652.pdf>.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		conditions, that electricity generation sector have developed mechanisms to mitigate the related risks – the Energy Reallocation Mechanism (from the Portuguese Mecanismo de Realocação de Energia – MRE) based on the hydro plant´s assured energy is one of them, its acts as a balancing pool reducing the electricity production variability caused by hydrologic regimes. Another evidence of the climate regional distinctiveness can be noted by the Spot Price value division into sub-markets (south, southeast/Midwest, northeast, and north). Also called Settlement Price for the Differences (translation for Preço de Liquidação das Diferenças - PLD) it is used to valorize the purchase and the sale of electric power in the short term market[3]. Nevertheless the climate conditions are not the only distinguishing feature among the several Brazilian regions. The tariff applied for electric-power distribution system uses (TUSD) also varies depending on the state in which the power plant is connected. Established by specific regulations provided by ANEEL, this tariff has a big impact in the IRR, e.g. if SHPP Pipoca would have been implanted at Piauí the TUSD value R$ 6.26/kW[4] and the project´s IRR would be 14.01%, on the other hand if the project´s state was Rio Grande do Sul the TUSD value would be R$ 2.71/kW[5] and the IRR would be 14.93%, only considering TUSD variation. This IRR´s increment is equivalent to an increase of 6.4% of the Pipoca´s total	we had did not show a drastic drop of the LDP in January, which should provide a value still above $ 50 per MWh. The current price level was only expected to March, with the onset of heavy rains". The hydrology of São Francisco basin, as previously discussed, is already considered when the value of assured energy of SHP was defined. Regarding the mentioned Law 12.488, dated 09/04/1997, project participants are requested to demonstrate the impact of the construction of fish ladder in this project activity, if applicable. Project participants are also requested to clarify if the electricity price (PLD´s Energy Spot Price) in submarket where the project activity is locates strongly differs from the other Brazilian energy submarkets. This CAR is still open Conclusion regarding client's Response # 4 Based on file "CAR5_PLD Prices CCEE_original.xlsx" provide by project participants, which data are obtained from CCEE, it is possible to note that the energy values from Southeast – Center West submarkets (where the project activity is located) differs from the other Brazilian submarkets (North, Northeast, and South). Project participants are requested to revise the common practice analysis of PDD and include

[3] Attached follows a spreadsheet with the historic PLD values.
[4] http://www.aneel.gov.br/cedoc/reh2009871.pdf
[5] http://www.aneel.gov.br/cedoc/reh2009895.pdf

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		investment. It is worth mentioning that each state has a specific state environmental agency responsible to determine the technical standards required to obtain all environmental licenses, with regional regulations and distinct administrative process established by each state region. Therefore, when evaluating the different climate conditions of each region, and the specific environmental regulatory framework of each state, and the energy price subdivision per markets, and also the different values of TUSD applied at each Brazilian state, it's clear that the National territory does not consist of the same "comparable environments" as required by the "Tool for the demonstration and assessment of additionality". 3rd Response The fact, climate conditions are considered in several stages of a SHPP implementation process doesn't indicate that this regional characteristic are flattened and free from variations. These climate variations have strong influence in the technical aspects related to a small hydropower plant implementation since meteorological events have strong influence in hydrologic process ". "Climate affects all major aspects of the electric power sector from electricity generation, transmission and distribution system to consume demand for power" . Furthermore, this deep climate directly	all SHP located at the same submarket of project activity. This CAR is still open Conclusion regarding client's Response # 5 The common practice analysis was properly revised according to "Guidelines on Common Practice, version 1.0 This CAR is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		influences PLD´s price (energy spot price) variation, as can be confirmed by the following article "Chuva faz preço da energia cair até 20% no mercado livre" . The specific Minas Gerais´ regulations can be evidenced by state law number 12.488 issued on 09/04/1997 which obliges the construction of transposition system for aquatic animals in hydroelectric power plants, obligation not seen at Bahia state, for example. 4th Response Hydro Plants are so bounded to climate conditions, that electricity generation sector have developed mechanisms to mitigate the related risks – the Energy Reallocation Mechanism (from the Portuguese Mecanismo de Realocação de Energia – MRE) based on the hydro plant´s assured energy is one of them, its acts as a balancing pool reducing the electricity production variability caused by hydrologic regimes. Another evidence of the climate regional distinctiveness can be noted by the Spot Price value division into sub-markets (south, southeast/Midwest, northeast, and north). Also called Settlement Price for the Differences (translation for Preço de Liquidação das Diferenças - PLD) it is used to valorize the purchase and the sale of electric power in the short term market (see a spreadsheet with the historic PLD values attached). Nevertheless the climate conditions are not the only distinguishing feature among the several Brazilian regions. The tariff applied	

