FINAL VALIDATION REPORT

PAMPEANA ENERGÉTICA LTDA. AND VÁRZEA DO JUBÁ ENERGIA LTDA.

PAMPEANA AND TERRA SANTA SMALL HYDROPOWER PLANTS PROJECT ACTIVITY

Report No: 8000364947-08/366

Date: 2011-03-11

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Final Approval by: Rainer Winter (FA)	Organisational unit: TÜV NORD JI/CDM Certification Program
Client: Pampeana Energética Ltda. Várzea do Jubá Energia Ltda.	Client ref.: Mr. Ricardo Rêgo
Summary:	☒ positive validation opinion ☐ negative validation opinion

Pampeana Energética Ltda. and Várzea do Jubá Energia Ltda. have commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "Pampeana and Terra Santa Small Hydropower Plants Project Activity" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity consists in the construction of two small hydropower plants to export electricity to the grid.

A risk based approach has been followed to perform this validation. In the course of the pre-validation, 12 Corrective Action Requests (CARs) and 04 Clarification Requests (CRs) were raised and successfully closed. In addition no FAR has been issued.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (Brazil) and all relevant UNFCCC requirements for CDM.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 176,358 tCO_2e are most likely to be achieved within the 07 years (renewable) crediting period (1st July 2011 to 30th June 2018).

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation. The request for registration will not be submitted before the Letter of Approval (LoA) is issued by the Brazilian DNA.

Report No.: 8000364947 08/366	Subject Group: Climate Protection	
Report title: PAMPEANA AND TERRA SANTA SMALL HYDROPOWER PLANTS PROJECT ACTIVITY		
Work carried out by: Inga Köster (TL) Gilberto Andrade (TM) Fernando P. Pacheco (TM)		
Final technical review by: Alexandra Nebel (TR) Rainer Winter (TR)	Local technical review by -	
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Indexing terms

Climate protection
Kyoto Protocol
CDM
Validation

Abbreviations

ANEEL	Brazilian National Agency of Electric Energy
BAU	Business as usual
BCB	Brazilian Central Bank
BNDES	Brazilian National Bank of Sustainable Development
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CCEE	Brazilian Electricity Energy Trading Chamber
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CONAMA	Brazilian National Commission of Environment
CP	Certification Program
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
MME	Brazilian Ministry of Mines and Energy
ONS	Brazilian National System Operator
PDD	Project Design Document
QC/QA	Quality control/Quality assurance
QMS	Quality Management System
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1 OBJECTIVE / SCOPE

The purpose of a validation is to have an independent third party assess the project design. In particular the project's baseline, the monitoring plan (MP), and the project's compliance with

- the requirements of Article 12 of the Kyoto Protocol;
- the CDM modalities and procedures as agreed in the Marrakech Accords under decision 3/CMP.1
- the annex to the decision;
- subsequent decisions made by COP/MOP & CDM Executive Board and
- other relevant rules, including the host country legislation and sustainability criteria

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

The validation scope is given as a thorough independent and objective assessment of the project design including especially: the correct application of the methodology, the project's baseline study, additionality justification, local stakeholder commenting process, environmental impacts and monitoring plan, which are included in the PDD and other relevant supporting documents, to ensure that the proposed CDM project activity meets all relevant and applicable CDM criteria.

The information included in the PDD and the supporting documents were reviewed against the requirements as set out by the UNFCCC. The validation team has, based on the requirements in the Validation and Verification Manual/VVM/, carried out a full assessment of all evidences to assess the compliance of the project with the key areas as outlined in section V.E. and V.F. of the VVM (version 1.2, EB 55).

The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions. TÜV NORD JI/CDM CP can not be held liable by any entity for making its validation opinion based on any false or misleading information supplied to it during the course of validation.

The validation is not meant to provide any consulting to the project participants. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

2 GHG PROJECT DESCRIPTION

2.1 Project Characteristics

Essential data of the project is presented in the following Table 2-1.

Table 2-1: Project Characteristics

Item	Data		
Project title	Pampeana and Terra Santa Small Hydropower Plants Project Activity		
Project size	☒ Large Scale ☐ Small Scale		
Project Scope *(according to UNFCCC sectoral scope numbers for CDM)*	☒	1	Energy Industries (renewable- /non-renewable sources)
	☐	2	Energy distribution
	☐	3	Energy demand
	☐	4	Manufacturing industries
	☐	5	Chemical industry
	☐	6	Construction
	☐	7	Transport
	☐	8	Mining/Mineral production
	☐	9	Metal production
	☐	10	Fugitive emissions from fuels (solid, oil and gas)
	☐	11	Fugitive emissions from production and consumption of halocarbons and hexafluoride
	☐	12	Solvents use
	☐	13	Waste handling and disposal
	☐	14	Afforestation and Reforestation
	☐	15	Agriculture
Applied Methodology	ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 12.1)		
Crediting period	☒ Renewable Crediting Period (7 y) ☐ Fixed Crediting Period (10 y)		
Start of crediting period[1]	2011/07/01		

2.2 Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-2).

Table 2-2: Project Parties and project participants

Characteristic	Party	Project Participant
Host party	Brazil	Pampena Energética Ltda. (private entity)
		Várzea do Jubá Energia Ltda. (private entity)
		Ecopart Assessoria em Negocios Empresariais Ltda. (private entity)

[1] As per the final PDD (version 5)

Characteristic	Party	Project Participant
Other involved party/ies	NA	NA

2.3 Project Location

The details of the project location are given in table 2-3:

Table 2-3: Project Location

No.	Project Location
Host Country	Brazil
Region:	Mato Grosso state
City:	• Pampeana SHPP: Barra dos Bugres city • Terra Santa SHPP: Tangará da Serra city
Latitude:	• Pampeana SHPP: 14° 49' 48.29'' S • Terra Santa SHPP: 14° 47' 34.75'' S
Longitude:	• Pampeana SHPP: 57° 54' 41.68'' W • Terra Santa SHPP: 57° 58' 01.92'' W

2.4 Technical Project Description

The technical key data are provided in table 2-4 below

Table 2-4: Technical data of the project activity

Technical Characteristics	SHP Pampeana	SHP Terra Santa
Installed capacity (MW)	28	27.4
Reservoir Area (km^2)	4.17	6.25
Turbines		
Manufacturer	Vatech Hydro do Brasil Ltda.	Vatech Hydro do Brasil Ltda.
Type	Francis	Francis
Quantity	3	3
Nominal Power (MW)	9.3	9.5
Generators		
Manufacturer	Weg Equipamentos Elétricos S.A.	Weg Equipamentos Elétricos S.A.
Type	Syncronos	Syncronos
Quantity	3	3
Nominal Power (MW)	9.73	9.14

3 METHODOLOGY AND VALIDATION SEQUENCE

3.1 Validation Steps

The validation of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the project design document (PDD)
- Desk review of the PDD and supporting documents
- Validation planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft validation reporting
- Resolution of corrective actions (if any)
- Final validation reporting
- Technical review
- Final approval of the validation.

The sequence of the validation is given in the table 3.1 below:

Table 3.1: Validation sequence

Topic	Time
Assignment of validation	2008-09-11
Submission of PDD for global stakeholder commenting process	2009-01-16
On-site visit	2009-04-15
Draft reporting finalised	2009-08-13
Final reporting finalised	2011-02-23
Technical review on final reporting finalised	2011-03-11

3.2 Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the validation can be provided,
- Impartiality issues are clear and in line with the CDM accreditation requirements

a contract review was carried out before the contract was signed.

3.3 Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a validation team, consistent of one team leader and 3 additional team members, were appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 3-2 below.

Table 3-2: Involved Personnel

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence	Technical competence [4]	Host country Competence	Team Leading competence
☐ Mr. ☒ Ms.	Inga Köster	TÜV NORD CERT, Germany	TL	A	☒	-	☐	☒
☒ Mr. ☐ Ms.	Gilberto Andrade	TÜV NORD CERT, Germany	TM	E	☒	S	☒	☐
☒ Mr. ☐ Ms.	Fernando Pacheco	BRTÜV (TUV NORD Brazil), São Paulo	TM	E	☒	-	☒	☐
☒ Mr. ☐ Ms.	Rainer Winter	TÜV NORD CERT, Germany	TR[3], FA	SA	☒	S	☐	☒

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence	Technical competence [4]	Host country Competence	Team Leading competence
☐ Mr. ☒ Ms.	Alexandra Nebel	TÜV NORD CERT, Germany	TR[3]	A	☒	-	☐	☒

[1] TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer Team; FA: Final approval

[2] GHG Auditor Status: A: Assessor; E: Expert; SA: Senior Assessor; T: Trainee; TE: Technical Expert

[3] No team member

[4] As per S01-MU03 or S01-VA070 A2 (such as A, B, C.....)

Certificates of appointment for the above mentioned team members are enclosed in annex 6 of this report.

3.4 Consideration of Public Stakeholder Comments

Acc. to the modalities and procedures the draft PDD, as received from the project participants, has been made publicly available on the dedicated UNFCCC CDM website prior to the validation activity commenced. Stakeholders have been invited to comment on the PDD within the 30 days public commenting period.

In case comments are received, they are taken into account during the validation process. The comments and the discussion of the same are documented in annex 5 of this report.

3.5 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol is used. The protocol shows, in a transparent manner, criteria and requirements, means of validation and the results from pre-validating the identified criteria. The validation protocol reflects the generic CDM requirements each CDM project has to meet as well as project specific issues as applicable. The validation protocol serves the following purposes:

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

The validation protocol is described in Figure 1.

Validation Protocol Table A-1: Requirement checklist				
Checklist Item	***Validation Team Comment***	***Reference***	***Draft Conclusion***	***Final Conclusion***
The checklist items in Table A-1 are linked to the various requirements the project should meet. The checklist is organised in various sections. Each section is then further sub-divided as per the requirements of the topic and the individual project activity.	*The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the validation team and how the assessment was carried out. The reporting requirements of the VVM shall be covered in this section.*	*Gives reference to the information source on which the assessment is based on*	*Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CR or FAR (see below) is raised. The assessment refers to the draft validation stage.*	*In case a corrective action or a clarification the final assessment at the final validation stage is given.*

Figure 1: Validation protocol tables

The completed validation protocol is enclosed in Annex 1 to this report.

3.6 Review of Documents

The published PDD (version 1) and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

3.7 Follow-up Interviews

The validation team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for CDM.

During validation the validation team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in table 3-3.

Table 3-3: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Project consultant	- Chronological description of the project activity with documents of key steps of the implementation. - Current status of plant design - Technical details of the project realization, project feasibility, designing, operational life time, monitoring of the project - Host Government Approval - Approval procedures and status - Monitoring and measurement equipment and system. - Financial aspects - Crediting period - Project activity starting date - CER allocation / ownership - Baseline study assumptions - Additionality - Sustainable development issues - Monitoring - Analysis of local stakeholder consultation - Roles & responsibilities of the project participants w.r.t. project management, monitoring and reporting - National Legislation - Editorial issues of the PDD

A comprehensive list of all interviewed persons is part of section 7 ‘References’.

3.8 Project comparison

The validation team has compared the proposed CDM project activity with similar projects or technology that have similar or comparable characteristics and with similar projects in the host country in order to achieve additional information esp. regarding:

- Project technology
- Additionality issues
- Reasons for reviews, requests for reviews and rejections within the CDM registration process.

3.9 Resolution of Clarification and Corrective Action Requests

3.9.1 Definition

A **Corrective Action Request (CAR)** will be established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for validation of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered by the UNFCCC or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

3.9.2 Draft Validation

After reviewing all relevant documents and taken all other relevant information into account, the validation team issues all findings in the course of a draft validation report and hands this report over to the project proponent in order to respond on the issues raised and to revise the project documentation accordingly.

3.9.3 Final Validation

The final validation starts after issuance of the proposed corrective action (CA) of the CARs CLs and FARs by the project proponent. The project proponent has to reply on those and the requests are “closed out” by the validation team in case the response is assessed as sufficient. In case of raised FARs the project proponent has to respond on this, identifying the necessary actions to ensure that the topics raised in this finding are likely to be resolved at the latest during the first verification. The validation team has to assess whether the proposed action is adequate or not.

In case the findings from CARs and CLs cannot be resolved by the project proponent or the proposed action related to the FARs raised cannot be assessed as adequate, no positive validation opinion can be issued by the validation team.

The CAR(s) / CL(s) / FAR(s) are documented in chapter 4.

3.10 Technical review

Before submission of the final validation report a technical review of the whole validation procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the validation team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the validation opinion and the topic specific assessments as prepared by the validation team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

3.11 Final approval

After successful technical review of the final report an overall (esp. procedural) assessment of the complete validation will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

Only after this step the request for registration can be started (in case of a positive validation opinion).

4 VALIDATION FINDINGS

In the following table the findings from the desk review of the published PDD, visits, interviews and supporting documents are summarised**:**

Table 4-1: Summary of CARs, CLs and FARs issued

Validation topic [1)]	No. of CAR	No. of CL	No. of FAR
General description of project activity (A) - Project specification - Technical project description - Participation - Contribution to sustainable development - PDD editorial aspects - Technology to be employed	3	0	0
Project Baseline, Additionality and Monitoring Plan (B) - Application of the Methodology - Project Boundary - Baseline identification - Calculation of GHG emission reductions Project emissions Baseline emissions Leakage - Additionality determination - Monitoring Methodology - Monitoring Plan - Project management planning	8	4	0
Duration of the Project / Crediting Period (C)	1	0	0
Environmental impacts (D)	0	0	0
Stakeholder Comments (E)	0	0	0
SUM	**12**	**4**	**0**

[1)] The letters in brackets refer to the validation protocol

The following tables include all raised CARs, CLs and FARs. For an in depth evaluation of all validation items it should be referred to the validation protocols (see Annex 1). The findings of validation process are summarized in the tables below.

General	Finding CAR A1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Please refer to section A.4.1.4 of PDD. The geographic location seems not correct (as per google maps). Please make sure that the exact coordinates are given. Please also indicate how far both power stations are away from each other. Which station is placed upstream and which downstream. Revision of PDD is necessary. Additionally, the geographical coordinates of Pampeana SHP in PDD are different of the environmental report sent to the validation team. Correction it is necessary.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Google map information is based on an image from 07/06/2005, i.e., before of the construction of the plants. In this way, PPs will use official data from the ANEEL. Terra Santa: 14° 47' 34.75" S, 57° 58' 01.92" W (http://www.aneel.gov.br/cedoc/dsp20071871.pdf) Pampeana: 14° 49' 48.29" S, 57° 54' 41.68" W (http://www.aneel.gov.br/cedoc/dsp20071872.pdf) The distance between the plants is 7 km. Terra Santa is placed upstream.		
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The geographic locations of the plants were corrected in version 2 of the PDD according to ANEEL documents which are public available. Moreover, it was provided information on the plants location on the river flow and the distance between them (7 Km). Pampeana is placed downstream and Terra Santa upstream.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

General	Finding CAR A2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	As per guidelines for completing a PDD, in section A.4.3 of PDD it must be stated whether the baseline scenario is the same prior and after the project activity and whether the technology used is safe and sound.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The technology of SHP is well known in Brazil, and it is a safe and sound technology, using equipments made in Brazil. Manufactures of the equipments for SHPPs have been in Brazil for some decades. There were no equipments operating prior to the start of the implementation of the project activity. The baseline scenario is the same as the scenario existing prior to the start of implementation of the project activity.		

General	Finding CAR A2
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	All requested information was included on section A.4.3 of PDD version 2. The equipments used in the project activity are well known and commonly used in the host country in similar SHP projects. The project is a new project activity where no other hydro power stations have been in place before.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CAR A3		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In section A.2 of PDD the capacity of the power stations is given as 28 MW and 27.4 MW, for Pampeana and Terra Santa respectively. Table 2 in section A.4.3 shows a nominal power of 29.1 MW for Pampeana plant. Please correct the information for Pampeana hydro station as there is an inconsistency.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The correct information for Pampeana hydro station is 28 MW. The information in section A.4.3 was corrected.		
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The PDD was revised and the correct capacity of power station for Pampena included (28 MW).		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

General	Finding CAR B1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The table given in section B.3 exclude the emissions from the reservoir. As the reservoir is between the limits of 4 and 10 W/m² the project must account for methane emissions from reservoirs.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	It was informed in section B.3 of the PDD that emissions from reservoirs were included because the power density of the reservoir of both plants is between the limits of 4 and 10 W/m².		

General	Finding CAR B1
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Ok, it was inserted on PDD section B.3 the methane emissions due to the reservoir area as predicted on the applied methodology. Nevertheless in the table in section B.3. it is still written a "No" under the question "Included?". Please correct it to a "Yes".
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The table in section B.3 was corrected.
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	CAR closed. Table 4 in PDD section B.3 was correctly revised.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CAR B2		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Please refer to section B.5, Early consideration of CDM: This section needs revision and completion in the following issues: a) It should be included with date the GSP and Feasibility Study. b) it needs to be clarified why the GSP started one and a half years after construction start in Terra Santa. c) Clarify why the financial closure was after the purchase of the main equipment. d) The starting date of the project activity is only <u>one</u> point of time for <u>both</u> sites and therefore the earliest date should be select. Consideration under section C.1.1. is also necessary. e) What were the documents used to identify the construction date? What was the equipment considered?		

General	**Finding CAR B2**
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	a) GSP: from 15/10/2008 to 13/11/2008; FSR date: 03/10/2005 (there was no formal Feasibility Study Report; feasibility of both plants was discussed in the board meeting of 03/10/2005, which is also the evidence for consideration of CDM incentives). b) The PDD includes both plants. As shown by annexed document "Pampeana_Land disappropriation.pdf", the authorization for land disappropriation for Pampeana was issued only on 01/07/2008. It took some time to acquire the lands and define the construction time schedule. Only after this was done, PDD was sent to GSP. c) At the time the main equipments were purchased for Terra Santa and Pampeana, Brennand Group was purchasing equipments for four other SHPPs (Planalto, Santa Gabriela, Ouro and Ibirama). Since that was a big purchase, the group managed to get better prices and delivery time. Additionally, at that time, there was a boom in the purchase of equipments for SHPPs, so that prices were higher and delivery times were longer than normal. It must be also said that, in Brazil, the approval of financing by BNDES may take long, so that projects often start before it eventually occurs. Ecopart is assessing several CDM projects under the same condition. d) Starting date of the project activity is 18/05/2006 (construction permit for Terra Santa); e)Construction date considers civil construction start, for both plants: Pampeana:15/04/2007; Terra Santa: 15/12/2006; as shown by annexed documents "Pampeana_Construction Start.pdf" and "Terra Santa_Construction Start.doc".

General	Finding CAR B2
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	a) Ok, item solved. GSP and Feasibility Study dates were included on revised PDD. b) Ok, item closed. The GSP of the PDD was delayed due to the Pampeana plant land disappropriation order, which was guarantee only in July, 2008 according to ANEEL authorization. c) Ok, item clarified. It was clarified that the financial closure was after the main equipments acquisition because of a more attractive commercial transaction. At that moment, the Brennand Group was buying others equipment for different owned PCHs, what brings more complexity on the commercial negotiations with the equipment's manufacture. Therefore, the financial closure took longer than the expected. d) The starting date of the project was defined as the date of issuance of construction permit for Terra Santa plant (2006/05/18). e) Additionally, the construction dates of both plants were determined according to the construction contracts signed. However CAR remains opened as the early consideration of CDM (before starting date) could not be evidenced by the validation team by any document. Please, provide to validation team substantial evidence regarding the serious CDM consideration before the starting date of the project as per described on EB 49, Annex 22. The last revised version of the PDD mentions a Meeting Register that occurred on October 3, 2005, but it lacks of more supporting document/reference. Thus, the answer provided is not conclusive.
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Please find annexed (files "Step Zero Terra Santa" and "Step Zero Pampeana" evidence of early consideration of CDM: the registers of a meeting that occurred on October, 2005, as mentioned in the PDD, section B.5
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The meetings registers occurred on October 2005 were sent to the validation team and could be properly assessed. However, it is still necessary to evidence the real and continuous actions were taken to ensure the CDM status of the project. Please refer to EB 49 Annex 22 paragraphs 6 (b). Additionally, please revise section B.5 of the PDD including detailed information on the previous CDM consideration and please include the project milestones (preferably in tabular form).
Corrective Action #3 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The Section B.5. was revised, and the project milestones were included.