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		for electric-power distribution system uses (TUSD) also varies depending on the state in which the power plant is connected, as mentioned before. Established by specific regulations provided by ANEEL, this tariff has a big impact in the IRR as previously discussed. It is worth mentioning that climate variations have strong influence in the technical aspects related to a small hydropower plant implementation since meteorological events have strong influence in hydrologic process ". "Climate affects all major aspects of the electric power sector from electricity generation, transmission and distribution system to consume demand for power" . Furthermore, this deep climate directly influences PLD´s price (energy spot price) variation, as can be confirmed by the following article "Chuva faz preço da energia cair até 20% no mercado livre" . Please refer to the PLD prices in order to achieve a better overview of the energy prices in the four submarkets provided by CCEE (available at <http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=7ccaa5c1de88a010VgnVCM100000aa01a8c0RCRD>. Accessed by EQAO on August, 3th 2011). For definition, PLD is the Settlement Price for the Differences (translation for Preço de Liquidação das Diferenças) and is defined by CCEE to account and settle possible differences amongst contracted electricity and verified real values. This is used to short term market. And this is an indicative for the difference of prices in the whole country in	

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		order to minimize risks due to differences between the actors of the Natinal Inteconnected System, as well as specific climate conditions. The article is mentioning the whole issue, not only the specific case of Minas Gerais, since this matter is not specific related to Pipoca project, but all hydro projects in the country and therefore justifies the chosen scenario to common practice analysis, stating that specific climate conditions interfere the project implementation. Refer to the values presented on file: CAR5_PLD Prices CCEE_original (attached to this response), based on the information provided by the website of the Chamber of Electric Energy Commercialization (Câmara Comercializadora de Energia Elétrica - CCEE), that is available at the Prices link: http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=39aca5c1de88a010VgnVCM100000aa01a8c0RCRD. The prices show differences of prices amongst the four regions. Therefore, when evaluating the different climate conditions of each region, and the specific environmental regulatory framework of each state, and the energy price subdivision per markets, and also the different values of TUSD applied at each Brazilian state, it's clear that the National territory does not consist of the same "comparable environments" as required by the "Tool for the demonstration and assessment of additionality".	

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		It is also important to mentio that each state have a state environmental agency responsible to determine the technical standards required to obtain all environmental licenses, with specific regional regulations and distinct administrative process established by each state region. The installation of mechanisms for fish ladder in Brazil has been boosted with the release of state laws aimed at mitigating the impacts of dams on fish survive, this law obligates the construction of mechanisms for piracema in the area of Minas Gerais. Piracema is the name given to the period of the year when fish within the Paraguay River basin—which includes the Pantanal region and next locations as well as rivers —reproduce. This evidences that specific climate conditions in Brazil (climate regions, such as Pantanal) are different and this law shows those diverse in the country, specifying the project location. This law increases the number of environmental restrictions in the License with respect to aquatic fauna and fish fauna programs, such as presented in Pipoca Operation License. 5th response from PP: Project participants revised the common practice analysis of PDD including all SHP located at the same submarket of project activity (Southeast and Center-west Regions in Brazil). Please check version 4 of the PDD.	
~~**CAR 12**~~ The project's starting date (20/05/2008-date when SHP Pipoca was bought by CEMIG) indicated in PDD version 1 is not in line with the	B.5.4 B.5.5 C.1.1.1 C.1.1.2	Due Pipoca´s high investment requirement and low rate of return the project could not be implemented until 2008 when a joint venture with CEMIGs occurred. The company´s	The mentioned CEMIG Administration Board's 58th meeting minutes (dated 29/11/2007 and evidence of CDM prior consideration) authorizes CEMIG to buy Pipoca SHPP shares and indeed

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
Glossary of CDM terms (version 5) because it does not represent the earliest real date on which project participant has committed to expenditures related to the implementation or related to the construction of the project activity. During the site visit it was provided the EPC (Engineering, Procurement and Construction) contract of SHP Pipoca, dated 20/10/2008, that seems to be the earliest real starting date of the proposed project activity. Based on that, the PP shall clarify if the EPC contract is the earliest date evidence (document) of expenditures related to the implementation or related to the construction of the project activity or provide other evidences in line with the Glossary of CDM terms (version 5) and revise the project's starting date ("Guidelines on the demonstration and assessment of prior consideration of the CDM project activities" / EB 49-annex 22 must be followed) accordingly. Furthermore, the PP shall use the most recent "Guidelines on the demonstration and assessment of prior consideration of the CDM project activities" (EB49 - Annex 22).		expertise associated with the carbon credits revenues enabled the project´s implementation, this necessary condition can be verified at CEMIG Board's meeting held on 29/11/2007. So, considering that CEMIG´s joint venture occurred earlier than the EPC contract signature, and to the fact that without CEMIG´s acquisition, the project would not be implemented. PP considers 20/05/2008 (date in which CEMIG bought 49% share of Pipoca SHPP) as the most appropriate starting date, which is in accordance with the "Glossary of CDM terms", that states: "…the earliest date at which either the implementation or construction or real action of a project activity begins". 2nd Response As previously stated, it was only with CEMIG´s participation and the CERs revenues, that the project could overcome the economical feasibility barrier. The first EPC contract signed by Pipoca S.A. had as a necessary condition to its execution, the Service Order issuance. For its part the Service Order issuance depended on CEMIG´s entrances into the project (as evidenced by the Administration Board's 58th meeting minutes, condition "xi", and by the Letter of intent agreed), which occurred only on 20/05/2008, a month after the contract´s deadline (15/04/2008) determined by the first EPC. This delay happened due bureaucratic procedures that took six month to be fulfilled.	mentions in one ("x") of its eleven conditions ("i" to "xi") the following: "(x) obtenção e comercialização de créditos de carbono com base em metodologia estabelecida pela ONU" ("...secure and commercialize carbon credits..."). This very same meeting minutes, on its condition "xi", mentions that the EPC contract was already signed (by Pipoca SHPP) on 05/10/2007 but the EPC received during the site visit, dated 20/10/2008, states that the previous EPC contract (dated 05/10/2007) was terminated, because Pipoca SHP did not issued (explicit condition to the continuation of this contract) the agreed Service Order until 15/04/2008 and so the effective (valid) EPC is the one dated 20/10/2008. Nevertheless, the "Glossary of CDM Terms" version 05 also mentions: "In light of the above definition, 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. This, for example, can be the date on which contracts have been signed for equipment or construction/operation services required for the project activity. Minor pre-project expenses, e.g. the contracting of services /payment of fees for feasibility studies or preliminary surveys, should not be considered in the determination of the start date as they do not necessarily indicate the commencement of implementation of the project." and the evidence provided by project participant/s for the project's starting date ("Instrumento particular de acordo de acionistas da Hidrelétrica Pipoca S.A.", dated 20/05/2008) as the act of CEMIG buying shares from a company (Pipoca SHPP) is not clearly related to the date on which project participant/s commited to expenditures related to the