General	Finding CAR B2
DOE Assessment #3 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The project milestones were included in section B.5 of the PDD. However CAR remains opened considering the following consideration: I. Pampeana's installation license was issued on 2006/2/16, therefore before Terra Santa's license (2006/5/18). The last event was considered as the project starting date. The DOE requests clarification regarding the correctness on the starting date determination considering Pampeana's license issuance and the CDM Glossary of terms.
Corrective Action #4 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The issue was raised due a typing mistake, Pampeana´s construction license was issued on 2007/2/16 as indicated at the license, and the PDD was corrected accordingly. Please verify the latest version of the document.
DOE Assessment #4 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The installation license of both plants could be properly assessed and no deviations were detected. Additionally, the PDD was revised to be consistent with the evidences provided. However, please refer to the following pending issues: a) Start date definition: The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins. The issuance of a construction permit is not a "real action". Real action could be the purchase order of equipment (01/07/2006) b) After early consideration there is a gap of more than two years between MD and action to start CDM activities. (See EB49 Annex 22, paragraph 7-9). At least it is to provide a proper justification why the gap of more than two years is acceptable.
Corrective Action #5 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	a) The start date was altered, please see the latest version of the PDD; b) The list of continuous actions taken to ensure the CDM status of the project, at section B.5, was revised including an email sent on 01/02/2007 requesting preliminary data of Pampeana and Terra Santa. The email follows annexed.

General	Finding CAR B2
DOE Assessment #5 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	a) The starting date was revised to 2006/07/01, which corresponds to the purchase of order of main equipments. Sections B.5 and C.1.1 of the PDD were correctly revised. b) The management decision/early CDM consideration evidence (signed board meeting register dated 2005/10/03) mentions that the board decided to proceed with the CDM project implementation based on solicited studies. These studies were internally conducted by Brennand Group, which the result was the cash flow spreadsheet of the project. All input parameters of the cash flow analyses are detailed assessed in table A-3 of this report. The Feasibility Study mentioned in section B.5 of the PDD is the same cash flow spreadsheet of the project, but in its first version. In addition, the early CDM consideration can be further indirectly demonstrated by notable knowledge of the CDM scheme by Brennand Group before the project Management Decision and starting date of the project (2006/07/01). Since 2000 Brennad Group together with Koblitz Ltda. developed a partnership focused only in the development of renewable energy projects (BK Energia Participações Ltda.), which invests in several renewable energy projects. Particularly, Itacoatina and Arapucel are CDM registered projects (registration dates are respectively 2006/05/12 and 2006/12/15) and the Global Stakeholder process of both were realized before the MD of Pampeana project, in 2005/05/04 by TÜV SÜD. The facts above clearly demonstrate the confidence of Brennand Group in the CDM registration to reduce the investment risk of the project implementation./PCDM/ To complement, the continuous and real CDM acts can be evidenced by the email exchange between the PPs dated 2007/02/01 could be properly evidenced. The email was sent by Mr. Marco Mazaferro from Ecopart to Mr. Mozart Siqueira Campos Araujo, which is president of Brennand Group and at that time was the focal point contact with Ecopart, asking for specific technical data of Pampeana and Terra Santa project, such as installed capacity, capacity factor, reservoir area, plant chronogram and available licenses. /PCDM/
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CAR B3		
Classification	☒ CAR	☐ CL	☐ FAR

General	**Finding CAR B3**
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Please refer to PDD section B.5., Additionality: a) Sub-step 1a: Scenario one must be split up into two scenarios as for the PP these are completely different alternatives which have to be discussed separately. In the following, one of these alternatives has to be identified as the baseline candidate. The assessment must be clearly described. b) Calculation of WACC: The formula given in the PDD is not in line with the formula given in the excel sheet. c) Sensitivity analysis: Two parameters have been chosen: project revenue and running costs. It should be clarified why investment costs have not been included in the sensitivity analysis. d) Moreover, the IRR has been calculated over 15 years and the project lifetime is 25 years. According to EB 41 Annex 45 the fair value must be considered in the IRR calculation when choosing a shorter period for IRR calculation than the project lifetime. Thus, revision is necessary.

General	**Finding CAR B3**
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	a) Sub-step 1A was revised, as follows: To define the alternatives to the project activity, there is a two-sided analysis, taking into consideration the perspective of the project owner and the perspective of the country. Scenario 1: From the country's perspective, the alternative for producing a similar amount of energy, as the one the project is to provide, is the continuation of the current (previous) situation of electricity supplied mostly by large hydro with large reservoirs and thermal power stations. Scenario 2: From the project owner's perspective, the project allows the company to export electricity to the grid. Hence, the alternative to the project activity is the proposed project activity undertaken without being registered as a CDM project activity. b) IMPORTANT: The benchmark presented to the Project has changed from WACC of the company to the cost of equity of the hydro sector in Brazil, following the Guidance on the Assessment of Investment Analysis. The comparable return to the cost of equity is the equity IRR, and therefore, a new spreadsheet have been presented for the cash flow, paragraph 11 of the guidance. Calculation of WACC: The formula given in the PDD was corrected. c) Sensitivity analysis: Investment costs have been included in the sensitivity analysis. d) IRR calculation: IRR is now calculated over 25 years. IRR calculation includes the two first years of investment plus 25 years of operation, totalizing 27 years for Terra Santa and 28 years for Pampeana.

General	Finding CAR B3
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	a) It is necessary to revise Scenario 1 of sub-step 1a. Please separate the assessment of the large hydro and thermal power generation. One of these alternatives has to be identified as the baseline candidate and the assessment must be clearly described. b) The project benchmark was changed to the host country cost of equity of the hydro electric sector. Despite of that the cash flow spreadsheet was not sent to the validation team for a detailed assessment. Please make clear on the PDD and/or spreadsheet the source, justification and applicability considering the time of investment decision of all values applied in the financial analyses. Evidences must be provided supporting the parameters values used. c) and d) Additionally, a final assessment on the sensitivity analyses and the time considered for the cash flow analyses is only possible after the receipt of the financial spreadsheet from PP.
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	a) Regarding the baseline candidate: A recently published book, produced by authors from the University of São Paulo in May 2009, analyzes the expansion of the Brazilian national electricity system and considers that the technical-economic limit of hydropower projects is almost reached. In this context, the study points as a trend the implementation of fossil fuel thermal power plants or large projects in regions like the Amazon. The study states that, although investment in renewable energy in a long-term planning is being made, the Brazilian energetic matrix tends toward a more intensive use of carbon, mainly through the insertion of natural gas and coal thermal power plants. (Source: *O Setor Elétrico Brasileiro No Enfrentamento Dos Desafios Climáticos: Oportunidades Ocultas No Aproveitamento De Desperdícios* – Brazilian Electrical Sector Facing Climate Challenges: Hidden Opportunities for Energy Waste Reduction, by Flávio de Miranda Ribeiro, Francisco Carlos B. Santos and Marcos Praxedes - http://www.usp.br/mudarfuturo/2009/cap4.htm, with an abstract in English, and http://www.usp.br/mudarfuturo/2009/, São Paulo, May/2009). b) c) and d) Please refer to the new version of PDD and spreadsheet attached to this response.

General	Finding CAR B3
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The financial spreadsheet was sent to the validation team and the information on the baseline candidates was given in the PP answer above. However, CAR remains opened based on the following: a) Scenario 1 of sub-step 1a actually presents two separates alternatives to the project activity (large hydro and thermal power plant). Considering that these identified alternatives are completely different from each other, please separate the assessment of the large hydro and thermal power generation alternatives. One of these alternatives has to be identified as the baseline candidate and the assessment must be clearly described; b) The formula of Ke calculation in the financial spreadsheet is different from the one given in the PDD; c) The cited reference of the financial parameter "Rf - Yield of Sovereign BB Debt" could not properly assessed (the value applied was not found); d) The US inflation value applied was based on the 2005 reference year. However financial closure was on 2006; e) All input parameters applied in the financial analyses necessary to the equity IRR calculation for Pampeana and Terra Santa must be detailed indicated. All input data should be valid at the moment of investment decision and the sources shall be precisely referenced (title of document or website link, pages, paragraph, etc). The DOE strongly recommends PP to include all input parameters indicated in the financial spreadsheet "input" also in PDD section B.5 (please make reference to the source applied as per the requested information detailed above, i.e document, website, page).

General	Finding CAR B3
Corrective Action #3 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	a) Scenario 1 consists of the Brazilian interconnected system, which is composed by a mix of plants with different energy sources and specific characteristics (according to the most recent ANEEL´s database[2] the current grid is supplied by over 2,230 power plants, with different energy sources, such as: hydro, oil, natural gas, biogas, cane bagasse, wood, rice husk, coal, wind and nuclear). Considering the above explanation, Project Participants stress that the baseline scenario does not consider only one source of energy, therefore the simplification requested (to consider the interconnected Brazilian energy system as composed by only two kind of energy sources) is not the most realistic description. In order to avoid further miscomprehension PP changed the Scenario 1´s description (National Interconnected System). Hence, according to ACM0002 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 as described in the "Tool to calculate the emission factor for an electricity system".* b) The formula described at the PDD was corrected and is in accordance with the formula used in the cost of equity spreadsheet. The necessary reference to determine the Ke value was included. c) The hyperlink (http://www.bcb.gov.br/pec/indeco/Port/ie5-27.xls) was checked by PP and founded available, the referred spreadsheet, follows annexed. The parameter value *"Global 34 (Reabertura) - 28-year Brazilian Federal Bond - appropriate to the project cash flow period"* considered at Ke calculation can be checked at the cell H25, at IE5-27 spreadsheet. d) The benchmark analysis is a model based on the available data at the moment in which the analysis was developed. At the referred time the 2006 US inflation value wasn't available, therefore PP considered the 2005 US inflation value. e) The parameter´s references considered at the financial analysis were included, both at the PDD and the spreadsheets. Regarding the evidences related to IRR parameters, PP forwarded the BNDES financial contract pages that describes the parameters applied at Pampeana´s and Terra Santa´s financial analyses presented to the bank evaluation, as can be verified at: - Terra Santa BNDES financing contract (BNDES/FINEM nº 4001.451-9) page 30, annexed. - Pampeana BNDES financing contract (BNDES/FINEM nº 4001.452-7) page 30, annexed. - Cost of similar Projects, the SHPP Ombreiras balance sheet, follows annexed.

General	Finding CAR B3
DOE Assessment #3 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Topics a) to d) could be properly assessed. However item e) remains opened and was detailed assessed below (e to g): a) OK, topic solved. Step 1a was revised and scenario 1 description is clearly described in the revised PDD, which corresponds to the current practice continuation and therefore, electricity generation in the National Interconnected grid, not considering the project plant implementation. According to ANEEL more than 2,230 power plants are connected to the national grid using different energy sources, such as hydro, oil, natural gas, biogas, cane bagasse, wood, rice husk, coal, wind and nuclear. No deviations could be detected. b) OK, topic solved. The Ke formula given in the PDD was revised and it is now in accordance with the financial spreadsheet. No deviations could be detected. c) OK, topic solved. The spreadsheet used to determine the parameter Rf was made available to the DOE. The value was correctly identified using National official source form the Brazilian National Bank. d) OK, topic solved. PP provides sufficient clarification to justify the use of the 2005 US inflation value, as at the moment of investment decision (October 2005) the US inflation value of 2006 was not available yet. e) It is necessary to provide evidence/reference/document to the validation team supporting the identified values of the financial parameters determined based on the experience of the project sponsors in similar projects (O&M, Managerial, Transmission Costs and Losses). f) It is necessary to clearly indicate all the considered taxes and its applicable National Law/Regulation/Decree indicated in the financial parameter “Taxes”. It is not necessary to indicate one financial parameter for each of the taxes considered, but the overall calculation of the parameter must be detailed demonstrated indicating the reference of each applied value. The calculation approach must also be detailed provided. g) Considering the depreciation term of 30 years defined according to ANEEL Resolution No 24, the equipments fair value after the period considered at the cash flow analyses should be included as a cash inflow at the end of the analysis period is necessary. Therefore, revision/clarification is necessary.

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

<table>
<tr><th>General</th><th>Finding CAR B3</th></tr>
<tr><td>Corrective Action #4
This section shall be filled by the PP. It shall address the corrective action taken in details.</td><td>
e) The total operational costs (O&M, Managerial, Transmission Costs and Losses) can also be evidenced by an Eletrobrás´s study on SHPP (Diretrizes para estudo e projetos de Pequenas Centrais Hidrelétricas, page 31) attached. At the referred study, the total operational cost of a SHPP can be estimated as 5% the total investment value, which is consistent with the value applied at both IRR as shown:

Pampeana
<table>
<tr><th>Total operational Costs</th><th>Reference</th></tr>
<tr><td>R$ 5,384,996</td><td>Value in accordance with Eletrobrás SHPP study (5% of total investment: R$ 107,699,921)</td></tr>
<tr><td>R$ 5,261,203</td><td>Project sponsor´s experience (23% of the project revenue,R$ 22,879,147)</td></tr>
</table>
Terra Santa
<table>
<tr><th>Total operational Costs</th><th>Reference</th></tr>
<tr><td>R$ 5,967,525</td><td>Value in accordance with Eletrobrás SHPP study (5% of total investment, R$ 119,350,501)</td></tr>
<tr><td>R$ 5,076,412</td><td>Project sponsor´s experience (23% of the project revenue, R$ 22,071,357)</td></tr>
</table>
The total operational cost of Pampeana SHPP calculated by both methods have similar values (a difference below 5%), and at Terra Santa´s case, a greater difference is observed, nevertheless the values considered at both project´s financial analysis are smaller than the one foreseen by Eletrobrás study consisting of a conservative estimative.

f) The taxes references were included;

g) The fair value were included at the cash flow analyses, please refer to the latest version of financials spreadsheet and the latest version of the PDD.
</td></tr>
</table>

General	Finding CAR B3
DOE Assessment #4 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Topic e) was properly closed. However, please refer to topics g) and f) below that remains opened: e) Ok, item solved. The Eletrobrás study could be properly evidenced by the validation team. Considering that PP's estimative to the calculation of IRR are very similar and more conservative to the evidence provided by Eletrobrás the validation team agrees with the idfentified O&M costs. f) The references of the taxes applied were correctly included in the revised IRRs calculation spreadsheet. However, it is necessary to clear indicate in the IRR calculation to which value (i.e. net/gross income) the identified percentage of taxes are applied to. Revision/clarification is necessary. g) The applied fair value could not be properly assessed by the validation team. It is necessary to inlude this parameter in table 8 of PDD and clearly justify its applicability in the financila analyses.
Corrective Action #5 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	f) The taxes´s calculation and references were detailed in the revised IRR spreadsheet. g) The fair value was included in the financial analyses spreadsheet at the sheet´s "Inputs".
DOE Assessment #5 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	f) OK, item closed. The financial spreadsheet was revised and detailed information was included indicating to each parameter the taxes are applyed. g) OK, item closed. The fair value parameter was included in table 8 of PDD and revised spreadsheet. Detailed information regarding its calculation is clearly described in table 8 of the PDD.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☒ Additional action should be taken ☐ The project complies with the requirements

General	Finding CAR B4		
Classification	☒ CAR	☐ CL	☐ FAR

General	Finding CAR B4
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In the section B.5, the investment analysis, some parts were not traceable. Revision is required as follows: a) In sub-step 1b, is necessary to detail what is the mandatory laws and regulations of each entity. b) What is the source of parameter cost of debt? c) Please send to validation team the document that proves the participation of BNDES with 75% of equity in the project. d) Is necessary to send to validation team the bibliography used to calculate: the estimating the cost of equity (Ke) and the document used in footnote 8. e) Is necessary to explain why in yield of sovereign 15-year BB debt it was used data from May 2007? f) In parameter yield of sovereign 15-year BB debit, the value used was to 10 years. Please correct. g) In parameter 10-year BB credit risk premium over US treasures, why it was used data from 2005? h) In parameters 15-year US/Brazil inflation differential and international market equity risk premium is necessary to clearly indicate the source of data as it was not possible to acces the indicated reference. i) Clarification is also required whether personnel costs have been considered in the investment analysis.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	a) Mandatory laws and regulations of each entity cited in sub-step 1b are public and can be found in the following sites: http://www.ons.org.br, http://www.aneel.gov.br/?idiomaAtual=1, http://www.sema.mt.gov.br/ b) This parameter is not used anymore; shareholder IRR is now compared to the cost of equity. c) Since the considered benchmark is now the cost of equity of the market, participation of BNDES is not necessary in the calculation of the benchmark. d) Calculation and references are presented on Ke spreadsheet, which is calculated following CAPM (Capital Asset Pricing Model) methodology. e) Appropriate changes have been made accordingly. f) Appropriate changes have been made accordingly. g) Appropriate changes have been made accordingly. h) Sources of references have been informed accordingly. i) Personnel costs have been considered in the investment analysis.
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The parameters cost of dept and BNDES participation share are no longer applicable to the financial assessment as the new identified benchmark is the cost of equity. However, please refer to opened CAR B3, which requests a detailed description of all parameters applicable on the cash flow analyses and to send the financial spreadsheet to the validation team. CAR B4 can only be closed at the time of proper assessment of raised CAR B3.

General	Finding CAR B4
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	A detailed description the parameters applied on the cost of equity calculation, and evidence related to IRR calculation were presented. Please see CAR B3 answer.
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	CAR B3 could be properly closed. Therefore, the validation team agrees in closing this CAR. Please refer to raised CAR B3 above.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CAR B5		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In, methodological choices, section B.6.1, Step 4 and 5 of PDD the terms of the equation needs to be described. Correction is necessary.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	In section B.6.1, Step 4, the following information was included: The sample group of power units m used to calculate the build margin consists of either: (a) The set of five power units that have been built most recently, or (b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently.		
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Ok, corrected information included on step 4 of section B.6.1. Despite of that it is still necessary to include the parameters description of the formula given on step 5 of the same section of the PDD.		
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Parameters description of the formula given on step 5 of section B.6.1 was included.		
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Ok, parameters descriptions were included.		

General	Finding CAR B5
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CAR B6		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In section B.6.2 the following parameters should be included: EF_{Res} and the Plant load factor (PLF). Especially for the PLF it should be discussed and justify why it is 81 % and 86 % for the two plants. Please, give a reference where this factor comes from.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	According to annexed official document, from the Ministry of Mines and Energy, "Portaria MME n 100 (assured energy)", tracked in red, the average MW for Pampeana is 22.74 MW, for an installed power of 28 MW, resulting in a load factor of 81%. For Terra Santa, average MW is 21.94 MW, for an installed power of 27.4 MW, resulting in a load factor of 80% (and not 86%, as it was informed before).		
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Both requested parameters were included on section B.6.2 of the revised PDD. Despite of that it is necessary to fulfil the line justification of choice of data of the parameters table. The plant load factor was correctly identified according to an official document from the Brazilian Ministry of Mines and Energy.		
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Justification of choice of data was included in the parameters table.		
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Please fulfil the line justification of choice of data of the parameter justification of choice of data of the parameters table $EF_{Res.}$		
Corrective Action #3 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The line justification was fulfilled.		
DOE Assessment #3 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Ok, the parameters table in section B.6.2 were completed fulfilled. No deviation could be detected.		

General	Finding CAR B6
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CAR B7		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Revision of the following parameters given in section B.7.1 are necessary: a) EGy and TEGy listed in section B.7.1: Please, explain more detailed how the measurement will be carried out and at which meter the measurement will take place. Please, also explain how you will derive to the net electricity by measuring import and export. b) Cap_{PJ}: Clarify what is the recognized standard you refer to. c) A_{PJ}: Please describe how you measured the surface area of the reservoir. Describe the exact approach chosen. Give a QA/QC procedure to crosscheck the measurement. d) The monitoring parameters required to calculate the combined margin CO2 emission factor shall be included (cp. “Tool to calculate the emission factor for electricity system”). e) The monitoring frequency of A_{PJ} shall be included.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	a) EGy is measured by a meter model SL7000 (with redundancy), collected by CEMAT, which is the measurement agent. TEGy is measured by ABB meters model MGE at the output of the generators. Regarding net electricity, it is the energy measured by SL7000. So, it is a direct measurement. See also CLB3. b) Cap_{PJ}: Annexed official document, from the Ministry of Mines and Energy, “Portaria MME n 100 (assured energy)”, tracked in red, shows the installed power for both plants. c) $A_{PJ:}$ Topographical measurements of the reservoirs were made (see annexed document “Pampeana_Basic Project” , and “Terra Santa_Basic Project”). The information provided by the plants can be cross-checked with the official information in ANEEL’s site, which indicate maximum reservoir area for normal operation: http://www.aneel.gov.br/cedoc/dsp20071871.pdf (Terra Santa) http://www.aneel.gov.br/cedoc/dsp20071872.pdf (Pampeana) d) and e) Monitoring parameters A_{PJ} and the combined margin CO2 emission factor were included in the PDD.		

General	**Finding CAR B7**
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Topics b) and d) could be properly closed. The parameter Cap_{PJ} was correctly revised and information on the source used was included. Additionally, the parameters utilized for the EF calculation were correctly included on section B.7.1 of PDD. However, please refer to the following pending issues: a) It is still necessary to clarify on PDD the equipments used for EGy and TEGy measuring for each plant and their location. For the parameter TEGy it is necessary to revise the QA/QC procedures as it does not make sense (it mentions the electricity delivered to the grid and not the internal consume of electricity, which is also applicable to this parameter measurement). Additionally, Annex 4 is not completed and should be revised including the information of the QA/QC procedures. b) the parameter A_{PJ} was determined by topographic survey method carried out by an independent third party and could be crosschecked with official ANEEL's data public available on ANEEL website. Additionally, the parameter will be yearly monitored. Despite of that it is still necessary to fulfill the QA/QC procedure for this parameter on PDD.