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		Once the contract lost its validity, a contract renewal became necessary; the second EPC, which consisted of the same contract, technically identical to the first one, but including a readjustment over the total investment value. These conditions are also foreseen at the Letter of intent signed on November 14th, 2005, by HP 2 do Brasil and CEMIG. The document establishes on its seventh clause at paragraph 7.4 : "In case both parts decide by their association to exploit and implement the enterprise, they shall comply with the following conditions: a) CEMIG´s inclusion as shareholder of the Special Purpose Entity wich detains the enterprise autorization with a shareholding of 49%; After on the same paragraph, we see the following: d) invest the necessary capital in order to implement and explore the enterprise;"[6] Those implementation conditions were only fully attended on 20/05/2008 with Pipoca S.A.´s subscription agreement, which included CEMIG as a shareholder, who	implementation or to the construction of the project activity and, furthermore, CEMIG was not and is not a project participant. This CAR is still open. Conclusion regarding client's Response # 2 Project participants provided a "Memorandum of Understanding", dated 14/11/2005 demonstrating that the participation of CEMIG as shareholder, with 49% of shares is a condition to the implementation and exploration of Pipoca SHP. This is in line with document "CEMIG Administration Board's 58th meeting minutes", item (xi) that states the following: "..the order of service for the start of construction of major works will only occur after the subscription by CEMIG GT of 49% of the shares of Hidrelétrica Pipoca S.A." This CAR is closed

[6] PP´s translation from the Letter of Intent presented to the validation team.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		comprised the initial investment to the projects implementation begin as previously agreed. Therefore, since the EPC contract could only became viable after CEMIG´s entrance, it is clear, that CEMIG´s subscription agreement (20/05/2008) in which CEMIG´s paid up R$ 3.632 million in order to start Pipoca S.A. implementation is the most appropriate event which better complies with the starting date definition in "Glossary of CDM terms". Furthermore, CEMIG is also a PP since is a shareholder of Pipoca S.A.	
~~**CAR 13**~~ Project participants included the parameter TEG_y (Total electricity produced by the project activity) in section B.7.1 of PDD version 1. According to ACM0002, this parameter is applicable to hydro power project activities with a power density of the project activity (PD) greater than 4 W/m^2 and less than or equal to 10 W/m^2. Thus, this parameter must be removed from PDD.	B.7.1.1	The parameter was removed from the PDD.	The parameter TEG_y (Total electricity produced by the project activity) was removed from Section B.7.1 of PDD version 2 This CAR is closed.
~~**CAR 14**~~ In the PDD version 1 is not clear how the electricity delivered to grid by Pipoca SHP will be measured. PPs are requested to revise the PDD including the location of the electricity meters for SHP Pipoca and explaining how this data will be consolidated.	B.7.1.3	The eletricity delivered to the grid will be measured by biling energy meters located in the control room of Hidroelétrica Pipoca´s substation. The meters measures continuously the electricity dispatched to the grid, CCEE has remote access to energy information. The energy generated by the plants will be checked by CCEE, which will generate an official report with the checked information. The compiled data will be used to certify the energy generation reported produced by the Project Participant (PP). Along the quantity of	A description regarding the location, measurement and data consolidation of energy delivered to grid was included in PDD version 2. This CAR is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		net electricity generation supplied by the plant, PP will monitor yearly: the build and operating margin CO2 emission factor for grid connected power; The area of the reservoir measured in the surface of the water; and the installed capacity of the hydro power plant after the implementation of the project activity. The information above was included at the PDD.	
~~**CAR 15**~~ Project participants are requested to include in the section B.7.2 of the PDD a description of the procedures for registration, monitoring, measurement and reporting of CER, also indicating the responsible for each activity.	B.7.2.6	Section B.7.2 was updated as requested including procedures for registration, monitoring, measurement and reporting of CERs.	The PDD version 2 was revised accordingly. This CAR is closed.
~~**CAR 16**~~ PDD section B.7.2 must mention the monitoring frequency of all monitored parameters.	B.7.2.9	The monitoring frequencies of all parameters were included at section B.7.2.	The sections B.7.1 and B.7.2 of PDD version 2 describes that the energy delivered to grid will be measured continuously by CCEE and monthly recorded. The others parameters of this project activity, which are: the build and operating margin of Brazilian connected grid; the area of the reservoir and SHP Pipoca´s installed capacity will be yearly monitored, as per applied baseline methodology. This CAR is closed.
~~**CAR 17**~~ Regarding the evidences mentioned on "Table 5 - Project starting date" on page 13 of PDD version 1, PPs are requested to revise/explain the following inconsistence: * Pipoca SHP EPC contract is dated 20/10/2008, instead of 25/10/2008.	C.1.1.1	The inconsistence was due a typing mistake, the EPC contract date was corrected at the second version of the PDD.	The PDD was revised accordingly. Project participants also revised the number of the table, which is "Table 6 - Project Starting date" on PDD version 2 This CAR is closed.
~~**CAR 18**~~ Project participants are requested to update the	B.5.2	Please refer to the document "Default Answer Ke Guidance_v2".	Project participants properly discussed in the attached "Default Answer Ke Guidance_v2.pdf" the differences between the PPs calculation and

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
investment analysis based on Guidelines on the Assessment of Investment Analysis, version 5, (EB 62 Annex 5). Also explain if the "Default values for the expected return on equity" defined by this Guidelines are applicable or not to this project activity.			the Guideline on the Assessment of Investment Analysis. Project participants prepared a comparison of all variables of Cost of Equity (Ke) in order to justify the differences between the Guideline value (11.75%) and PPs value (18,1%). For the Risk Free and Equity Risk Premium project participants are using more conservative values than the Guideline. The main differences are in the determination of Countr Risk Premium and Sectorial Risk, project participants are using a 5-year average of Country Risk Premium based on EMBI+ (Emerging Markets Bond Index) Brazil instead of Moody's Rating and for the Sectorial Risk project participants are using the "Average Beta US electric-generation re-levered to Brazilian leverage" arguing that the index that is being used in the Guideline does not reflect specifically the industry the project is inserted. Project participants prepared a consistent discussion and clarify all differences between two indexes. This CAR is closed.
~~**CL 1**~~ According to ANNEL Resolution number 474, dated 06/03/2006 the installed capacity of SHP is 20 MW, this value is different from the technical proposal n° 25/1117 rev B specifications, which mentions 3 generators of 7.33 MVA MW, totalizing 22 MVA (19.8 MW, as per mentioned power factor = 0.9), as well as in the PDD (version 1) – section A.4.3, table 2. PPs are requested to clarify this different values of installed capacity.	A.2.3.1 A.4.3.1 B.2.1 B.2.3 D.1.6	Pipoca´s basic design had to be modified several times in order to optimize its performance, the plant´s definitive configuration can be checked by ANNEL resolution number 1.695 issued on June 14th, 2010, which specifies the plant´s installed capacity (20 MW). 2nd Response The PDD´s generators potency was mistakenly described, The corrected power of each generator is 7410 kVA (7,410 kVA*0,9 =	The ANEEL Resolution # 1695, dated 14/06/2010 endorses the parameters of Pipoca´s consolidated basic design. According to this resolution, the minimum installed capacity of project activity is 20 MW, composed by 3 generators with individual installed capacity of 7.33 MVA. The description of these equipments is the same presented by proposal n° 25/1117 rev B specifications, which also indicates a power factor = 0.9, resulting in a installed capacity of 19.8 MW Project participants are still requested to clarify