General	**Finding CAR B7**
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Equipments used for EGy and TEGy measuring for each plant and their location. - EGy – meter model SL7000 (manufactured by ACTARIS, more details at http://www.actaris.com/html/products-1577.html). Pampeana - Physical Location: inside the substation, beside the powerhouse. Electrical Location: between the output of 138 KV transformers and the output breaker of the substation. Terra Santa - Physical Location: inside the substation, beside the powerhouse. Electrical Location: between the output of 138 KV transformers and the output breaker of the substation. - TEGy – meter model IDM 144 (manufactured by ABB, more details at http://www.tjm.com.br/IDM144.pdf). Pampeana - Physical Location: in the powerhouse. Electrical Location: at the output terminals of each generator. Terra Santa - Physical Location: in the powerhouse. Electrical Location: at the output terminals of each generator. - QA/QC procedures for parameter TEGy already mentions, in its description, that TEGy is the "total electricity produced by the project activity, including the electricity supplied to the grid **and the electricity supplied to internal loads**". It was corrected in the PDD, page 30, that information regarding QA/QC procedures is provided in section B.7.2, and not in Annex 4. - QA/QC were included at PDD. Please find annexed the documents "PCH PAMPAEANA PROJETO BÁSICO CONSOLIDADO RELATÓRIO FINAL", and "PCH TERRA SANTA PROJETO BÁSICO CONSOLIDADO RELATÓRIO FINAL" referring to the applied procedures and equipments used.
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Pending issues: a) Please clearly explain how the internal consume of energy will be monitored to identify the TEGy parameter of both plants. Additionally, please include the given in formation in this raised CAR response w.r.t the applied meters also in the PDD.
Corrective Action #3 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The data collected at the meters (ABB IDM 144) will be consolidated in internal reports. These data are operational parameters that must be observered during the plant operation.

General	Finding CAR B7
DOE Assessment #3 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Please, clearly describe in the PDD what will be the measurement procudure of the electricty delivered to the grid and the total electricity generation (electrticity for internal consume plus delivered to the grid) for each plant including the monitoring frequency of the data to be compiled. What are the type (class and accuracy) of the meters involved (main and backup) in each parameter calculation. Where are the exact location in the plant of each meter applied in the above parameters identification? Additionally, please detailed describe the calibration frequancy of the meters applied.
Corrective Action #4 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Both SHPP have the same configuration concerning the total electricity generation. A meter is installed at the output of each generator (IDM 144 (manufactured by ABB, more details at http://www.tjm.com.br/IDM144.pdf). These measurements are crosschecked by another IDM 144 meter (with the same specification) installed after the auxiliary system. The generators are located at the powerhouse of each SHPP. The location and technical specification were also included in the PDD at section B.7.2., please verify the latest version of the document. The meter´s calibration will be carried out every two years.
DOE Assessment #4 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The measurement and procedures for monitoring the total electricity generation and the electricity delivered to the grid are clearly described in PDD section B.7.1 and B.7.2 Additionally, the applied electricity meters were detailed described in PDD section B.7.2 including its calibration frequency, type and location.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CAR B8		
Classification	☒ CAR	☐ CL	☐ FAR

General	Finding CAR B8
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Revision of the calculations spreadsheet is necessary with respect to the following issues: c) Cell F9 the formula is linked to a blank cell (D9). d) Pampeana info: What is meant by the different dates for commercial generation (cell B9), do they influence the calculation? e) Pampeana info: Net energy generation (cell C17): make transparent the input value of "28". What does it mean? f) IRR: Give an overview in an extra sheet with all input values used for the analysis to make the calculation transparent. (e.g. it is not clear how you come to the project revenue (what is the price per kWh) or how you calculated the depreciation). Furthermore the result of cells R7 of the following sheets is not displayed correctly: project cash flow, cost- and price sensibility-analysis. g) General: Please make sure that all abbreviations are explained and transparent.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	- In the revision of the calculation spreadsheets (file "Pampeana&Terra Santa_CERs_2009.08.05_v.2.xls"), page "Table 9", cell G9 is now linked to D10. - Those dates, referred at cell B10, as now indicated in the revision of the spreadsheets (file "Pampeana&Terra Santa_CERs_2009.08.05_v.2.xls"), correspond to the operation starting dates of each turbine. - 28 MWh is the energy consumed by the auxiliary systems, in each plant. This value is used in the estimations of EG Facility in the PDD, as explained in CLB3. - IRR: appropriate changes have been made.
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	CER calculation spreadsheet revised accordingly. Please refer to opened CAR requesting the financial spreadsheet to be sent to DOE.
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Please find annexed the revised CER calculation spreadsheet.
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The CERs calculation spreadsheet was separated from the financial analyses. No deviations could be detected in the CERs calculation spreadsheet. However, please refer to opened CAR B3 w.r.t the financial analyses. Considering that the CAR B3 was maintained opened and the CERs calculation spreadsheet was correctly revised the validation team agrees in closing this raised finding.

General	Finding CAR B8
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CL B1		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	The referenced methodology in section B.1 of PDD is ACM 0002 version 7. As the deadline for this is in August 2009 it should be considered to change to the new methodology version.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The referenced methodology in section B.1 of PDD is now ACM 0002 version 10		
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	ACM 0002 version 10, the last version available on UNFCCC website, is now applied on the project activity.		
Description of finding #2 *Describe the finding in unambiguous style; address the context (e.g. section)*	The CAR was re-opened as the version 11 is now available in the UNFCCC website.		
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	ACM 0002 version 12.1, the last version available on UNFCCC website, is now applied on the project activity.		
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Ok the last version of the applied methodology is applied. Therefore, CL is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

General	Finding CL B2		
Classification	☐ CAR	☒ CL	☐ FAR

General	Finding CL B2
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In section B.7.2, monitoring plan, it is necessary to clarify which one of the meter is bidirectional, where the main measurement will be carried out and what will happen in cases if a meter fails. Furthermore, please clarify whether there are any transmission losses to be considered and how will the data be stored?
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Meters for the measurement of EGy, model SL7000, are bidirectional. This measurement is carried out at the output of the 138 KV transmission line for each plant and it is redundant, so that, in case the first meter fails, the second automatically replaces it. There are no transmission losses to be considered, since measurements are carried out at the output of the 138 KV transmission line for each plant.
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The above given information must be included on PDD section B.7.2.
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Information was included in section B.7.2 of the PDD.
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Ok, information included in the revised PDD.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☒ Additional action should be taken ☐ The project complies with the requirements

General	Finding CL B3		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In tables 8 and 9 in section B.3, column net energy generation, it is necessary to explain which are values used to calculate this parameters. Additionally, please explain more detailed the calculation.		

General	Finding CL B3
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The denomination of columns "net energy generation" was changed to "EG Facility,y (MWh)". These values are measured directly by energy meters model SL7000, at the output of the 138 KV transmission lines for each plant, so that there is no calculation. The name of column "Electricity dispatched into the grid (MWh)" was also corrected, to "TEGy (MWh)". These values are measured directly at the output of the generators by ABB meters model MGE. Hence, no calculation will be involved in the measurement of these two parameters. Only the estimation of "EG Facility" in the PDD subtracts the energy consumed by the auxiliary equipments (28 MWh/day) from the total energy produced by the generators.
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Tables were correctly revised and sufficient information given to close the CL.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CL B4		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In the IRR calculation spreadsheets of Pampeana and Terra Santa there is an extra amount of 10000000 R$ for O&M costs in years 13 and 23 of both cash flows. This amount has not been explained under input parameters in PDD and excel sheet. This amount shall have a link to input data and a reference shall be given.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The amounts indicated at year 13, and year 23 are related to the Plant´s equipment preventive maintenance, this procedure is schedule to take place every 10 years after the plant´s full operation. This value is coherent with the evidence already presented (Eletrobrás studies on SHPP). The O&M average applied in the IRR analyses is R$ 5,3 million/year. Eletrobrás studies on SHPP foresees 5% of the total investment value (R$ 5,38 million/year for Pampeana and 5,97 million/year for Terra Santa), therefore the value adopted by PP consists of a conservative approach.		

General	Finding CL B4
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The extra cost presented in years 13 and 23 of the cash flow consists of estimative costs of preventive equipment's maintenance cost that is expected to occur every 10th year. The value applied is adequate and conservatively determined considering Eletrobrás public available data. In the IRR cash flow a more conservative value of R$ 5,3 million/year has been applied instead of a higher value when taking in to account 5% of the total investment. Please refer to table A-3 of this report for detailed assessment on O&M costs. The CL is closed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

General	Finding CAR C1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	In section C.2.1.1, the starting date of the crediting period needs to be changed to a more realistic date considering the time necessary for the validation and registration process of MDL.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The starting date of the crediting period was changed to 01/01/2010.		
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The date revised is still not conservative considering the time for finalizing the validation, LoA issuance form Brazilian DNA and UNFCCC request for registration.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The starting date of the crediting period was changed to 01/05/2010. All the calculations were modified accordingly.		
DOE Assessment #1 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Considering that we are in May 2010, the date revised is still not conservative considering the time for finalizing the validation, LoA issuance form Brazilian DNA and UNFCCC request for registration.		
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The starting date of the crediting period was changed to 01/07/2011. All the calculations were modified accordingly.		

General	Finding CAR C1
DOE Assessment #2 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Revision is necessary considering that the indicated crediting period in the revised PDD is not in accordance with the above information.
Corrective Action #3 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The PDD was revised considering the indicated crediting period, please see the latest version of the PDD.
DOE Assessment #3 *The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Ok, the PDD was revised adressing consistently the defined starting date of the creditong period (2011/07/01).
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements

5 VALIDATION ASSESSMENT SUMMARY

5.1 General Description of the Project Activity

5.1.1 Participation

LOA

In accordance with the CDM M&P at the stage of validation a Party involved may or may not have provided its approval at the time of making the PDD public. The approval of the parties involved is required at the time of requesting registration.

At the time of the completion of this report the LoA for Brazil (host country) is pending. For the Brazilian DNA a positive validation opinion is a prerequisite for the host government approval and thus the LoA cannot be considered at the present validation stage. The request for registration will not be submitted before it has been issued by the DNA.

Project Participants

The party involved in the project activity is **Brazil** (Host Party).
The project participants are:

- Pampeana Energética Ltda. (private entity)
- Várzea do Jubá Energia Ltda. (private entity)
- Ecopart Assessoria em Negocios Empresariais Ltda. (private entity)

All information provided in section A.3 and Annex 1 of the PDD are consistent.

5.1.2 Contribution to Sustainable Development

The project participant contributes to the sustainable development through the following actions: clean and renewable electricity generation, better working conditions and increases opportunity for employment and contribution for local economy. More detailed information can be found in the section A.2 of the PDD.

Nevertheless , the national confirmation to the sustainable development will only be confirmed with the LoA issuance by Brazilian DNA, which will only be issued based on the final revision number of this Validation Report.

5.1.3 PDD editorial Aspects

The CDM SSC PDD completing Guide form version 3 was applied. The PDD has in general been filled in accordance with the PDD guidelines. Nevertheless several editorial changes were discussed with the PP in order to improve the PDD.

5.1.4 Technology to be employed.

The PDD and technical data of the plant's equipments were reviewed in detail. Interviews were performed with the PPs and a plant tour was realized during on-site visiting. Detailed information regarding the equipments to be used in the project scenario is transparently provided. The description of the project in the PDD is complete and accurate.
The proposed CDM project comprises two small power plants with total capacity of 55.4 MW (28 MW Pampeana and 27.4 MW Terra Santa). The project technical design does reflect current good practices as the implemented technology is state-of-art and will contribute to climate change mitigation. No technology transfer is involved in the project activity. Pampeana Energética Ltda. and Várzea do Jubá Energia Ltda. are the companies responsible to operate Pampeana and Terra Santa small hydro power plants, respectively. Both companies are 99% owned by Brennand Group/bre/.
In the host country (Brazil), it's stated that SHP has to comply with the following condition:

- The area of the reservoir must be less than 3 Km^2 (300 ha) and generation capacity must be between 1 MW and 30 MW.

In some specific cases ANEEL can grant the PCH status of a determined hydro power plant with reservoir bigger than 3 Km^2, which are the cases of Pampeana and Terra Santa plants. As the reservoirs of both plants results on a minimum environmental impact, ANEEL's Resolutions indicates the PCH status of both plants.
The objective of the project activity is to reduce GHG emissions by replacing electricity of the SIN which has at least one fossil fuel unit. The project activity is estimated to reduce GHG emissions equivalent to 25,194 tCO_2e annually.
For an in depth evaluations of all validation items please refer to the validation protocol (Annex). The Annex also includes all CARs, CRs.

5.1.5 Small Scale Projects

Not applicable.

5.2 Project Baseline, Additionality and Monitoring Plan

5.2.1 Application of the Methodology

The project applies the latest version of the approved methodology ACM 0002 version 12.1 (valid from 2010/09/17 onwards). The project is in line with all requirements and stipulations mentioned in all sections of the applied meth (see also check list question B.1.4 below in the Annex). The project activity is not expected to result in significant emissions, related both to project and leakage, other than those listed in the methodology.

In order to assess the applicability of the project, the PDD was reviewed and the applicability determination of the PDD was counter checked against the criteria given in the applicability section of the methodology. The information in the PDD was checked during on-site visit to prove that such information is valid and reflects the reality of the project.

The methodology is applicable under the following conditions:

- **For grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).**

The project activity fits option (a), as it consists of the implementation of a new small hydro power plant/unit.

- **The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir 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;**

The project activity is the installation of a new small hydro power plant/unit.

- **In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 10 to calculate the parameter $EG_{PJ,y}$): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;**

Not applicable to the project activity as it consists of a new small hydro power plant.

- **In case of hydro power plants, one of the following conditions must apply:**

  a. **The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or**

Not applicable to the project activity.

  b. **The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the**

project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m2; or

Not applicable to the project activity.

c. The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m2

Pampeana and Terra Santa Small PCHs are small hydro power plants with new reservoirs and with power density of 6.71 W/m^2 and 4.38 W/m^2 respectively

- **The methodology is not applicable to the following:**

a. Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;

Not applicable to the project activity.

b. Biomass fired power plants;

Not applicable to the project activity.

c. Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m2.

As explained above, the power densities of both power plants are higher than the defined limit.

See also section B.1 of the protocol below.

5.2.2 Project Boundary

The project´s spatial and system boundaries are clearly defined in the project documentation. The project encompasses Pampeana and Terra Santa PCHs and all physically connected power plants of the Brazilian National Interconnected System. The boundary definition is in line with the applied methodology.

Moreover, all sources and GHGs required by ACM 0002 are included in the table in section B.3 of the PDD.

5.2.3 Baseline Identification

The baseline is determined according to the applicable methodology and does not require alternative baseline consideration. The identified baseline 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".*

5.2.4 Calculation of GHG Emission Reductions

In this project, the grid emission coefficient is calculated by "combined margin method" consisting of the combination of "operating margin (OM)" and "build margin (BM)" according to the procedures prescribed in the "tool to calculate the emission factor for an electricity system"/TEF/. Thus emission reductions for this project activity will be the amount of electricity supplied to the grid multiplied with the emission coefficient of the National Interconnected System (SIN).

As per Brazilian Designated National Authority (DNA) Resolution No. 8, SIN must be considered as a unique System. Emission factors calculated for the single system have been made available on the DNA website/dna/. The calculation follows the methodological tool "Tool to calculate the emission factor for an electricity system", version 2 approved by the CDM Executive Board.

The emission reductions (ER_y) of the project activity during the crediting period are the difference between the baseline emission (BE_y), project emission (PE_y) and leakage (L_y).

Baseline emission: BE_y is calculated by multiplying the electricity baseline emission factor or grid emission factor (EF_y) and the net electricity exported to the SIN (EG_y).

The grid emission factor will be determined *ex-post* and estimated as a combined margin (CM), consisting of the weighted average of dispatch data analysis operating margin (EF_{OM}) and build margin (EF_{BM}) factors to calculate the emissions reductions. The weight factors are default both for build and operating emission factors (w_{OM} = w_{BM} = 0.5). Thus $EF_{CM} = 0{,}5*EF_{OM} + 0{,}5* EF_{BM}$.

The calculation is based on data published by Brazilian DNA. For the ex-ante estimation of emission reductions the grid emission factors based on data of the year 2007 has been applied. Thus EF_{CM} is 0.1635tCO_2/MWh (i.e., EF_{OM} = 0.2476 tCO_2/MWh and EF_{BM} = 0.079 tCO_2/MWh).

The validation team is convinced that the identified EF_{gridCM} is properly calculated. The emission coefficient calculation is deemed to be adequate and transparent. All data required for emission coefficient calculation are derived from publicly available data of DNA website/dna/.

Project emission: The project emission is considered as zero. As indicated in ACM 002 if the power density of the power plant is greater than 4 MW/ km^2 and less than

or equal to 10 MW/ km^2, project emissions from the reservoir (PE) should be accounted as option a) of the methodology. As the power density of both power plants that consists this project are above 4 MW/ km^2 and below 10 MW/ km^2 (Pampeana 6.71 MW/ km^2 and Terra Santa 4.38 MW/ km^2), PE was calculated using option a), where PE is equal the default emission factor for emissions from reservoirs (the default value as per EB23 decision is 90 Kg CO_2e/MWh) multiplied by the total electricity produced by the project activity (including both power plants, the electricity supplied to the grid and the electricity supplied to internal loads) divided by 1000.

Leakage: The technology introduced is not transferred to or from another project activity. Thus leakage can be ignored.

The emission reduction calculation was reviewed by the validation team. All underlying data/ values are transparent presented and assessed to be adequate.

The assured energy (22.43 MW for Pampeana and 21.89 MW for terra Santa) used for the calculation is provided in the Brazilian Ministry of Mines and Energy website (http://www.mme.gov.br/mme/galerias/arquivos/legislacao/portaria/Portaria_n_135-2007.pdf).

Acc. to the final PDD the project is expected to reduce emissions of 176,358 tCO_{2e} over the 7 years crediting period.

Please refer to section B.5 of Annex 1 below for more detailed assessment.

5.2.5 Additionality Determination

Consideration of CDM in decision making (if project start before validation)

The project starting date was determined based on the date of purchase order of the main equipments for the two power plants (2006/07/01)/SD/. The project starting date is before 2nd August 2008. Therefore, the previous CDM consideration as per EB 49, Annex 22 must be properly assessed by the validation team as follows:

On 2005/10/03 the minutes of the Board Meeting has been provided, which corresponds to the management decision /MD/ to proceed with the project, where São João Energética Ltda. and Nova Energética Ltda, which are special purpose companies of Brennad Group that holds the concession to exploit and operate Terra Santa and Pampeana hydropower plants/bre/, considered the CERs revenues as decisive to this project implementation. The MD minute registers mentions that the board decided to proceed with the CDM project implementation based on solicited studies. These studies were internally conducted by Brennand Group and the result was the cash flow spreadsheet of the projects. All input parameters of the cash flow analyses are detailed assessed in table A-3 of this report. The Feasibility Study mentioned in section B.5 of the PDD is the same cash flow spreadsheet of the project in its first version from 2005. In addition, the early CDM consideration can be further indirectly demonstrated by notable knowledge of the CDM scheme by Brennand Group before the project Management Decision and starting date of the project (2006/07/01). Since year 2000 Brennad Group together with Koblitz Ltda. developed a partnership focused only in the development of renewable energy

projects (BK Energia Participações Ltda.), which invests in several renewable energy projects. Particularly, Itacoatina and Arapucel are CDM registered projects (registration dates are respectively 2006/05/12 and 2006/12/15) and the Global Stakeholder process of both were realized before the MD of Pampeana project, in 2005/05/04 by TÜV SÜD. The facts above clearly demonstrate the confidence of Brennand Group in the CDM registration to reduce the investment risk of the project implementation./PCDM/

To complement, the continuous and real CDM acts can be evidenced by the email exchange between the PPs dated 2007/02/01. The email was sent by Mr. Marco Mazaferro from Ecopart (CDM consultant) to Mr. Mozart Siqueira Campos Araujo, which is president of Brennand Group and at that time was the focal point contact with Ecopart, asking for specific technical data of Pampeana and Terra Santa project, such as installed capacity, capacity factor, reservoir area, plant chronogram and available licenses./PCDM/ Therefore the validator concludes that the gap of action is below 2 years and that reliable evidences have been presented to show continuous action on the CDM development of the project activity.

Application of methodology / methodological tools

In section B.5 of the PDD it is described the additionality determination. The sequence utilized by the PP to demonstrate the additionality of the project has followed the step-wise approach described in version 5.2 of the "Tool for the demonstration and assessment of additionality". The additionality is demonstrated by investment benchmark analyses (option III). The equity IRR was compared with the Cost of Equity (Ke) of the sector. Please refer to tables A-3 for a detailed assessment of the project financial parameters.

Alternatives

The list of alternatives contains the status-quo and the project activity not undertaken as a CDM project. No other alternatives have been analysed as viable. The PP states that without CDM benefits, the project could not be developed.