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		6,669 MW*3= 20 MW) as shown by the annexed photograph and ANEEL´s resolution numbers 3024, 3072, and 3275 attached which sums 20MW (3*6,667kW). 3rd Response The Section A.4.3 table 3was corrected please refer to the latest version of the PDD.	the different values of installed capacity. This CL is still open. Conclusion regarding client's Response # 2 The ANEEL Dispatches: #3024, dated 07/10/2010; # 3072, dated 15/10/2010 and #3275, dated 28/10/2010 were checked and the capacity of each generation unit of Pipoca SHP is 6,667 kW. Project participants also provided the nameplate of a generator manufactured by GE Motors with installed capacity of 7410 kVA and power factor of 0,92. This data are not in line with Section A.4.3, table 3 of PDD version 3 This CL is still open Conclusion regarding client's Response # 3 The table 3 section A.4.3 of PDD version 3, dated 29/04/11 was revised accordingly. This CL is closed
~~**CL 2**~~ The PDD version 1 applies the approved baseline methodology ACM0002 Version 10 (valid until 25/02/2010 - requests for registration can be submitted until 25/10/2010). Considering the present validation timeline to register projects, it is recommended to revise the PDD according to ACM0002 version 11, valid from 26/02/2010 onwards.	B.1.1 B.7.2.1	The PDD was revised in accordance with ACM0002 version 11. 2nd Response The methodology version was updated. 3rd Response The Tool´s version was updated please refer to the PDD´s latest version.	The PDD version 2 was revised and it applies ACM0002 version 11. However, considering the grace period (until 17/05/2011) 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 12, valid from 17 September 2010 onwards. This CL is still open.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
			Conclusion regarding client's Response # 2 Project participants are requested to update the version of "Tool to calculate the emission factor for an electricity system" (version 2.1.0), which is valid from 16 Oct 2009 00:00:00 GMT onwards) This CL is still open Conclusion regarding client's Response # 3 The PDD version 3, dated 29/04/11 was revised accordingly. This CL is closed
~~**CL 3**~~ The PDD mentions in the beginning of section B.2: *"The methodology ACM0002 is applicable to projects consisting of "the installation or modification/retrofit of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit"*. PPs are requested to clearly indicate on section B.2. of PDD if SHP Pipoca consists on the installation or modification/retrofit of a power plant/unit.	B.2.1	The fact that PDD project consists of the installation of a new plant was indicated on section B.2.	The Section B.2 of PDD version 2 clearly indicates that Pipoca SHP consists on the installation of new power plant. This CL is closed.
~~**CL 4**~~ PPs shall provide the evidence for the statement in PDD version 1 – section B.4 "…*71.2 % of the Brazil's installed capacity is composed by large hydropower plants which on average present large reservoirs and 24.22 % by thermal power*	B.4.8	The reference was included and the values were updated, please see the reference annexed. 2nd Response	The provided reference indicates that large hydro power plants corresponds to 69,02% of Brazilian´s installed capacity, while thermal power plants represents 25.32%. The PDD indicates that the percentage of large hydro power plants and thermal power plants is

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
stations....		Attached follows the references which is in accordance with the values applied at the PDD, which indicates that the percentage of large hydro power plants and thermal power plants is respectively 69.20% and 25.20 %.	respectively 69.20% and 25.32 %. Revise the PDD accordingly. This CL is still open. The evidence regarding the values presented on figure 7 on sub step 4b of PDD version 3 was proved by project participants on file "http___www.aneel.gov.pdf" This CL is closed
~~**CL 5**~~ Considering that the project's owner CEMIG and OMEGA have been investing in others SHPs apart from Pipoca project activity, provide evidences that the benchmark used in SHP Pipoca were considered in other SHPs, as per EB51 – Annex 58, parag. 14.	B.5.2 B.5.3	In accordance with "Guidelines on the assessment of investment analysis" internal company benchmarks/expected returns should only be applied in cases where there is only one possible project developer, since it is not the case of the present project activity Project Participants adopted a benchmark based on publicly available data.	The benchmark is the Ke (Cost of Equity) it was calculated by project participants with publicly available data. This CL is closed.
~~**CL 6**~~ The "*Valuation_Pipoca.xls*" spreadsheet *and* Minutes of Meeting held on 27/08/2008 and published on 29/08/2008 – Resolution Communication of CEMIG Administrative Council provided by the project participants indicate that the IRR obtained is 13.25%, that is lower than the applied benchmark, equal to 15.75%. However, when the investment decision was taken, the IRR was considered as 15.39% (Minutes of Meeting occurred on 29/11/2007 and published on 30/11/2007 – Resolution Communication of CEMIG Administrative Council). These IRR differences shall be clarified.	B.5.2 B.5.3	The IRR value (13.25%) and benchmark (15.75%) considered at the meeting held on 27/08/2008 were based on parameters available at the referred time, which were different from the parameters available at the first meeting date, 29/11/2007. A new IRR calculation was remade, please see the document annexed and the PDD´s second version.	All modifications that are cited in the document "CEMIG-CRCA 082-2008.08.27" (i.e.: increase of investment value) have the characteristic of reducing the IRR. This CL is closed.
~~**CL 7**~~ As the benchmark (Cost of Equity - Ke) was calculated without considering the inflation impact, it shall be clarified if the energy price,	B.5.2 B.5.3 B.5.6	All inputs considered on the IRR´s second version are adjusted in accordance with the reference date established on the 29/11/2007 meeting: April 2007. The project flow doesn't	All provided inputs were verified and considered in accordance with the reference date, April 2007.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
costs and all other lines of P&L have the same behavior over the years. Also the data reference (source) of the energy price and its respective adjusts over the years shall be clarified.		consider the inflation impact, and is in accordance with the benchmark. The energy price value was based on the third new energy auction, considering the Marginal Price Auction (the highest price of the auction) adjusted by the Inflation targeting in Brazil (4,5%). 2nd Response The third new energy auction happened on 10/10/20067.	PPs informed that all values in project flow do not consider the inflation impact, in accordance with the benchmark. Project participants shall clarify/justify why these parameters do not have the same inflation behavior over the years, i.e., if energy price is to be adjusted by IGP-M and Costs by IGP-M minus 2%, the project profitability is to be different over the years and this difference should be considered. According to PPs response: "The energy price value was based on the third new energy auction, considering the Marginal Price Auction (the highest price of the auction) adjusted by the Inflation targeting in Brazil (4,5%)". Project participants should provide the reference date of this third new energy auction. This CL is still open. Conclusion regarding client's Response # 2 The inflation adjustment of 4,5% made by project participants in the Energy Price reflects the annual inflation in Brazil. The reference of third new energy auction was provided. This CL is closed.
~~**CL 8**~~ Provide the breakdown and the evidences of the values of Operational and Maintenance Costs applied on "*Valuation_Pipoca.xls*". If the operational and maintenance services are regulated by a contract, the start date, prices, inflation and index used on the prices	B.5.2 B.5.3 B.5.6	At the investment analysis considered at CEMIG Board's meeting held on 29/11/2007 the Operation and Maintenance costs applied were inferior than value at the estimate budget value (annexed), as a conservative measure the lowest O&M cost was considered in the investment analysis.	The Operational and Maintenance costs were applied by project participants in the financial analysis spreadsheets a variable cost and this value (R$ 719 thousands in 2010) is about 15% lower than the presented document (R$ 815 thousands).

7 Available at http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=054f163c9124d010VgnVCM1000005e01010aRCRD

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
adjustment must be provided.			This CL is closed.
~~**CL 9**~~ Clarify and justify if the energy distribution costs were discounted from the gross revenue of energy sales.	B.5.2 B.5.3 B.5.6	The energy distribution cost considered was established by ANEEL (Resolution n° 446 03/04/2007) which defines (R$4.16/MWh), in accordance with the the Law nr. 9648, issued on May 27th, 1998, SHPP receives a 50% discount on the energy distribution cost resulting (R$ 2.08/MWh).	The value of R$ 2.08/MWh was considered on spreadsheet "Valuation_Pipoca_2010.09.01.xls", as described on worksheet "Premissas" cell D45 This CL is closed.
~~**CL 10**~~ According to document "*Encaminhamento de Cronograma de Implantação*", dated 28/11/2008, sent to ANEEL, the total investment to SHP Pipoca is R$ 124 million and the applied spread is TJLP (Long Term Interest Tax) + 2.15. The value of the investment applied on "*Valuation_Pipoca.xls*" (R$ 114,411 million) is based on a minutes of meeting previous to above mentioned document, dated from 29/08/2008. Moreover, the spread applied on spreadsheet corresponds to TJLP +2.55%. These differences shall be explained/justified.	B.5.2 B.5.3 B.5.6	The project investment increased due a project design modifications identified after the first Meeting held on 29/08/2008. PP call the attention to the fact that the TJLP value is the same for both (29/11/2007 and 28/08/2008) valuation (6.25%) this value can be accessed at BNDES site8, the spread rate is a result of an analysis carried out by the financial institution. The financial institution´s spread rate varies conform the projects characteristics and the current economical policy. 2nd Response The first financial analyses presented to the Validation Team, had as reference CEMIG´s second meeting (27/08/2008) which reaffirmed the benefits of CERs revenues considering the EPC renegotiation that resulted in an increase of project´s total investment. This increment impacted on the total financing credit value. PP altered the investment analyses reference in order to attend a clarification raised by the Validation Team (see CL6), which called the attention to the fact that the investment	The total investment presented in the financial analysis spreadsheet "Valuation_Pipoca_2010.09.01.xls" (R$ 100.3 million) is different from the presented value in the first financial analysis in the spreadsheet "Valuation_Pipoca.xls". The presented document "Valor do Crédito-BNDES.pdf" contains a different value of the total financing credit (R$ 83.4 million) than the value applied in the spreadsheet "Valuation_Pipoca_2010.09.01.xls" (R$ 69.9 million). These differences shall be explained/justified. This CL is still open. Conclusion regarding client's Response # 2 The values of investment, presented on spreadsheet "Valuation_Pipoca_v2_en.xlsx" are in line with CEMIG´s Boarding meeting, dated 27/11/2007. The applied investment value of R$ 100,361,000, which was presented on also spreadsheet "Valuation_Pipoca_2010.09.01.xlsx" is lower than the value presented on spreadsheet

8 Available at http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Custos_Financeiros/Taxa_de_Juros_de_Longo_Prazo_TJLP/index.html