As the baseline is directly given by the methodology ACM 0002, the selection of alternatives is not required, otherwise all possible market alternatives for generation of electricity would have to be listed, such as eolic, biomass, fossil fuel based thermo electric power plants, etc.

The alternatives described in the PDD are in agreement with mandatory laws and regulations and there is no legislation in Brazil preventing any of the identified alternatives.

Investment Analyses

It is demonstrated by the investment barrier analysis that the project scenario is not the most attractive alternative without benefits from CER sales. The latest version of the Guidance on the Assessment of Investment Analysis (EB51 Annex 58) was applied in the assessment and the calculation approach is correct.

A benchmark analysis was correctly chosen for the financial assessment, which is deemed appropriate as the project generates other financial benefits (electricity sell revenues) than the sales of CERs, and therefore Option I (Simple Cost) could not be used and Option II is not appropriate because the alternative to the project (continuation of current practice) will not requires investment from the PP.
The equity IRR calculation was reproduced by the validation team for both PCHs. The source of IRR calculation is assessed to be adequate and the assumptions stated in the reports are assessed to be reasonable. The project's IRR was estimated to be 12.16% for Pampeana PCH and 12.94% for Terra Santa PCH, without CERs income. The IRRs are based on the project lifetime of 28 years (25 years + 3 years construction) and are compared with the Brazilian Cost of Equity (Ke) of the sector, which is 16.2% and it is considered suitable for the project activity. The Ke and IRRs calculation could be properly assessed by the validation team. Please refer to calculation spreadsheet attached to this project documentation.
It was clarified by the PP that the project financing and feasibility study phase (2005 to 2007) took longer than the expected because of a more attractive commercial transaction. At that time, Brennand Group was buying others equipment for different owned PCHs, what brings more complexity and time consume on the commercial negotiations with the equipment's manufacture.
All parameters are assessed to be plausible and were cross-checked with documental evidence or publicly available sources, as described in detail in section B.4 of Annex 1 and also Table A-3, Annex 3 below.

Sensitivity Analyses

A sensitivity analysis (varying plus or minus 10%) of the major impacting parameters in the cash flows was realized. All parameters that relevantly impact the cash flow analysis (tariff, energy generation, plant load factor, O&M costs and total investment) were included in the sensitivity analysis. The sensitivity analysis provided by the PP clearly shows that the financial investment is very robust, as in no case a variation of +-10% of the above parameters could reach the breakeven point. Therefore, the likelihood of significant variation of the parameters is deemed low.

Only in the cash flow of Pampeana considering 10% lower investment over a time of 28 years leads to an IRR of 16.19%, which is nearly reaching the benchmark of 16.2%. Considering the most conservative assumption for investment data from 2005 in contrary with the actual paid amount of investment, the increase of investment was and is very unlikely. Further the long time span of 28 years is considering a very conservative approach. The validation team is convinced that this situation would not happen.

Exactness of calculations

Moreover, the financial spreadsheet presented was thoroughly checked so that each formula, reference and input value was reviewed to ensure that the calculations were correctly presented.

Conclusions
Finally, considering the provided documents, interviews with the financial consultant, the result of the financial calculation and TUV´s local expertise, the validator considers the investment analyses robust and therefore CDM income decisive for project implementation.

Please refer section B.4 of Annex 1 and also Table A-3, Annex 3 below for a more detailed assessment of all financial parameters.

Barrier analysis

Not applicable as no barriers were claimed to this project activity.

Common practice analysis

Considering that Brazil has a very big territorial extension, different climate regions and that these varieties of climate directly influence in the technical aspects related to a small hydropower plant implementation, the common practice analyses is based on power plants in the same region of the project (Mato Grosso state). Additionally, no large scale hydropower plants (installed capacity over 30 MW) were analyzed.
ANEEL official data from April 2004 to June 2009 /ANEEL/ regarding small hydro power plants that started operation in Mato Grosso state identifies the SSHPs that received some kind of incentive to its development (CDM or PROFINA). There were 18 SSHPs under operation in Mato Grosso at 2009, 14 of them received incentives from CDM or PROFINA. PROINFA is a renewable energy incentive program, which includes biomass, wind, and small hydro power plants. In this program, renewable energy projects sign long-term PPAs (Power Purchase Agreements) with a guaranteed higher price. The proposed project activity does not get incentives from the PROFINA program. All four SSHPs implemented without incentives have a significant less installed capacity (2-6 MW) than the project activity. Therefore, the validation team concludes that the financial incentive is decisive for this type of project activity implementation in the project region.

Summary

As described in the PDD and assessed in detail in the Annexes below, the additionality demonstration is based on the financial analysis and clearly shows that the project activity is not the most attractive alternative as its IRR is lower than the identified benchmark and it requires a significantly high investment.

5.2.6 Monitoring Methodology

The monitoring plan in the PDD is in compliance with the applied monitoring methodology ACM 0002 and it is assessed by the validation team as adequate and feasible. For details see section B.6 of the Annex below.

5.2.7 Monitoring Plan

The monitoring plan in the PDD covers all parameters which have to be monitored w.r.t. the project boundary in line with monitoring methodology ACM 002 and the monitoring arrangements are assessed by the validation team as adequate and feasible.

The monitoring of all baseline parameters is sufficiently addressed. It consists of metering the net electricity delivered to the grid (EG_y) of both plants, the total energy generation by both plants (TEG_y), the installed capacity of both plants after the project implementation, the area of the reservoirs of both power plants after the project implementation and the grid emission factor ($EF_{grid,CM,y}$.) based on combined margin (CM), consisting of the weighted average of operating margin (EF_{OM}) and build margin (EF_{BM}) factors. The $EF_{grid,CM,y}$ will be determinate *ex-post*, according to values published by DNA publication. EG_y will be measured continuously and recorded monthly. Monitoring of project emissions from the reservoir depend on the monitoring of EG_y and TEG_y as a default emission factor of a reservoir is applied. The total electricity generated of each power plant will be monitored constantly by energy meters installed at the output of each generator. Data reports will be hourly consolidated and the meter maintenance and calibration (every two years) will be Brennand Group's responsibility. In addition the electricity delivered to the grid will be measured by four meter (main and backup, one par responsible for each power plant) that are controlled by ONS. ONS is responsible to maintain these meters in proper operation and to inform CCEE about the amount of electricity delivered to the grid. After that CCEE turns its official and commercialize the electricity generated.

The monitoring of leakage emissions is not necessary as it is considered zero for this project activity.

The procedure for calibration, accuracy and maintenance of monitoring equipment and the responsibilities are clearly mentioned in section B.7. and Annex 4 of the PDD[/PDD/].

The data from the energy meters will be cross checked with the CCEE data bank (Electric Power Commercialization Chamber in Brazil). The data from CCEE system is independent and reliable as it is audit by a third party.
The class of accuracy in the measurement equipment that will be used in the project activity follows national standards (NBR 14519 from ABNT – Brazilian Association for Technical Standards) indicated by the ONS.

For details see section B.6 of the Annex below.

5.2.8 Project Management Planning

The project management planning is appropriate for the purpose of the project monitoring, as described in section B.7.2 of the PDD.

5.2.9 Crediting Period

The choice of the seven year (renewable) crediting period was unambiguously given in the PDD and corresponding calculation spreadsheet. The crediting period starting date is 01 July 2011 and that is deemed appropriate. Additionally, the starting date of the project activity as mentioned in the PDD/PDD under Section C.1 and verified by the validation team is 01/07/2006 which is the start of the significant investments, such as turbines/SD/. The project life time (25 years duration) indicated in the Section C.1.2 of the PDD/PDD/ was verified by the validation team

5.2.10 Environmental Impacts

The host government does not request for an EIA for this specific project activity. To be in line with Brazilian Laws and requirements an Environmental Study was performed at the time of the Environmental Licenses issuance. According to Brazilian legislation an Environmental Study is necessary at the time of Environmental License issuance, which is the initial step for the implementation of an Enterprise in the host country. At that moment, an Environmental Study must be taken to assure that the company operation is environmentally safe and sound. Considering that the Brazilian local Environmental bodies have issued the Installation Environmental license /EL/ for the plant predicted to operate in the proposed project activity, the validation team assumes that the Environmental Study was appropriately assessed. Additionally, no transboundary impacts could be identified for the proposed project activity.

5.2.11 Comments by Local Stakeholders

According to the Resolution number 1 of the Brazilian Inter-Ministerial Commission on Climate Change2, invitations for comments by local stakeholders are required by the Brazilian Designated National Authority (DNA) as part of the procedures for analyzing CDM projects and issuing letters of approval.

The DNA required project participants to communicate with the public through letters, to be sent inviting for comments to: Brazilian national NGO's forum; local attorneys' and prosecutors' agency; municipality's chamber (mayor and assembly men); State's and municipal's environmental authorities and local communities' associations.

As defined by the Designated National Authority (DNA), PP informed various stakeholders about the project details through letter invitation mentioning an electronic address were the Portuguese version of the PDD was available, according to DNA's Resolution /R7/. The project participant should leave 30 days opened for comments. No comment was received.

As a result from the stakeholder involvement process it can be concluded that no relevant concerns of the local stakeholders are existing. The stakeholder process was conducted in compliance with the requirements of the Brazilian DNA.

6 VALIDATION OPINION

Pampeana Energética Ltda. And Várzea do Jubá Energia Ltda. have commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "Pampeana and Terra Santa Small Hydropower Plants Project Activity" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity consists in the construction of two small hydropower plants to export electricity to the grid.

A risk based approach has been followed to perform this validation. In the course of the pre-validation, 12 Corrective Action Requests (CARs) and 04 Clarification Requests (CRs) were raised and successfully closed. In addition no FAR has been issued.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (Brazil) and all relevant UNFCCC requirements for CDM.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 176,358 tCO_2e are most likely to be achieved within the 07 years (renewable) crediting period (1st July 2011 to 30th June 2018).

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation. The request for registration will not be submitted before the Letter of Approval (LoA) is issued by the Brazilian DNA.

Hannover, 2011-03-11

Inga Köster

TÜV NORD JI/CDM CP

Validation Team Leader

Essen, 2011-03-11

Rainer Winter

TÜV NORD JI/CDM CP

Final Approval

7 REFERENCES

Table 7-1: Documents provided by the project participant

Reference	Document
/**ANEEL**/	ANEEL offical data: - Dispatch from Agência Nacional de Energia Elétrica (National Agency at electric energy) at SHP Pampeana. Dispatch number 1,872, on June 14th 2007. - Dispatch from Agência Nacional de Energia Elétrica (National Agency at electric energy) at SHP Terra Santa. Dispatch number 1,871, on June 14th 2007. - ANEEL Resolution # 1305 issued on March 18th, 2008. - ANEEL Resolution # 1871 issued on June 14th, 2007. - ANEEL Resolution nr. 44 dated March 17th, 1999 (items 35 and 85 of this resolution). - ANEEL Resolution # 72 issued on January 06th, 2005. - ANEEL Resolution # 317 issued on April 20th, 2004.
/**EL**/	Environmental Licenses: - Installation License at Pampeana, number 1070/2007, process number 35007/2007, issued on February 02nd 2007, valid until Dec ember 16th 2008 - Installation License at Terra Santa, number 360/2006, process number 936/2003, issued on May 05th 2006, valid until May 18th 2009. - Municipal License of Varzea do Juba (SHP Terra Santa), DAM number 222.285, municipal inscription 003172, issued on November 10th 2008, valid until December 31st 2008.
/**ER**/	Environmental Reports: - Consolidate report of environment programs at final phase at building SHP Terra Santa. Issued by Seiva engenharia e projetos ambientais issued on 2006/10/12. - Environment study of SHP Pampeana. Issued by Seiva Engenharia e projetos ambientais dated 2006/05/17 - Environment study of SHP Terra Santa. Issued by Seiva Engenharia e projetos ambientais 2006/05/18
/**FD**/	Financial data: - Contracts of Supply of Electric Energy (SHP Terra Santa): dated on 2007/12/12 will supply energy from 2008 until 2014, dated on 2007/12/01

Reference	Document
	will supply energy from 2008 until 2022 and dated on 2007/12/05 will supply energy from 2012 until 2016. - Social communication program from SHP Pampeana, issued by Seiva – Engenharia e projetos ambientais. Procedure number 1904/2003, date August/2007. - BNDES Financing contract dated November of 2007 - Portaria MME No. 135 issued on June 25th, 2007. - PIS/PASEP: Law nr. 10,637, December 31st, 2002 - COFINS: Law nr. 10,833, December 29th, 2003 - Law nr. 8,981, January 20th, 1995 - Law nr. 9,430, December 27th, 1996
/**MD**/	Management decision: Board meeting 2005/10/03 for Pampeana and Terra Santa
/**O&M**/	- Executive project of deforestation area of the dam, SHP Pampeana. Issued by Fabio de Borba Fernandes from Seiva Engenharia e Projetos Ambientais, procedure number 1904/2003, date July/2008. - Executive project of environment and health education, SHP Pampeana. Issued by Édina Gomes da Silva from Seiva Engenahria e Projetos Ambientais, procedure number 1904/2003, date August/2007. - Inspection report of SHP Pampeana, notification term number 020/2008 – CES, issued by Energy and Sanitation Coordinator, realized by AGER/MT. Date October/2008. - Hydro sediment and water level monitoring program, SHP Pampeana. Issued by Kely Rejane Silva Dantas from Seiva Engenharia e Projetos Ambientais, procedure number 1904/2003, date October/2007. - Ictiofaune program monitoring, SHP Pampeana. Issued by Thiago Paiva de Paula from Seiva Engenahria e Projetos Ambientais, procedure number 1904/2003, date November/2007. - Land faune monitoring program, SHP Pampeana. Issued by Thiago Paiva de Paula from Seiva Engenharia e Projetos Ambientais, procedure number 1904/2003, date November/2007. - Limnologico and water quality monitoring program, SHP Pampeana. Issued by Édina Gomes da Silva from Seiva Engenharia e Projetos Ambientais, procedure number 1904/2003, date August/2007. - Metering Certificate (main meter) from Actaris, Meter SL 7000 by Pampeana. Serial number 37103650, trailing RBC: certificado CRC 445/07, date 07/11/2007. - Metering Certificate (backup meter) from Actaris, Meter SL 7000 by Terra Santa. Serial number 37103651, trailing RBC: certificado CRC 445/07, date 07/11/2007. - Program of control of erosive processes, SHP Pampeana. Issued by Dimas de Mello from Seiva Engenharia e Projetos Ambientais, procedure number 1904/2003, date May/2007. - Program of environment management, SHP Pampeana. Issued by Weslley G. de Oliveira from Seiva Engenharia e Projetos Ambientais,

Reference	Document
	procedure number 1904/2003, date November/2007.
/**PCDM**/	Evidences of prior consideration of CDM: - Email exchange between PP dated 2007/02/01 - Feasibility Study presented in the Board Meeting dated 2005/10/03
/**PDD**/	Project Design Document "Pampeana and Terra Santa Small Hydropower plants project activity", version 01 of 2008/10/06 hosted for stakeholder commenting during 15/10/2008 to 13/11/2008. Latest version: 18/10/2010 version 6
/**PSD**/	Proposal sent by TÜV NORD to Várzea do Jubá Energética S.A and Pampeana Energética S.A dated 2008/09/11.
/**SD**/	Starting date evidences: - Equipment invoices of generators and turbines for both SHPP dated 2006/07/01.
/**SCP**/	Stakeholder consultation process evidences: - Stakeholders Invitation Letter's post mail protocols dated 2008/04/16.
/**TD**/	Technical data: - Executive Abstract - Main Equipment's Manuals (turbines and generators)
/**XLS**/	- Pampeana and Terra Santa CERs calculation - Pampeana IRR calculation - Terra Santa IRR calculation - Benchmark determination spreadsheet.

Table 7-2: Background investigation and assessment documents

Reference	Document
/**ACM0002**/	Consolidated baseline methodology for grid-connected electricity generation from renewable sources (version 12.1)
/**CPM**/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/**GCP**/	UNFCCC: Guidelines for completing CDM-PDD

Reference	Document
/**GT**/	UNFCCC: CDM Glossary of Terms
/**IPCC-GP**/	IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000
/**IPPC-RM**/	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual
/**KP**/	Kyoto Protocol (1997)
/**MA**/	Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7))
/**PDD-T**/	Project Design Document Form (CDM SSC PDD) - Version 03.1
/**R7**/	Resolution #7 of CIMGC of 05/05/2008
/**R8**/	Resolution #8 of CIMGC of 26/05/2008
/**TA**/	“Tool for the demonstration and assessment of additionality” (Version 5.2).
/**TEF**/	“Tool to calculate the emission factor for an electricity system” (Version 2).
/**TPLE**/	“Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” (Version 2).
/**VVM**/	Validation and Verification Manual - Version 1.2, EB 55/Annex 1

Table 7-3: Websites used

Reference	Link	Organisation
/aneel/	http://www.aneel.gov.br/	National Agency of Electric Energy
/bcb/	http://www.bcb.gov.br/	Brazilian Central Bank
/bndes/	http://www.bndes.gov.br/	Brazilian National Bank of Sustainable Development
/bre/	http://www.brennandenergia.com.br/	Brennand Group website
/conama/	http://www.mma.gov.br/	Brazilian National Commission of Environment
/dam/	http://pages.stern.nyu.edu/~adamodar/	Professor Damodaran webpage. He holds M.B.A. and Ph.D. degrees from the University of California, Los Angeles, as well as a B.Com. in Accounting from Madras University and a PGDM from the Indian Institute of Management Bangalore His web page has been online since 1998 and the published information is widely use for financial analysis all over the world.
/dna/	http://www.mct.gov.br/	Brazilian DNA – Brazilian Ministry of Science and Technology
/elbras/	http://www.eletrobras.com/	A Major Brazilian Power Utility
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/mme/	http://www.mme.gov.br/	Brazilian Ministry of Mines and Energy
/ons/	http://www.ons.org.br/home/	Brazilian National Operator of the Electric System
/rot/	http://www.rotarybrasil.com.br/dolar.htm	Rotary International is the world's first service club organization
/unfccc/	http://cdm.unfccc.int	UNFCCC

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/**IM01**/	V	☒ Mr. ☐ Ms.	A. Bezerra	Regional management, Brennand Energia
/**IM01**/	V	☒ Mr. ☐ Ms.	O. P. C. G. Oliveira	Build management, Brennand Energia
/**IM01**/	V	☒ Mr. ☐ Ms.	F. C. Souza	Operation regional management, Brennand Energia
/**IM01**/	V	☒ Mr. ☐ Ms.	F. J. L. S. Pinto	Environment coordinator, SHP Pampeana
/**IM01**/	V	☒ Mr. ☐ Ms.	E. T. Batistote	Speaker of SHP Terra Santa
/**IM01**/	V, E, T	☐ Mr. ☒ Ms.	R. Freitas	Consultant Ecopart

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

ANNEX

A1: Validation Protocol

A2: Assessment of Baseline Identification

A3: Assessment of Financial Parameters

A4: Assessment of Barrier analysis

A5: Outcome of the GSCP

A6: Appointment certificates of the team members

ANNEX 1: VALIDATION PROTOCOL

Table A-1: Requirements Checklist

Checklist Item (incl. guidance for the validation team)	**Validation Team Comments** (justification and substantiation of information, data and evidences)	**Ref.**	**Draft Concl.**	**Final Concl.**
A. General Description of Project Activity				
A.1. Approval *The written approval of the parties involved is a mandatory requirement*				
A.1.1. Has the project provided written approvals of all parties involved? (EB 55 Annex 1 §44) *Indicate whether a letter of approval has been received, with a clear reference to the supporting documentation.* *Indicate whether this letter was provided to the DOE by the project participants or directly by the DNA*	*Description:* The only party involved in the project activity is Brazil (Host Party). In accordance with the CDM M&P at the stage of validation a Party involved may or may not have provided its approval at the time of making the PDD public. The approval of the parties involved is required at the time of requesting registration. *Justification of evidences:* For the Brazilian DNA a positive DOE opinion is necessary prior to the request of the LoA. *Conclusion:* The LoA will be requested if the project receives a positive opinion.	/PDD/ /dna/ /R1/ /R7/	Awaiting LoA issuance	
A.1.2. Are the approvals issued from orgainsations	*Description:* See comment in A.1.1 above.	/PDD/ /dna/	Awaiti	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
listed as DNAs on the UNFCCC CDM website? (EB 55 Annex 1 §§ 44, 47, 48, 49 (b), 49 (c), 53) *Indicate the means of validation employed to assess the authenticity, i.e. in case of doubt whether LoA has been verified with the DNA. Further describe which entity submitted the LoA for validation.*	*Justification of evidences:* *Conclusion:*	/R1/ /R7/	ng LoA issuance	
A.1.3. Do the written approvals confim that the corresponding party is a Party to the Kyoto Protocol? (EB 55 Annex 1 §45, (a))	*Description:* Brazil, the host country, has ratified the Kyoto Protocol on 23rd August 2002. The Brazilian DNA assigned for CDM is the "Global Climate Change international Commission". *Justification of evidences:* Evidenced at UNFCCC website. *Conclusion:* The project complies with the requirement.	/unfccc/	OK	OK
A.1.4. Do the written approvals confim that the participation is voluntary? (EB 55 Annex 1 §45, (b))	*Description:* See comment in A.1.1 above. *Justification of evidences:* *Conclusion:*	/PDD/ /dna/ /R1/ /R7/	Awaiting LoA issuance	OK
A.1.5. Does the written approval from the host country confim that the project contributes to the sustainable development in the country? (EB 55 Annex 1 §45, (c))	*Description:* See comment in A.1.1 above. *Justification of evidences:* *Conclusion:*	/PDD/ /dna/ /R1/ /R7/	Awaiting LoA issuance	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
A.1.6. Do the written approvals refer to the precise project title in the PDD submitted for registration or an additional specification of the project activity, e.g. PDD version number? (EB 55 Annex 1 §§45 (d), 50)	*Description:* See comment in A.1.1 above. *Justification of evidences:* *Conclusion:*	/PDD/ /dna/ /R1/ /R7/	Awaiting LoA issuance	OK
A.1.7. Are the written approvals unconditional with regard to A.1.3 to A.1.6? (EB 55 Annex 1 §46)	*Description:* See comment in A.1.1 above. *Justification of evidences:* *Conclusion:*	/PDD/ /dna/ /R1/ /R7/	Awaiting LoA issuance	OK
A.1.8. Is the information regarding the project participants listed in section A3 and in Annex 1 of the PDD internally consistent to each other? (EB 55 Annex 1, § 51)	*Description:* Yes, they are internally consistent. *Justification of evidences:* PDD. *Conclusion:* Project complies with requirements.	/PDD/	OK	
A.1.9. Are all project participants listed in the PDD approved at least by one Party involved? (EB 55 Annex 1, § 51) *Indicate whether the participation of the project participant(s) has been approved by a Party to the Kyoto Protocol.* *Describe the means of validation employed to draw this*	*Description:* See comment in A.1.1 above. *Justification of evidences:* PDD version 1. *Conclusion:* project complies with requirement.	/PDD/ /dna/ /R1/ /R7/	Awaiting LoA issuance	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
conclusion.				
A.1.10. Are any other project participants approved but not listed in the PDD? (EB 55 Annex 1, § 52)	*Description:* See comment in A.1.1 above. *Justification of evidences:* *Conclusion:*	/PDD/ /dna/ /R1/ /R7/	Awaiting LoA issuance	OK
A.1.11. Does the DoE have a direct contractual relationship with the PP? (EB 55 Annex 1, § 51; EB 50 Annex 48, §§ 7–9) A.1.12. *Check whether the PPs listed in the published PDD are still listed in the PDD going to be submitted to request for registration.*	*Description:* There is a signed Proposal for carrying out the CDM validation of this project between TÜV NORD CERT GmbH and Pampeana Energética S/Aand Várzea do Jubá Energética S/A signed on 2008-09-11. *Justification of evidences:* It is a valid contract between the DOE and PP. *Conclusion:* The project complies with the requirements	/PSD/	OK	
A.2. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*				
A.2.1. Has the host country confirmed that the project assists it in achieving sustainable development? (EB 55 Annex 1, §§ 125 – 127) *Contain a statement confirming whether the letter of*	*Description:* See comment in A.1.1 above. *Justification of evidences:*	/PDD/ /dna/ /R1/ /R7/	Awaiting LoA issuan	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
approval by the DNA of the host party confirmed the contribution of the project to the sustainable development of the Host Party.	*Conclusion:*		ce	
A.2.2. Will the project create other environmental or social benefits than GHG emission reductions? (EB 55 Annex 1, §§ 123 – 125) *Describe the other positive aspects not related to GHG emission reduction on the environment.*	*Description:* The view of the project participants on the contribution of the project activity towards sustainable development is briefly described in section A.2. Besides GHG reduction, the project also helps reducing the reliance on fossil fuel for power generation and reducing pollution caused by it. Moreover, It increases job opportunities to local people. *Justification of evidences:* The project was reviewed in detail, the sites where the hydro power station is located were inspected and operational and managerial staff was interviewed. *Conclusion:* The project creates other social-environmental benefits than GHG emission reductions.	/PDD/ /IM01/	OK	
A.3. PDD editorial aspects *The PDD used as a basis for validation shall be prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website.*				
A.3.1. Has the latest version of the PDD form been applied? (EB 55 Annex 1, § 55)	*Description:* Yes, it has been used the version 3 of CDM-PDD. No deviations thereof have been observed.	/PDD/ /unfccc/	OK	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	Justification of evidences: The website if the UNFCCC was checked. *Conclusion:* The latest PDD template has been used.	/PDD-T/		
A.3.2. Has the PDD been duly filled in accordance with the latest guidance(s)? (EB 55 Annex 1, §§ 56, 57)	*Description:* In general, the PDD has been dully filled. Minor editorial issues were discussed with representatives of the PP during site visit. *Justification of evidences:* The PDD has been checked in detail and compared against the latest guidance, especially /GCP/. *Conclusion:* The PDD was dully filled.	/PDD/ /unfccc/ /GCP/	OK	
A.4. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The DOE should ensure that environmentally safe and sound technology and know-how is used.*				
A.4.1. Does the PDD contain a clear, accurate and complete project description? (EB 55 Annex 1, §§ 58, 59) *The PDD shall contain a clear description of the project activity which provides the reader with a clear understanding of the precise nature of the project activity and the technical*	*Description:* A comprehensive project description is given in sections A.2 and A.4.3 of the PDD. The project description is compatible with the type and category of the project activity as described in item A.4.2 of the PDD. However, CAR A1, A3 was raised. *Justification of evidences:* For the assessment the validation team	/PDD/ /TD/ /IM01/	~~CAR A1~~ ~~CAR A3~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
aspects of its implementation. *Pl. consider esp.* chapters *A.2, A.4.2 and A.4.3 (in case of LSC PDD) for assessment.* *Describe the process undertaken to validate the accuracy and completeness of the project description.* *Contain the DOE's opinion on the accuracy and completeness of the project description.*	has: a) reviewed the PDD in detail; b) carried out a site visit; c) carried out interviews with technical and operational personnel of Brennand Group and the project consultants. *Conclusion:* The project description is mainly in line with the project implementation apart from the following: **(CAR A1)** Please refer to section A.4.1.4 of PDD. The geographic location seems not correct (as per google maps). Please make sure that the exact coordinates are given. Please also indicate how far both power stations are away from each other. Which station is placed upstream and which downstream. Revision of PDD is necessary. Additionally, the geographical coordinates of Pampeana SHP in PDD are different of the environmental report sent to the validation team. Correction it is necessary. **(CAR A3)** In section A.2 of PDD the capacity of the power stations is given as 28 MW and 27.4 MW, for Pampeana and Terra Santa respectively. Table 2 in section A.4.3 shows a nominal power of 29.1 MW for Pampeana plant. Please correct the information for Pampeana hydro station as there is an inconsistency.			
A.4.2. Is this description in accordance with the real situation or (in case of greenfield projects) is it most likely that the project will be implemented acc to the project description	*Description:* The PDD is in accordance with the real situation. However, please refer to raised CARs A1 and A3 *Justification of evidences:* This could be verified during site visit as described in question A.4.1 above. *Conclusion:* CARs A1 and A3 were raised.	/PDD/ /TD/ /IM01/	~~CAR A1~~ ~~CAR A3~~	OK
A.4.3. In case the project involves alteration of the	Not applicable, since the project does not involve alteration of the		NA	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
existing installation or process, is a clear description available regarding the differences between the project and the pre-project situation? EB 55 Annex 1, §§63, 64) *Describe the steps taken to validate this issue.*	existing installation or process. It is a Greenfield project.			
A.4.4. Does the project design engineering reflect current good practices? *Consider the equipment specifications, literature (e.g. EU BREF papers) and professional experiences. Describe the process undertaken to assess the engineering.*	*Description:* The equipments to be installed are manufactured by very well known companies in the sector, Weg Equipamentos Elétricos S.A. (generators) and Vatech Hydro do Brasil Ltda. (turbines). *Justification of evidences:* The validation team could verify the information above by inspecting the project site, reviewing technical data of the turbine-generators/TD/ and the project lay-out. *Conclusion:* The project design reflects current good practices and the equipments are safe and sound. However, please refer to raised CAR A2. **(CAR A2)** As per guidelines for completing a PDD, in section A.4.3 of PDD it must be stated whether the baseline scenario is the same prior and after the project activity and whether the technology used is safe and sound.	/PDD/ /TD/ /EL/	~~CAR A2~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
A.4.5. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country? *Describe the process undertaken to assess the state of the art technology.*	*Description:* Please refer to raised CAR A2 above. *Justification of evidences:* *Conclusion:*	/PDD/ /TD/ /EL/	~~CAR A2~~	OK
A.4.6. Does the project make provisions for meeting training and maintenance needs? *Describe the process undertaken to assess the maintenance and training needs.*	*Description:* In any case training of maintenance personnel will be carried out by Brennand Group, which as large experience in implementation of hydro project in the host country *Justification of evidences:* Described in section A.4.3 and B.7.2 of PDD and confirmed by interviews with representatives of PPs. Additionally, the operational procedures, including training and maintenance needs have been checked. *Conclusion:* Project complies with requirements.	/PDD/ /IM01/ /O&M/	OK	
A.5. Small scale project activity *It is assessed whether the project qualifies as small-scale CDM project activity*				
A.5.1. Does the project qualify as a small scale CDM project activity as defined in decision 4 / CMP.1 annex II? (EB 55 Annex 1, § 135 – 136 (a))	*The project does not qualify as small-scale CDM project activity.*	/PDD/	NA	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
A.5.2. Does the project apply one of the approved small scale categories and any methodology and tool referred therein? (EB 55 Annex 1, § 136 (b)) *Check, if applicable the expiry dates of the applied methodology. Further, take into consideration the general guidance to the methodologies[3], which provide guidance on equipment capacity, equipment performance, sampling and other monitoring related issues.*	*The project does not qualify as small-scale CDM project activity.*	/PDD/	NA	
A.5.3. Is the small scale project activity not a debundled component of a larger project activity? (EB 55 Annex 1, § 136 (c)) *Describe the steps taken to validate this issue. Pl refer to the Compendium of guidance on debundling (EB 36, Annex 27).*	*The project does not qualify as small-scale CDM project activity.*	/PDD/	NA	
A.5.4. Is an assessment of the environmental impacts of the proposed SSC CDM project activity required by the host Party? (EB 55 Annex 1, § 13^6 (d))	*The project does not qualify as small-scale CDM project activity.*	/PDD/	NA	
B. Project Baseline, Additionality and Monitoring Plan				

[3] http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
B.1. Application of the Methodology				
B.1.1. Does the project apply an approved and applicable CDM methodology and a valid version thereof? (EB 55 Annex 1, §65) *Describe the steps taken to validate this issue.*	*Description:* The project activity applies version 7 of the approved methodology ACM 0002. *Justification of evidences:* To ensure that the applied methodology is approved by the executive board and the PP has chosen the latest version, the methodologies section of UNFCCC CDM website (http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html) was visited. *Conclusion:* CL B1 was raised. **(CL B1)** The referenced methodology in section B.1 of PDD is ACM 0002 version 7. As the deadline for this is in August 2009 it should be considered to change to the new methodology version.	/PDD/ /ACM 0002/ /unfccc/	~~CL B1~~	OK
B.1.2. Is the applied CDM methodology identical with the version available on the UNFCCC website? (EB 55 Annex 1, §§65, 70) *Describe the steps taken to validate this issue.*	*Description:* Please refer to comment in topic B.1.1 above. *Justification of evidences:* The PDD was reviewed against the stipulations of the methodology. *Conclusion:* CL B1 was raised.	/PDD/ /ACM 0002/ /unfccc/	~~CL B1~~	OK

Checklist Item (incl. guidance for the validation team)	**Validation Team Comments** (justification and substantiation of information, data and evidences)	**Ref.**	**Draft Concl.**	**Final Concl.**
B.1.3. Are all applicability criteria in the methodology, the applied tools or any other methodology component referred to therein fulfilled? (EB 55 Annex 1, §§66 (a) – (b), 68, 71, 76) *Describe for <u>each</u> applicability criterion listed in the selected approved methodology the steps taken to assess the information contained in the PDD.*	*Description:* Please refer to comment in topic B.1.1 above. *Justification of evidences:* The PDD was reviewed against the stipulations of the methodology. *Conclusion:* CL B1 was raised.	/PDD/ /ACM 0002/ /unfccc/	~~CL B1~~	OK
B.1.4. In case one or more applicability criteria have not been met, has the validation team requested clarification to, revision of or deviation from the methodology in accordance with the latest guidelines? (EB 55 Annex 1, §§ 72–75)	*Description:* Not applicable as project meets all applicability conditions of ACM0002. *Justification of evidences:* See comment just above. *Conclusion:* Not applicable.	/PDD/ /ACM 0002/	NA	
B.1.5. Is the project in accordance to every other stipulation or requirement mentioned in all sections of the methodology and in guidances for approved methodologies provided by the CDM EB? (EB 55 Annex 1, §69 – 71) *Describe the steps taken to check whether the proposed project activity meets <u>all the other possible stipulations and /or limitations</u> mentioned in all sections of the approved*	*Description:* Please refer to comment in topic B.1.1 above. *Justification of evidences:* The PDD was reviewed against the stipulations of the methodology. *Conclusion:* CL B1 was raised.	/PDD/ /ACM 0002/ /unfccc/	~~CL B1~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
methodology selected.				
B.2. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project*				
B.2.1. Are the project's spatial boundaries (geographical) clearly defined? (EB 55 Annex 1, §§67 (a), –78 – 80) *Provide information on how the validation of the geographical boundary has been performed either based on reviewed documented evidence or by describing what was observed/viewed during a site visit.*	*Description:* The spatial boundaries are not precisely described, so CL A1 has been raised. *Justification of evidences:* The spatial boundaries of the project have to be better described. *Conclusion:* CL A1 was raised.	/PDD/ /ACM 0002/ /unfccc/	~~CAR A1~~	OK
B.2.2. Are all sources and GHGs included in the project boundary as required in the applied methodology? (EB 55 Annex 1, §§67 (a), 78 – 80) *Provide information on how the validation of the GHGs and sources has been performed either based on reviewed documented evidence or by describing what was observed/viewed during a site visit.*	*Description:* Not all sources and GHGs required by ACM 0002 were included in the table in section B.3 of the PDD. *Justification of evidences:* The PDD was reviewed against the applied methodologies emissions considered emission sources. *Conclusion:* The sources are not in compliance with the applied methodology as well as with the real situation. **(CAR B1)** The table given in section B.3 exclude the emissions from the reservoir. As the reservoir is between the limits of 4 and 10 W/m² the project must account for methane emissions from reservoirs.	/PDD/ /ACM 0002/ /unfccc/	~~CAR B1~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
B.2.3. In case the methodology allows to choose whether a source and/or gas is to be included, is the choice sufficiently explained and justified? (EB 55 Annex 1, §§67 (a), 78 – 80) *Confirm if the justification provided by the PPs is reasonable, based on assessment of supporting documented evidence provided by the PPs or by onsite observations.*	*Not applicable, since the methodology does not allow such choices.*	/PDD/ /ACM 0002/ /unfccc/	NA	
B.3. Baseline Identification *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.*				
B.3.1. What possible baseline scenarios have been considered? (EB 55 Annex 1, §§ 67 (b), 83) *Fill in all alternatives in table A-2.*	*Description:* The baseline is determined according to the applicable methodology and does not require alternative baseline consideration. See definition of baseline in B.3.3 below. *Justification of evidences:* ACM0002 provides a definition of the baseline for the installation of a new grid-connected renewable power plant/unit. *Conclusion:* See definition of baseline in B.3.3 below.	/PDD/ /ACM 0002/ /unfccc/	OK	
B.3.2. Is the list of alternatives complete? (EB 55 Annex 1, §§67 (b), 83)	*Not applicable, as the baseline is given by the methodology.*	/PDD/	NA	

Checklist Item (incl. guidance for the validation team)	**Validation Team Comments** (justification and substantiation of information, data and evidences)	**Ref.**	**Draft Concl.**	**Final Concl.**
Describe how it was validated that all alternatives are plausible and no plausible alternative is excluded from the consideration				
B.3.3. What has been identified as the baseline scenario? (EB 55 Annex 1, §§81 – 82, 86) *Describe the chosen BL scenario, taking into consideration the technology that would be employed and / or the activities that would take place in the absence of the proposed CDM project activity.*	*Description: '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".'* *Justification of evidences:* The definition of ACM002 was applied. *Conclusion:* The definition of ACM002 was applied.	/PDD/ /ACM 0002/ /unfccc/	OK	
B.3.4. Has the baseline scenario been determined according to the methodology? (EB 55 Annex 1, §§82, 87 (e)) *Describe how it is validated that the identification of the most plausible baseline scenario is carried out in accordance with the applied methodology and applied methodological tools. Please refer to table A-2.*	For details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2. ☒ The determination has been carried out as per the procedure contained in the applied methodology. ☐ The following CARs / CLs have been identified with respect to the selection of the baseline scenario: *Description:* The baseline is the electricity that would have otherwise been generated by the operational plants connected to the national Interconnected System. *Justification of evidences:* The definition of ACM002 was applied. *Conclusion:* The definition of ACM002 was applied.	/PDD/ /ACM 0002/ /unfccc/	OK	

Checklist Item (incl. guidance for the validation team)	**Validation Team Comments** (justification and substantiation of information, data and evidences)	**Ref.**	**Draft Concl.**	**Final Concl.**
B.3.5. Has any plausible alternative scenario been excluded? (EB 55 Annex 1, § 83) *Describe how it is validated that no plausible alternative scenario has been excluded.*	*Not applicable, as the baseline is given by the methodology.*	/PDD/ /ACM 0002/ /unfccc/	OK	
B.3.6. Is the identified baseline scenario reasonable and has the baseline scenario been determined using conservative assumptions where possible, including relevant references and sources? (EB 55 Annex 1, §§ 84 - 86(a)-(c)) *Describe whether the choice of the identified baseline scenario is reasonable by validating the key assumptions, calculations and rationales used in the PDD. Describe whether these are listed, relevant and conservatively interpreted in the PDD.*	*Not applicable, as the baseline is given by the methodology.*	/PDD/ /ACM 0002/ /unfccc/	OK	
B.3.7. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations? (EB 55 Annex 1, §§ 85, 87(d)) *Describe whether the PP has shown that all relevant policies and circumstances have been identified and correctly considered in the PDD in accordance with the guidance by the Board. Pl. consider the guidance EB 22 annex 3 (regarding E+ and E- policies).*	*Not applicable, as the baseline is given by the methodology.*	/PDD/ /ACM 0002/ /unfccc/	OK	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
B.3.8. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced? (EB 55 Annex 1, § 87(a)–(c)) *Describe whether the documents and sources referred to in the PDD are correctly quoted and clearly referenced.*	*Not applicable, as the baseline is given by the methodology.*	/PDD/ /ACM 0002/ /unfccc/	OK	
B.3.9. Does the PDD contain a *verifiable* description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity. (EB 55 Annex 1, § 86)	*Not applicable, as the baseline is given by the methodology.*	/PDD/ /ACM 0002/ /unfccc/	OK	
B.4. Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*				
B.4.1. Methodology				
B.4.1.1. Does the PDD describe the how the project is additional and does the additionality justification follow the requirements of the applied methodology and/or methodological tools?	*Description:* The sequence utilized by the PP to demonstrate the additionality of the project has followed the step-wise approach described in version 5.2 of the "Tool for the demonstration and assessment of additionality". The additionality is demonstrated by benchmark analysis calculating equity IRR.	/PDD/ /FD/	~~CAR B2~~ ~~CAR B3~~	OK