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		decision was taken prior to 27/08/2008 on 29/11/2007 (Minutes of Meeting of CEMIG Administrative Council) and the Validation Team requested to align all related parameters with investment decision´s period. Therefore, the lowest total investment value was adopted since it is the most conservative value for the IRR, and adequate with the available data at the investment decision period, as recommended the Guidance on the assessment of investment analysis (EB 39, annex 10), paragraph 6 which states: Guidance: Input values used in all investment analyses should be valid and applicable <u>at the time of the investment decision</u> taken by project participant. 3rd Response The percentage applied is consistent with the CEMIG´s Boarding meeting, dated 27/11/2007 where states that the project´s total equity consisted of 30,445 millions, and the total investment consists of 100,361 millions. Moreover this percentage (70%) is common practice in the business, this assumption takes into account that BNDES would finance 80% of all financeable items, which represents about 70% of the total investment, please refer to BNDES´s site where it describes that the bank´s financing conditions for renewable energy projects.	"Valuation_Pipoca.xlsx" of 114,411,000.00. Project participants are requested to clarify if the percentage of 69,66 % (cell J26) applied on worksheet "Assumptions" of spreadsheet "Valuation_Pipoca_v2_en.xlsx" is based on value of total investment. This CL is still open Conclusion regarding client's Response # 3 The values of investment presented by project participants are in line with presented evidences and the modifications that were made in other versions of financial analysis were conservative. The percentage applied to calculate the stockholders / BNDES portion of the investment is in line with the information presented by project participants and BNDES's site. This CL is closed
~~**CL 11**~~ Regarding the total project's investment of R$ 114,410,525.00, it is not possible to validate the	B.5.2 B.5.3	Considering Pipoca´s equity rate the total investment can be verified through the loan obtained with BNDES, which follows	All contracts mentioned by project participants are relevant to this analysis, however it was not presented the detail of the investment values. All

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
accuracy of the parameters presented in the calculation. All costs (sources) related to construction, equipments, etc shall be provided.		annexed. The value in it is higher than the one considered at the prior consideration´s time due the available information at the period. Since adopting the lowest value is a conservative measure, PP maintained the value indicated at CEMIG Board's meeting held on 29/11/2007. Please refer to the new IRR calculation spreadsheet. 2nd Response As previously mentioned, the total investment considered at the time of the investment decision was of R$ 100.3 million, the expected total investment value can be verified by CEMIG Administration Board's 58th meeting minutes (dated 29/11/2007) and by an energy article describing Pipoca´s project (annexed). As confirmed by the validation team with the document "Encaminhamento de Cronograma de Implantação", dated 28/11/2008, sent to ANEEL, the total investment to SHP Pipoca is R$ 124 million a much higher value then the one considered at the time of investment decision, a conservative assumption regarding the project´s addionality. 3rd Response Attached Follows additional contracts that sums up over R$ 111 million. 1. EPC Contract, considering the contractual amendments (R$ 99.071 million) 2. Land Acquisition (R$ 2.8 million) 3. Owner's engineer (R$ 2.57 million) 4. Environmental control plan (R$ 1.88	costs (sources) related to construction, equipment, etc. shall be provided by project participants. This CL is still open. Conclusion regarding client's Response # 2 The conservative approach in the investment values by project participants is correct. The evidences, such as contracts or estimative, still should be presented by project participants. This CL is still open Conclusion regarding client's Response # 3 All information presented by project participants are relevant and credible. This CL is closed.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		million) 5. Social improvement (R$ 0.46 million) 6. Road considering the contractual amendments (R$ 1.30 million) 7. Equipments for the connection line (R$ 0.35 million) 8. Bridge construction (R$ 0.28 million) 9. Topography survey for the connection line construction (R$ 0.11 million) 10. Substation Construction and equipment(R$ 0.65 + 0.36 million) 11. Insurance (R$ 1.8 million) There are several additional costs that weren't listed due difficulties in compiling a wide variety of small values contracts, nevertheless the total amount indicated already surpass the total investment cost considered in the investment analyses.	
~~**CL 12**~~ Provide evidences of the origin of the value of the energy supplied to internal loads presented (2.17 MWh/day) in the "*Pipoca_Estimated CERs_2009.10.*07" spreadsheet.	B.6.1.1	The parameter was an estimative, based on the Project developer's experience, since the internal loads are not considered on the CERs calculation, it was removed. Please refer to the second version of the CER spreadsheet. 2nd Response Pipoca´s assured energy was established by ANEEL Resolution #65, issued on 25/04/2004 (still effective). ANEEL Resolution # 464, dated 31/12/2009 was subtracted from the CERs spreadsheet; please refer the latest version of the	The CER spreadsheet "Pipoca_Estimated CERs_2010.09.01.xls" applies the assured energy of 104,244 MW that is in line with ANEEL Resolution #65, dated 25/04/2004. The CER spreadsheet also mentions the ANEEL Resolution # 464, dated 31/12/2009 to confirm the assured energy. Project participants are requested to clarify if the mentioned document # 464, dated 31/12/2009 is the ANEEL technical note. If so, revise the spreadsheet, considering the review of Pipoca´s Consolidated Basic Project, otherwise provide the mentioned ANEEL Resolution This CL is still open.