Checklist Item (incl. guidance for the validation team)	**Validation Team Comments** (justification and substantiation of information, data and evidences)	**Ref.**	**Draft Concl.**	**Final Concl.**
(EB 55 Annex 1, §§67 (d), 95 – 95) *Describe how it is validated that additionality justification is carried out in accordance with the applied methodology and/or applied methodological tools. Further focus your assessment on the reliability and credibility of data, rationales and assumptions, justifications and documentations provided by the PP.*	*Justification of evidences:* The PDD was reviewed in detail and supporting evidences cross-checked. However, several CARs and CLs indicated below in this section have to be closed out to allow a final and conclusive assessment by the Validation Team. *Conclusion:* Refer to findings raised below in this section. **(CAR B2)** Please refer to section B.5, Early consideration of CDM: This section needs revision and completion in the following issues: a) It should be included with date the GSP and Feasibility Study. b) it needs to be clarified why the GSP started one and a half years after construction start in Terra Santa. c) Clarify why the financial closure was after the purchase of the main equipment. d) The starting date of the project activity is only one point of time for both sites and therefore the earliest date should be select. Consideration under section C.1.1. is also necessary. e) What were the documents used to identify the construction date? What was the equipment considered? **(CAR B3)** Please refer to PDD section B.5., Additionality: a) Sub-step 1a: Scenario one must be split up into two scenarios as for the PP these are completely different alternatives which have to be discussed separately. In the following, one of these alternatives has to be identified as the baseline candidate. The assessment must be clearly described.		~~CAR B4~~	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	b) Calculation of WACC: The formula given in the PDD is not in line with the formula given in the excel sheet. c) Sensitivity analysis: Two parameters have been chosen: project revenue and running costs. It should be clarified why investment costs have not been included in the sensitivity analysis. Moreover, the IRR has been calculated over 15 years and the project lifetime is 25 years. According to EB 41 Annex 45 the fair value must be considered in the IRR calculation when choosing a shorter period for IRR calculation than the project lifetime. Thus, revision is necessary. **(CAR B4)** In the section B.5, the investment analysis, some parts were not traceable. Revision is required as follows: j) In sub-step 1b, is necessary to detail what is the mandatory laws and regulations of each entity. k) What is the source of parameter cost of debt? l) Please send to validation team the document that proves the participation of BNDES with 75% of equity in the project. m) Is necessary to send to validation team the bibliography used to calculate: the estimating the cost of equity (Ke) and the document used in footnote 8. n) Is necessary to explain why in yield of sovereign 15-year BB debt it was used data from May 2007? o) In parameter yield of sovereign 15-year BB debit, the value used was to 10 years. Please correct. p) In parameter 10-year BB credit risk premium over US treasures, why it was used data from 2005? q) In parameters 15-year US/Brazil inflation differential and			

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	international market equity risk premium is necessary to clearly indicate the source of data as it was not possible to access the indicated reference.			
B.4.2. Consideration of CDM before project start				
B.4.2.1. Is the project starting date reported in accordance with the CDM glossary of terms? (EB 55 Annex 1, § 104(a)) *Assess why the chosen starting date can be considered as the earliest date at which either the implementation or construction or real action of a project has begun or will begin.* *Check that no other activities related to the project that happened before the identified start date can be considered as start date. In this context please also take into consideration infrastructural expenses if they are relevant (in terms of costs and importance for the project implementation) in the specific context of the project activity.*	*Description:* The starting date definition is still not clear. Please refer to opened CAR B2. *Justification of evidences:* /SD/ *Conclusion:* CAR B2 was raised. **(CAR B2)** Please refer to section B.5, Early consideration of CDM: This section needs revision and completion in the following issues: a) It should be included with date the GSP and Feasibility Study. b) it needs to be clarified why the GSP started one and a half years after construction start in Terra Santa. c) Clarify why the financial closure was after the purchase of the main equipment. d) The starting date of the project activity is only one point of time for both sites and therefore the earliest date should be select. Consideration under section C.1.1. is also necessary. e) What were the documents used to identify the construction date? What was the equipment considered?	/PDD/ /SD/	~~CAR B2~~	OK
B.4.2.2. In case the project start date is on or after 2nd August 2008 has the PP informed the DNA and UNFCCC about the intension to seek CDM status? (EB 55 Annex 1, §99)	*Not applicable as the project starting date is before 2008/08/02.*	/PDD/	NA	

Checklist Item (incl. guidance for the validation team)	**Validation Team Comments** (justification and substantiation of information, data and evidences)	**Ref.**	**Draft Concl.**	**Final Concl.**
(EB 55 Annex 1, §§ 99–101) *Describe whether such a notification has been provided by the project participants within six months of the project activity start date; if NOT it shall be determined that the CDM was not seriously considered.*				
B.4.2.3. In case the project start date is before commencing of validation and 2nd August 2008, was the incentive from the CDM seriously considered and are details given in the PDD? (EB 55 Annex 1, §§ 98, 100) (EB 55 Annex 1, §§ 100, 102) *Describe whether the evidence to support such consideration is adequately and transparently described in the PDD.*	*Description:* The early CDM consideration could not be properly evidenced. *Justification of evidences:* to be sent to DOE. *Conclusion:* **(CAR B2)** Please refer to section B.5, Early consideration of CDM: This section needs revision and completion in the following issues: a) It should be included with date the GSP and Feasibility Study. b) it needs to be clarified why the GSP started one and a half years after construction start in Terra Santa. c) Clarify why the financial closure was after the purchase of the main equipment. d) The starting date of the project activity is only <u>one</u> point of time for <u>both</u> sites and therefore the earliest date should be select. Consideration under section C.1.1. is also necessary. e) What were the documents used to identify the construction date? What was the equipment considered?	/PDD/ /PCDM/ /FD/	~~CAR B2~~	OK
B.4.2.4. How and when was the decision to proceed with the project taken? *Describe the steps taken to validate the starting date.*	*Description:* Please refer to raised CAR B2. *Justification of evidences:*	/PDD/ /PCDM/	~~CAR B2~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	Conclusion: CAR B2 was raised.	/FD/		
B.4.2.5. Is the project start date consistent with the available evidences? (EB 55 Annex 1, §102) *Describe the evidence assessed regarding the prior consideration of the CDM (if necessary). Describe whether the evidence to support such consideration is adequately and transparently described in the PDD.*	*Description:* Yes, the evidences could be assessed and no deviations were detected. *Justification of evidences:* project expenditures. *Conclusion: The starting date war correctly identified.*	/PDD/ /GCP/ /SD/	OK	
B.4.2.6. Was the decision to proceed with the project taken by a person which has the authority to do so? (EB 55 Annex 1, § 102(a) *Describe the steps taken to validate this issue.*	*Description:* Please refer to raised CAR B2. *Justification of evidences:* *Conclusion:* CAR B2 was raised.	/PDD/ /PCDM/ /FD/	~~CAR B2~~	OK
B.4.2.7. How was the CDM involved in the decision making process? (EB 55 Annex 1, § 100) (EB 55 Annex 1, § 102) *Describe why CDM was a decisive factor in the decision making process.*	*Description:* Please refer to raised CAR B2. *Justification of evidences:* *Conclusion:* CAR B2 was raised.	/PDD/ /PCDM/ /SD/	~~CAR B2~~	OK
B.4.2.8. Do the evidences provided doubtlessly prove that continuous and real actions were taken in order to secure the CDM	*Description:* Please refer to raised CAR B2. *Justification of evidences:*	/PDD/ /PCDM/	~~CAR B2~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
status? (EB 55 Annex 1, § 102; EB 49 Annex 22, §7)	*Conclusion:* CAR B2 was raised.	/SD/		
B.4.2.9. Is the gap of documented evidences to secure the CDM status less than 3 years and are the evidences relevant for substantiating the action taken, credible, reliable and complete? (EB 49 Annex 22, §8)	*Description:* Please refer to raised CAR B2. *Justification of evidences:* *Conclusion:* CAR B2 was raised.	/PDD/ /PCDM/ /SD/	~~CAR B2~~	OK
B.4.2.10. Did implementation of the project ceased after its commencement and did implementation recommence after consideration of the CDM? (EB 51 Annex 58, § 7) *Describe the reasons for ceasing the project and explain why the incentive from CDM was necessary to recommence the implementation.*	*Not applicable to project activity.*		NA	
B.4.2.11. Can the CDM involvement in the decision assessed as serious? *Describe whether or not the project would have been undertaken without the incentive of the CDM.* (EB 55 Annex 1, § 104(b)–(c))	*Description:* Please refer to raised CAR B2. *Justification of evidences:* *Conclusion:* CAR B2 was raised.	/PDD/ /PCDM/ /SD/	~~CAR B2~~	OK
B.4.3. Identification of alternatives Step 1				

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
(in case of SSC projects pl. Skip steps 1 and 2)				
B.4.3.1. Does the list of alternatives contain the status-quo situation, the project not undertaken as a CDM project as well as all other viable means of supplying the outputs or sevices that are to be supplied by the proposed CDM project activity? (EB 55 Annex 1, §§ 105 – 107) *Describe the steps taken to validate this issue on the basis of your local and sectoral knowledge.*	*Description:* The list of alternatives contains the status-quo and the project activity not undertaken as a CDM project. *Justification of evidences:* No other alternatives have been analysed as viable. *Conclusion:* The list of alternatives contains only the status-quo and the project activity not undertaken as a CDM project because no other alternatives are viable. Without CDM benefits, the PP states that the project could not be developed.	/PDD/ /ACM002/	OK	
B.4.3.2. Have all realistic alternatives been identified to the project? (EB 55 Annex 1, §§ 105 – 107) *Describe whether the list of alternatives is complete. Describe how it is validated that the alternatives are realistic.*	*Description:* As the baseline is directly given by the methodology ACM 0002, the selection of alternatives is not required, otherwise all possible market alternatives for generation of electricity would have to be listed, such as eolic, biomass, fossil fuel based thermo electric power plants, etc. which would not add a relevant point for assessment of additionality. *Not applicable to project activity.*	/PDD/ /ACM002/	NA	
B.4.3.3. Do all identified alternatives comply with enforced legislations? (EB 55 Annex 1, §§ 106(c)) *Describe the steps taken to validate this issue. Refer to the legislations.*	*Description:* Yes, all alternatives described in the PDD are in agreement with mandatory laws and regulations. *Justification of evidences:* There is no legislation in Brazil preventing any of the identified alternatives. *Conclusion:* All alternatives described in the PDD comply with mandatory laws and regulations.	/PDD/ /aneel/ /conama/	OK	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
B.4.4. Investment analysis Step 2 *In case the investment analysis as per step 2 is chosen to justify the additionality Annex 2 "Assessment of Financial Parameters" has to be used to provide additonal details of the the calculation parameters..*				
B.4.4.1. Does the PDD provide evidence that the project would not be the most economically or financially attractive alternative or economically / financially feasable without the revenues from the sale of CERs? (EB 55 Annex 1, §108)	*Description:* At the PDD, a benchmark analysis is the basis of additionality determination and equity IRR is the financial indicator chosen. According to Draft PDD the IRR is below the benchmark, and hence not the most financially attractive alternative. However, findings have been raised and need to be closed before forming an opinion. *Justification of evidences:* The finding raised need to be closed to form an opinion. *Conclusion:* Refer to the CAR B3 and B4 raised.	/PDD/ /FD/	~~CAR B3~~ ~~CAR B4~~ ~~CL B4~~	OK
B.4.4.2. Is an appropriate analysis method chosen for the project (simple cost analysis, investment comparison analysis or benchmark analysis)? (EB 55 Annex 1, §108) *Describe why the selected analysis method is appropriate under consideration of potential revenues and costs, potential project alternatives and potential available benchmark values.*	*Description:* Yes, the project a benchmark analysis was correctly chosen for the financial assessment, which is deemed appropriate as the project generates other financial benefits (electricity sell revenues) than the sales of CERs, and therefore Option I (Simple Cost) could not be used and Option II is not appropriate because the alternative to the project (continuation of current practice) will not requires investment from the PP. Option III has been selected. *Justification of evidences:* It is clearly demonstrated in the PDD and evidences provided that the continuation of the common practice (electricity generated from the grid) will not require PP's initial	/PDD/ /FD/ /XLS/ /IM01/	OK	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	investment. *Conclusion:* Benchmark Analysis was correctly chosen as a method for the demonstration of additionality.			
B.4.4.3. Is a clear, viewable and unprotected Excel spreadsheet available for the investment calculation? (EB 55 Annex 1, §110) *Describe the steps taken to validate this issue.*	*Description:* Yes, a clear, viewable and unprotected Excel spreadsheet was provided. *Justification of evidences:* Financial spreadsheet was reviewed. *Conclusion:* The financial spreadsheet was available in an unprotected version.	/FD/ /XLS/	OK	
B.4.4.4. Does the period chosen for the investment analysis reflect the technical lifetime of the project activity or in case a shorter period is chosen, is the fair value of the project activity's assets at the end of the investment analysis period (as a cash inflow) included? (EB 55 Annex 1, §1098; EB 51 Annex 58 § 3 – 4) *Describe how the technical lifetime / period chosen for calculating financial parameter(s) is reviewed and which documents were utilised in the course of review. Describe furthermore the approach used to check the inclusion of a potential fair value.*	*Description:* The period of the financial analysis adopted is 28 years of project lifetime based on the technical lifetime of 25 years of the main equipments. However, it is necessary to clarify the applicability of a fair value in the context of the project activity. *Justification of evidences:* Financial spreadsheet and technical data of the equipments was reviewed-. *Conclusion:* The application of 28 years for the investment analysis is a conservative approach. Further please refer to CAR B3 and B4 raised.	/PDD/ /TD/ /FD/ /XLS/	~~CAR B3~~ ~~CAR B4~~	OK
B.4.4.5. Is the (remaining) technical lifetime of	*Not applicable to the project activity.*		NA	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
existing or project equipment defined in accordance with the guidance of the *Tool to determine the remaining lifetime of equipment*? (EB 50 Annex 15)				
B.4.4.6. Is the fair value calculated in accordance with local accounting regulations (where available) or international best practice? (EB 55 Annex 1, §109; EB 51 Annex 58 §4) *State the accounting regulations applied for calculating the fair value and describe why these are applicable under the project specific circumstances. Describe potential mismatches between regulations and the approach applied for calculating the fair value.*	*Description*: Please refer to comment above. *Justification of evidences:* *Conclusion:*	/FD/ /XLS/	~~CAR B3~~ ~~CAR B4~~	OK
B.4.4.7. Is the book value as well as the expectation of the potential profit or loss included in the fair value calculation? (EB 55 Annex 1, §109; EB 41 Annex 45 §4)	*Description: Please refer to comment above* *Justification of evidences:* *Conclusion:*	/FD/ /XLS/	~~CAR B3~~ ~~CAR B4~~	OK
B.4.4.8. Are depreciation and other non-cash related items added back to net profits for the purpose to calculate the financial indicator? (EB 55 Annex 1, §109; EB 41 Annex 45 §5)	*Description:* Yes, the depreciation was included back for the IRR calculation. There are no other non-cash related items. *Justification of evidences:* PDD and financial spreadsheet.	/PDD/ /FD/ /XLS/	OK	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	Conclusion: The IRR calculation was correctly performed.			
B.4.4.9. Is taxation excluded in the investment analysis or is the benchmark intended for post tax comparisons? (EB 55 Annex 1, §109; EB 41 Annex 45 §5)	*Description:* Taxation is included in the IRR calculations. *Justification of evidences:* PDD and financial spreadsheet. *Conclusion:* The IRR calculation was correctly performed. However a CAR B3 and B4 were raised regarding more detailed information related to the financial parameters applied.	/PDD/ /FD/ /XLS/	~~CAR B3~~ ~~CAR B4~~	OK
B.4.4.10. Were the input values used in the investment analysis valid and applicable at the time of the investment decision? (EB 55 Annex 1, §§109, 112; EB 41 Annex 45 §6) *In case the basis for input values is a Feasibility Study Report (FSR) describe how it has been ensured that the period in time between the finalisation of the FSR and the investment decision is sufficiently short so that it is unlikely that input values would have materially changed.*	*Description:* Not all input values were transparently referenced. *Justification of evidences:* PDD, financial spreadsheet and reference documents listed in section 7-1. *Conclusion:* CAR B3 and B4 were raised.	/PDD/ /FD/ /XLS/	~~CAR B3~~ ~~CAR B4~~ ~~CL B4~~	OK
B.4.4.11. In case of project IRR: Are the costs of financing expenditures (loan repayments and interests) excluded from the calculation of project IRR? (EB 55 Annex 1, §109; EB 41 Annex 45 §9)	*Description:* Not applicable as the indicator used is project IRR. *Justification of evidences:* PDD, financial spreadsheets and contracts listed in table 7-1. *Conclusion:* Not applicable.	/PDD/ /FD/ /XLS/	NA	
B.4.4.12. In cases where a post-tax benchmark is applied please ensure that actual interest	*Not applicable*		NA	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
payable is taken into account in the calculation of income tax. (EB 51 Annex 58, § 11) *As per the guidance it is recommended to select a pre tax benchmark in order to Describe the steps taken in assessing this requirment.*				
B.4.4.13. In case of equity IRR: Is the part of the investment costs, which is financed by equity considered as net cash outflow and is the part financed by debt excluded in net cash outflow? (EB 55 Annex 1, §109; EB 41 Annex 45 §10)	*Description:* Please refer to raised CARs B3 and B4 regarding the financial parameters applied in the investment analyses. *Justification of evidences:* PDD, financial spreadsheets and contracts listed in table 7-1. *Conclusion:* CAR B3 and B4 were raised.	/PDD/ /FD/ /XLS/	~~CAR B3~~ ~~CAR B4~~	OK
B.4.4.14. Is the type of benchmark chosen appropriate for the type of IRR calculated (e.g. local commercial lending rates or weighted average costs of capital for project IRR; required/expected returns on equity for equity IRR)? (EB 55 Annex 1, §§ 111; EB 41 Annex 45 §11) *In case risk premiums are applied describe its suitability to reflect the risks associated with the project activity.*	*Description:* Please refer to raised CARs B3 and B4 regarding the financial parameters applied in the investment analyses. The benchmark can only be assessed after the closure of the raised findings. *Justification of evidences:* PDD, financial spreadsheets and contracts listed in table 7-1. *Conclusion:* CAR B3 and B4 were raised.	/PDD/ /FD/ /XLS/	~~CAR B3~~ ~~CAR B4~~	OK
B.4.4.15. Is the benchmark value suitable for the project activity and is it reasonable to assume that no investment would be made	*Description:* Please refer to raised CARs B3 and B4 regarding the financial parameters applied in the investment analyses. The benchmark can only be assessed after the closure of the raised	/PDD/ /FD/	~~CAR B3~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
at a rate of a lower return than the benchmark? (EB 55 Annex 1, §109; EB 41 Annex 45 §12 – 14) *Describe whether it is reasonable to assume that a lower rate of return would consequently result in the baseline scenario.*	findings. *Justification of evidences:* PDD, financial spreadsheets and contracts listed in table 7-1. *Conclusion:* CAR B3 and B4 were raised.	/XLS/	~~CAR B4~~	
B.4.4.16. Is it ensured that the project cannot be developed by other developers than the PP? (EB 55 Annex 1, §109; EB 41 Annex 45 §12 – 13)	*Description:* No others possible developers could be identified for this project activity. *Justification of evidences:* The PDD was reviewed, interview approach with Brennand Group and Ecopart. *Conclusion:* The project can only be developed by the PP,	/PDD/ /IM01/	OK	
B.4.4.17. Was the benchmark consistently used in the past for similar projects with similar risks? (EB 55 Annex 1, §112(c))	*Description:* Please refer to raised CARs B3 and B4 regarding the financial parameters applied in the investment analyses. The benchmark can only be assessed after the closure of the raised findings. *Justification of evidences:* PDD, financial spreadsheets and contracts listed in table 7-1. *Conclusion:* CAR B3 and B4 were raised.	/PDD/ /FD/	~~CAR B3~~ ~~CAR B4~~	OK
B.4.4.18. Does the PDD and related spreadsheets contain a sensitivity analyis and does the same contain variation of parameters	*Description:* Yes, a sensitivity analysis (varying plus or minus 10%) of the major impacting parameters in the cash flows was realized. However, please refer to raised CARs B3 and B4.	/PDD/ /FD/	~~CAR B3~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
which may vary throughout the project lifetime, (EB 55 Annex 1, §§109, 111 (e); EB 41 Annex 45 §16 – 17) *Describe relevance of parameters used in the sensitivity analysis as well as their likeliness to vary during the project's lifetime. Parameters which are fixed on the basis of contracts, PPAs etc. may not be subject to variation and not adequate.*	*Justification of evidences:* The PDD and financial spreadsheet was detailed reviewed together with the supporting evidences of the financial input data. *Conclusion:* The sensibility analysis was correctly performed for the most relevant parameters. However, the sensitivity analyses assessment can only be concluded after the closure of Cars B3 and B4.	/XLS/	~~CAR B4~~ ~~CL B4~~	
B.4.4.19. Were only variables that constitute more than 20% of either total project costs or total project revenues subjected to reasonable variation? (EB 55 Annex 1, §109; EB 41 Annex 45 §16)	*Description:* All parameters that relevantly impact the cash flow analysis by more than 20% were included in the sensitivity analysis. However, please refer to raised CARs B3 and B4. *Justification of evidences:* The PDD, the financial spreadsheet and supporting evidences of the financial input data were reviewed in detail. *Conclusion:* All necessary parameters to perform a conservative sensitivity analysis were included in the financial assessment. However, the sensitivity analyses assessment can only be concluded after the closure of Cars B3 and B4.	/PDD/ /FD/ /XLS/	~~CAR B3~~ ~~CAR B4~~ ~~CL B4~~	OK
B.4.4.20. Have parameters, constituting less than 20% of total project costs or revenues, been identified with potential material impact on the financial parameter? (EB 55 Annex 1, §109; EB 41 Annex 45 §16)	*Description:* Please refer to topic B.4.4.17 above. *Justification of evidences:* The PDD and financial spreadsheet was detailed reviewed together with the supporting evidences of the financial input data.	/PDD/ /FD/ /XLS/	~~CAR B3~~ ~~CAR B4~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
Describe whether those parameters are considered in the sensitivity analysis?	*Conclusion:* No different parameter other than the ones included in the sensitivity analysis was identified as potential material impact on the financial assessment. However, the sensitivity analyses assessment can only be concluded after the closure of Cars B3 and B4.		~~CL B4~~	
B.4.4.21. Is the range of variation reasonable in the specific context of the project activity, taking into consideration historic trends in the business sector? (EB 55 Annex 1, §108; EB 41 Annex 45 §17) *Describe whether the range of variation is appropriate with focus on historic developments, e.g. price of oil / labour etc., energy potential in the region in question.*	*Description:* The range of variation adopted in the sensitivity analysis was plus and minus 10%. However, please refer to topic B.4.4.17 above. *Justification of evidences:* The PDD and financial spreadsheet was detailed reviewed together with the supporting evidences of the financial input data. *Conclusion:* The range adopted in the sensitivity analysis is sufficient to cover the parameters fluctuation over the time. However, the sensitivity analyses assessment can only be concluded after the closure of Cars B3 and B4.	/PDD/ /FD/ /TD/ /XLS/	~~CAR B3~~ ~~CAR B4~~ ~~CL B4~~	OK
B.4.5. **Barrier analysis Step 3 or SSC additionality assessment**				
B.4.5.1. Are there any barriers given which have a clear and direct impact on the financial returns of the project? (EB 55 Annex 1, §§ 115, 134, 137) *In case of LSC projects those issues cannot be considered as barriers and shall be assessed in the investment analysis. In case of SSC projects the same fundamentals as for LSC projects shall*	*Barriers are not claimed for this project activity.*	/PDD/	NA	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
apply, i.e. the assessment of the investment barrier according to EB 51, Annex 58.				
B.4.5.2. Are the barriers described risk related (e.g technology failure, other performance related risks) or has the unavailabilty of sources of finance for the project been described and adequately substantiated? (EB 55 Annex 1, §§ 116, 134, 137) *Are there other barriers or barriers due to prevailing practice existent which would have led to higher emissions?*	*Barriers are not claimed for this project activity.*	/PDD/	NA	
B.4.5.3. Has the unavailabilty of means of finance for the proejct been described and adequately substantiated? Do evidences doubtlessly prove that the financing of the project was assured only due to the benefit of the CDM? (EB 55 Annex 1, §§ 116, 137, EB 50 Annex 13, § 9)	*Barriers are not claimed for this project activity.*			
B.4.5.4. How is it justified and evidenced that the barriers given in the PDD are real? (EB 55 Annex 1, § 116(a))	*Barriers are not claimed for this project activity.*	/PDD/	NA	
B.4.5.5. How is it justified that one or a set of real barriers prevent(s) the implementation of the project activity and do not prevent the implementation of at least one of the	*Barriers are not claimed for this project activity.*	/PDD/	NA	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
alternatives? (EB 55 Annex 1, § 116 (b))				
B.4.5.6. Does the review of relevant background information on the nature of the company(ies) and entitiy(ies) involved in the financing and implementation of the project sufficiently justify that the barriers related to the lack of access to capital, technologies and skilled labour are real? (EB 50 Annex 13, § 4)	*Barriers are not claimed for this project activity.*	/PDD/	NA	
B.4.5.7. Has it been demonstrated in an objective way how the CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by any of the barriers? (EB 50 Annex 13, § 5)	*Barriers are not claimed for this project activity.*	/PDD/	NA	
B.4.5.8. Would provision of additional financial means lead to the mitigation of the barrier(s) demonstrated? (EB 50 Annex 13, § 7) *Describe why provision of additional financial means would not lead to mitigation of the barrier(s) demonstrated and hence analysing the project's additionality within the framework of an investment analysis is inappropriate. .*	*Barriers are not claimed for this project activity.*	/PDD/	NA	
B.4.6. Common practice analysis Step 4				

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
(in case of SSC projects skip this step)				
B.4.6.1. Is the defined region for the common practice analysis appropriate for the technology/industry type? (EB 55 Annex 1, § 120(a) *Describe the why the project activity is not common practice in a transparent and unambiguous manner.*	*Description:* Condering that Brazil has a very big terretorial extension, different climate regions and that these varieties of climate directly influence in the technical aspects related to a small hydropower plant implementation, the commom practiceanalyuses is based on power plants ate the same region of the project (Mato Grosso state). Additionally, no large scale hydropower plants (installed capacity over 30 MW) were analyzed. *Justification of evidences:* The choice of the Mato Grosso state is justified as there are significant diversions of climate conditions in Brazil. *Conclusion:* The project complies with the requirements.	/PDD/ /aneel/	OK	
B.4.6.2. To what extent similar projects have been undertaken in the relevant region? (EB 55 Annex 1, § 120 (b))	*Description:* ANEEL official data from April 2004 to June 2009 regarding small hydro power plants that started operation in Mato Grosso state identifies the PCHs that received some kind of incentive to its development. There were 18 PCHS under operation in Mato Grosso at 2009, which 14 of them received incentives (CDM or Proinfa). Therefore, it is clearly evidenced that the financial incentive is decisive for this type of project activity implementation in the project region. *Justification of evidences:* Similar project in Mato Grosso state were considered in the common practice analyses from ANEEL which is considered as a reliable source. *Conclusion:* The project complies with the requirements.	/PDD/ /aneel/	OK	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
B.4.6.3. In case similar projects are identified, are there any key differences between the proposed project and existing or ongoing projects and what kind of differences are observed? (EB 55 Annex 1, § 120 (c))	*See comments above.*	/PDD/ /aneel/	OK	
B.5. Ex-Ante Calculation of GHG Emission Reductions *It is assessed whether the ex-ante calculations of project emissions, baseline emissions, leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified. Furthermore calculation of emission reductions shall be assessed.*				
B.5.1. Are the equations applied correctly according to the applied approved methodology? (EB 55 Annex 1 §§67 (c), 89–90, 92) *Describe clearly the steps taken to assess whether the methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. Further take into consideration that all estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.*	☐ The equations applied for calculation are correctly applied according to the approved methodology. ☒ The following mistakes have been identified in this context: *Description:* For further transparency, CAR B5 was raised. See below. *Justification of evidences:* See findings raised below. *Conclusion:* **(CL B5)** In section B.6.1, Step 4 and 5 of PDD the terms of the equation needs to be described. Correction is necessary.	/PDD/ /ACM002/	~~CAR B5~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
B.5.2. In case the methodology allows for different methodological choices, are the equations applied properly justified and have they been used reflecting the other methodological choices (i.e. baseline identification)? (EB 55 Annex 1 §§ 90–91) *Assess the correct selection and application of methodological choices. Describe whether proper justification has been provided (based on the choice of the baseline scenario, context of the project activity and other evidence provided) and whether the correct equations have been used reflecting the relevant methodological choices.*	*Not applicable as the methodology does not allow such choices.*	/PDD/ /ACM002/	NA	
B.5.3. Have conservative assumptions been used when calculating the project emissions? (EB 55 Annex 1 §§ 90–91) *Describe clearly the steps taken to assess whether all the assumptions and data used by the PP are listed in the PDD including references and sources and are conservatively interpreted in the PDD.*	*Description:* The baseline emissions are calculated based on net energy generated multiplied by the combined margin emission factor (EF) calculated according to the Tool to Calculate the emission factor for an electric system and published by Brazilian DNA. *Justification of evidences:* Data used is adequate as the EF value is publicly available and calculated by the Ministry of Science and Technology and published by the Brazilian DNA and the energy generation is calculated based on the assured energy of the plants. *Conclusion:* Conservative assumptions were used to calculate emission reductions. However, please refer to raised CL B3. **(CL B3)** In tables 8 an 9, column net energy generation, it is necessary to explain which are values used to calculate this parameters. Additionally, please explain more detailed the	/PDD/ /dna/	~~CL B3~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	calculation.			
B.5.4. Does the implementation of the project activity lead to GHG emissions within the project boundary which are expected to contribute more than 1% of the overall expected average annual emission reductions, which are not addressed by the methodology? (EB 55 Annex 1, §77)	*Description:* Emissions due to the reservoir must be considered according to ACM 0002. Revision is necessary. *Justification of evidences:* The PDD was reviewed and the project site was inspected during site visit. *Conclusion:* **(CAR B1)** The table given in section B.3 exclude the emissions from the reservoir. As the reservoir is between the limits of 4 and 10 W/m² the project must account for methane emissions from reservoirs	/PDD/ /ACM002/	~~CAR B1~~	OK
B.5.4.1. Has a plant load factor (PLF) been defined ex-ante and considered for determination of baseline emissions? (EB 48 Annex 11, §§ 1, 3–4) *Describe why the PLF is conservative in the framework of calculating emissions reductions and whether the PLF is the same in the framework of demonstrating additionality by applying the investment analysis. Note, in order to be conservative in both cases the PLF may be different.*	*Description:* Although the energy generated will be monitored ex-post, an ex-ante value has been defined. *Justification of evidences:* The assured energy was determined based on National official data form ANEEL. *Conclusion:* The assured energy of both plants are determined by ANEEL and these values were correctly applied for the estimated ex-ante ER.	/PDD/ /ANEEL/	OK	
B.5.5. Are all data and parameters which remain fixed throughout the crediting period correct, applicable to the project and will lead to a conservative estimation of emission	*Description:* More detailed information was solicited regarding the fixed parameters identification. CAR B6 was raised. *Justification of evidences:* See CAR B6 below.	/PDD/ /ACM002/	~~CAR B6~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
reductions? (EB 55 Annex 1, § 91) *Describe clearly the steps taken to assess whether the values used for the fixed parameters are considered reasonable, correct and applicable in the context of the project activity. Check esp. chapter 6.2 of the PDD.*	*Conclusion:* **(CAR B6)** In section B.6.2 the following parameters should be included: EF_{Res} and the Plant load factor (PLF). Especially for the PLF it should be discussed and justify why it is 81 % and 86 % for the two plants. Please, give a reference where this factor comes from.			
B.5.6. Are all ex-ante calculation values for monitoring parameters (as defined as per chapter B.7.1) reasonable? (EB 55 Annex 1, § 91) *Describe clearly the steps taken to assess whether the values used for the monitoring parameters are considered reasonable, applicable and conservative in the context of the project activity*	☐ All "Values of data to be applied for the purpose of calculating expected emissions reductions" are considered to be reasonable, applicable and conservative. ☒ The following mistakes have been identified in this context: **(CAR B7)** Revision of the following parameters given in section B.7.1 are necessary: f) EGy and TEGy listed in section B.7.1: Please, explain more detailed how the measurement will be carried out and at which meter the measurement will take place. Please, also explain how you will derive to the net electricity by measuring import and export. g) Cap_{PJ}: Clarify what is the recognized standard you refer to. h) A_{PJ}: Please describe how you measured the surface area of the reservoir. Describe the exact approach chosen. Give a QA/QC procedure to crosscheck the measurement. i) The monitoring parameters required to calculate the combined margin CO2 emission factor shall be included (cp. "Tool to calculate the emission factor for electricity system"). The monitoring frequency of A_{PJ} shall be included.	/PDD/ /ACM002/	~~CAR B7~~	OK
B.5.7. Are the emission reductions real, measurable and give long-term benefits related to the	*Description:* Several CARs and CLs have been raised and have to be closed out before forming an opinion.		Not yet OK	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
mitigation of climate change. *Describe the steps taken to validate this issue.*	*Justification of evidences:* see comment above. *Conclusion:* please refer to the CARs and CLs raised.			
B.6. Monitoring of Emission Reductions *It is assessed whether the monitoring plan is appropriate for the project activity and in line with the applied methodology.*				
B.6.1. Are all monitoring parameters required by the applied methodology contained in the monitoring plan? (EB 55 Annex 1, §§ 67 (e), 121, 123(a), 124) *Assess whether all applicable parameters listed in the methodology are included in the monitoring plan.* *Pl. check further whether the selection of parameters not to be monitored (section B.6.2) is appropriate and in line with the applied methodology.* *In case of different approaches can be chosen acc. to the methodology assess whether the selection of parameters is justified and correct.*	*Description:* Almost all of the requested monitoring parameters are correctly described in section B.7.1 of the PDD. However, CAR B7 was raised soliciting more detailed information regarding the monitoring plan. *Justification of evidences:* The PDD and technical data of the project was reviewed in detail. *Conclusion:* CL B7 was raised.	/PDD/ /ACM002/	~~CAR B7~~	OK
B.6.2. Are the means of monitoring of all parameters contained in the monitoring plan feasible and in accordance with the requirements of the	*Description:* As detailed above, CAR B7 was raised requesting more information regarding the monitoring parameters. Moreover, the monitoring plan given in section B.7.2 of the PDD needs to be	/PDD/ /ACM002/	~~CAR B7~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
applied methodology? (EB 55 Annex 1, § 123(a)–(b), 124) *Assess whether the provided information for all parameters w.r.t.* a) *Label (name of the data / parameter)* b) *data unit* c) *description* d) *source of data* e) *measurement equipment / method / procedure* f) *monitoring frequency* g) *QA/QC procedures* *are appropriately described and in compliance with the requirements of the methodology..*	more precisely given as solicited in the raised CL B2. *Justification of evidences:* the PDD was reviewed in detail against the requirements of ACM 002 and considering the context of the project. *Conclusion:* Please refer to raised CAR B6. In addition CL B2 was raised. **(CL B2)** In section B.7.2, monitoring plan, it is necessary to clarify which one of the meter is bidirectional, where the main measurement will be carried out and what will happen in cases if a meter fails. Furthermore, please clarify whether there are any transmission losses to be considered and how will the data be stored?		~~CL B2~~	
B.6.3. Have all means of implementing the monitoring plan, e.g. equations necessary for ex-post emission reduction calculation, been described clearly and in line with the methodology? (EB 55 Annex 1 121 (b), 122) (EB 55 Annex 1, §§ 123(b), 124) *Check whether all necessary equations have been provided in the PDD. Pl. consider that ex-post and ex-ante calculations might be different.* *Please consider that additional equations might be*	*Description:* No, CAR B6 and CL B2 were raised. See below. *Justification of evidences:* the PDD was reviewed in detail against the requirements of ACM 002 and considering the context of the project. *Conclusion:* CAR B6 and CL B2 were raised.	/PDD/ /ACM002/	~~CAR B7~~ ~~CL B2~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
necessary to calculate auxiliary parameters.				
B.6.4. Is it likely that the monitoring arrangements described in the PDD can properly be implemented in the context of the project activity? (EB 55 Annex 1 122 (c)) (EB 55 Annex 1, § 124(c)) *Assess whether the described monitoring arrangements are sufficient and realistic to enable a thorough monitoring. Pl. consider also special monitoring conditions, e.g. downtimes of monitoring equipment etc.*	*Description:* Findings above need to be closed before forming an opinion. *Justification of evidences:* Sections B.7.1 and B.7.2 was reviewed in detail. *Conclusion:* Not yet possible to reach a conclusion.	/PDD/ /ACM002/	~~CAR B7~~ ~~CL B2~~	OK
B.6.5. Are the QA/QC procedures appropriate sufficient to ensure the emission reductions achieved from the project activit can be reported ex-post and verified? (EB 55 Annex 1, § 124(b)) *Please consider the description given in section B.7.2. Describe which QA/QC provisions are considered. Address Quality Management System provisions, calibration and maintenance of equipment. Address further any review procedures.*	*Description:* Findings above need to be closed before forming an opinion. *Justification of evidences:* Sections B.7.1 and B.7.2 was reviewed in detail. *Conclusion:* Not yet possible to reach a conclusion.	/PDD/ /ACM002/	~~CAR B7~~ ~~CL B2~~	OK
B.6.6. Are procedures identified for data management? (EB 55 Annex 1 122 (b)) (EB 55 Annex 1, § 124(b)) *Check whether appropriate provisions are considered for data management including responsibilities, what records to*	*Description:* Finding CL B2 above need to be closed before forming an opinion. *Justification of evidences:* Sections B.7.1 and B.7.2 was reviewed in detail.	/PDD/ /ACM002/	~~CL B2~~	OK

Checklist Item (incl. guidance for the validation team)	**Validation Team Comments** (justification and substantiation of information, data and evidences)	**Ref.**	**Draft Concl.**	**Final Concl.**
keep, storage area of records and how to process performance documentation *Check further the data archiving provisions for the project activity and ensure that provisions are made to archive data for the whole crediting period + 2 years.*	*Conclusion:* Not yet possible to reach a conclusion.			
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*				

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
C.1. Is the project's starting date clearly defined and evidenced? (EB 55 Annex 1, 99) *Check whether the starting date is correct. Apply the definition of the project starting date as per the "Glossary of CDM terms".*	*Description:* The starting date of the project acticity is not clearly defined/SD/. *Justification of evidences:* The investment expenditures related to the project was reviewed/SD/. *Conclusion:* CAR B2 was raised.	/PDD/ /SD/ /IM01/	~~CAR B2~~	OK
C.2. Is the project's operational lifetime clearly defined and evidenced? *Check whether the project lifetime is correctly defined. Consider the guidance on the assessment of investment analysis (annex to the additionality tool).* *Check in case of phased implementation this has been reflected throughout the whole PDD incl. the financial assessment, if applicable.*	*Description:* Yes, the expected operational lifetime stated in the PDD is 25 years, which is in line with the equipments technical specification. *Justification of evidences:* equipment's technical specification. *Conclusion:* The operational lifetime is clearly defined and in line with the range provided by the manufacturer of the equipment.	/PDD/ /TD/	OK	
C.3. Is the start of the crediting period clearly defined and reasonable? *Check whether the envisaged starting date of the crediting period is realistic, taking into consideration the times needed for validation and registration.*	*Description:* The starting date of the crediting period was to soon determine. *Justification of evidences:* See below *Conclusion:* **(CL C1)** In section C.2.1.1, the starting date of the crediting period needs to be changed to a more realistic date considering the time	/PDD/ /SD/	~~CAR C1~~	OK

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
	necessary for the validation and registration process of MDL.			
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 DOE.*				
D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)? (EB 55 Annex 1, §§ 131–133) *Check the host party regulations, regarding EIA.*	*Description:* The host government does not request for an EIA for this specific project activity. To be in line with Brazilian Laws and requirements an Environmental Study was performed at the time of the Environmental Licenses issuance. According to Brazilian legislation an Environmental Study is necessary at the time of Environmental License issuance, which is the initial step for the implementation of an Enterprise in the host country. At that moment, an Environmental Study must be taken to assure that the company operation is environmentally safe and sound. Considering that the Brazilian local Environmental bodies have issued the Installation Environmental license for the plant predicted to operate in the proposed project activity, the validation team assumes that the Environmental Study was appropriately assessed. Additionally, no transboundary impacts could be identified for the proposed project activity. *Justification of evidences:* Brazilian Environmental Legislation and Installation License *Conclusion:* The project complies with the requirements and obtained approval from the national environmental authority.	/PDD/ /conama/ /EL/ /IM01/	OK	
D.1.2. In case an Environmental Impact Assessment (EIA) is requested by the host party, has it	*Description:* Yes, see comment above	/PDD/	OK	

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
been carried out and if applcable duly approved? (EB 55 Annex 1, §§ 131–133) *Check the EIA and its approval, if applicable.*	*Justification of evidences:* see above. *Conclusion:* project has obtained environmental approval.	/conama/ /EL/ /IM01/		
D.1.3. Has an analysis of the environmental impacts of the project activity been sufficiently described and in line with the host party environmental legislation? (EB 55 Annex 1, §§ 131–133) *Check the PDD (section D). Check whether the project will create any adverse environmental effects.* *Check the relevant national environmental legislation.*	*Description:* Yes, see comment above *Justification of evidences:* see above. *Conclusion:* project has obtained environmental approval.	/PDD/ /conama/ /EL/ /IM01/	OK	
D.1.4. Are transboundary environmental impacts considered in the analysis? (EB 55 Annex 1, §§ 131–133) *Check the documents and local official sources / expertise regarding transboundary environmental impacts.*	*Description:* No, there are no transboundary environmental impacts envisaged for this project activity. *Justification of evidences:* NA *Conclusion:* There are no transboundary environmental impacts envisaged for this project activity.	/PDD/ /conama/ /EL/ /IM01/	OK	
E. Stakeholder Comments *The DOE should ensure that stakeholder comments have been invited with appropriate media and that due*				

Checklist Item (incl. guidance for the validation team)	Validation Team Comments (justification and substantiation of information, data and evidences)	Ref.	Draft Concl.	Final Concl.
account has been taken of any comments received.				
E.1. Have relevant local stakeholders been invited to consultation prior to the publication of the PDD? (EB 55 Annex 1, § 128) *Check by means of document review and interviews with local stakeholders if and when a local stakeholder consultation process has been carried out.*	*Description:* Yes, stakeholders were invited to invite comment related to the project activity through a invitation letter sent. The letter was sent prior to the publication of PDD for global stakeholder consultation. The considered Stakeholders are liste bellow: *Justification of evidences:* The attendance list of the meeting was submitted and reviewed by the validation team. Moreover, the letters confirmation receipts could be checked. *Conclusion:* Relevant stakeholders attended the meeting which confirms the adequacy of the invitation method.	/PDD/ /IM01/ /SCP/ /dna/	OK	
E.2. Can the local stakeholder consultation process be assessed as adequate? (EB 55 Annex 1, § 129(a)–(c)) *Describe what assessment steps have been undertaken to assess the adequacy of the stakeholder consultation process. Give a final opinion on the adequacy.* *Please consider the following requirements in this context:* *(a) Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited;* *(b) The summary of the comments received as provided in the PDD is complete;*	*Description:* Yes, the stakeholder consultation was conducted in form of letters sent to stakeholders including description of the project activity, with proof of receipt. All proof of receipt could be checked during on-site visiting and no deviation could be detected. No comments were received for the proposed project activity. *Justification of evidences:* The evidences about the stakeholder consultation process were reviewed, as explained above in E.1. Section E of the PDD was reviewed. *Conclusion:* The Stakeholder consultation process was adequately conducted.	/PDD/ /IM01/ /SCP/ /dna/	OK	

Checklist Item (incl. guidance for the validation team)	**Validation Team Comments** (justification and substantiation of information, data and evidences)	**Ref.**	**Draft Concl.**	**Final Concl.**
(c) The project participants have taken due account of any comments received and have described this process in the PDD.				