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		document.	Conclusion regarding client's Response # 2 The value of assured energy is on line with ANEEL Normative Resolution # 65, dated 22/05/2004. The CERs spreadsheet was revised (file: "Pipoca_Estimated CERs_2011.02.18.xls"). Project participants also applied the last available value of Brazilian grid emission factor, published by Brazilian DNA and revised the Sections A.4.4, B.6.3 (table 15). B.6.4, B.7.l.1 and Annex 1 of PDD version 3. This CL is closed
~~**CL 13**~~ Clarify if the modifications presented on the *Technical Note, nº 464 2009/CGH ANEEL* project were accepted or their expectation to occur and confirm if the value of assured energy used on emissions reductions calculation is still valid.	B.6.3.1	The ANNEL resolution number 1.695 issued on June 14th . 2010 defines the assured energy considering the plant´s modification. 2nd Response The assured energy was established by ANEEL Resolution # 65 (25/05/2004), still effective. And also, the technical note #464 (dated of 31/12/2009) in its 23 paragraph states that there was no need in reassessing the energy studies since no alteration on the total installed capacity was observed.	The ANEEL Resolution 1.695, dated 14/06/2010, describes that the minimum installed capacity of Pipoca SHP is 20 MW. It does not mention the assured energy. This CL is still open. Conclusion regarding client's Response # 2 The value of assured energy is in line with ANEEL Normative Resolution # 65, dated 22/05/2004. The energy was not modified as defined by ANEEL Technical Note #464, dated 31/12/2009. This CL is closed
~~**CL 14**~~ Evidences referent to the mentioned operational lifetime shall be provided.	C.1.2.1	According to ANEEL's resolution nº367, 02/06/2009 the lifetime of the equipments is over 30 years. Please see the reference annexed. 2nd Response Annex follows a letter from the generator's	The evidences of operational lifetime must be related to the equipments applied by the project activity. This CL is still open. Conclusion regarding client's Response # 2

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
		supplier and an email with an expert´s valuation9 from the company who supplied the Turbines nproviding an operational lifetime of 25 years. The PDD was also updated accordingly. 3rd Response Attached follows an email clearly specifying the lifetime of the installed Pipoca´s turbines. Moreover, the expert will be available for further clarifications at phone number +55 11 4133 0008 (Mr. Joel de Almeida, ANDRITZ HYDRO BRASIL LTDA).	Project participants provided a letter from GE Energy Motors (the manufacturer of generators), dated 28/07/2010 describing that the generators to be employed by SHP Pipoca present a life time of is 25 years. This letter (file "Vida_RI3633.pdf ") provided the following description of generators that was crosschecked with generator nameplate provided by project participants (DSC09910.jpg): • Generator type ATI. • installed capacity of 7,410 kVA. • Model 217R117, 6900 V-IP23 Evidence regarding the life time of turbines to be employed by project activity are still requested This CL is still open Conclusion regarding client's Response # 3 The e-mail provide by project participants, dated 03/05/11 sent by Mr Joel de Almeida (Commercial Director of turbine manufacturer) clearly indicates that the lifetime of turbines to be employed by Pipoca SHP is 25 years. This CL is closed
~~**CL 15**~~ The PPA contract between Hidrelétrica Pipoca S.A. and Stola do Brazil Ltda mentions that the seller (Hidrelétrica Pipoca S.A.) has received incentives for electricity generation. Project participants are requested to clarify/explain which are the mentioned incentives.	B.5.2 B.5.3	Small Hydro Power Plants have discount at the distribution system rate (50%) established by the Law nr. 9648, issued on May 27th, 1998.	The mentioned Law # 9648, dated 27/05/2008 defines on its article 26 that power plants with installed capacity between 1 MW and 30 MW have a discount of 50 % on the rates related to use of electricity transmissions and distributions systems. This CL is closed.

9 Joel de Almeida, available for further explanation at +55 11 4133 0008

Draft report clarifications and corrective action requests	Ref. to table 2	Summary of project participants' response	Validation team conclusion
~~CL 16~~ Letters sent to local stakeholders and the web link where the PDD in Portuguese was made publicly available shall be provided.	E.1.2 E.1.3	The letters, with the respective web link were where the PDD in Portuguese was made publicly available, were sent in August 10th, 2009. See the letters and their respective ARs attached to this response.	The letters sent to local stakeholder were provided and the web link where the PDD in Portuguese were made publicly available on 06/11/2009 at 10:31 is http://sites.google.com/site/consultadcp/. (Accessed by RINA on 03/11/2009 at 15:17 Brazilian time). This CL is closed.
~~CL 17~~ The section A.4 of published PDD indicates the text: (*ERRO! Fonte de referencia não encontrada*). The PDD shall be revised.	A.4.3.1	The section was revised and corrected. 2nd Response The document was revised; please refer to latest version of the document.	The text, still remains on section A. 4. of PDD version 2 (pages 4 and 5) and also in "substep 4.a (Page 26). This CL is still open. Conclusion regarding client's Response # 2 The PDD version 3 was revised accordingly. This CL is closed
~~CL 18~~ According to section B.7.2 of PDD version 1, Hidrelétrica Pipoca S.A. is the responsible for the calibration of energy meters. The Project participants are requested to clarify/explain in PDD if the mentioned energy meters are owned by PP or if they belong to the local utility.	B.7.1.4	The meters are owned by the Hidrelétrica Pipoca S.A. and are directly linked with CCEE, which is able to access all measured data remotely at any time. The meters are sealed and are submitted to periodic survey and recalibration procedures. 2nd Response The provided explanation was included at section B.7.2 as a footnote (number 34).	Project participants are requested to include the provided explanation on Section B.7.2 of PDD. This CL is still open. Conclusion regarding client's Response # 2 The PDD version was revised accordingly This CL is closed