ANNEX 2: ASSESSMENT OF BASELINE IDENTIFICATION

Table A-2: Assessment of Baseline Identification (EB 51 Annex 3, §§ 82 – 85)

☒	Baseline is not identified (i.e. it is given by the baseline methodology)
☐	Assessment of baseline see below

Baseline Alternatives identified	Inline with the Methodology?	Eliminated	Reasons for elimination / non-elimination from list of alternatives	Evidence used	DOE Assessment	
					Appropriateness of elimination	Assessment of validation team (results and means of assessment)

ANNEX 3: ASSESSMENT OF FINANCIAL PARAMETERS

Table A-3: Assessment of Financial Parameters (EB 51 Annex 3, §§110, 111, 113/ in case financial parameters stem from FSR §112,)

☒	No barrier analysis is used for additionality justification						
☒	Assessment of financial parameters see below						
Parameter	**Value applied**	**Unit**	**Source of Information (please indicate document and page)**	**Reference**	**DOE ASSESSMENT**		
					Correctness of value applied	**Appropriateness of information source**	**Comment**
Total Investment – Pampeana	Project: 4,312,354 Civil works: 59,068,261 National equipment: 25,593,227 Management: 4,194,571 Environment: 2,726,924 Transmiss	R$	Financing contract – November of 2007 International Energy Agency study from 2005, pages 56 – 58.	/FD/ /XLS/ /rot/	☒	☒	The document sent to the BNDES asking for the project financing could be evidenced during on site visiting. The value applied was correctly identified and no deviations could be detected. The total investments of both power plants were adjusted according to the General Market Price Index from October 2005 to November 2007 to be considered conservative. Additionally, at the time of Management Decision the total investment estimative considered the lowest value presented in an international study performed by the International Energy Agency (IEA) in small hydro project around the globe (1,500,000 USD per installed MW). Considering IEA information and the given installed capacity at the time of MD (30 MW – please refer to Installed capacity parameter assessment given below in this table), the total Investment for Pampeana would be 45,000,000

	ion system: 4,276,107 Land: 3,768,772 Diverse: 3,759,713 Total: 107,699,921					USD, which corresponds to 132,750,000 BRL considering the average monetary exchange rate from September 2002 to September 2005 (2.95 BRL/USD) - http://www.rotarybrasil.com.br/dolar.htm. Therefore, the DOE is convinced that the most conservative value is applied in the cash flow analyses.
Total Investment – Terra Santa	Project: 4,330,465 Civil works: 72,050,595 National equipment: 25,402,976 Management: 4,203,631 Environment: 2,735,984 Transmission system: 4,701,906 Land: 2,165,232 Diverse:					The document sent to the BNDES asking for the project financing could be evidenced during on site visiting. The value applied was correctly identified and no deviations could be detected. The total investments of both power plants were adjusted according to the General Market Price Index from October 2005 to November 2007 to be considered conservative. Additionally, at the time of Management Decision the total investment estimative considered the lowest value presented in an international study performed by the International Energy Agency (IEA) in small hydro project around the globe (1,500,000 USD per installed MW). Considering IEA information and the given installed capacity of Terra Santa at the time of MD (27.4 MW – please refer to Installed capacity parameter assessment given below in this table), the total Investment for the plant would be 41,100,000 USD, which corresponds to 121,245,000 BRL considering the average monetary exchange rate from September 2002 to September 2005 (2.95 BRL/USD) - http://www.rotarybrasil.com.br/dolar.htm. Therefore, the DOE is convinced that the most conservative value is applied in the cash flow

	3,759,713 Total: 119,350,501						analyses.
Installed capacity	Pampeana: 28 Terra Santa: 27.4	MW	ANEEL Resolution # 1305 issued on March 18th, 2008. ANEEL Resolution # 72 issued on January 06th, 2005. ANEEL Resolution # 1871 issued on June 14th, 2007. ANEEL Resolution # 317 issued on April 20th, 2004.	/PDD/ /ANEEL/ /XLS/	☒	☒	The referenced documents could be checked during on site visiting and no deviations could be detected. The parameters are correctly identified based on national official data. At the time of MD the available ANEEL's Resolutions indicates a higher value for Pampeana plant (30 MW) and the same value for Terra Santa. For conservativeness of the IRR calculation of Pampeana plant the installed capacity considered in the cash flow analyses was 28 MW in terms of investment.
Assured Capacity	Pampeana: 22.43 Terra Santa:	MW	Portaria MME No. 135 issued on June 25th, 2007. ANEEL Resolution # 72 issued on January 06th, 2005. ANEEL Resolution # 317 issued on April 20th, 2004. Portaria MME No. 75 issued on May 08th,	/PDD/ /ANEEL/ /TD/ /XLS/ /mme/	☒	☒	The initial values for assured energy of both plants considered at the time of the investment decision was based on Project Proponent Expertise (Brennand Group) and experience with other hydro power project under operation Brazil. The project´s Pampeana´s first design were verified and approved by ANEEL on January 6th 2005, as presented by the ANEEL Resolution No. 72. At that time Pampeana project consisted of 30 MW SHPP with an Assured Energy of 18.7 MW. When applying both values in the projects cash flows the project IRR is more conservative than the one identified.

	22.23		2007. ANEEL Resolution # 317 issued on April 20th, 2004.				Terra Santa had its first basic design project approved on April 20th, 2004. ANEEL´s Resolution 317 determines only the project´s installed capacity (27,4MW). At that time, the responsibility for the assured energy assessment was changing from ANEEL to MME (law 10.848/2004, regulated by the decree number 5.163 of 2005). Since the project was submitted on the transition period, the assured energy value was only available later on through MME´s Resolution of May 8th, 2007, which determines an assured energy equal to 22.23 MW. The value is higher than the project´s final version, therefore in order to adopt the most conservative approach it was applied the highest investment valuation. All cited documents could be checked during onsite visiting and no deviations could be detected. The parameter is identifies based on MME national official data.
Energy price	Long terms contract: 109,89	BRL/MWh	According to the energy auction held in 2005 for new hydropower plant projects adjusted with TJLP index. Information available at CCEE's website.	/PDD/ /FD/ /XLS/ /ccee/	☒	☒	The energy price of long term contracts was determined based on the energy auction occurred on 2005/12/16. The average price for the energy price fixed to PCHs and adjusted with the General Market Price Index from December 2005 to November 2007. The energy price was determined based on public available date form CCEE website. The website could be consulted and no deviations were detected.

	Spot Market: 80,38		According to historical price of The Spot Price, also called Settlement Price for the Differences available at CCEE's website.				The spot market is a different alternative to the energy negotiation in Brazil. Considering its price variation along the time and the offered security in the long term contracts, PPs intends to sell 100% of its generated energy through long term contracts. Therefore, the spot market energy price is not applied in the cash flow analyses. Additionally, it is important to mention that utilizing the higher energy price (Long Term Contracts) in the financial analyses results in a more conservative IRR calculation.
Operational Costs	Managerial: 6 O&M: 9 * plus 10,000 BRL each 10th year Transmission: 8 Losses: 0 Total: 23	% of project revenues	IEA study (2005) Eletrobrás (2009) – Guidelines for PCH Implementation (free translation of "Diretrizes para estudos e projetos de pequenas centrais hidrelétricas") public available at Eletrobra's website.	/PDD/ /FD/ /XLS/ /elbras/	☒	☒	The components of the Operational costs value was determined based on PP's expertise in the sector at the time of Management Decision. An extra cost due to preventive periodic maintenance is expected at years 13 and 23 of the cash flow spreadsheet. The total operational cost value adopted could be cross checked with an international study performed by the International Energy Agency (IEA) in small hydro project around the globe in 2005 and Eletrobrás public available official data from 2009. At the time of Management Decision the O&M costs estimative considered the lowest value presented in an international study performed by the International Energy Agency (IEA) in small hydro project around the globe (40 USD/MWh). Analyzing Pampeana and Terra Santa cash flows it is possible to identity that the applied values for O&M costs, considering the same unit of IEA study, are around 27 BRL/MWh for Pampeana and 26 BRL/MWh for Terra Santa. Converting the BRL values into USD currency considering the average exchange rate from September 2002 to September 2005 (2.95 BRL/USD) - http://www.rotarybrasil.com.br/dolar.htm -

							it is identified 79.65 and 76.7 USD/MWh, respectively. Therefore, the DOE is convinced that the most conservative value are applied in the cash flow analyses. Additionally, Eletrobrás indicates an estimative of operational costs of 5% of the Total Investment. Considering the above, the validation team calculated the values of operational cost considering PP's and Eletrabrá's approaches. It was evidences that the total operational cost identified by PP is similar and more conservative to the IRR calculation compared to the one referenced in national official data. Therefore, the validation team concludes that the applied values were correctly determined.
PIS (Tax)	0,65	% of sales revenues	PIS/PASEP: Law nr. 10,637, December 31st, 2002	/PDD/ /FD/ /XLS/	☒	☒	The value was correctly determined based on the national applicable Law.
COFINS (Tax)	3,0	% of sales revenues	COFINS: Law nr. 10,833, December 29th, 2003	/PDD/ /FD/ /XLS/	☒	☒	The value was correctly determined based on the national applicable Law.
Total Social Tax	Social tax: 9 Revenue base (CSLL): 12 Total: 12% x 9% = 1.08%	% of net income	Law nr. 8,981, January 20th, 1995	/PDD/ /FD/ /XLS/	☒	☒	The value was correctly determined based on the national applicable Law.

Total Income Tax	Revenue base: 8 Income tax: 25 Total: 8% x 25% = 2%	% of net income	Law nr. 9,430, December 27th, 1996	/PDD/ /FD/ /XLS/	☒	☒	The value was correctly determined based on the national applicable Law.
Fair Value	Pampeana: 20.327 Terra Santa: 15,463	BRL	Calculated at the financial analyses spreadsheet. Included at the end of the assessment period as a cash inflow in the final year. Fair value inclusion on the cash flow is a conservative measure since the full value of the capital expenditure had not been consumed. The value considers the total construction value and the depreciation amount accounted in the cash flow.	/PDD/ /XLS/	☒	☒	The fair value was calculated based on the annual depreciation rate after the equipments lifetime. The identified fair values of both plants corresponds to the difference of the total investment minus the sum of the annuals depreciations over the project lifetime. The identified fair values were included as a cash flow income at the end of the cash flow analyses.
Depreciation	3.33	%	ANEEL Resolution nr. 44 dated March 17th, 1999 (items 35 and 85 of this resolution).	/PDD/ /ANEEL/	☒	☒	The depreciation rate was determined based on ANEEL official data for the hydro power sector. The total depreciation is expected to occur in 30 years. The ANEEL Resolution could be property assessed and no deviations could be detected. The identified value is in line with National official data.
Amortization Term	10	years	National Secretariat of Federal Revenue Service.	/PDD/ /XLS/ /bcb/	☒	☒	According to the Federal Secretariat of Revenue Service the maximum period for amortization is 10 years (10%/year). To be conservator the PP

							applied the maximum rate as possible according to National Laws and Regulations.
Benchmark	16.2	%	Calculated based on the Capital Asset Pricing Model (CAPM)	/PDD/ /XLS/	The identified value was correctly calculated based on CAPM financing approach and no deviation could be detected.	All references used for the benchmark calculation were provided to the validation team and are from recognized financial institutions.	The Cost of Equity (Ke) was determined as the suitable benchmark for the project and it was calculated based on the CAPM modeling, which is commonly applied to theoretically determine an appropriate rate of return of an asset. Its calculation takes into account the expected return of a theoretical risk-free asset (R_f), systematic risk or market risk (β) and the expected International Market Equity Risk Premium (R_m). The calculation approach of the benchmark is clearly described in the financial spreadsheet. Please refer to the parameters applied in the benchmark calculation in this table for transparency of the benchmark determination.
Expected return of a theoretical risk-free asset (R_f),	8.25	%	Global 34 (Re-opening) - 28-year Brazilian Federal Bond - appropriate to the project cash flow period	/PDD/ /FD/ /XLS/ /bcb/	The identified Rf was identified based on BCB data.	The ABIF is the Chilean banks and financial institutions association which is an organization that get together all the banks and national and international private financial institutions that are established in the country.	The identified value corresponds to the 28-year bond of the Brazilian Central Bank. The considered bond is considered appropriate to the project cash flow period according to the technical lifetime o the main equipments (25 years).
International Market Equity Risk Premium (R_m)	6.47	%	Damodaran on line webpage: http://www.stern.nyu.edu/~adamodar/pc/datasets/histretSP.xls	/PDD/ /XLS/ /dam/	The value applied could be checked in Damodaran	Professor Damodaran holds M.B.A. and Ph.D. degrees from the University of	Considering that professor Damodaran is well known expert in financial parameters calculation, the validation team agrees with the use of the value applied.

					online web page. No deviation was detected.	California, Los Angeles, as well as a B.Com. in Accounting from Madras University and a PGDM from the Indian Institute of Management Bangalore His web page has been online since 1998 and the published information is widely use for financial analysis all over the world.	
Systematic risk or market risk (β)	1.51	%	Damodaran on line webpage: http://pages.stern.nyu.edu/~adamodar/pc/archives/emergcompfirm05.xls	/PDD/ /XLS/ /dam/	The value applied could be checked in Damodaran online web page. No deviation was detected.	Professor Damodaran holds M.B.A. and Ph.D. degrees from the University of California, Los Angeles, as well as a B.Com. in Accounting from Madras University and a PGDM from the Indian Institute of Management Bangalore His web page has been online since	Considering that professor Damodaran is well known expert in financial parameters calculation, the validation team agrees with the use of the value applied. The Beta factor was obtained from USA stock market information under Chemical Specific Industries, which Methanex is also included. It was estimated by regressing weekly returns on stock against New York Stock Exchange composite using 5 years of data or listed period.

						1998 and the published information is widely use for financial analysis all over the world.	

ANNEX 4: ASSESSMENT OF BARRIER ANALYSIS

Table A-4: Assessment of Barrier Analysis (EB 51 Annex 3, § 117)

☒	No barrier parameters are used for additionality justification
☐	Assessment of barriers see below

Kind of Barrier (invest, tech, other)	Description of Barrier	Evidence used	Assessment of validation team	
			Appropriateness of information source	Explanation of final result

ANNEX 5: OUTCOME OF THE GSCP

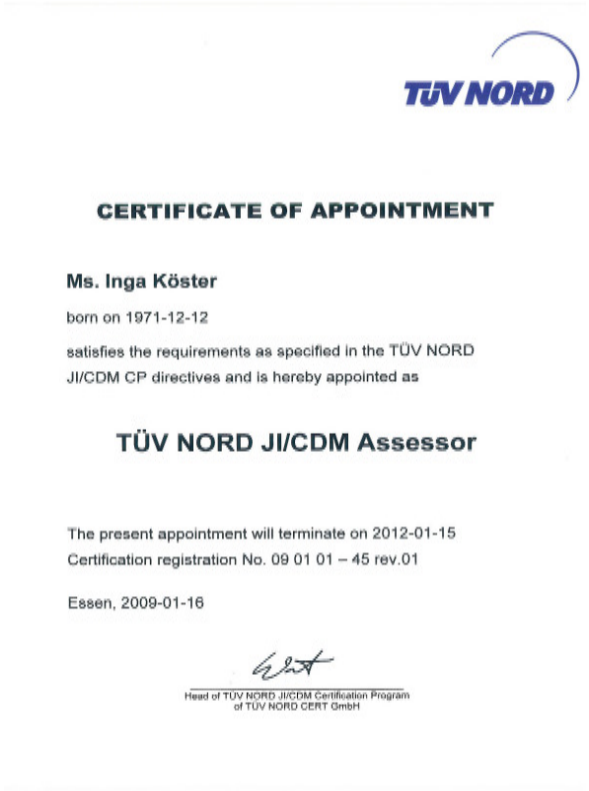
Table A-5: Outcome of the Global Stakeholder Consultation Process (§§ 40-42, VVM Version 1.2)

☒	No comments were received during the global stakeholder consultation period
☐	Comments were received during the global stakeholder consultation period. The comments (in unedited form) and the consideration/response of the validation team are presented below:

Comment No.:	Comment by:	Inserted on:	Subject	Comment *)	Action taken by the validation team to take due account on the comment *)	Conclusion (incl. CARs CLs or FARs)

*) In case clarifications have been requested by the validation team corresponding rows shall be added

ANNEX 6: APPOINTMENT CERTIFICATES OF TEAM MEMBERS



TÜV NORD

CERTIFICATE OF APPOINTMENT

Ms. Inga Köster

born on 1971-12-12

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

TÜV NORD JI/CDM Assessor

The present appointment will terminate on 2012-01-15
Certification registration No. 09 01 01 – 45 rev.01

Essen, 2009-01-16

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

CERTIFICATE OF APPOINTMENT

Dr. Gilberto Gomes Andrade

born on 1946-01-30

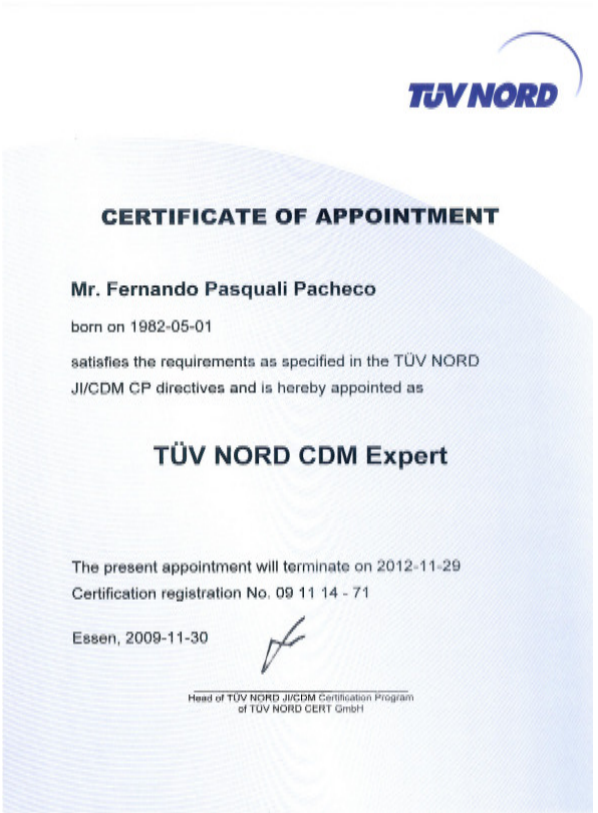
satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

TÜV NORD CDM Expert

The present appointment will terminate on 2013-02-02
Certification registration No. 10 02 01 - 16

Essen, 2010-02-03

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH



TÜV NORD

CERTIFICATE OF APPOINTMENT

Mr. Fernando Pasquali Pacheco

born on 1982-05-01

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

TÜV NORD CDM Expert

The present appointment will terminate on 2012-11-29
Certification registration No. 09 11 14 - 71

Essen, 2009-11-30

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

CERTIFICATE OF APPOINTMENT

Mr. Dipl-Ing. Rainer Winter

born on 1963-02-21

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby re-appointed as

TÜV NORD JI/CDM Senior Assessor

The present appointment will terminate on 2013-07-03
Certification registration No. 04 02 154-03
Initial appointment Assessor: 2004-03-01
Senior Assessor: 2007-07-07

Essen, 2010-07-04

Deputy of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

CERTIFICATE OF APPOINTMENT

Ms. Alexandra Nebel

born on 1980-07-25

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

TÜV NORD CDM Assessor

The present appointment will terminate on 2012-11-19
Certification registration No. 09 11 08 - 95

Essen, 2009-11-20

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH