
CDM VALIDATION REPORT

COMPANHIA HIDRELÉTRICA TELES
PIRES

TELES PIRES HYDROPOWER PLANT
PROJECT ACTIVITY IN BRAZIL

REPORT No: C-1-B-01-L-0222-VA

REVISION No: 3.2



VALIDATION REPORT – VVSv2.0

Date of first issue:	Project No:	
3 April 2012	C-1-B-01-L-0222	
Project Title:		
Teles Pires Hydropower Plant Project Activity		
Approved By and Date:	Organizational unit:	
Bilal Anwar (24 December 2012)	Perry Johnson Registrars Carbon Emissions	
Client Name:	Client ref.:	
Companhia Hidrelétrica Teles Pires	68,696	
Publication of PDD for Global Stakeholders Consultation:		
Commenting Period:	From 25-01-2012 to 23-02-2012	
First PDD Version and Date:	Version 1.0 dated 30-12-2011	
Final PDD Version and Date:	Version 7.0 dated 04-10-2012	
Summary:		
Companhia Hidrelétrica Teles Pires has commissioned PJRCES, Inc to perform the validation of the project: Teles Pires Hydropower Plant Project Activity. The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against CDM Validation and Verification Standard (version 02.0), Kyoto Protocol requirements and UNFCCC rules.		
Methodology (ies) used:	ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources	
Version number and date:	Version 13.0.0 (EB67 Annex13) Valid from 11-05-2012	
Sectoral Scope:	01	
Scale of the Project Activity:	<input checked="" type="checkbox"/> Large Scale <input type="checkbox"/> Small Scale	
Validation Status:		
The report is based on the assessment of the project design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, follow up actions and also the review of the applicable approved methodology and underlying formulae and calculations. In summary, it is PJRCES, Inc's opinion that the Teles Pires Hydropower Plant Project Activity in Brazil, as described in the Final PDD Version 7.0 dated 04-10-2012, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version-13.0.0. PJRCES, Inc, thus requests the registration of the project as a CDM project activity.		
<input type="checkbox"/> Corrective Actions & Clarifications Requested <input checked="" type="checkbox"/> Recommendation to CDM EB with a request for registration <input type="checkbox"/> Not recommended for registration as a Negative Validation Opinion is issued. (The validation report shall be sent to the CDM Executive Board)		
Validation Team:		Documentation Distribution:
Team Leader	Ricardo Costa	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit <input type="checkbox"/> Limited distribution <input type="checkbox"/> Unrestricted distribution
Team Member	Claudia Freitas	
Team Member	Rodrigo Gatti	
Financial Expert	Anuradha.S	
Sector Expert (TA-1.2)	Luiz Cardoso	
Independent Technical Review:		
Technical Reviewer:	Trainee Technical Reviewer:	
Date: 23 October 2012	Date:	
Name: Bilal Anwar	Name:	
Report No.:	Rev. No.	Date:
C-1-B-01-L-0222-Va	1	03-04-2012
	2	25-07-2012
	3	23-10-2012
	3.1	13-12-2012
	3.2 ¹	24-12-2012

¹ The Validation Report v.3.2 has been updated to reflect the receipt of the Letter of Approval from the DNA of Brazil as per paragraph 44b) of the VVS v2.0. This is the only change that has been made to the version 3.1 referred in the LoA/66/.



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ABBREVIATIONS

ANEEL	Brazilian Electricity Regulatory Agency
BAU	Business as usual
BM	Build Margin
BNDES	Brazilian Development Bank (in Portuguese “Banco Nacional de Desenvolvimento Econômico e Social”)
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CCEE	Electric Energy Commercialization Chamber (in Portuguese Câmara de Comercialização de Energia Elétrica)
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CCTP	Constructium Consortium Teles Pires formed by the companies: Odebrecht (CNO); Alstom Brasil Energia e Transporte Ltda. and Voith Hydro Ltda.
CHTP	Specific purpose company formed to run Teles Pires Hydropower Plant – “Companhia Hidrelétrica Teles Pires” (project owner)
CIMGC	Interministerial Commission on Global Climate Change (CIMGC from the Portuguese “Comissão Interministerial de Mudança Global do Clima”)
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CM	Combined Margin
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
EB	Executive Board
EIA	Environmental Impact Assessment
EPE	Power Research Company (in Portuguese - “Empresa de Pesquisa Energética”)
EQAO	CDM consultant company “Ecopart Assessoria em Negócios Empresariais Ltda”
IBAMA	Brazilian Institute of Environment and Natural Resources
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MCTI	Ministry of Science, Technology and innovation, Brazilian DNA
MME	Ministry of Mining and Energy
MP	Monitoring Plan
NGO	Non-governmental Organization
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
OM	Operating Margin
ONS	Electric System National Operator
PAC	Growth Acceleration Program from Brazilian Government
PCP	Project Cycle Procedure
PPA	Power Purchase Agreement
PDD	Project Design Document
PS	Project Standard
SIN	Brazilian National Interconnected System
UHE	Hydropower plant
UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM Validation and Verification Standard



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1. INTRODUCTION

1.1 OBJECTIVE (§19)

The Companhia Hidrelétrica Teles Pires has commissioned PJRCES, Inc to perform a validation of the Teles Pires Hydropower Plant Project Activity project in Brazil (hereafter called “the project”).

The objective of a CDM validation is to conduct a thorough and independent assessment of proposed project activities against the applicable CDM requirements. In particular, the validation is required to confirm that the project's baseline, the monitoring plan (MP) and the project's compliance as documented in the project design document are sound and reasonable and meets stated requirements and identified criteria of UNFCCC and host country criteria.

Validation is seen as necessary apparatus to provide assurance to relevant stakeholders on the quality of the project and its intended generation of certified emission reduction (CER). UNFCCC criteria refer to the Kyoto Protocol criteria (Article 12), the CDM modalities and procedures and the subsequent related decisions by the COP/MOP and the CDM Executive Board.

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

1.2 SCOPE

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations as stated below and QMS of PJRCES, Inc.

Based on the recommendations of the Validation and Verification Standard version 2.0 (hereafter called “VVSv2.0”), the validation team has employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs. Where, no specific means of validation is specified, the validation team has applied the standard auditing techniques as described in §22 of the VVSv2.0.

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

1.3 VALIDATION TEAM (148-e)

The validation of the project activity has been carried out by qualified personnel in line with the procedures defined in PJRCES, Inc quality manual for validation and team definition. The validation report has undergone a technical review before requesting registration of the project activity. The technical review was performed by an independent technical reviewer.



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ROLE OF THE VALIDATION/ASSESSMENT TEAM									
ASSESSMENT TEAM	ROLE	COMPETENCY			TASK PERFORMED				
		METH EXPERT	TECHNICAL AREA	HOST COUNTRY EXP.	DESK REVIEW	SITE VISIT	REPORT PREPARATION	INDEPENDENT TECH. REVIEW	
Rodrigo Gatti	VT	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Ricardo Costa	LV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Anuradha.S	FE			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Claudia Freitas	VA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
Luiz Cardoso	TE		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
Bilal Anwar	ITR	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NA			<input checked="" type="checkbox"/>	

Note:

- 1) VA – Validator, VT – Validator trainee, LV – Lead Validator, FE – Financial Expert, TE – Technical Expert, ITR – Independent Technical Reviewer
- 2) DR – Desk review of PDD and documents, SV – Site Visit, RP – Final Report Preparation.
- 3) Technical Expert involved has the required Host country knowledge



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2. METHODOLOGY OF VALIDATION

In assessing information, the PJRCES, Inc have applied the means of validation specified throughout VVSv2.0 and where appropriate standard auditing techniques, including, but not limited to as specified in §22 of the VVSv2.0.

2.1 DESK REVIEW OF CDM-PDD/CDM-SSC-PDD AND ADDITIONAL DOCUMENTATION (§22-a(i))

The desktop review includes:

- ↳ A review of the PDD (including annexes) and the relevant supporting documents. The detailed list of documents reviewed throughout the validation process, are included in the section 7, under references.
- ↳ Preparation of project specific validation checklist in line with the requirements of the §37 of the CDM M&Ps, the applicability conditions of the selected methodology and guidance issued by the Board VVSv2.0.
- ↳ Reporting of validation findings taking into account the public comments received on UNFCCC website.

2.2 USE OF VALIDATION PROTOCOL (§22-a(ii))

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The checklist shows, in a transparent manner, criteria and requirements, means of validation and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables:

Table 1 (Mandatory Requirements): This table provides the mandatory requirements to be followed by any CDM project activities as articulated in the Kyoto Protocol (Article12), CDM Modalities and Procedures and Simplified Modalities and Procedures for Small Scale CDM Project Activities.

Table 2 (Validation checklist): This table is prepared in accordance with the requirements of §37 of the CDM M&Ps, the applicability conditions of the selected methodology and guidance issued by the Board.

Table 3 (Resolution of corrective Action and clarification request): This table serves as medium to communicate with project participants on any short comings of the proposed project design with respect to the requirement of “Table 2”.

The completed validation protocol is enclosed in Appendix A to this report identifying Corrective Action Requests and clarification Requests.

All the 3 tables are described below.



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Table 1: Mandatory Requirements for CDM Project Activities

Requirement	Reference	Conclusion
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.

Table 2: Requirement checklist

Validation requirement Checklist	REF. (§§) VVSv2.0	Means of Validation	Evidence	Conclusion	
				Draft	Final
The various requirements as per §37 of the CDM modalities and procedures, in line with the VVSv2.0	The various requirements in Table 2 are linked to checklist questions the project should meet.	The section is used to elaborate and discuss the question and/or the conformance to the question. It is further used to explain the conclusions reached.	Explains how conformance with the checklist question is investigated. Examples of means of validation are document review (DR) or interview (I). N/A means not applicable	If the conclusions from the means of Validation are either a CAR, FAR or a CL, these should be listed in this section.	If the conclusions from the Table 3 discussions are either a FAR or issues closed these should be listed in this section.

Table 3: Resolution of issues identified in Table 2 of the Validation Checklist

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation Team conclusion
CAR/CL №	Description of CAR/CL	Reference		
CAR#01/CL#01	If the draft conclusions from the Table: 2 are either a CAR, FAR or a CL, these should be listed in this section	Reference to the section of the Table2 or any other reference.	The responses given by the project participants during the communications with the validation team should be summarized in this section.	This section should summarize the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".

2.3 FOLLOW-UP ACTIONS (§22-b)

In order to ensure that no relevant information has been omitted, PJRCES, Inc has performed following follow-up actions

- ↳ Interviews with relevant stakeholders in the host country, personnel with knowledge of the project design and implementation;
- ↳ Cross checks between information provided by interviewed personnel (i.e. by checking sources or other interviews).
- ↳ Background investigation and follow-up interviews with personnel of the project participant, the CDM project consultant, legal authorities and other stakeholders.



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Between [27-09-2012 to 29-09-2012, qualified validation team from PJRCES, Inc performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. The site visit consisted of a visit to the main office of the project owner. The decision of not going to the site was based on paragraph 67 of the VVS 2.0 /55/. Given the hydro power plant is under initial construction (photos and schedule of works have been available for validation team) there was no physical site inspection to be done.

The main topics of the interviews are summarized in the table below. (§148-d)

SL. Nº	DATE	NAME	ORGANIZATION	TOPIC
/01/	27-09-2012 to 29-09-2012	Celso Ferreira	Companhia Hidrelétrica Teles Pires	<ul style="list-style-type: none"> - Company structure - Information of project construction - Project Management
/02/	27-09-2012 to 29-09-2012	Gustavo Marques	Companhia Hidrelétrica Teles Pires	<ul style="list-style-type: none"> - Company structure - Information of project construction - Project Management
/03/	27-09-2012 to 29-09-2012	Ricardo Esparta	EQAO	<ul style="list-style-type: none"> - Baseline determination of the project - Applicability of selected methodology - Issues related to the additionality - Common practice analysis - Emission reductions calculation - Emission reduction monitoring plan

2.4 REPORTING OF FINDINGS (§24 to §29)

During the validation of a project activity, where PJRCES, Inc identified issues that required further elaboration, research or expansion in order to determine whether the project activity meets the relevant CDM requirements, and can achieve credible emission reductions, PJRCES, Inc ensured that these issues are accurately identified, formulated, discussed and concluded in the validation report in form of following different types of findings.

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

Where a non-conformance arises the Assessor shall raise a **Corrective Action Request (CAR)**. A CAR is issued, where:

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



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The validation process may be cut short until this information has been made available to the validation team's satisfaction. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

Additionally, a **Forward Action Request (FAR)** may be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. The FARs so identified however, shall not relate to the CDM requirements for registration.

Corrective Action Requests and Clarification Requests are raised in the draft validation protocol and detailed in **Table 3** of **Appendix A**. In this table, the Project Participant is given the opportunity to "close" outstanding CARs and respond to CLs and FARs.

The validation protocol serves the following purposes:

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

2.5 INTERNAL QUALITY CONTROL (§148-f)

Following the completion of the assessment process and a recommendation by the validation team, all documentation will be forwarded to an Independent Technical Reviewer. The task of the Independent Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Independent Technical Reviewer may either accept or reject the recommendation made by the validation team. Findings can be raised at this stage and PP must address the same within agreed timeline.



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3. COMMENTS FROM PARTIES, STAKEHOLDERS & ACCREDITED NGO'S

In accordance with sub-paragraphs 40 (b) and (c) of the CDM modalities and procedures, the project design document of a proposed CDM project activity shall be made publicly available and the DOE shall invite comments on the validation requirements from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available. This chapter describes this process for this project.

3.1 GLOBAL STAKEHOLDER CONSULTATION (§37)

The Project Design Document Version 1.0 dated 30-12-2011 for this project was made available on <http://cdm.unfccc.int/Projects/Validation/DB/0LAWB1YZURTG26K2GL72WDDP2VOA/LS/view.html> and was open for comments for Parties, Stakeholders and Accredited NGO's for a period of 30 days starting from 25-01-2012 until 23-02-2012.

3.2 COMPILATION OF COMMENTS RECEIVED (§37)

Comments from the following persons/organizations were submitted to the DOE:

- GSP comment 1. Submitted by International Rivers on behalf of Brent Millikan
- GSP comment 2. Submitted by International Rivers on behalf of Brent Millikan
- GSP comment 3. Submitted by Zhong Zhou Li
- GSP comment 4. Submitted by Zhong Zhou Li
- GSP comment 5. Submitted by Zhong Zhou Li
- GSP comment 6. Submitted by International Rivers on behalf of Brent Millikan
- GSP comment 7. Submitted by International Rivers on behalf of Brent Millikan

Comments (1) and (2) refers specifically to UHE Teles Pires and have exactly the same content, as well as (3) and (4) are the same, but were made on generic basis more related to the CDM requirements for additionality demonstration. Comment (5) was directed to another project activity, which the Host Country is very likely India. Comment (6) is also specifically referred to UHE Teles Pires and Comment (7) was submitted by the same sender of (6) only asking for confirmation of receipt of Comment (6).

3.3 DETAILS OF THE ACTIONS TAKEN TO TAKE DUE ACCOUNT OF THE COMMENTS (§37)

All comments were answered by PPs and provided to the validation team in the Appendix 4/29/. In order to answer all received comments, PPs grouped them by similarity, which were roughly divided in three main issues:

- Additionality
- Environmental licensing
- GHG emission from hydropower reservoirs

For each of abovementioned issues PPs firstly, summarized the related comments, secondly answered to the issues and in some cases, provided further comments and evidences.

With respect to the questions related to the additionality demonstration, all input parameters and calculations were submitted to the DOE for validation, corrections were made in order to fully comply with the CDM requirements. For further details, please refer to Sections B.4 and B.5 of the PDD/25/.



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the spreadsheets with calculations /26//27/ and to Section 4 and Appendix B of this Validation Report. PPs properly substantiated that in addition to additionality demonstration, Teles Pires Hydropower Plant Project Activity falls under an E- Policy, given in Brazil some policies and actions were implemented by the government since 2003 to promote renewable energy generation and energy efficiency in the Energy Sector in order to change the trend of increased demand for fossil fuel power plants observed in the period from 1996 to 2002 and accentuated after the major national blackouts from 2001 and 2002. In that matter, the Executive Board of the CDM (EB 22 Annex 3)/65/ established that "national and/or sectoral policies or regulations that give comparative advantages to less emissions-intensive technologies over more emissions-intensive technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs), so called E- Policy, that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001) need not be taken into account in developing a baseline scenario (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place). Therefore, under current CDM rules, the fact of this project being a priority for the Brazilian government does not prevent Teles Pires Hydropower Plant Project Activity to be eligible to the CDM. Otherwise the CDM would create a perverse incentive for Host Parties not to introduce policies which would contribute to emission reductions.

PPs also addressed in an appropriate way the questions regarded to environmental issues, since there is a consolidated regulation and procedures for licensing hydropower projects in Brazil, which includes public hearings to all local communities impacted by the project. Up to now, UHE Teles Pires has accomplished to receive from IBAMA all the Environmental Licenses (L.P/35/ and L.I./36/) required for the actual implementation stage of the project. It shall be noted that in order to have these permits valid, UHE Teles Pires must to continuously comply with several social/environmental requirements determined by the Environmental Authorities. Ultimately, the social/environmental issues will also be considered by the Brazilian DNA (CIMGC) when evaluating this project to issue the Letter of Approval.

Comments/criticism regarding the GHG emissions of hydropower projects were also adequately answered by PPs and the validation team can confirm that the project emissions were considered according to the applied methodology/53/ and the CDM requirements. More details can be found in Section B.6 of the /25/, the ERs spreadsheet with calculations /28/ and to Section 4 and Appendix B of this Validation Report. Beyond that is out of the scope of this validation.

PJR CES deem that PPs have taken due account of the comments received during the validation process.



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4. VALIDATION FINDINGS

4.1 APPROVAL (§38-§44) & CONTRIBUTION TO SUSTAINABLE DEVELOPMENT (§50-§52)

It has been verified that Letter of Approval/66/ dated 18-12-2012 issued by the Brazilian DNA is consistent with project activity title in the PDD/25/ and authorizes the project participants (Companhia Hidrelétrica Teles Pires and Ecopart Assessoria em Negócios Empresariais Ltda. – EQAO) for the project activity. It further confirms that Brazil has ratified the Kyoto Protocol, and therefore a Party to it, in 23 August 2002, the project activity is voluntary and contributes to the sustainable development of Brazil.

The referred LoA/66/ has been received directly from the project participant and its authenticity has been confirmed by checking the original letter/66/ and comparing with other letters issued by the Brazilian DNA for other registered CDM projects/71/.

Opinion:

In the opinion of the validation team the LoA/66/ is meeting the requirements stipulated in the §38 §44 for approval and §50 §52 for contribution to sustainable development of VVSv2.0. It has been determined that the LoA is unconditional with respect to §39 (a-d). It has also, been confirmed from LoA that proposed CDM project activity assists Brazil (Host Party) in achieving the sustainable development.

4.2 AUTHORIZATION (§39-§49)

The host Party for this project is Brazil and has ratified the Kyoto Protocol on 23-08-2012. This was checked from the UNFCCC website <http://cdm.unfccc.int/DNA/index.html>. The project participants listed in section A.4 and Appendix 1 of PDD/25/ are Companhia Hidrelétrica Teles Pires(CHTP) and Ecopart Assessoria em Negócios Empresariais Ltda. (EQAO). The LoA/66/ from the Brazilian DNA approves the participation of Companhia Hidrelétrica Teles Pires and Ecopart Assessoria em Negócios Empresariais Ltda. (EQAO), therefore the project participants are authorized by the Party of Kyoto Protocol.

No Annex I Party has been identified in the PDD/25/ and therefore no further Letter of Approval was available. It is noted that the CDM EB has agreed that the registration of a CDM project activity can take place without an Annex I Party being involved at the stage of registration. It should also be noted that before CER can be transferred to an Annex 1 Party, a Letter of Approval from Annex 1 Party will need to be submitted.

Opinion:

In the opinion of the validation team, there are two project participants in the section A.4 and Appendix 1 of the PDD/25/ and their participation has been approved by DNA of Brazil, which is a Party to the Kyoto Protocol. The participation has been confirmed based on the Letter of Approval/66/ issued by the DNA of the host Party as referenced in the section 4.1 above.

4.3 MODALITIES OF COMMUNICATIONS (§53-§61)



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4.3.1 MODALITIES OF COMMUNICATION STATEMENT (§59-§61)

The project participants listed in section A.4 and Appendix 1 of PDD/25/ are Companhia Hidrelétrica Teles Pires (CHTP) and Ecopart Assessoria em Negócios Empresariais Ltda. (EQAO). The MoC/33/ provided by the PP has been duly verified against the project title and information mentioned in Appendix 1 and found to be consistent.

The validation team has assessed the corporate identity of the project participants, focal point, including specimen signatures and employment status of their authorized signatories as listed in MoC statement by directly checking evidence as follows:

- **Companhia Hidrelétrica Teles Pires:** The company identity was verified through the Board meeting Minutes of the Company Formation/49/, dated 19/01/2011, and notarized on 26/01/2011. The authorized personal identity of the focal point from CHTP was verified through the company's Board meeting minutes from the same date appointing Mr. Celso Ferreira as Technical Director/50/. This information has been further cross-checked with the contracts signed between EQAO and CHTP to develop the CDM project/11//12/ as well between CHTP and PJRCES to perform the CDM validation services/117/.
- **Ecopart Assessoria em Negócios Empresariais Ltda:** The company identity was verified through the Company Formation Contract of EQAO/52/, which was further cross-checked with the contracts signed between EQAO and CHTP to develop the CDM project/11//12/. EQAO also provided a written confirmation/51/ that Ms. Melissa Sawaya Hirschheimer and Mr. Marco Mazaferro are duly authorized to be the focal points on behalf of EQAO.

PP has also used the latest F-CDM-MOC, version2.1 and information provided in the F-CDM-MOC and its annex 1 is complete and accurate. PJRCES also will check the consistency of information between the PDD/25/, Letter of Approval (LoA)/66/ and the Modalities of Communication (MoC)/33/.

Opinion:

In the opinion of the validation team, there is only one project participant in the section A.4 and Appendix 1 of the PDD/25/ and the MoC/33/ provided by the PP has been duly verified against the project title and information mentioned in PDD/25/ and found to be consistent. Also, it is confirmed that the official signing and submitting the MoC is authorized by the PP and is meeting the requirements stipulated for Modalities of communications in the §53-§61 of VVSv2.0.

4.4 PROJECT DESIGN DOCUMENT (§62-§63) & PROJECT ACTIVITY DESCRIPTION (§64-§69)

The project activity consists of the implementation of a Greenfield grid-connected hydropower plant in Teles Pires River between the municipalities of Paranaita, Mato Grosso state and Jacareacanga, Pará state, in the border of Midwest/North regions of Brazil. The project's central geographical coordinates derived from the Brazilian Electricity Regulatory Agency (ANEEL from Portuguese language) are at latitude 9°21'04" South and longitude 56° 46'39" West, which have been verified by PJRCES with the Google earth and in the government dispatch N° 3,504 /72/ accessed through the ANEEL website².

The project activity involves the installation and operation of 05 Francis turbines of 369.70 MW nominal power each and 05 three phase synchronous generators with nominal power of 404.45 MVA and power factor of 0.9, resulting into a nominal power of 364 MW each, supplied by the

² ANEEL (Brazilian Electricity Regulatory Agency). Available at: <http://www.aneel.gov.br/>



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consortium formed by Alstom Brasil Energia e Transporte Ltda. and Voith Hydro Ltda./19//13/. Thereby the total installed capacity of the proposed project is 1,820 MW /19//72/.

The main characteristics of the project activity (Table below) have been verified to be in line with those provided in the Final Consolidated Basic Project/19/, which was elaborated by a third party professional body hired by Companhia Hidrelétrica Teles Pires and further approved by ANEEL/72/. The technology adopted in the proposed project reflects current good practices in the region and there is no technology transfer from Annex I Party involved.

Technical Parameter	Value
Dam	
Length / Type	1,220 m / Built in compacted concrete at the riverbed and rockfilled with claim core at the sides.
Spillway	At the right side, sized based on a 10,000-year recurrence interval flow of 13.704 m ³ /s.
Reservoir area at 220 m	134.7 km ²
Water head level (maximum and minimum)	220 m
Nominal water flow per unit	764 m ³ /s;
Nominal net head	52.2 m
Turbines	
Number of units / Type	05 / Francis with vertical axis
Nominal Power of each unit	369.7 MW
Nominal rotation	75 rpm
Power Factor	94%
Generators	
Number of units / Type	05 / Three-phase synchronous
Nominal power	404.45 MVA
Power Factor	90%
Tension	13.8 kV
Frequency	60 hz



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Installed Capacity	1,820 MW
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The set of 05 turbines/generators referred above conferred to a total firm energy of 940.6 MWavg/year/17/ and a final plant load factor of 51.68%, which will generate a total electricity of 8,239,656 MWh/year (940.6 MWh * 8760hs/year * 51.68% PLF). The net electricity dispatched to the grid calculates as 8,056,736 MWh/year after deducting the grid transmission losses (2.22%). PJRCES reviewed both documents/17//19/ and also considering that the firm energy has been approved by the Brazilian Electricity Regulatory Agency (ANEEL from Portuguese language), while applying the project activity for implementation approval/73/, it is considered to be complying with the requirements of 'Guidelines for the reporting and validation of plant load factors'/62/.

The project is expected to be fully operational by 2015 and will have a reservoir area of 134.7 km² /72/ at the maximum-maximorum reservoir level (220 m), which results in a power density of 13.51 w/m² (1820 MW/134.7 km²).

The net power generation delivered to the Brazilian National Interconnected System (SIN, from the Portuguese, "Sistema Interligado Nacional") in non-leap years is expected to be 8,056,736 MWh/year through a 35 years concession thus displacing more carbon-intensive electricity generated by the mix of plants connected to the SIN. Based on the estimated total net power generation the estimated average annual emission reductions calculates as 2,499,498 tCO₂/year, totaling 24,994,984 tCO₂ for the whole fixed crediting period of 10 years.

The approval for the electricity connected to the SIN has been provided and verified by PJRCES through review of ANEEL Dispatch Nr. 3,504 /72/. The validation team has also reviewed the project implementation schedule and project design layouts/19//14/ and has carried out an on-site visit to assess the project details and its implementation status /76//77/.

PJRCES is able to confirm that the PDD Version 7.0 dated 04-10-2012 is in compliance with the guidance and has followed the structure and guidance in the latest Guidelines for Completing the Project Design Document form/54/ under the "VVS Track".

Opinion:

In the opinion of the validation team the final PDD/25/ is complying with the relevant forms and guidance. Further, it is confirmed that the description of the project activity as contained in the final PDD/25/ is found consistent on ground and have been validated from the permission letter/72/, UHE Final Consolidated Basic Project/19/ and found to be accurate and complete.

4.5 APPLICATION OF THE SELECTED BASELINE & MONITORING METHODOLOGY (§70-§100)

4.5.1 APPLICABILITY OF THE SELECTED BASELINE & MONITORING METHODOLOGY (§70-§79)

The project activity correctly applies the approved consolidated baseline and monitoring methodology - ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" version 13.0.0 /53/, EB 67, Annex 13, valid from 11 May 12 onwards.

The validation of compliance of the project activity with the applicability conditions of the applied methodology by PJR CES has been undertaken as follows:

Applicability of selected methodology "ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version-13.0.0"			
Sl. No	Applicability condition	Validation team assessment	Reference Document



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01	<p>The methodology is applicable to grid-connected renewable power generation project activities that:</p> <p>(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).</p>	<p>The project activity is a Greenfield grid-connected hydro power plant at a site where there was no renewable energy project operating prior to implementation of this project. The proposed project will have an installed capacity of 1,820 MW and the generated electricity will be dispatched to the Brazilian National grid – SIN.</p> <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Feasibility Study, Consolidated Basic Project, Concession Contract and the government resolutions allowing the implementation of UHE Teles Pires.</p>	<p>/16/ /18/ /19/ /20/ /25/ /73/ /74/</p>
02	<p>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;</p>	<p>The proposed project activity is the installation of a new run-of-river hydro power plant.</p> <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Feasibility Study, Consolidated Basic Project, Concession Contract and the government resolutions allowing the implementation of the project activity under run-of-river operation regime and referring to its short water retention time (4.6 days)./17/</p>	<p>/16/ /17/ /18/ /19/ /20/ /25/ /73/ /74/ /69/</p>
03	<p>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.</p>	<p>Not applicable. The project activity is a Greenfield grid-connected hydro power plant at a site where there was no renewable energy project operating prior to implementation of this project.</p> <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Feasibility Study, Consolidated Basic Project, Concession Contract and the government resolutions allowing the implementation of UHE Teles Pires.</p>	<p>/16/ /18/ /19/ /20/ /25/ /73/ /74/</p>
04	<p>In case of hydro power plants:</p> <ul style="list-style-type: none"> One of the following conditions must apply: 	<p>The implementation of the proposed project activity will result in a new reservoir of 134.7 km², while the installed capacity is 1,820 MW,</p>	<p>/19/ /20/ /25/</p>



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	<p>o The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs; or</p> <p>o The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the project emissions section, is greater than 4 W/m²; or</p> <p>o The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the project emissions section, is greater than 4 W/m².</p>	<p>therefore, the power density is 13.51 w/m² (calculation provided in Section B.6.1 of the PDD), which is greater than 4 W/m².</p> <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Consolidated Basic Project and the Concession Contract.</p>	/73/
05	<p>In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m² all the following conditions must apply:</p> <ul style="list-style-type: none"> • The power density calculated for the entire project activity using equation 5 is greater than 4 W/m²; • Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project¹ that collectively constitute the generation capacity of the combined power plant; • Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; • Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m², is lower than 15 MW; • Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 	<p>Not applicable. The implementation of the proposed project activity will result in a new single reservoir.</p> <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Consolidated Basic Project and Feasibility Study of the Hydrological and Energetic potential for UHE Teles Pires from EPE.</p>	<p>/25/ /19/ /75/</p>



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	W/m ² , is less than 10% of the total installed capacity of the project activity from multiple reservoirs.		
06	<p>The methodology is not applicable to the following:</p> <ul style="list-style-type: none"> • 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; • Biomass fired power plants; • A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m². 	<p>None of them are applicable to the project activity, since:</p> <ul style="list-style-type: none"> • The project activity is a Greenfield power plant at a site where there was no renewable energy project operating prior to the implementation of the project activity. • The project activity is a hydro power plant. • The proposed project activity will have a power density of 13.51 w/m², which is greater than 4 W/m². <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Consolidated Basic Project, Concession Contract, the government resolutions allowing the implementation of UHE Teles Pires and Feasibility Study of the Hydrological and Energetic potential for UHE Teles Pires from EPE.</p>	<p>/25/ /19/ /20/ /73/ /74/ /75/</p>

In addition, the applicability conditions of the tools referred by ACM0002, version 13.0.0 to the project activity are justified as follows:

Applicability of Tools referred by “ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version-13.0.0”		
Tool	Applicability condition	Validation team assessment
Tool to calculate the emission factor for an electricity system, version 02.2.1 /59/	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The proposed project activity is the installation of a hydro power plant supplying electricity to the National grid. Estimation of operating margin, build margin and combined margin has been calculated applying the steps of the tool.
	The tool is not applicable if the project electricity system is located partially or totally in an Annex-I country.	The project electricity system, which is the Brazilian National Interconnected System (SIN) is located in a non-Annex I country.
Tool for demonstration and assessment of additionality (v06) /58/	Project activities that apply this tool in context of approved consolidated methodology ACM0002, only need to identify	The additionality of the project activity has been demonstrated and assessed using the latest version of this tool as determined by ACM0002, version



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	that there is at least one credible and feasible alternative that would be more attractive than the proposed project activity.	13.0.0.
Combined tool to identify the baseline scenario and demonstrate additionality /60/	If the project activity is the retrofit or replacement of existing grid-connected renewable power plant/unit(s) at the project site, a step-wise procedure to identify the baseline scenario shall be applied by using the Combined tool to identify the baseline scenario and demonstrate additionality.	Not applicable, since the project activity is a Greenfield hydro power plant connected to SIN grid. Therefore, the baseline scenario is already determined by ACM0002, version 13.0.0. There is no further applicability condition for using the tool.
Tool to calculate project or leakage CO2 emissions from fossil fuel combustion /61/	For geothermal and solar thermal projects, which also use fossil fuels for electricity generation, CO2 emissions from the combustion of fossil fuels shall be accounted for as project emissions ($PE_{FF,y}$). The use of fossil fuels for the back up or emergency purposes (e.g. diesel generators) can be neglected. $PE_{FF,y}$ shall be calculated as per the latest version of the Tool to calculate project or leakage CO2 emissions from fossil fuel combustion.	Not applicable, since the project activity is a hydro power plant.

Opinion:

It has been concluded by the assessment team that the relevant applicability conditions in the context of the project activity are duly included in the PDD and critically validated. The choice of selected methodology ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version-13.0.0 is justified and the applied methodology has been found to be the most suitable in the context of the proposed CDM project activity. The version used by PP is valid till date.

4.5.2 DEVIATION AND CLARIFICATION FROM / ON APPROVED METHODOLOGY (§78-§81)

A. DEVIATION FROM AN APPROVED METHODOLOGY (§78-§80)

Not applicable.

Opinion:

As confirmed in the section 4.5.1 above the proposed project activity meets all the applicability conditions of the applied methodology and no deviation has been proposed by PP or identified by validation team.



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B. CLARIFICATION ON THE APPLICABILITY OF AN APPROVED METHODOLOGY (§81)

Not applicable.

Opinion:

As confirmed in the section 4.5.1 above the proposed project activity meets all the applicability conditions of the applied methodology and no clarification request is required.

4.5.3 PROJECT BOUNDARY (§82-§87)

As per the requirements of the applied baseline and monitoring methodology ACM0002, version 13.0.0, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

Therefore the spatial extent of the project boundary is clearly defined as the site of UHE Teles Pires and the Brazilian National Interconnected System (SIN), comprising all power plants connected physically to this grid. The project's system boundaries are clearly defined as the SIN, which is in line with the delineation of grid boundary as provided by the Brazilian DNA/70/. The defined project boundary is also in line with the ACM0002, version 13.0.0/53/.

The emission sources and gases included in the project boundary are:

	GHGs involved	Description
<i>Baseline emissions</i>	CO ₂	According to 'ACM0002 version 13.0.0' only CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity are accounted for.
<i>Project emissions</i>	CH ₄	As the project is a hydro power plant and its Power Density is 13.51 w/m ² , i.e. greater than 10 w/m ² , no CH ₄ emissions from the project activity shall be accounted for according to ACM0002 version 13.0.0. However, project sponsor will monitor the reservoir area as required by the methodology.
<i>Leakage</i>	N/A	As per ACM0002 version 13.0.0, no leakage emissions are to be considered for the project activity.

Opinion:

There are no GHG emissions occurring within the project activity boundary as a result of the implementation of the proposed project activity (as the project activity involves installation of project activity, which will harness Renewable energy to generate power) it has been confirmed that such emissions, if any, would not contribute more than 1% of overall expected average annual emission reductions.

The project boundary included in the PDD/25/ has been confirmed by the validation team during the desk review/25//19//20//73//74//75/ and site visit/76//77/ and found to be consistent. The identified boundary and the selected sources and gases are justified for the proposed CDM project activity.



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4.5.4 BASELINE SCENARIO IDENTIFICATION AND DESCRIPTION (§88-§95)

Since the project activity is the installation of a new grid-connected renewable power plant/unit and is not a capacity addition, retrofit or replacement of existing grid-connected renewable power plant/unit, the baseline is prescribed by the applied methodology ACM0002, version 13.0.0/53/ as the "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".

The connected power grid for the proposed project is the Brazilian National Interconnected System (SIN).

Therefore, the baseline scenario is the continuation of the current situation, i.e. the electricity to be generated by the hydro power plant would be generated by the mix of plants connected to SIN and by the addition of new generation sources, as reflected in the combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM), which are provided by an official source, the Brazilian DNA/71/. The weighting is set to be 50% and 50% for OM and BM emission factors respectively, which is in line with the "Tool to calculate the emission factor for an electricity system", version 2.2.1 /59/.

As per the paragraph 115 of the VVSv2.0 /55/, where the baseline scenario is prescribed in the approved methodology, no further analysis is required. However, it is confirmed by PJR CES that the baseline identified in the final version of the PDD/25/ is correctly identified following the conditions and requirements of the applied baseline methodology.

Opinion:

In the opinion of the validation team, it is confirmed that

- All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- The approved baseline methodology has been correctly applied to identify the most plausible baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed project activity.

4.5.5 ALGORITHMS AND/OR FORMULAE USED TO DETERMINE EMISSION REDUCTIONS (§96-§100)

The emission reductions (ER_y) by the project activity during the crediting period is the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (L_y), as follows:

a) Baseline emissions: Baseline emissions (BE_y in tCO_2) are the product of the grid emission factor ($EF_{grid,CM,y}$ in tCO_2/MWh) times the electricity that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr).

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$



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Where:

BE_y = Baseline emissions in year y (tCO₂/yr)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$ = Combined margin CO₂ emissions factor in year y (tCO₂/MWh)

Given the project activity is the installation of a new grid-connected hydropower plant at a site where no renewable power plant was operated prior to the implementation of the project activity, according to ACM0002, version 13.0.0:

$EG_{PJ,y} = EG_{facility,y}$

$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant to the grid in year y (MWh/yr).

Determination of $EF_{grid,CM,y}$

The Project Activity is connected to the Brazilian National Interconnected System (SIN). By means of the Resolution number 8/70/, the Interministerial Commission on Global Climate Change (CIMGC), the Brazilian DNA, delineated the electricity system as the National Interconnected Grid (SIN), for CDM purposes. It covers all the five macro-geographical regions of the country (North, Northeast, South, Southeast and Midwest).

The Brazilian DNA provides every year, updated information about the emission factor of operating margin and build margin /45/, which is calculated according to the “Tool to calculate the emission factor for an electricity system”, considering only grid power plants (option I of Step 1).

The Operating margin ($EF_{grid,OM,y}$) is calculated as per the dispatch data analysis OM from Option (c) of Step 3, therefore, shall be determined ex post.

With respect to the Build margin ($EF_{grid,BM,y}$), PPs chose Option 1 of the tool/59/, determining BM ex-ante based on the most recent information available at the time of submission of the PDD for validation (Base year 2010).

The grid emission factor is determined ex post as a combined margin, consisting of a weighted average of the operating margin ($EF_{grid,OM,y}$) and the build margin ($EF_{grid,BM,y}$), as per equation below:

$$EF_{grid,CM,y} = EF_{grid,OM,y} * w_{OM} + EF_{grid,BM,y} * w_{BM}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh)

$EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh)

w_{OM} = Weighting of operating margin emissions factor (%)

w_{BM} = Weighting of build margin emissions factor (%)

According to the tool/59/, for hydropower plants $w_{OM} = 0.5$ and $w_{BM} = 0.5$ shall be used to obtain the $EF_{grid,BM,y}$. The Brazilian DNA website provides for 2010, $EF_{grid,OM,y} = 0.4796$ and $EF_{grid,BM,y} = 0.1404$.

Therefore, $EF_{grid,BM,y}$ resulted in 0.3100 tCO₂e/MWh.

PJRCES confirms that the PDD was submitted for global stakeholder consultation on 25 January 2012 and the data used for calculation of the grid emission factor is the most recent available at the commencement of validation. The data used in the Emission Factor calculation/28/ is in accordance with the data published by CIMGC in 2010/45/.



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b) Project emissions: The applied methodology ACM0002 version 13.0.0 establishes that project emissions of hydropower plants are accounted only for $PE_{HP,y}$ (Project emissions from water reservoirs of hydro power plants in year y). So, $PE_y = PE_{HP,y}$, which is based on the Power Density of the water reservoir, calculated as follows:

$$PD = (Cap_{PJ} - Cap_{BL}) / (A_{PJ} - A_{BL})$$

Where:

PD = Power density of the project activity (W/m²)

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W), which has been confirmed to be 1,820,000,000 W/72/.

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero.

A_{PJ} = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m²), validated as 134.70 km²/72/ at the maximum water level of 220 m.

A_{BL} = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m²). For new reservoirs, this value is zero.

Therefore, the project Power Density is calculated to be 13.51 w/m², which is greater than the threshold level of 10 w/m². Hence, according to ACM0002 version 13.0.0, $PE_{HP,y}$ is zero.

In conclusion, PE_y of this project activity is zero.

c) Leakage: As per the requirements of the applied baseline methodology, no leakage has to be considered for the project activity.

Based on the above mentioned emission factor and net power generation of approximately be 8,056,736 MWh (considering an installed capacity of 1,820 MW) annual estimated emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

$$ER_y = BE_y - 0 - 0$$

$$BE_y = EG_{PJ,y} * EF_{Grid,CM,y}$$

$$ER_y = BE_y = 8,056,736 \text{ MWh} * 0.3100 \text{ tCO}_2/\text{MWh}$$

$$ER_y = 2,497,446 \text{ tCO}_2\text{e/year}^{34}$$

Opinion:

In the opinion of the validation team, it is confirmed that:

- All assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;
- All values used in the PDD are considered reasonable in the context of the proposed project activity;

³ Note that the result of multiplying 8,056,736 MWh by 0.31 = 2,497,588 tCO₂e/year. The difference to 2,497,446 tCO₂e/year is due to the rounding of the Emission Factor, which the actual value is 0.3099823, when showed with more digits. However the final value of ERs showed in the PDD and VR is the correct one (more conservative), since it has been calculated in the ERs spreadsheet/28/ without roundings.

⁴ For leap years (one extra day in the year) PPs accounted the extra 24 hours in the year, hence $EG_{PJ} = 8,239,656 \text{ MWh}$ and $ER_y = 2,504,288 \text{ tCO}_2\text{e}$ for that particular year.



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- d. The baseline methodology and corresponding tool(s) have been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- e. All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

4.6 ADDITIONALITY (§101-§104)

The additionality of the proposed CDM project activity has been demonstrated as per “Tool for the demonstration and assessment of additionality” (Version 6) as required by the applied methodology ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version-13.0.0.

4.6.1 PRIOR CONSIDERATION OF THE CLEAN DEVELOPMENT MECHANISM (§105-§112)

Since the starting date is later than 2 August 2008, the serious consideration of CDM was assessed based on the Paragraph 107 in the VVSv2.0 /55/ and the “Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM” /57/.

The project starting date was 19 August 2011 and the project proponents have not published the PDD for stakeholder consultation prior to the start date. In accordance with the requirements of the guidelines the PPs informed Brazilian DNA and the UNFCCC on 22 December 2010 of the project commencement and their intention to seek CDM status /5//6//8//9/. Both notifications have been submitted prior the project start date which is 19 August 2011.

PJRCES reviewed notifications and their confirmations/7//10/ and also cross-checked on the UNFCCC website/67/ and found them to be in line with the “Guidelines on the demonstration and assessment of prior consideration of the CDM” /57/.

PJRCES has undertaken a review of the status of activities related to the project’s implementation in order to verify the prior consideration. The table below presents details of some key events, timelines and the evidences validated by PJRCES validated for each CDM milestone:

Date	Documented evidence	Activity Description	Milestone
17 December 2010	/16/	Energy auction held by ANEEL	Pre-implementation phase of the project
22 December 2010	/5//6//7//8//9//10/	CDM Prior Consideration notification to UNFCCC and Brazilian DNA.	Prior Consideration of CDM
7 June 2011	/20/	Concession contract between ANEEL and CHTP	Pre-implementation phase of the project
18 August 2011	/11/	The contract to develop the CDM project activity was signed between Ecopart Assessoria em Negócios Empresariais Ltda. and Companhia Hidrelétrica Teles Pires.	CDM project development
19 August 2011	/13/	EPC contract is signed between CHTP and CCTP (Odebrecht; Alstom; Voith)	Project start date
August 2011	/19/	Basic project design approval by ANEEL	Pre-implementation phase of the project



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January 2012	/21//22/ /23//24/	Local Stakeholder consultation process for the CDM as required by Brazilian DNA	CDM project development
25 January 2012	/1//68/	PDD version 01 is made public for Global Stakeholder consultation	GSP – start of validation

The validation team of PJRCES has assessed and verified the evidences for the starting date of the project as well as the activities presented with respect to prior consideration and continued real actions undertaken by the PP. Based on the review of the evidence, PJRCES is able to confirm that the choice of the starting date (date when EPC contract was signed) demonstrates the commitment of PPs with the implementation of the project and is in accordance with the 'Glossary of CDM terms'/56/.

Furthermore, a review of the evidences shows that the gap between activities and events undertaken by PP is validated to be less than 2 years. PJRCES therefore concludes that CDM was seriously considered in the decision to proceed with the project activity, and the continuing and real actions have been taken to secure the CDM status for the project activity.

It is PJRCES's opinion that the proposed project activity complies with the requirements of the latest version of the guidance on prior consideration of CDM /57/.

Opinion:

In the opinion of the validation team, the start date of the project activity is validated as 19 August 2011 based on the EPC Contract/13/ issued to the contractor/supplier. The prior CDM consideration has been validated based on the certified true copy of the Board Resolution dated 22 December 2010.

In the opinion of the validation team, the proposed CDM project activity is identified as a new project activity, which complies with the applicable requirements as defined in the latest version (EB62 Annex13) of the "Guidelines on the demonstration and assessment of prior consideration of the CDM".

4.6.2 STEP 01: IDENTIFICATION OF ALTERNATIVES (§113-§116)

According to the applied baseline methodology ACM0002 version 13.0.0 /53/, if the project activity is the installation of a new grid connected renewable power plant/unit, the baseline scenario is the following:

"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system"

The proposed project is a new hydro power plant that would annually deliver a total of be 8,056,736 MWh of electricity to the National Interconnected System - SIN (national grid) in Brazil. As per paragraph 115 of the VVSv2.0 /55/, no analysis of baseline alternatives is required if the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario. However, PPs have identified alternative scenarios in the PDD which have been validated by PJRCES.

Alternative scenarios for the project activity have been identified as per the applied baseline methodology ACM0002 v13.0.0 and the applicable tool for demonstration and assessment of additionality, version 6.0.0/58/. Given the nature of PP's companies (CHTP – specific purpose



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company set up specifically to construct and operate the UHE Teles Pires) and EQAO (CDM project developer), PP has identified two alternatives, which are summarized below:

Alternative 1: *The proposed Project activity undertaken without being registered as a CDM project activity;*

Alternative 2: *Continuation of the current situation, i.e. electricity will continue to be generated by the existing generation mix operating in the grid.*

The identification of alternatives and their substantiation have been found consistent and in accordance with the requirements of the applied baseline methodology as well its applicable tool. The alternatives listed in the PDD are found to be credible and complete as per the requirements of the approved applied methodology, VVSv2.0 and tool for demonstration and assessment of additionality/58/.

Sub-step 1b. Consistency with mandatory laws and regulations

Alternatives mentioned above are in compliance with Brazilian legislation from the electricity sector and environmental regulatory entities, namely, Brazilian Electricity Regulatory Agency (ANEEL)/20//74/ and, the Brazilian Institute of Environment and Natural Resources (IBAMA) /34//36//104/.

In Section B.5 of the PDD, project participants also described some national policies put in place by the Brazilian Government and the recent changes in the Energy Sector to show that hydropower generation is being promoted in Brazil at least since 2008 as a low greenhouse gas emitting technology, which configures as an E- policy/65/. The timeline of events and the evidences were checked by the validation team as provided in the Table below:

Year	Event	Validated Evidences/References
2003/ 2004	Federal Government announced a new model for the Brazilian Electricity Market, envisaging the establishment of a common mechanism for the purchase of energy and to allow the market risk to be shared among participants instead of being borne exclusively by the government.	<ul style="list-style-type: none"> ○ Federal law No 10,847 – Creation of the Power Research Company/107/; ○ Federal law No 10,848 – Commercialization of electricity/108/; ○ Decree No 5,163 – Regulation of the electricity market /108//109/
2004/ 2007	The new generation contracted in the first 10 tenders under the new model, was predominantly fossil-fuel based, namely, 3.6% biomass-fired, 35% hydropower and 61.4% fossil-fuel-fired.	<ul style="list-style-type: none"> ○ Esparta, A.R.J. (2008). Greenhouse gases emission reductions in the Brazilian power sector – Kyoto Protocol's CDM experience and a future pathway. /47/
2006	Brazilian Government recognized the GHG emission reduction potential of hydropower projects in the Ten-Year Plan for Electric Energy Expansion 2006-2010.	<ul style="list-style-type: none"> ○ Ten-Year Plan for Electric Energy Expansion 2006-2010/48/.
2008	Brazilian Government included the goal to keep a high share of renewable in the primary energy sources and to increase hydropower generation in the first version	<ul style="list-style-type: none"> ○ CIMC – National Committee of Climate Change - National Plan



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	of its National Plan on Climate Change.	on Climate Change (PNMC) /111/
2010	An increase in energy supply by hydroelectric power plants (range of estimated reduction: 79 to 99 million tons of CO ₂ eq in 2020), was communicated by the Brazilian Government to the UNFCCC, as a follow up of the Copenhagen Accord.	<ul style="list-style-type: none"> o Federal Republic of Brazil communication to UNFCCC- Letter including nationally appropriate mitigation actions/110/

The validation team deemed correct the justification that, under current CDM rules, the fact of this project being a priority for the Brazilian government does not prevent Teles Pires Hydropower Plant Project Activity to be eligible under the CDM. Otherwise the CDM would create a perverse incentive for Host Parties not to introduce policies which would contribute to emission reductions investment activities.

PJRCES, based on its local and sectoral expertise is able to confirm that the Alternative Scenarios 1 and 2 referred in section above are in compliance with the local laws and regulations. No local regulation have been noted which prevents the implementation of hydro power plants and similarly for continuation of electricity to be provided by the grid which is also baseline for the project activity and will be discussed at the next steps.

Opinion:

In the opinion of the validation team, the list of alternatives which includes the proposed project activity without being registered as a CDM project activity, as identified in the PDD, which complies with the applicable current laws and regulations is found to be credible and complete.

4.6.3 STEP 02: INVESTMENT ANALYSIS (§117-§123)

PPs have chosen the investment analysis to demonstrate additionality. According to sub-step 2a. of the “Tool for the demonstration and assessment of additionality”, version 6.0.0/58/ an appropriate method for the investment analysis shall be determined.

The tool provides three options:

- Option I: simple cost analysis
- Option II: investment comparison analysis
- Option III: benchmark analysis

Since the proposed project generates financial and economic benefits other than CDM-related income through the sales of electricity, and also the baseline alternative does not involve an investment for the project participants, a benchmark analysis is justified for conducting the investment analysis.

A. BENCHMARK ANALYSIS

The economic and financial indicator of project internal rate of return (IRR) calculated after tax in the financial model of the project activity has been used to compare with the benchmark in the power sector in the host country.

The benchmark was calculated applying the Weighted Average Cost of Capital (WACC)/26/ for the power generation sector in Brazil. Since investment in electricity generation to be dispatched to the



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SIN grid could have been done by any entity other than the project participant, the PP has determined the benchmark using publicly available data according to paragraph 30.(a) of the “Tool for the demonstration and assessment of additionality”, version 6.0.0/56/, i.e. based on government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, documented by official publicly available financial data.

The calculation of the benchmark took into consideration the cost of debt and the cost of equity for a typical investor in the sector of the project activity and was applied to the cash flow of the project as a discount rate when comparing its value to the Internal Rate of Return (IRR) of the project (in accordance with paragraph 12, Annex 5, EB 62)/64/. The WACC considers that the shareholders expect compensation for the projected risk of investing resources in a specific sector or industry in a particular country, hence, it is deemed to be appropriate.

It has been further confirmed that the WACC calculation was based on parameters that are standard in the market, considering the specific characteristics of the project type (Brazilian power sector), and is not linked to the subjective profitability expectation or risk profile of the PP.

Since the investment decision date is 19 August 2011 (when CHTP signed the EPC contract)/13/, the benchmark was calculated based on the latest data available at the time of investment decision, i.e. first semester of 2011 or 2010 for full year data.

The WACC of 7.27% was calculated through the formula below:

$$WACC = Wd \times Kd + We \times Ke$$

$$WACC = 50\% \times 1.86\% + 50.00\% \times 12.67\% = 7.27\%$$

We and **Wd** are, respectively, the weights of equity and debt typically observed at the sector. PP applied **We** of 50.00% and **Wd** of 50.00%, which are in accordance with paragraph 18 of the “Guidelines on the assessment of investment analysis”, version 5/64/.

Kd is the cost of debt observed in the market related to the project activity, and which already accounts for the tax benefits of contracting debts. **Kd** was calculated as per the following formula:

$$Kd = [1 + (a+b+c) \times (1-t)] / [(1+d) - 1]$$

The validated input values used to determine the cost of debt are presented and justified in the table below:

Parameter	Value	Justification / Means of Validation
a- Financial Cost	6.27%	Corresponds to a five-year average (of the Long Term Interest Rate (in a free translation from the Portuguese “Taxa de Juros de Longo Prazo”) given by BNDES. The five-year average adopted to calculate the TJLP aims to reflect a conservative average of the long term interest rate, considering that it presents a large range of variation through the years. The validation team confirmed the calculation for Financial Cost of 5 year average (from July 2006 to June 2011) in the WACC spreadsheet (Sheet “TJLP”)/26/ is correct and applicable at the time of investment decision and cross-checked with the values provided quarterly in the BNDES website/83/. Hence PJRCES deem it conservative and appropriate for the project activity and the benchmark calculation context.
b- BNDES Spread	0.90%	The validation team confirmed the value provided in the WACC spreadsheet (Sheet “Wacc”)/26/ with the



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		BNDES spread rate applied to non-fossil fueled electricity generation projects by revising the BNDES website/84/ and further cross-checked against publications on capital cost of companies in the Brazilian electricity sector /81/. The value was valid at the time of investment decision. Hence PJRCES deem it conservative and appropriate for the project activity and the benchmark calculation context.
c- Credit Risk Rate	2.09%	The validation team confirmed in the BNDES website/84/ that the credit risk rate applied to non-fossil fueled electricity generation projects ranges from 0% to 4.18%, and therefore PPs used the mean value (2.09%) of such range. This value was cross-checked against the Administrative Report from CHTP, referring to a spread of 2.4% applied by BNDES with respect to a loan approved in 14 December 2011/97/. Therefore, PJRCES team considered the credit risk rate of 2.09% conservative and appropriate for the project activity and the benchmark calculation context.
d-Financial Intermediation Rate	0.5%	The validation team confirmed the value provided in the WACC spreadsheet (Sheet “Wacc”)/26/ and cross-checked with values provided in the BNDES website/84/ with respect to financial intermediation rate applied by BNDES accredited financial institutions for loans to non-fossil fueled electricity generation projects through revising Therefore, PJRCES team considered the financial intermediation rate reliable and suitable for the project activity and the benchmark calculation context.
(t) Marginal tax rate	34%	<p>The validation team verified in the Normative Instruction N° 51 from the Secretariat of the Federal Revenue of Brazil /79/ that the value, applicable to the tax regime Real Profit for the marginal tax rate is comprised of two taxes: Social tax (CSLL) of 9% and Income tax (IR) of 25% (applied for profits greater than BRL 20,000/month), totaling 34% applied on the net profit.</p> <p>PJRCES confirmed that the tax regime of Real Profit is applicable to the project type and the values of CSLL and IR were further cross-checked through the website of the Secretariat of the Federal Revenue of Brazil /79/ and publications reporting countries corporate marginal taxes /80/ or discussing capital cost of companies in the Brazilian electricity sector/81//82/. PJRCES team deems it conservative and appropriate for the project activity and the benchmark calculation context.</p>
(d) Inflation forecast	4.5%	The validation team cross-checked this value against the target inflation rate published in the website of the Brazilian Central Bank/85/. PJRCES deem this value conservative and adequate, since there is no data available regarding to the inflation forecast of the Brazilian Central Bank for the duration of the crediting period, hence it complies with paragraph 7 of the



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		Appendix of the “Guidelines on the assessment of investment analysis”, version 5/64/.
After tax Cost of Debt (p.a.) - Kd	1.86%	The validation team checked the calculation in the WACC spreadsheet/26/ and found it accurate. In addition, the PJR CES team compared this calculation with other publications discussing capital cost of companies in the Brazilian electricity sector /81//82/ and found the value obtained for Kd by PPs to be conservative and suitable for the project activity and the benchmark calculation context.

Ke is the cost of equity and represents the rate of return for equity investments and was estimated through the equation:

$$Ke = ((1+(Rf + \beta \cdot Rm + Rc))/(1+\pi'))-1$$

The cost of equity (**Ke**) was determined considering publicly available data from the USA in order to determine the Risk-free rate (**Rf**), the US expected inflation (**I**) and the Equity Risk Premium (**Rm**) at the time of the project investment decision. Taking into account that the proposed project activity is located in Brazil and will generate electricity, project participants customized these parameters applying the estimated country risk premium (**Rc**) and the Sectoral Risk (**β**) from the power sector.

The values used in the cost of equity calculation are presented and justified in the table below:

Parameter	Value	Justification / Means of Validation
(Rf) Risk-free rate	4.24%	Corresponds to one-year average of 30 years bond rate based on the US Treasury bond, which are long term assets of a mature market. The validation team confirmed that the calculation provided for the Risk free rate (from 19 August 2010 to 18 August 2011) in the WACC spreadsheet, Sheet “T. Notes”/26/ is correct and applicable at the time of investment decision and also cross-checked with the values provided in the US Federal Reserve website/86/. Given the operational lifetime of the project and since US treasury bond volatilities are historically low and a one year period of 30 years bond rate prior to investment decision date to estimate risk free rate is deemed by PJR CES reasonable and appropriate for the project activity and the benchmark calculation context.
(Rm) Equity risk premium	6.03%	The market premium is estimated based on the historical difference between the S&P 500 returns and the long term US bond returns. The spread over the risk-free rate is the average of the difference between those returns. The validation team confirmed that the calculation provided for the Equity risk premium (from 1928 to 2010) in the WACC spreadsheet, Sheet “Returns by year” /26/ for Stocks (11.23%) minus T. Bonds (5.28%) is correct and applicable at the time of investment decision and also cross-checked with the values provided in the Damodaran website/87/. The adoption of a period encompassing 82 years, provide a



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		<p>more consistent number since volatility on stocks is high therefore the longest period is better to have a most accurate average reasonable and appropriate for the project activity context. Therefore, PJR CES deem the determination of Equity risk premium by PPs correct and adequate for the project activity and the benchmark calculation context.</p>
(Rc) Estimated country risk premium	2.37%	<p>The country risk premium for Brazil has been referred to the JPMorgan Emerging Markets Bond Index Plus (EMBI+) as a liquid US-dollar emerging markets debt benchmark, which tracks total returns for actively traded external debt instruments in emerging markets.</p> <p>The validation team confirmed that the calculation provided for the country risk premium as the average of the last 5 years (from 21 August 2006 to 18 August 2011) in the WACC spreadsheet, Tab “EMBI+”/26/ is correct and applicable at the time of investment decision and also cross-checked with the values provided in the Brazilian Institute of Applied Economic Research (Ipea)/89/. Therefore, PJRCES deem the determination of country risk premium by PPs correct and adequate for the project activity and the benchmark calculation context.</p>
(β) Sectoral Risk	1.41	<p>The beta value (β) is derived from the correlation between returns of US companies from the power sector and the performance from returns in the US market. It was further adjusted to the leverage of Brazilian companies in the power sector, reflecting both structural and financial risks.</p> <p>The validation team confirmed that the calculation provided for the sectoral risk using an average value of 0.85 (un-levered beta) from the US power companies and levered, using the average market debt/equity ratio (50/50) which is usual for the industrial sector in Brazil and 34% income tax as demonstrated in the WACC spreadsheet, Tab “Beta US”//26/ is correct and applicable at the time of investment decision. The validation team also cross-checked the beta values with the values provided in the Damodaran website/87/. Hence, PJRCES deem the determination of the Sectoral Risk after tax by PPs as correct and adequate for the project activity and the benchmark calculation context.</p>
(I) US expected inflation	2.17%	<p>Corresponds to one-year average of 10 years US T. Bonds (3.05%) minus TYPSE 10 also form US (0.88%).</p> <p>The validation team confirmed that the calculation provided for the US expected inflation (from 19 August 2010 to 18 August 2011) in the WACC spreadsheet, Tab “T. Notes”/26/ is correct and applicable at the time of investment decision. The validation team has also cross-checked with the values provided in the US Federal Reserve website/86/. Given the operational lifetime of the project and since US treasury bond</p>



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		volatilities are historically low and a one year period of 10 years bond rate prior to investment decision date to estimate US inflation is deemed by PJR CES reasonable and appropriate for the project activity and the benchmark calculation context.
Cost of Equity with Brazilian Country Risk (p.a.) - Ke	12.67%	The validation team checked the calculation in the WACC spreadsheet/26/ and found it accurate. In addition, the PJR CES team compared this calculation with other publications discussing capital cost of companies in the Brazilian electricity sector /81//82/ and found the value obtained for Ke by PPs to be conservative and suitable for the project activity and the benchmark calculation context.

Based on the information above, PJR CES confirms that the calculation of this benchmark is accurate and reasonable for the proposed project.

B. INPUT PARAMETERS

As mentioned above, the financial indicator chosen by PPs is the Internal Rate of Return (IRR) of the Project after tax. The Project IRR is compared with the WACC detailed above.

The validation of key input parameters determined for the financial analysis by PJRCES is presented below:

Parameter	Value	Justification / Means of Validation
Plant Export Capacity	1,820 MW	The validation team confirmed the plant export capacity reported in the PDD/25/ and the IRR spreadsheet (Sheet "FCF")/27/ with the value provided in the last version of the Consolidated Basic project /19/ approved by Aneel Resolution N° 3,324/73/ and further cross-checked the information with ANEEL Dispatch N° 3,504 /72/ and the Concession contract between ANEEL and CHTP/20/. Therefore, PJR CES deem the plant export capacity of the proposed project is appropriate and reliable.
Revised Assured Energy	940.60 MWavg	The validation team confirmed the revised assured energy reported in the PDD/25/ and the IRR spreadsheet (Sheet "FCF")/27/ with the value provided in the last version approved of the Consolidated Basic project /19/ and further cross-checked the information with Aneel Resolution N° 3,324/73/ ANEEL Dispatch N° 3,504 /72/. Therefore, PJR CES deem the revised assured energy of the proposed project is appropriate and reliable.
Auction Assured Energy	915.40 MWavg	The validation team confirmed the auction assured energy reported in the PDD/25/ and the IRR spreadsheet (Sheet "FCF")/27/ with the value provided in the Tender from ANEEL for auction N° 04/2010 /16/ and further cross-checked the information with the last version



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		approved of the Consolidated Basic project /19/, the ANEEL Dispatch N° 3,504 /72/ and the Concession contract between ANEEL and CHTP/20/. Therefore, PJRCES deem the auction assured energy of the proposed project is appropriate and reliable.
Transmission Losses	2.22%	The validation team confirmed the Transmission losses of the SIN grid reported in the PDD/25/ and the IRR spreadsheet (Sheet "FCF")/27/ with the calculation provided in the spreadsheet "Perdas de Transmissão - UHE Teles Pires"/15/ as a 4-year average (from 2007 to 2010) of the Grid losses reported by CCEE. PJR CES team further cross-checked the information with the CCEE Annual Reports from 2007, 2008, 2009 and 2010/90/. Therefore, PJR CES deem the Transmission Losses calculated for the proposed project is appropriate and reliable.
Internal consumption	0.00%	Due to the lack of evidence, PPs has considered zero percent as internal consumption of electricity by UHE Teles Pires. The validation team confirmed the internal consumption value reported in the PDD/25/ and the IRR spreadsheet (Sheet"FCF")/27/. Given this is conservative for the investment analysis purpose, i.e. would increase Project IRR to be compared against the benchmark, PJR CES deem this value reasonable and appropriate.
ACR Price	BRL 58.35	The electricity tariff is fixed in the PPA from ANEEL Auction N° 04/2010 /16/ for 85% of the auction assured energy for UHE Teles Pires, i.e. 778 MWavg (915.4 x 85%) will be commercialized at the Regulated Contracting Environment (ACR) during a term of 30 years (initiating on 1 January 2015). The validation team confirmed the revised assured energy reported in the PDD/25/ and the IRR spreadsheet (Sheet "FCF")/27/ with the value provided by CCEE regarding the results of the 11 th Auction for New Energy/91/ and further cross-checked the information with Finance request report submitted to the Brazilian Development Bank/37/. Therefore, PJR CES deem the revised ACR price of the proposed project is appropriate and reliable.
ACL Price	BRL 145.00	The electricity tariff for the remaining energy generated by UHE Teles Pires, which is allowed to be commercialized in the Free Contracting Environment (ACL), i.e. 162.6 MWavg (the revised assured energy: 940.6 MWavg minus the 778 MWavg that will be commercialized in the ACR). The validation



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		<p>team confirmed the revised assured energy reported in the PDD/25/ and the IRR spreadsheet (Sheet "FCF")/27/ with the value provided in the Finance request report submitted to the Brazilian Development Bank/37/ and further cross-checked with 3rd party report discussing Scenarios for Future Energy Price in the ACL market/92/. Therefore, PJR CES deem the ACL price of the proposed project is appropriate and reliable.</p>
CAPEX	BRL 3,567,628,457	<p>The validation team verified the investment costs in the PDD/25/ and the IRR spreadsheet (Sheet "Inv" and Sheet "Payment Schedule")/27/ with the values provided in the EPC contract/13/ and the Finance request report submitted to BNDES by CHTP/37/., confirming they are adequate to the time of investment decision. The validation team has also cross-checked the CAPEX value with the 4th Balance Report of PAC2/99/ (the last one available at the time of the validation), which is published by Brazilian Government every quarter, reporting the status of the main infrastructure projects under construction, including UHE Teles Pires and other new large hydropower plants (UHE) in Brazil. There are 3 UHEs within the output range of +/- 50% capacity of Teles Pires (UHE Estreito with 1,087 MW and CAPEX of BRL4,295 Million; UHE Teles Pires with 1,820 MW and CAPEX of BRL4,000 Million and UHE Jatobá with 2,338 MW and CAPEX of BRL5,100 Million). Therefore, two aspects from this updated report indicate for the conservativeness of the CAPEX used in the investment analysis by PPs:</p> <ol style="list-style-type: none"> 1- The CAPEX estimated at the time of the investment analysis (BRL 3,568 million) for UHE Teles Pires is 11% lower than the actual costs incurred for the proposed project; 2- When comparing values of the Investment cost per MW of installed capacity the value of UHE Teles Pires used in the investment analysis is BRL1.96 Million/MW, when the actual values of the 3 UHEs are in a range of 2.18 to 3.95 Million BRL/MW. <p>Therefore, PJR CES confirms the CAPEX used for the proposed project is reliable and reasonable.</p>
OPEX (average)	BRL 251,508,149/year	<p>Refers to total operating costs, which include O&M and the levies determined by ANEEL (CCEE Base; TAR; Royalties; Insurance; TUST; R&D; TFSEE; UBP and ONS).</p>



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		<p>The validation team confirmed the total operating costs calculated in the IRR spreadsheet (Sheet"FCF")/27/, validating each of the input parameters as further detailed in this table. PJR CES team also cross-checked the costs of OPEX per MWh from UHE Teles Pires (BRL251,508,000 / be 8,056,736 MWh = BRL 31.22/MWh) and found it to be within the range reported by IEA (International Energy Agency) in 2010 for new large hydro plants (USD 0.05 to 20/MWh/100/, which applying an exchange rate/112/ for 2010 = 1USD = 1.76 BRL, results in BRL 0.088 to 0.352/MWh). Therefore, PJR CES deem the OPEX the proposed project is appropriate and reasonable.</p>
- O&M	BRL 16,759,000/year	<p>Refers to operation and maintenance costs (administrative + maintenance expenses) from UHE Teles Pires.</p> <p>The validation team confirmed O&M value in the IRR spreadsheet (Sheet"FCF")/27/ with the values provided in the EPC contract/13/, which fixes the O&M costs for the first 3 years. Given PPs applied the same value for other years of the assessment period without escalation and considering that usually O&M costs increases along the years, PJR CES confirms the O&M is conservative and suitable for the proposed project activity.</p>
- CCEE Base	BRL 0.19/MWh	<p>Refers to a contribution shared by all CCEE agents to pay the operational and investment costs from CCEE activities, where CCEE total costs are shared According to the Article 12 of the Federal Decree N° 5,177/93/.</p> <p>The validation team confirmed the CCEE Base value reported in the PDD/25/ and the IRR spreadsheet/27/ and further cross-checked with the values provided in the CCEE Budget 2010/94/ and CCEE Annual Report 2010/90/. Therefore, PJR CES deem the CCEE Base cost of the proposed project is appropriate and reliable.</p>
- TAR - Updated Reference Tariff	BRL 68.34/MWh	<p>The Updated Reference Tariff is used to calculate the Financial Compensation for the Hydrological Exploitation of Water Resources (CFURH) charged to all hydro power plants in Brazil, according to the Federal Law N° 7,990/101/. TAR is updated every year by ANELL.</p> <p>The validation team confirmed the TAR value reported in the PDD/25/ and the IRR spreadsheet/27/ and further cross-checked with the value provided in the Aneel</p>



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		Resolution No 1,096/38/, which establishes the TAR for 2011. Therefore, PJRCES deem the TAR value of the proposed project is appropriate and reliable.
- Royalties	6.75%	<p>The percentage of Royalties is the second input parameter used to calculate the Financial Compensation for the Hydrological Exploitation of Water Resources (CFURH), which is charged to all hydro power plants in Brazil, according to the Federal Law No 7,990/101/. The royalties are fixed in 6.75% by ANELL.</p> <p>The validation team confirmed the TAR value reported in the PDD/25/ and the IRR spreadsheet/27/ and further cross-checked with the values provided in the Aneel Atlas, Chapter 4/39/. Therefore, PJR CES deem the Royalties applied to the proposed project is appropriate and reliable.</p>
- Insurance (% of assets)	0.00%	Due to the lack of evidence, PPs has considered zero percent of assets cost as insurance. The validation team confirmed the insurance value reported in the PDD/25/ and the IRR spreadsheet/27/. Given this is conservative for the investment analysis purpose, i.e. would increase Project IRR to be compared against the benchmark, PJR CES deem this value reasonable and appropriate.
- TUST	BRL 8.960/kW/month	Refers to the tariff for the use of electric energy transmission lines, which is established by ANEEL. The validation team confirmed the TUST values reported in the PDD/25/ and the IRR spreadsheet/27/ and further cross-checked with the values provided in the Aneel Resolution N° 1,086 /40/. Therefore, PJR CES deem the TUST value applied to the proposed project is appropriate and reliable.
- R&D - Research and Development	1%	<p>Refers to the tariff imposed to companies from the energy sector for Research & Development investment, which corresponds to at least 1% of each independent energy generator net income as determined by Article N°2 of Law N°9.991/102/</p> <p>The validation team confirmed the R&D values reported in the PDD/25/ and the IRR spreadsheet/27/ and further cross-checked with the values provided in the Aneel Resolution N° 1,086 /40/. Therefore, PJR CES deem the R&D costs applied to the proposed project are appropriate and reliable.</p>
- UBP	BRL 5,514,831.81	Refers to the tariff for the use of a public good, which is determined by ANEEL.



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		The validation team confirmed the UBP value reported in the PDD/25/ and the IRR spreadsheet/27/ and further cross-checked with the value provided in the ANEEL Public Notice 04/2010/13/ and the Concession Contract/20/. Therefore, PJR CES deems the UBP applied to the proposed project is appropriate and reliable.
- TFSEE	BRL 385.73/kW	Refers to the tariff for electricity inspection services for electricity charged by ANEEL. The validation team confirmed the TFSEE value reported in the PDD/25/ and the IRR spreadsheet/27/ and further cross-checked with the value provided in the ANEEL Ordinance N° 4,080/41/ and the ANEEL Ordinance N° 360/103/. Therefore, PJR CES deems the TFSEE applied to the proposed project is appropriate and reliable.
- ONS	BRL 190,336 BRL/year	Refers to the reimbursement of part of the administration and operation costs of ONS applied to all generation, transmission and distribution agents as well as free consumers that are connected to the national grid (SIN), as established by ANEEL Resolution N° 328/95/. The validation team confirmed the ONS value reported in the PDD/25/ and calculation provided in the IRR spreadsheet (Sheet "ONS")/27/ and further cross-checked with the values provided in the ANEEL Resolution N° 328/95/; Energy Balance 2011/96/; ANEEL Resolution 2,459/2010/42/ and the ONS - Verification Report of Services and Transmission Charges /43/. Therefore, PJR CES deems the ONS fee applied to the proposed project is appropriate and reliable.
Depreciation	4% and 10%	PJR CES verified the depreciation rate of 10% (10 years) applied for the equipment and 4% (25 years) applied for the installations and the residual value against to the reported in the PDD/25/ and the calculation provided in the IRR spreadsheet (Sheet "Inv")/27/. These depreciation rates were further cross-checked through the website of the Secretariat of the Federal Revenue of Brazil/114/ and through ANEEL Accounting Manual/113/. Therefore, PJR CES confirms that the depreciation rates and residual value applied in the financial analysis for the project are in line with the relevant laws and accounting rules.
Residual Value	BRL 728,877,240	
Taxes:		
- IR	25%	PJR CES confirmed that the tax regime of Real Profit is applicable to the project type



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- CSLL	9%	and the values of PIS/COFINS (correctly applied to the gross revenues) and CSLL+IR (correctly applied to net revenues) were verified against to the reported in the PDD/25/ and calculation provided in the IRR spreadsheet/27/. These taxes were further cross-checked through the website of the Secretariat of the Federal Revenue of Brazil/44//79/. Therefore, PJR CES confirms that all taxes rates applied in the financial analysis for the project are in line with the relevant current laws and regulations and adequately represent the economic situation of the project.
- PIS	1.65%	
- COFINS	7.6%	

In conclusion, PJRCES confirms the project IRR calculations were provided in a spreadsheet/27/ in a transparent and replicable way. The calculations were verified and found to be correct and the assumptions used in the calculations were deemed by PJRCES to be consistent and applicable at the time of investment decision (EPC contract 19 August 2011/13/).

Based on PJRCES's local and sectoral knowledge, PJRCES is able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

The project IRR without CDM revenues is 3.38%, which confirms that the project in the absence of CDM benefits and compared to the benchmark (7.27%) is not financially attractive.

C. CALCULATION AND COMPARISON OF FINANCIAL INDICATORS (ONLY APPLICABLE TO INVESTMENT COMPARISON ANALYSIS / BENCHMARK ANALYSIS)

The benchmark (WACC) and IRR calculations were provided in two separate spreadsheets/26//27/. The calculations were verified and found to be correct by PJRCES. The assumptions used in the calculations were deemed to be correct by PJR CES. The project-IRR without CDM revenues is 3.38%, which confirms that the project in the absence of CDM benefits and compared to the benchmark is not financially attractive.

D. SENSITIVITY ANALYSIS (ONLY APPLICABLE TO INVESTMENT COMPARISON ANALYSIS / BENCHMARK ANALYSIS)

The sensitivity analysis has been carried out for parameters that most likely to fluctuate over time and contributing for more than 20% to project costs or total revenues as per the Guidelines on the assessment of investment analysis/64/. Hence, variations were done by altering the following parameters:

- Reducing investment expenses (investment costs).
- Increasing project's revenues (electricity tariff);
- Increasing energy generation by the plant (power generation);
- Reducing cost of operational (total operating costs)

Key indicators	IRR with 10% variation	Variation to reach the Benchmark of 7.27%
Original Value	3.38% (no variation)	n.a
Investment costs	-10% would be 4.37%	-32.30%
Electricity Tariff	+10% would be 4.57%	+35.10%



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Power Generation	+10% would be 5.63%	+18.00%
Total Operating costs	-10% would be 3.97%	-72.00%

As per the sensitivity analysis presented above it is demonstrated that equity IRR remains lower than the benchmark in all reasonably evaluated scenarios.

CAPEX

The project IRR will reach the benchmark of 7.27% if the total investments decrease by 32.30%. However, such a decrease is not realistic to the actual project scenario, since PP's currently revised CAPEX estimate is BRL 4 billion, i.e. 11% higher than previously considered at the time of investment decision. This information was verified by the validation team in the 4th Balance Report of PAC2/99/, which is published by Brazilian Government every quarter, reporting the status of the main infra-structure projects under construction in Brazil, including UHE Teles Pires. This fact is also reinforced peer-review literature findings related to the estimation of construction costs and schedules in developing countries. Using a sample of 125 projects (59 thermal and 66 hydropower) Bacon and Besant-Jones (1998)/115/ show that although the ratio of actual to estimated cost can be smaller than one (indicating actual investment smaller than estimated), less than 10% of the analyzed projects disbursed less than forecasted. One of the conclusions of the paper is that "the estimated values were significantly biased below actual values".

From the above information PRJCES confirm that a reduction of 32.30% in the project activity investment expenses is very unlikely to happen.

Electricity Tariff

The project IRR will reach the benchmark of 7.27% if the total revenues from the electricity sales increase by 35.10%. Nevertheless, the electricity tariff of the Project was established by the energy auction carried out by the Chamber of Electric Energy Commercialization (CCEE) on 17 December 2010/91/. The value of the electricity tariff was fixed at R\$58.35 for a term of 30 years (initiating on 1 January 2015) which will be commercialized in the Regulated Contracting Environment (ACR). According to the auction notice/16/, 85% of the forecasted annual power supply to the grid at the time of the auction has to be commercialized in the ACR. The remaining energy can thus be commercialized in the Free Contracting Environment (ACL), where PPs estimated a price of R\$145. Since the tariff for the ACR is fixed, a variation of +212%, i.e. the ACL price should be BRL 308.00 during the 30 years of operation of the project activity to reach the benchmark, clearly not a plausible scenario.

Therefore, PJRCES confirms that it is highly unlikely for the total revenues from the electricity sales increase by 35.10%.

Power generation

The expected annual power supplied to the grid by the Project as established by the Mines and Energy Ministry (Ordinance MME n°27/2010) is calculated based long-term historical hydrological data (available since 1930s) and therefore the long term average annual power supplied is unlikely to be significantly different to the value used in the financial analysis.

Furthermore, projects hydropower plants such as UHE Teles Pires are included in the Reallocation Energy Mechanism (MRE from the Portuguese "Mecanismo de Realocação de Energia") created by ONS with the purpose to share and mitigate the hydrological risks associated with the centralized dispatch and to optimize the hydrothermal system. The objective is to ensure that all plants that are part of the MRE receive their levels of physical guarantee regardless of their level of energy generation, provided that the total generation of the MRE is not below the total physical guarantee of the system. This means that the MRE reallocates energy by transferring the surplus from those that produced beyond their physical guarantee to those that generated less. In other words, the intention of the MRE is to assure that all generators commercialize the guaranteed energy assigned to them independently from their real energy generation.



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The reallocation/transfer of energy between hydro's incurs in the cost called "minimum water cost" which is based on an optimization tariff determined by ANEEL to cover the incremental cost incurred in the operation and maintenance of the plant, payment of a financial tariff compensation fee of hydrological resources used which is calculated based on the amount of energy generated. Whenever attributed energy of a generator after being reallocated in the MRE is higher than the contracted one, the generator is entitled to sell this surplus in the short term market at the momentary PLD (Settlement Price Difference) value. The same applies in the opposite situation, in which the generator will have to purchase energy from the short term market if they don't comply with their contractual obligations (energy generation deficit). Consequently, this means that if a plant generates more energy and it is reallocated in the MRE, the compensation fee the plant receives will not generate any additional revenues, but only cover the cost (O&M) of its additional generation.

Moreover, being UHE Teles Pires defined by ANEEL as a participant in the apportionment of the losses which occur within the basic network, these losses should have been considered. As per the sector regulation, UHE Teles Pires is only allowed to negotiate a quantity of electricity already discounting these losses.

The proposed project activity is contractually bound to sell 85% of its assured energy in the ACR market at a fixed price as determined by the energy auction and the rest, minus losses, to the ACL market. In addition, PPs already took into account for the financial analysis the optimization of the hydropower potential of the plant, which increased the firm energy of the plant by 2.75% from 915.4 MWavg at the time of the auction to 940.6 MWavg.

Based on the aforementioned, PRJ CES confirms that a consistent increase of 18.00% in the long term average annual power supplied to the grid is definitely not a likely scenario.

Total Operating costs

The results of the sensitivity analysis shows that if the Project incurred a reduction of 72.00% of the operating costs the IRR of the Project would reach the 7.27% benchmark.

This is not a plausible scenario, given more over 90% of the operating costs are due to fees or tariffs already established by ANEEL resolutions or annually calculated by the national entities, in which the annual values have constantly increased along the years.

In addition, the rest of the 7% of operating costs are related to the O&M costs, which are contractually established between the project developer and the service provider at a fixed rate and as a conservative approach, PPs did not escalated such costs in the investment analysis. Therefore, PJR CES confirms that no significant decrease of the O&M costs can be reasonably expected.

E. CONCLUSION

The analysis above clearly shows that only under very unrealistic and highly favorable circumstances it would be possible to the Project IRR reach the benchmark. PJR CES concludes that the IRR is lower than the benchmark for a realistic range of assumptions for the key input parameters and therefore, that the Project is not financially attractive.

4.6.4 STEP03: BARRIER ANALYSIS (§124-§127)

According to the "Tool for the demonstration and assessment of additionality" /58/, if after the sensitivity analysis it is concluded that the proposed CDM project activity is unlikely to be the most financially/economically attractive, then PPs shall proceed to Step 4 (Common practice analysis). Therefore, no barrier analysis is required to this project activity.

A. DETERMINE WHETHER THE BARRIERS ARE REAL:



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Not applicable.

B. DETERMINE WHETHER THE BARRIERS PREVENT THE IMPLEMENTATION OF THE PROJECT ACTIVITY BUT NOT THE IMPLEMENTATION OF AT LEAST ONE OF THE POSSIBLE ALTERNATIVES:

Not applicable.

4.6.5 STEP04: COMMON PRACTICE ANALYSIS (§128-§130)

PPs have undertaken the common practice analysis of the project according to the Tool for the demonstration and assessment of additionality, version 6.0.0/58/, finding that the proposed CDM Project Activity matches option (b) of paragraph 6, since it consists of a switch from grid electricity to electricity generation from hydropower plant.

Therefore, the stepwise approach prescribed in the paragraph 47 of the “additionality tool” was applied, which determines that a proposed project activity is considered common practice in a sector in the applicable geographical area if both conditions apply:

- the factor F ($F = 1 - N_{diff}/N_{all}$) is greater than 0.2; and
- $N_{all} - N_{diff}$ is greater than 3.

The four steps of the guidance are applied as follows:

Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.

Considering that Teles Pires Hydropower Plant Project Activity has 1,820 MW of installed capacity and applying the output range of +/-50%, only plants with installed capacity between 910 and 2,730 MW were considered in the analysis.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. (N_{all} - CDM projects shall not be included).

The applicable geographical area is the host country (Brazil) and the boundary is the power plants connected to the national grid (SIN).

The analysis was sourced from ANEEL database/116/, resulting in 24 plants interconnected to the SIN with installed capacity between 910 and 2,730 MW, in which twenty plants are hydropower plants, three are thermo power plants and one nuclear power plant. Therefore, $N_{all} = 24$.

The table below presents the identified plants connected to the SIN that apply the installed capacity criteria.



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TABLE 1 - IDENTIFIED OPERATIONAL PLANTS WITH INSTALLED CAPACITY BETWEEN 910 AND 2730 MW WITH OPERATIONAL STARTING DATE BEFORE 19 AUGUST 2011

Plant	Installed Capacity (MW)	Type	Operational Starting Date
Paulo Afonso IV	2,462.4	Hydropower plant	1979
Itumbiara	2,080.5	Hydropower plant	1981
São Simão	1,710.0	Hydropower plant	1978
Bento Munhoz da Rocha Neto	1,676.0	Hydropower plant	1980
Eng° Souza Dias	1,551.2	Hydropower plant	1974
Eng° Sérgio Motta	1,540.0	Hydropower plant	2003
Luiz Gonzaga	1,479.6	Hydropower plant	1988
Itá	1,450.0	Hydropower plant	2000
Marimbondo	1,440.0	Hydropower plant	1975
Salto Santiago	1,420.0	Hydropower plant	1980
José Ermírio de Moraes	1,396.2	Hydropower plant	1979
Serra da Mesa	1,275.0	Hydropower plant	1998
Ney Aminthas de Barros Braga	1,260.0	Hydropower plant	1992
José Richa	1,240.0	Hydropower plant	1999
Furnas	1,216.0	Hydropower plant	1963
Emborcação	1,192.0	Hydropower plant	1982
Machadinho	1,140.0	Hydropower plant	2002
Salto Osório	1,078.0	Hydropower plant	1975
Sobradinho	1,050.3	Hydropower plant	1979
Luiz C. Barreto de Carvalho	1,048.0	Hydropower plant	1969
Santa Cruz	1,000.0	Thermo power plant (NG)	2004
Governador Leonel Brizola	1,058.3	Thermo power plant (NG)	2004
Mário Lago	922.62	Thermo power plant (NG)	2001
Angra II	1,350.0	Nuclear power plant	2001

Therefore, there are 24 operational plants interconnected to the Brazilian SIN in the range identified above in Step 1 (910 MW – 2,730 MW), i.e. $N_{all} = 24$.

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity (N_{diff}).



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PPs identified the following types of technologies that differ from the proposed project activity according to paragraph 8 of the Additionality tool/58/:

a. Energy source/fuel: Taking into account that the UHE Teles Pires is a hydropower plant and generates electricity derived from a renewable energy source (water), Santa Cruz, Governador Leonel Brizola and Mário Lago thermo power plants and Angra II nuclear power plants identified in Step 2 above, shall not be compared to the proposed project activity since they apply different technologies in order to generate electricity.

b. Investment climate in the date of the investment decision, inter alia:

Based on the regional and sectoral expertise, PJRCES is able to confirm that with respect to the investment climate in the date of the investment decision, more specifically to the regulatory framework, until the beginning of the 1990's, the energy sector was composed almost exclusively by state-owned companies. From 1995 onwards, due to the increase in international interest rates and the lack of state investment capacity, the government started the privatization process. However, by the end of 2000 results were still modest. Although further initiatives, aiming to improve electric generation in the country, were taken between the 1990's and 2003, they did not attract enough new investments to the sector.

It was only after the implementation of the new model for the Brazilian Electricity Market sustained by Laws n°10.847/107/ and 10.848/108/ of March 15th, 2004 and Decree n°5.163/109/ of July 30th, 2004, that a more competitive electricity market began. This new model defined the creation of:

- A new institution responsible for the long term planning of the energy sector (Energy Research Company – EPE);
- An institution to evaluate continuously the electric energy supply (Electric Sector Monitoring Committee - CMSE) and;
- An institution to continue performing the activities that were taking care by the Wholesale Electric Energy Market (MAE) related to the commercialization of the interconnected electric energy system.

Taking into account this new regulatory framework, it is clear that the investment climate was totally different before the new model, hence it is reasonable to only consider projects for which the decision making process happened after March of 2004 to be similar to Teles Pires Hydropower Plant Project Activity. However, as showed in the table above, no hydropower plant has started operation after 2004 and before the starting date of the project activity (19 August 2011).

Therefore, considering the explanations provided in item (a) and (b) above, 4 plants apply different energy source/fuel and 20 plants started operation before 2004, $N_{diff} = 24$.

Step 4: Calculate factor $F = 1 - N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.

From the results discussed above, we have:

$$N_{all} - N_{diff} = 24 - 24 = 0 < 3 \text{ and,}$$

$$F = 1 - N_{diff}/N_{all} = 1 - 24/24 = 0 < 0.2$$

Opinion:

Based on the above information and on its local and sectoral knowledge, PJRCES confirms that the proposed project activity is not a common practice.

In conclusion, it is sufficiently demonstrated that the project is not a likely baseline scenario and thus project is additional.



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4.7 MONITORING PLAN (§131-§133)

The validation team determined whether the description of the monitoring plan included in the PDD/25/ is based on applied methodology ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version-13.0.0, including applicable tool(s) by applying a two-step process, as reported below:

A. ASSESS COMPLIANCE OF THE MONITORING PLAN WITH THE APPROVED METHODOLOGY AND THE APPLICABLE TOOL(S):

i. PARAMETERS DETERMINED EX-ANTE

PJR CES has assessed the assumptions and data sources of the parameters that will not be monitored and will remain fixed throughout the crediting period.

The parameters determined *ex-ante* are reported in the table below:

Parameter	Description	Value	Data Sources
W_{OM}	Weighting of operating margin emissions factor for hydro projects	0.5	Tool to calculate the emission factor for an electricity system, version 2.2.1/59/
W_{BM}	Weighting of build margin emissions factor for hydro projects	0.5	Tool to calculate the emission factor for an electricity system, version 2.2.1/59/
$EF_{grid,BM,y}$	Build margin CO ₂ emission factor in year y	0.1404 tCO ₂ /MWh	CIMGC (Brazilian DNA/71/). Base year 2010/45/
Cap_{BL}	Installed capacity of the hydro power plant before the implementation of the project activity	0.0 W	As defined in the methodology ACM0002, Version 13.0.0/53/ for new power plants.
A_{BL}	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full	0.0 m ₂	As defined in the methodology ACM0002, Version 13.0.0/53/, for new reservoirs. /25//19//20//73//75/

The combined margin emission factor is determined ex-post during monitoring, based on updated information provided by Brazilian DNA. The detailed calculations of the combined margin emission factor are described in the following section 4.5.5.

The parameters are found to be correct and in accordance with the applied baseline methodology ACM0002 version 13.0.0/53/ and the “Tool to calculate the emission factor for an electricity system, version 2.2.1” /59/.

PJRCES is able to confirm that all parameters are appropriate, applicable to the project activity and will result in a conservative estimate of the emission reductions.

ii. PARAMETERS DETERMINED EX-POST



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According to the approved monitoring methodology, the parameters monitored *ex-post* are presented in the following table:

Parameter	Description	Value applied in the PDD	Source of Data / Monitoring Frequency
$EG_{facility}$	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y	8,056,736 MWh/year	<p><u>Source:</u> Measured with bi-directional electricity meters – Main and Back up (Accuracy: 0.2%) located at the substation that will monitor:</p> <p>(i) The quantity of electricity supplied by the project plant to the grid and</p> <p>(ii) The quantity of electricity delivered to the project plant from the grid.</p> <p><u>Monitoring frequency:</u> Energy will be measured continuously, aggregated each 15 minutes and will be monthly consolidated. /46/.</p> <p><u>Calibration:</u> every 2 years /46/.</p> <p><u>Cross-check:</u> Electricity generation by the plant as published by CCEE will be used to cross check project participant's information.</p>
$EF_{grid, OM, y}$	Operating margin CO ₂ emission factor in year y	0.4796 tCO ₂ /MWh	<p>Source: OM is calculated by CIMGC (Brazilian DNA/71/), according to methodology ACM0002 and the “Tool to calculate the emission factor for an electricity system”, Option (c): Dispatch data analysis OM. The emission factor is provided at the CIMGC website every year /45/.</p> <p><u>Monitoring frequency:</u> Annually.</p>
Cap_{PJ}	Installed capacity of the hydro power plant after the implementation of the project activity.	1,820,000,000 W	<p><u>Source:</u> Determined based on recognized standards in the PBC/19/ and approved by ANEEL/72/.</p> <p><u>Monitoring frequency:</u> Annually.</p>
A_{PJ}	Area of the reservoir measured on the surface of the water, after the implementation of the project activity, when the reservoir is full.	134,700,000 m ²	<p><u>Source:</u> Determined under maximum water level of 220 m in the PBC/19/ and approved by ANEEL/72/.</p> <p><u>Monitoring frequency:</u> Annually.</p>



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PJR CES confirm that the monitoring parameters are found to be correct and in accordance with the applied baseline methodology ACM0002 version 13.0.0/53/ and the “Tool to calculate the emission factor for an electricity system, version 2.2.1” /59/.

Opinion:

PJRCES confirms that the description of the monitoring plan contains all necessary parameters, that they are described and that the means of monitoring described in the PDD/25/ plan complies with the requirements of ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version-13.0.0, including applicable tool(s).

B. ASSESS THE IMPLEMENTATION OF THE MONITORING PLAN:

The monitoring and recording of the required parameters will be carried out by trained personnel who will be managed by CHTP's Manager.

Details of the data to be collected, the frequency of data recording and its format, responsibilities and authorities for project management, procedures for monitoring and reporting, QA/QC procedures, procedures for calibration of metering equipment and procedures for training and maintenance have been elaborated in the monitoring plan described in the Section B.7.3 of the PDD Version 7.0 dated 04-10-2012.

Adequate training will be provided to relevant personnel before the commencement of the project. Relevant project management procedures will also be established and implemented before the commencement of the project as established in the applicable official procedures from ONS, ANEEL and CCEE, such as the Invoice Metering System/46/.

All monitoring data will be archived for the crediting period plus 2 years beyond as per the approved monitoring methodology. All these elements will also be further verified during verification.

Opinion:

The project participant has been interviewed and it has been observed during the site visit that the monitoring arrangements described in the monitoring plan are feasible within the project design. From the above discussion, it has been concluded that PP has got sufficient ability to implement the monitoring plan.

C. CONCLUSION

Following the requirements of the paragraph 132 of the CDM-VVS/55/, after reviewing the evidences provided by PPs and cross-checking with public literature, interviewing stakeholders during on site visit and based on the validation team sectoral expertise, PJR CES is able to confirm that:

(a) The monitoring plan is fully in compliance with the requirements of the applied monitoring methodology ACM0002, version 13.0.0;

(b) The monitoring arrangements described in the PDD are feasible and adequate with the project design, and;

The PPs are able to implement the monitoring plan. Emphasis should be on evaluating that all indicators of importance for controlling and reporting of project performance are incorporated in the monitoring plan.



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4.8 ENVIRONMENTAL IMPACTS (§134-§137)

According to the Brazilian Environmental Regulation, hydropower projects shall elaborate an environmental impact study (EIA from Portuguese “Estudo de Impacto Ambiental”) and a corresponding Environmental Impact Report (RIMA from Portuguese “Relatório de Impacto Ambiental”) and make them publically available before using natural resources and starting construction of the project. The approval of this study comes with the issuance of the environmental licenses (Preliminary License – LP; Installation license – LI and Operation License – LO), which for this project is in charge of the Brazilian Institute of Environmental and Renewable Natural Resources (IBAMA).

UHE Teles Pires has been granted with all permits needed at the current stage, as follows:

- LP N° 386, issued on 13 December 2010 and valid until 12 December 2012/35/.
- LI N° 818, issued on 19 August 2011 and valid until 18 August 2015/36/.

The issuance of these licenses by IBAMA means that it has been considered the project does not imply in negative transboundary environmental impacts. In that matter, PPs provided to the validation team the Environmental Management Plan/30/ developed by CHTP and submitted to IBAMA, which comprises five axis of action, as follows:

- Axis 1 – Programs directly linked to the construction
- Axis 2 – Monitoring, control, management and conservation plan
- Axis 3 – Compensatory programs
- Axis 4 and 5 – Support and special programs

PJR CES has assessed the environmental studies/75//14//30/ and the licenses/34//35//36/ during the onsite visit and cross-checked through IBAMA webhosted database/104/ and can confirm that the project activity fully complies with the Brazilian environmental regulations. It is further confirmed that appropriate measures were undertaken to address the identified environmental impacts.

4.9 LOCAL STAKEHOLDER CONSULTATION (§138-§140)

As per Brazilian DNA Resolution # 7 of 5 March 2008)/105/ local stakeholders shall be informed about the project activity by letters and also PDD in Portuguese language shall be available in the internet for consultation and a declaration stating how the project contributes to the sustainable development of the country must be made available to these stakeholders at least 15 days previous to the starting of the Global Stakeholder Process (GSP).

For Teles Pires Hydropower Plant Project Activity, the referred resolution defined the following as required local stakeholders:

- *Federal Attorney for the Public Interest;*
- *State Attorneys for the Public Interest of Mato Grosso and Pará;*
- *Environmental Agencies of Mato Grosso and Pará;*
- *Brazilian Forum of NGOs and Social Movements for Environment and Development;*
- *City Halls of Paranaíta and Jacareacanga;*
- *City Councils of Paranaíta and Jacareacanga;*
- *Environmental Agencies of Paranaíta and Jacareacanga;*
- *Community Associations of Paranaíta and Jacareacanga;*



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Validation team checked during the onsite visit that letters/21//22/ were sent by all required stakeholders and the Portuguese version of the PDD is available in the website:

<https://sites.google.com/site/consultadcp/projeto-uhe-teles-pires>

Portuguese version of PDD was available in the site above mentioned on 30 December 2011.

Both (invitation letters and website with Portuguese version of the PDD) have met the required deadline of 15 days previous to the starting of the global stakeholder process.

Regarding local stakeholder process, two comments were received.

The 1st comment was sent by Sindicato dos Trabalhadores e Trabalhadoras Rurais de Paranaita on behalf of Clarinda Maximino/23/, which the stakeholder recognizes positive impacts of the project activity in the city (economy development, more jobs, capacity building, and investment in roads and health system) and call the attention to possible negative impacts (work accidents, population growth and crime).

PPs answered with respect to the concern with negative impacts (work accidents, population growth and crime), explaining that two programs have been considered to minimize this impact, which are:

- Migrant Center (CAM, from the Portuguese “Centro de Atendimento ao Migrante”) in Paranaita to assist migrants arriving in the city in searching for a job at the project activity;
- Social Assistance Reference Center (CRAS, from the Portuguese “Centro de Referência da Assistência Social”), this one from the Secretary of the Municipality of Paranaita to assist unemployed workers not related to the project activity construction.

The 2nd comment was sent by the Environmental Agency of Para State (Secretaria de Estado do Meio Ambiente, Pará) on behalf of Edna Corumbá/24/, which only confirmed receipt of the invitation letter and that there was no comment. Therefore, no answer was required.

In addition to the Brazilian DNA local requirements for local stakeholder consultation of CDM projects/106/, CHTP also followed the federal and local states legislation, which requests public hearings with the local community during the environmental licensing. Therefore, three public hearings were carried out in November 2010 in the cities of Paranaita, Alta Floresta and Jacareacanga. Hearing reports are part of the environmental licensing documents publicly available at IBAMA’s website/104/.

PJR CES has reviewed the invitation letters and the responses to the stakeholder’s comments and considers that the local stakeholder consultation was carried out adequately, followed the local requirements and the project participants have taken due account of all comments.



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5. SPECIFIC VALIDATION REQUIREMENTS

5.1 SMALL SCALE PROJECT ACTIVITY – ELIGIBILITY (§150-§153)

Not applicable.

5.2 DE-BUNDLING (§154-§157)

Not applicable.

5.3 ADDITIONALITY (§158-§161)

Not applicable.



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6. VALIDATION OPINION

Perry Johnson Registrars Carbon Emissions Services, Inc (PJRCES) has performed a validation of the “Teles Pires Hydropower Plant Project Activity”. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

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

The host country is Brazil and no Annex I country is identified. The host country fulfils the participation criteria and has approved the project and authorized the project participants. The DNA from Brazil confirmed that the project assists in achieving sustainable development.

The project correctly applies approved baseline and monitoring methodology “ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version-13.0.0”. The project involves renewable energy generation by hydro based power generation. The project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average calculates as 2,499,498 tCO₂e per year over the selected 10 year fixed crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is in PJRCES’s opinion that the “Teles Pires Hydropower Plant Project Activity”, as described in the PDD Version 7.0 dated 04-10-2012, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version-13.0.0 thus requests the registration of the project as a CDM project activity.

Signed on Behalf of the Designated Operational Entity by Authorized Signatory

Bilal Anwar

24 December 2012



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7. REFERENCES

Documents provided by the Project Participants

/1/	PDD GSP - Teles Pires Hydropower Plant Project Activity, version 1.0 dated 30 December 2011 (file: "UHE Teles Pires PDD-2012.01.16-GSP")
/2/	Appendix 1 GSP - WACC investment spreadsheet calculation dated 25 November 2011 (file: "UHE Teles Pires-PDD-App 1-WACC calculation-11.11.25")
/3/	Appendix 2 GSP - IRR calculation dated 30 December 2011 (file: "UHE Teles Pires-PDD-App 2-IRR calculation-11.12.30")
/4/	Appendix 3 GSP - CER & EF calculation spreadsheet dated 28 December 2011 (file: "UHE Teles Pires-PDD-App 3-CER & EF calculation-11.12.28")
/5/	CDM Prior Consideration: form submitted to UNFCCC dated 22 December 2010 (file: "Prior Consideration of the CDM Form")
/6/	CDM Prior Consideration: e-mail submitted to UNFCCC dated 22 December 2010 (file: "2010.12.22-Notification")
/7/	CDM Prior consideration: UNFCCC confirm reception 20 January 2011 (file: "2010.12-23-Notification answer")
/8/	CDM Prior Consideration: form submitted to Brazilian DNA dated 22 December 2010 (file: "Formulário de Consideração Prévia do MDL")
/9/	CDM Prior Consideration: e-mail submitted to UNFCCC dated 22 December 2010 (file: "2010.12-22-Notificacao")
/10/	CDM Prior consideration: Brazilian DNA confirm reception dated 23 December 2010 (file: "2010.12-23-Notificacao resposta")
/11/	CDM development contract between CHTP (owner) and EQAO (CDM consultant) to develop PDD dated 18 August 2011 (file: "Ctto Prest Serv (1o pc MDL)_EQAO_TELES PIRES_18.08.2011")
/12/	CDM development contract between CHTP (owner) and EQAO (CDM consultant) to establish partnership in the CDM process development dated 17 August 2011 (files: "Teles Pires_PA_18062011")
/13/	EPC Contract signed between CHTP (owner) and CCTP (construction consortium), dated 19 August 2011 (file: "EPC contract Teles Pires-confidential.excerpt" and "Cronograma de Pagamentos")
/14/	Environmental Impact Assessment completed in September 2010 (files: "EIA Teles Pires - Volume 1 27_04_2010"; "EIA TPI - Volume 2 - Diag Meio Físico"; "EIA TPI Volume 3_FINAL1908"; "EIA TPI Volume 4"; "EIA TPI Volume 5"; "EIA TPI Volume 6"; "EIA TPI Volume 6"; "RIMA")
/15/	Transmission losses from SIN grid - Spreadsheet with calculation provide by PPs (file: "UHE Teles Pires_Perdas de Transmissão")
/16/	Tender from ANEEL for auction N° 04/2010 dated 17 November 2010, with the final rules for the auction to be held in 17 december 2010 (file: "Edital Leilao A-5 n° 4-2010")
/17/	ANEEL Summary sheet – Feasibility study and basic project, dated 27 June 2011 (file: "UHE Teles Pires-Ficha resumo (27jun11)")
/18/	ANEEL Summary sheet – Feasibility study and basic project, dated 26 August 2011 (file: "ANEEL - Ficha Resumo Teles Pires (26ago11)")
/19/	UHE Teles Pires Final Consolidated Basic Project, Report of August 2011, jointly elaborated by the companies: Odebrecht Energia, Alstom Brasil Energia e Transporte Ltda., Voith Hydro Ltda., and the engineering companie Intertechne Consultores SA and PCE – Projetos e Consultoria de Engenharia (file: "UHE Teles Pires-2011-Projeto Basico Consolidado-final")
/20/	Concession contract between ANEEL and CHTP allowing CHTP to make use of the hydrological resources of Teles Pires river for power generation connected to the SIN, dated 07 June 2011 (file: "Contrato Concessao 02_2011 - MME-UHE Teles Pires (07jun11)").



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/21/	Local stakeholder consultation: Invitation letter sent to local stakeholders, dated 30 December 2102 (file: “CCC pdf”)
/22/	Local stakeholder consultation: Mail receipt confirming the letters sent to local stakeholders (file: “ARs_UHE Teles Pires”)
/23/	Local stakeholder consultation: E-mail from the Community Association of Paranaíta city dated 13 January 2012 (file: “UHE Teles Pires Comentário Sindicato de Paranaíta”)
/24/	Local stakeholder consultation: E-mail from the Environmental Agency of Pará state - SEMA/PA, dated 02 February 2012 (file: e-mail subject - “UHE Teles Pires_Resposta ao comentário SEMA-PA”)
/25/	Final PDD - Teles Pires Hydropower Plant Project Activity version 07, dated 04 October 2012
/26/	Appendix 1 Final - WACC investment spreadsheet calculation dated 04 October 2012 (file: “UHE Teles Pires-PDD-App 1-WACC calculation-12.10.04”)
/27/	Appendix 2 Final - IRR calculation dated 04 October 2012 (file: “UHE Teles Pires-PDD-App 2-IRR calculation-12.10.04”)
/28/	Appendix 3 Final - CER & EF calculation spreadsheet dated 22 August 2012 (file: “UHE Teles Pires-PDD-App 3-CER EF calculation-12.08.22”)
/29/	Appendix 4 Final – Public comments dated 29 August 2012 (file “UHE Teles Pires-PDD-App 4-Public comments”)
/30/	Summary of Social and Environmental Activities presented in the Environmental Project Design of UHE Teles Pires, dated December 2011 (file: “Resumo das atividades dos programas socioambientais da UHE Teles Pires”)
/31/	CHTP Monthly Reports of Implementation Status submitted to ANEEL: <ul style="list-style-type: none"> - UHE Teles Pires Monthly Report, dated May 2012 (file: “RM-ANEEL-MAIO- 2012”) - UHE Teles Pires Monthly Report, dated June 2012 (file: “RM-ANEEL- JUN- 2012”) - UHE Teles Pires Monthly Report, dated July 2012 (file: “RM-ANEEL-JUL-2012”)
/32/	OECD - Economic Survey of Brazil 2005. Regulation of the Electricity Sector (file: “OECD - Regulation of Electricity Sector - Brazil 2005”)
/33/	Modalities of Communication – dated 16 July 2012 (file: “Teles Pires_MoC_2012.07.16”)
/34/	Positive opinion given by IBAMA for the EIA-RIMA of UHE Teles Pires, dated 28 September 2010 (file: “Parecer IBAMA nº 85-2010”)
/35/	Environmental license issued by IBAMA: Preliminary license 386/2010, dated 13 December 2010 (file: “Ibama-2010-Licenca Previa 386 UHE Teles Pires”)
/36/	Environmental license issued by IBAMA: Installation license 818/2011, dated 19 August 2011 (file: “Ibama-2011-Licenca Instalacao 818 UHE Teles Pires”)
/37/	Finance request report submitted to BNDES by CHTP, dated 03 February 2011 (files: “2011-02-03_Carta_consulta_prévia_para_Enquadramento_de_Projetos-FINEM “; “2011-Relatorio Enquadramento Teles Pires”)
/38/	ANEEL Resolution N° 1,096, dated 14 December 2010. (file: “ANEEL Resolution No 1,096 (14dez10)”)
/39/	ANEEL – ATLAS – Chapter 4: Hydraulic Energy – 4.11 – Financial compensation and royalties. Available at: http://www.aneel.gov.br/aplicacoes/atlas/energia_hidraulica/4_11.htm Retrieved August 2012.
/40/	ANEEL Resolution N°1,086, dated 16 November 2010 (file: “TUST_Resolução ANEEL 1086 16.11.2010”)
/41/	ANEEL Ordinance N° 4,080, dated 27 December 2010 (file: “ANEEL - Despacho No 4,080 (27dez10)”)
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/43/	ONS - Verification Report of Services and Transmission Charges, dated June 2011 (file: “ONS-APUR_201106”)



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/49/	Board meeting Minute of Company Formation – Companhia Hidrelétrica Teles Pires, dated 19 January 2011 (file: “Ata de conselho de adm - Constituição da Empresa.19.01.2011pdf”)
/50/	Board meeting minute from Companhia Hidrelétrica Teles Pires, appoint the Directory Members, dated 19 January 2011 (file: “Teles Pires - RCA 19 01 11 registrada”)
/51/	Board meeting Minute from EQAO appointing the authorized focal point for CDM projects, dated 15 October 2012 (file: “Declaração Responsável comunicação”)
/52/	Constitution contract – 3 rd Alteration and letter of attorney from EQAO: - File: “Ecopart_3a Alteração de Contrato Social”, dated 03 November 2008 - File: “Procuração Esparta”, dated 28 June 2012

Methodologies, tools and other guidance by the CDM Executive Board

/53/	ACM0002 Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 13.0.0 – EB 67 Annex 13, dated 11 may 2012
/54/	Guidelines for completing the Project Design Document form, version 01.0 – EB 66 Annex 8, dated 02 March 2012.
/55/	Clean Development Mechanism Validation and Verification Standard, version 02.0 – EB 65 annex 4, dated 25 November 2011.
/56/	Glossary of CDM terms, version 06 – EB 66 Annex 63, dated 02 March 2012.
/57/	Guidelines on the demonstration and assessment of prior consideration of the CDM, version 04.0 - EB 62 Annex 13, dated 15 July 2011.
/58/	Tool for the demonstration and assessment of additionality, version 6.0.0 – EB 65 Annex 21 dated 25 November 2011.
/59/	Tool to calculate the emission factor for an electricity system, version 2.2.1 – EB 63 Annex 19 dated 29 September 2011.
/60/	Combined tool to identify the baseline scenario and demonstrate additionality, version 4.0.0 – EB 66 Annex 48 dated 02 March 2012.
/61/	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion, version 2-EB 41 Annex 11 dated 02 August 2008.
/62/	Guidelines for the reporting and validation of plant load factors version 01.0 - EB 48 Annex



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	11, dated 17 July 2009.
/63/	Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol – Decision 3/CMP.1, dated 30 November 2005
/64/	Guidelines on the assessment of investment analysis version 5.0 - EB 62 Annex 5, dated 15 July 2011. □
/65/	Clarifications on the consideration on national and or sectoral policies and circumstances in Baseline Scenarios v.02 - EB 22 Annex 3

Letter of Approval

/66/	Letter of Approval - LoA from Brazilian DNA dated 18 December 2012 (file: "Teles Pires LoA 2012.12.18")
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Documents used by PJRCES to validate/cross-check the information provided by the project participants

/67/	Prior Consideration UNFCCC publication dated 22 December 2010 http://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html
/68/	Global stakeholder process: period of consultation and comments. Available at: http://cdm.unfccc.int/Projects/Validation/DB/0LAWB1YZURTG26K2GL72WDDP2VOALS/view.html , retrieved August 2012.
/69/	Technical expert input form (files: "teles_pires_F-06.10 Technical Expert input"; "Avaliacao Tecnica - UHE Teles Pires")
/70/	Resolution N° 8, issued by CIMGC on 26 May 2008, delineated the electricity system as being only one: the Brazilian National Interconnected System (SIN), for CDM purposes (file: "Resolução de nº 8, de 26 de maio de 2008").
/71/	MCTI - CIMGC - Brazilian DNA website . Available at: http://www.mct.gov.br/index.php/content/view/77650.html
/72/	Dispatch ANEEL 3,504, dated 26 August 2011 - approval of the Basic Project Consolidated
/73/	ANEEL Resolution nr. 3,324, dated on 31 January 2012 (file: "ANEEL - RESOLUÇÃO AUTORIZATIVA N° 3.324, DE 31 DE JANEIRO DE 2012")
/74/	Decree dated 01 June 2011 at the Federal Official Gazette of Brazil, granting to CHTP the exploitation for hydro power generation at UHE Teles Pires (file: "Decreto de 01 junho 2011 - Outorga Teles Pires")
/75/	EPE- Review of Studies concerning the Hydrological and Energetic potential for UHE Teles Pires. Additive 1, dated October 2010 (file: "Adendo n1_R2 - EVTE UHE Teles Pires")
/76/	Attendance Sheet
/77/	Opening and Closing meeting
/78/	ANEEL updated timeline concerning Auction No 04/2010, dated 02 February 2011 (file: "Edital ANEEL - 04_2010_03 - Cronograma atualizado em 02.02.2011")
/79/	Normative Instruction SRF N° 093 from the Secretariat of the Federal Revenue of Brazil, dated 24 December 1997, determines the Social Contribution (CSLL) and Income Tax (IR) on Net Corporate Profits (file: "Instrucao normativa SRF No 093 - IR & CSLL") Available at: http://www.receita.fazenda.gov.br/legislacao/ins/ant2001/1997/insrf09397.htm Retrieved August 2012.
/80/	KPMG - Corporate and Indirect Tax Survey 2011, dated September 2011 (file: "KPMG - corporate and indirect tax rate survey 2011").
/81/	ISAE-FGV – Cost of capital to small hydroelectric power plants (SHPPs) in the Clean Development Mechanism context, date November 2010 (file: "ISAE-FGV - WACC to SHPPs in the CDM context (nov2009)")
/82/	IPEA - Capital cost of power utilities of electric energy distribution in the tariff revision process (in a free translation from the Portuguese "Custo de capital das concessionárias de distribuição de energia elétrica no processo de revisão tarifária", date April 2006 (file:



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	“IPEA - Custo de capital das concessionárias de distribuição de energia elétrica no processo de revisão tarifária (abr06)”
/83/	BNDES website – Long Term Interest Rates (TJLP). Available at: http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Custos_Financeiros/Taxa_de_Juros_de_Longo_Prazo_TJLP/index.html
/84/	BNDES website – BNDES Finem (Project financing for Electricity generation projects). Available at: http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/energia_eletrica_geracao.html Retrieved August 2012.
/85/	Brazilian Central Bank – Inflation targeting in Brazil. Historic from 1999 to 2014. Available at: http://www.bcb.gov.br/pec/metas/InflationTargetingTable.pdf Retrieved August 2012.
/86/	U.S. Federal Reserve - 30-year US Treasury Yield; 10-year T. Notes; 10-year TIPS. Available at: http://www.federalreserve.gov/econresdata/researchdata.htm
/87/	Damodaran online – Updated Data - Data Sets - Historical data on Stocks, Bonds and Bills - US. Available at: http://pages.stern.nyu.edu/~adamodar/
/88/	Damodaran online – Updated Data – Individual company information: US - 1/11, dated January 2011. Available at: http://pages.stern.nyu.edu/~adamodar/
/89/	Brazilian Institute of Applied Economic Research (Ipea) – Macroeconomic Database – EMBI+. Available at: www.ipeadata.gov.br
/90/	CCEE- Annual report of the Electric Energy Commercialization Chamber (CCEE): - CCEE Annual Report from 2007 (file: "CCEE-2007-Relatorio_anual"); - CCEE Annual Report from 2008 (file: "CCEE-2008-Relatorio_anual"); - CCEE Annual Report from 2009 (file: "CCEE-2009-Relatorio_anual"); - CCEE Annual Report from 2010 (file: "CCEE-2010-Relatorio_anual");
/91/	CCEE - Results of 11 th Auction for New Energy – ref. Tender ANEEL N° 04/2010, dated 17 December 2010 (file: "Resultado Leilão"). Available at: http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vnextoid=9f57fa604f1bb210VgnVCM100005e01010aRCRD&vgnextfmt=default
/92/	Tractebel Energia – GDF Suez. Presentation: Scenarios for Future Energy Price, dated November 2010 (file: "Cenarios_preco_investidores_arquivamento_CVM_Posterior - Tractebel Energia (nov10)")
/93/	CCEE - Federal Decree N° 5,177, dated 12 August 2004, Article 12 (file: "Decreto N 5177 - Artigo 12"). Available at: http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2004/decreto/d5177.htm
/94/	CCEE Budget 2010, dated 18 November 2009 (file: "CCEE-Orcamento 2010-confidencial")
/95/	ANEEL - Authoritative Resolution N° 328 – Electric System National Operator, dated 12 August 2004 (file: "ANEEL - REA No 328 de 12 ago 04 - Estatuto Atualizado ONS (22abr09)")
/96/	EPE - MME - Brazilian Energy Balance 2011 - Base year 2010. Final Report, dated 2011 (file: "BEN_2011").
/97/	CHTP - Annual Financial Statement 2011, dated 07 February 2012 (file: "Relatorio Administracao 2011 - Hidreletrica Teles Pires")
/98/	Brazilian Ministry of Planning, Budget and Management - Growth Acceleration Program (PAC), dated 23 January 2007. Available at: http://www.pac.gov.br/ Retrieved August 2011



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/100/	OECD/IEA (International Energy Agency) – Renewable Energy Essentials: Hydropower, dated 2010 (file: "IEA - Hydropower_Essentials (2010)") Available at: http://www.iea.org/papers/2010/Hydropower_Essentials.pdf . Retrieved August 2012.
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/113/	ANEEL - Accounting Manual of the Energy Public Service, dated 2007 (file: "ANEEL - Manual Contabilidade (2007)")
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/117/	Contract between Companhia Hidrelétrica Teles Pires and PJRCES for CDM validation services dated 05 January 2012 (file: “F-06.02 Proposal for CDM Validation Services Teles Pires Hydropower Plant (13Jan2012)”)



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APPENDIX A – VALIDATION CHECKLIST

TABLE: 1 – MANDATORY REQUIREMENT FOR CLEAN DEVELOPMENT MECHANISM (CDM) PROJECT ACTIVITIES

REQUIREMENT	REFERENCE	CONCLUSION
ABOUT PARTIES		
1. The Project activity shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof. (http://unfccc.int/resource/docs/convkp/kpeng.pdf#page=12) (http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=15)	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
2. The Project activity shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC. (http://unfccc.int/resource/docs/convkp/kpeng.pdf#page=12)	Kyoto Protocol Art.12.2.	OK
3. The Project activity shall assist Parties included in Annex I in achieving compliance with their quantified emission reduction commitment under Article. 3. (http://unfccc.int/resource/docs/convkp/kpeng.pdf)	Kyoto Protocol Art.12.2	OK
4. The Project activity shall have the written approval of voluntary participation from the designated national authority of each Party involved. (http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=15)	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §28, §40a	CAR-1 OK
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties. (http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=24)	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, §2(f)	N/A
6. Parties participating in the CDM shall designate a national authority for the CDM. (http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=12)	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol. (http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=12)	CDM Modalities and Procedures §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded. (http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=12)	CDM Modalities and Procedures §31b	N/A



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REQUIREMENT	REFERENCE	CONCLUSION
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7. (http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=12)	CDM Modalities and Procedures §31b	N/A
ABOUT ADDITIONALITY		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity. (http://unfccc.int/resource/docs/2005/cmp1/eng/08a01.pdf#page=16)	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK
ABOUT FORECAST EMISSION REDUCTIONS AND ENVIRONMENTAL IMPACTS		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change. (http://unfccc.int/resource/docs/convkp/kpeng.pdf#page=12)	Kyoto Protocol Art. 12.5b	OK
FOR LARGE-SCALE PROJECTS ONLY		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out. (http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=14)	CDM Modalities and Procedures §37c	OK
ABOUT SMALL-SCALE PROJECT ACTIVITIES (IF APPLICABLE)		
13. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in §6(c) of the Marrakech Accords and shall not be a debundled component of a larger project activity. (http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=46)	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	N/A
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category. (http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=46)	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12b §22e	N/A
15. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented. (http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=47)	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	N/A
ABOUT STAKEHOLDER INVOLVEMENT		
16. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK



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REQUIREMENT	REFERENCE	CONCLUSION
http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=14		
17. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available. http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=15	CDM Modalities and Procedures §40	OK
OTHER		
18. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board. http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=14	CDM Modalities and Procedures §37e	OK
19. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies & circumstances. http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=16	CDM Modalities and Procedures §45c,d	OK
20. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure. http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=16	CDM Modalities and Procedures §47	OK
21. Project participants shall prepare a project design document in accordance with the format specified in appendix A to annex II. http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=23	CDM Modalities and Procedures Appendix B, §2	OK
22. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP. http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf#page=14	CDM Modalities and Procedures §37f	OK



VALIDATION FINDINGS – VVSv2.0

VALIDATION FINDINGS OVERVIEW

Findings of validation assessment team through desk review, physical site inspection (if applicable) and document review of Teles Pires Hydropower Plant Project Activity

Explanation of Table 3:

Draft report clarification requests, corrective action requests and forward action request			Summary of Project Participant's response	Validation Team conclusion
CAR/CL №	Description of CAR/CL	Reference		
CL#01/CAR#01	Assessment №: 01 Date: DD-MM-YYYY			
	Findings may be Corrective Action Requests (CARs), Clarification Requests (CLs), and Forward Action Request (FARs).	Reference to Table 2 / PDD / any other reference	PP shall provide their response in this column only.	Based on the response Validation team shall provides their assessment here.
	Assessment №: 02 Date: DD-MM-YYYY			
	Any Open issues after the assessment of response to be reproduced by the Validation team under the next assessment	Reference		
CL#02/CAR#02				
.				
.				
.				
CL#10/CAR#10				

Please Note: This is an open list and more findings may be added as validation progresses.

Responses to each Finding and relevant associated documentation should be recorded in this form by the PP and send back to the Team Leader/Validator in one submission to PJRCES (exception of finding linked to Letter of Approval, which can be submitted separately).

Rows for each assessment and further response will be appended to the table until the Findings has been addressed to the satisfaction of the Team Leader/Validator.

Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	11	20	0

Deadline for submission of responses to Assessment 01 by PP⁵:	01/10/2012
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⁵ Validation team to make sure for each Assessment that the deadline date mentioned is in mutual agreement with PP.

VALIDATION CHECKLIST – VVSv2.0

TABLE: 2 – VALIDATION REQUIREMENTS CHECKLIST (IN-LINE WITH § 37 OF CDM MODALITIES & PROCEDURES)

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
A. General Requirements						
A.1. Global Stakeholder Consultation (Section E- VVSv02)						
A.1.1.	Has the PDD been published for Global stakeholder consultation?	34	The PDD of version 1.0, dated 30 December 2011/1/ was made publicly available on DOE's climate change website (http://cdm.unfccc.int/Projects/Validation/DB/0LAWB1YZURTG26K2GL72WDDP2VOALS/view.html) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 25 January 2012 to 23 February 2012..	/68/	OK	OK
A.1.2.	If, the comments are received, respond to following					
	a. How all the comments received during GSC has been taken into account?	35 & 36	Seven comments were received from the following persons/organizations: Rivers on behalf of Brent Millikan; Zhong Zhou Li. However, PPs have not provided the response.	/1/ /68/	CL-9	OK



VALIDATION CHECKLIST – VVSv2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
A.2. Approval (Section F – VVSv02)						
A.2.1.	Clarify Party (ies) involved in the project activity and have DNAs of each Party provided their involvement in the CDM project activity by written approval?	38	Project participants are stated on the PDD section A.3, as below: 1) Companhia Hidreletrica Teles Pires (private entity) 2) Ecopart Assessoria em Negocios Empresariais Ltda. (private entity) The Parties involved do not wish to be considered as project participant.	/1/ /11/ /12/ /13/	OK	OK
A.2.2.	From the Letter of Approval, Please confirm following		There will be one approval from the Brazilian DNA. According to Brazilian DNA requirements LoA will be provided after the positive Validation report.	/66/ /106/	CAR-1	OK
	a. The Party is a Party to the Kyoto Protocol;	39 (a)	Please, refer to A.2.2.	/66/	CAR-1	OK
	b. Participation is voluntary	39 (b)	Please, refer to A.2.2.	/66/	CAR-1	OK
	c. Proposed CDM PA meets the host Party sustainable development criteria.	39 (c)	Please, refer to A.2.2.	/66/	CAR-1	OK
	d. Approval refers to precise project title in the PDD submitted for registration or an additional specification of the project activity, e.g. PDD version number	39 (d)	Please, refer to A.2.2.	/66/	CAR-1	OK



VALIDATION CHECKLIST – VVSv2.0

Validation Requirement Checklist		Ref. (§§)	Validation Team Comments		Conclusion	
		VVS	Means of Validation	Evidence	Draft	Final
A.2.3.	Is(are) the letter(s) of approvals unconditional with respect to A.2.2 (a) to (d)?	40	Please, refer to A.2.2.	/66/	CAR-1	OK
A.2.4.	Please confirm that the letter(s) of approval has been issued by the respective Party's designated national authority (DNA) and is valid for the proposed CDM project activity under validation.	41	Please, refer to A.2.2.	/66/	CAR-1	OK
A.2.5.	Is there any doubt with respect to the authenticity of the letter of approval?	42	Please, refer to A.2.2.	/66/	CAR-1	OK
A.3. Authorization (Section G – VVSv02)						
A.3.1.	Is the participation of the project participants in the project activity has been approved by at least one Party to the Kyoto Protocol?	45	Please, refer to A.2.2.	/66/	CAR-1	OK
A.3.2.	Project participant(s) are listed in tabular form in section A.4 of the PDD-form and are consistent with contact details provided in Appendix1.	46	Section A.4 of the PDD is duly filled according to the guidelines and consistent with Appendix 1.	/1/ /54/ /55/	OK	OK
	a. List of project participants and Party (ies)	46	Project participants are stated on the PDD section A.3, as below: 1) Companhia Hidreletrica Teles Pires (private entity) 2) Ecopart Assessoria em Negocios Empresariais Ltda. (private entity)	/1/ /54/	OK	OK
	b. Identification of host party	46	Brazil is the Host Party.	/1/ /54/	OK	OK
	c. Indication whether the Party wishes	46	It is indicated that the Host Party does	/1/	OK	OK



VALIDATION CHECKLIST – vvs_v2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	to be considered as project participant		not wish to be considered as project participant.	/54/		
A.3.3.	Are there any entities not authorized but listed in the PDD-form?	47	No entities other than those authorized as project participants are listed in section A.4 and Appendix-1.		OK	OK
A.3.4.	Is the approval of participation has been issued by the relevant DNA?	48	Please, refer to A.2.2.	/66/	GAR-4	OK
A.3.5.	Please confirm following					
	a. Does PJRCES have contractual agreement with Project participant(s)?	6	PJRCES has contractual agreement with Companhia Hidrelétrica Teles Pires.	/117/	OK	OK
	b. Is this a new Validation or recommencement of the Validation activity?	EB50 Annex48 Para 9	This is a new Validation and a new contract.	/117/	OK	OK



VALIDATION CHECKLIST – VVSv2.0

VALIDATION REQUIREMENT CHECKLIST	REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
	VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
A.4. Contribution to Sustainable Development (Section H – VVSv02)					
A.4.1. Does the LoA confirm that the Project activity contributes to the sustainable development of the host Party?	51	Please, refer to A.2.2.	/66/	CAR-1	OK
A.5. Modalities of communications (Section I – VVSv02)					
A.5.1. Has DOE received Modalities of communication (MoC) statement.	53	MoC Statement dated has been submitted by PP	/33/	OK	OK
A.5.2. Determine corporate identity of all authorized signatories of project participants & focal points included in MoC statement by one of the following approach:	53	The validation team has assessed the corporate identity of the project participants, focal point, including specimen signatures and employment status of their authorized signatories as listed in MoC statement by directly checking evidence as follows: - For Companhia Hidrelétrica Teles Pires: the company's identity was verified through the Board meeting Minute of the Company Formation/49/, dated 19/01/2011 and notarized in 26/01/2011. The authorized personal identity of the focal point from CHTP was verified through the company's Board meeting minute from the same date appointing Mr. Celso Ferreira as Technical Director. This information has been further cross-checked with the contracts signed between EQAO and CHTP to develop the CDM project as well between CHTP and PJRCES to perform the CDM validation services. - For Ecopart Assessoria em Negócios Empresariais Ltda: the company's identity was	/33/ /49/ /50/ /11/ /12/ /117/ /51/	OK	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
			verified through the Company Formation Contract of EQAO, which was further cross-checked with the contracts signed between EQAO and CHTP to develop the CDM project. EQAO also provided a written confirmation that Ms. Melissa Sawaya Hirschheimer and Mr. Marco Mazaferro are duly authorized to be the focal points on behalf of EQAO.			
	Directly checking evidence for corporate, personal identity and other relevant documentation	54(a)	The MoC has been verified by the validation team by directly checking evidence for corporate, personal identity and other relevant documentation.	/33/ /49/ /50/	OK	OK
	Notarized document	54(b)	All documents were notarized documents.	/33//49//50//51/	OK	OK
	Written confirmations from PP that includes all corporate and personal details, including specimen signatures, confirm that the same are valid and accurate.	54(c) 55 56	A written confirmation that Ms. Melissa Sawaya Hirschheimer and Mr. Marco Mazaferro are duly authorized to be the focal points on behalf of EQAO was provided to the DOE.	/51/	OK	OK
	Clarify any other means of validating the requirements laid in A.4.2 other than (a), (b) and (c) above.	57	N/A		N/A	N/A
A.5.3.	Determine that the MoC statement has been correctly completed and duly authorized – confirm following	59				
	a. Is latest version of the form “Modalities of Communication statement” (F-CDM-MOC) has been used?	60(a)	PP has used the latest F-CDM-MOC, version 2.1.	/33/ http://cdm.unfccc.int/Reference/PDDs_For%20index.html#reg	OK	OK



VALIDATION CHECKLIST – VVSv2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	b. Confirm whether the information in the form F-CDM-MOC and its annex 1 has been correctly filled in.	60(b)	PJRCES has validated the duly filled and authorized form F-CDM-MOC dated 16 July 2012 and confirms following <ul style="list-style-type: none"> ➤ Project details are duly filled and title is in conformance with the LoA and PDD-form ➤ Name, address and responsibility of PPs are clearly indicated. ➤ Contact details of the primary & alternate authorized signatory are duly filled in. ➤ Annex-1: title of PA is in-line with the PDD-form. Also, name of PPs, contact details, address and specimen signature have been validated and found to be in-order. 	/33/	OK	OK
	c. Confirm that project participants authorized signatories signing the F-CDM-MOC correspond to the project participants authorized signatories included in F-CDM-MOC, annex 1.	60(c)	PJRCES confirm the information provided in the F-CDM-MOC and its annex 1 is complete and accurate.	/33/ /25/	CL-1	OK
A.6. Project design document (Section J – VVSv02)						
A.6.1.	Confirm that the PDD was completed using the latest version of the PDD-form for appropriate type of project activity.	62	PDD has been prepared in accordance with the latest template and guidance from CDM EB available on the UNFCCC CDM website.	/1/ /54/ /55/	OK	OK
A.7. Description of project activity (Section K – VVSv02)						
A.7.1.	Confirm following for project activity description in the PDD-form	64				
	a. Is accurate and complete i.e. sufficiently covers all the relevant	64	The proposed project Teles Pires will be a hydropower plant in Midwest of Brazil	/1/	CAR-3	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	elements of the project activity.		interconnected to the National Interconnected System (SIN from Portuguese language) and will totalizing 1,820 MW. The expected electricity generation is 8,028,721 MWh/year through 35 years. The estimate of emission reductions is 2,497,364 tCO ₂ /year	/3/ /15/ /13/ /14/ /18/ /19/ /20/ /11/	CL-2 CL-10 CL-14 CL-20 CAR-10	OK OK OK OK OK
	b. Is providing the reader with a clear understanding of the nature of the proposed CDM project activity;	64	The validation team has reviewed the project implementation schedule and lay outs and has carried out a visit to PPs office to assess the project. The geographical coordinates of the project presented in the PDD have been cross checked with the Final Consolidated Basic Project/19/. The project will be located in the municipalities of Paranaita, Mato Grosso state and Jacareacanga, Para state.	/3/ /15/ /13/ /14/ /18/ /19/ /20/ /11/	CAR-3 CL-2 CL-10 CL-14 CL-20 CAR-10	OK OK OK OK OK OK



VALIDATION CHECKLIST – vvs2.0

Validation Requirement Checklist		Ref. (§§)	Validation Team Comments		Conclusion	
		VVS	Means of Validation	Evidence	Draft	Final
A.7.2. Is the project a new installation and already commissioned, or does the project involve alteration of existing installation or process?		65	<p>The project is a new installation hence it is not installed or commissioned.</p> <p>It consists of the installation of a new grid-connected renewable plant. The site visit took place on 29 February 2012 and 1 March 2012 at Teles Pires office.</p> <p>The decision of not going to the site was based on VVS 2.0/55/ paragraph 67. Due to the hydro power plant is under initial construction (photos and schedule of works have been available for validation team) there was no physical site inspection to be done.</p> <p>The validation team has reviewed the Feasibility Study (Ref. 29), Environmental Impact Assessment (Ref. 16) and Installation license (Ref. 17) of the project to confirm that the description in the PDD reflects the proposed CDM project activity.</p>	<p>/16/</p> <p>/18/</p> <p>/19/</p> <p>/20/</p> <p>/25/</p> <p>/73/</p> <p>/74/</p> <p>/78/</p>	OK	OK
A.7.3. If, outcome of A.7.2 states that project activity is in existing facilities or utilizing existing equipments then confirm following		65				
	a. Does methodology specifies other means of for inspection other than site visit.	65	<p>The site visit took place on 29 February 2012 and 1 March 2012 at Teles Pires office.</p> <p>The decision of not going to the site was based on VVS 2.0/55/ paragraph 67. Due to the hydro power plant is under initial construction (photos and schedule of works have been available for validation team) there</p>	<p>/16/</p> <p>/18/</p> <p>/19/</p> <p>/20/</p> <p>/25/</p> <p>/73/</p>	OK	OK



VALIDATION CHECKLIST – vvs/v2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
			was no physical site inspection to be done.	/74/ /78/		
	b. Large Scale	65(a)	Teles Pires Hydropower Plant Project Activity is a large scale project.	/1/ /52/	OK	OK
	c. Non-bundled small scale projects with emission reductions exceeding 15,000 tonnes per year	65(b)	N/A		N/A	N/A
	d. Bundled small-scale projects, each with emission reductions not exceeding 15,000 tonnes per year; in such cases the number of physical site visits may, however, be based on sampling, if the sampling size is justified through statistical analysis.	60(c)	N/A		N/A	N/A
A.7.4.	For other individual proposed small-scale CDM project activities with emission reductions not exceeding 15,000 tonnes per year, the DOE should conduct a physical site visit as appropriate	66	N/A		N/A	N/A
	a. Was Physical site visit conducted to confirm that the description in the PDD reflects the proposed CDM project activity, unless other means are specified in the methodology?	66	N/A		N/A	N/A



VALIDATION CHECKLIST – VVSv2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
A.7.5.	Confirm the means of validation to any other proposed CDM project activities that are not referred in A.7.3 & A.7.4 above.	67	N/A		N/A	N/A
A.7.6.	Please confirm following					
	a. Does the proposed CDM project activity involve the alteration of an existing installation or process?	68	The project is a new installation hence it is not installed or commissioned. It consists of the installation of a new grid-connected renewable plant.	/16//18//19//20/ /25//73//74//78/	OK	OK
	b. If yes, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation?	68	N/A		N/A	N/A
B. Application of the selected baseline and monitoring methodology (Section L – VVS02)						
B.1. Genral Requirements (01)						
B.1.1.	Does the methodology (ies) selected by project participants comply with methodologies previously approved by CDM executive Board?	70	PP has applied the approved baseline and monitoring methodology ACM0002: “Consolidated baseline methodology for grid connected electricity generation from renewable sources” Version 13.0.0.	/1/ /2/ /53/	OK	OK
B.1.2.	Is the version of the methodology valid?	70 73 75	ACM0002, version 13.0.0 is valid from 17 September 2010 onwards; this methodology has been correctly applied since the project activity consists of the installation of a renewable electricity generation plant (hydro power plant) that will be installed at a site where no renewable power plant was	/1/ /2/ /53/	CL-2	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST	REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
	VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
		operated previously. However, on PDD stated version is 12.2.0. PP is requested to clarify methodology version.			
B.1.3. Clarify the specific guidance and/or clarifications provided by the board with respect to the approved methodology and any applicable tools.	71	N/A		N/A	N/A
B.1.4. Has PP correctly applied the methodology (ies) correctly with respect to following?	72				
a. Project Boundary	72(a)	<p>The validation team has verified the physical and geographical boundaries through reviewed documented evidence.</p> <p>The project boundary defined in the PDD section B3 includes all emission sources, in accordance with the applied methodology ACM0002.</p> <p>For baseline, CO₂ emissions from the grid electricity generation (including existing grid-connected power plants and the addition of new grid-connected power plants) have to be accounted.</p> <p>For project activity (hydro electricity production) no greenhouse gas emissions have to be considered if the power density is greater than 10 w/m².</p>	/1/ /2/ /70/ /53/ /55/ /25/ /19/ /20/ /73/ /74/ /75/ /76/ /77/	CL-2	OK
b. Baseline identification	72(b)	The approved methodology ACM0002 version 13.0.0 defines a specific baseline directly for the hydro power projects. It states that if the project activity is the installation of a new grid-connected renewable power plant/unit, the	/1/ /2/ /53/	CL-2	OK



VALIDATION CHECKLIST – VVSv2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
			<p>baseline scenario is the following:</p> <p>“Electricity delivered to the grid by the project 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 calculations (PDD section B.6.1) and emission reduction calculation in PDD section B.6.3 as per the “Tool to calculate the emission factor for an electricity system”.”</p> <p>The validation team has confirmed during the desk review and onsite visit that the baseline described in the PDD has been correctly applied with the methodology ACM0002.</p>			
	c. Algorithms and/or formulae used to determine emission reductions	72(c)	Formula's used for determination of ER's are as per the applied methodology ACM0002, version 13.0.0 and the “Tool to calculate the emission factor for an electricity system, version 2.2.1	/1/ /4/ /59//53/	OK	OK
	d. Additionality	72(d)	PP has used relevant guidance with respect to the methodology ACM0002, version 13.0.0 and the Tool for the demonstration and assessment of additionality, version 6.0.0 and the referred guidelines.	/1/ /2/ /3//58//64/		
	e. Monitoring methodology	72(e)	The monitoring plan has been prepared using the relevant guidance provided in the methodology.	/1/ /53/ /46/ /71/ /72/ /18/ /19/	OK	OK



VALIDATION CHECKLIST – vvsv2.0

Validation Requirement Checklist	Ref. (§§)	Validation Team Comments		Conclusion	
	VVS	Means of Validation	Evidence	Draft	Final
B.2. Applicability of the selected baseline and monitoring methodology to the project activity (02)					
B.2.1. Is the methodology (ies) correctly quoted?	74	This methodology is applicable to 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. Validation opinion: the methodology has been correctly quoted.	/1/ /53/ /46/ /71/ /72/ /18/ /19/	OK	OK
B.2.2. Is the selected methodology (ies) applicable to project activity?	74	The selected methodology ACM0002, version 13.0.0 is applicable to the project activity, since it is a large scale project from a renewable energy hydro power plant.	/1/ /53/ /19/	CL 12	OK
B.2.3. Determine whether the project activity meets each of the applicability conditions of the approved methodology or any tool or other methodology component referred therein.	76				



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	ACM0002, v.13.0.0					
	The methodology is applicable to 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).		<p>The project activity is a Greenfield grid-connected hydro power plant at a site where there was no renewable energy project operating prior to implementation of this project. The proposed project will have an installed capacity of 1,820 MW and the generated electricity will be dispatched to the Brazilian National grid – SIN.</p> <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Feasibility Study, Consolidated Basic Project, Concession Contract and the government resolutions allowing the implementation of UHE Teles Pires.</p>	/16/ /18/ /19/ /20/ /25/ /73/ /74/	CL-12	OK
	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;		<p>The proposed project activity is the installation of a new run-of-river hydro power plant.</p> <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Feasibility Study, Consolidated Basic Project, Concession Contract and the government resolutions allowing the implementation of the project activity under run-of-river operation regime and referring to its short water retention time (4.6 days)./17/</p>	/16/ /17/ /18/ /19/ /20/ /25/ /73/ /74/ /69/	CL-12	OK
	In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power		Not applicable. The project activity is a Greenfield grid-connected hydro power plant at a site where there was no renewable	/16/ /18/ /19/	CL-12	OK



VALIDATION CHECKLIST – vvs_v2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	<p>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</p> <p>of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.</p>		<p>energy project operating prior to implementation of this project.</p> <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Feasibility Study, Consolidated Basic Project Basic Project, Concession Contract and the government resolutions allowing the implementation of UHE Teles Pires.</p>	<p>/20/</p> <p>/25/</p> <p>/73/</p> <p>/74/</p>		



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	<p>In case of hydro power plants:</p> <ul style="list-style-type: none"> • One of the following conditions must apply: <ul style="list-style-type: none"> o The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs; or o The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the project emissions section, is greater than 4 W/m²; or o The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the project emissions section, is greater than 4 W/m². 		<p>The implementation of the proposed project activity will result in a new reservoir of 134.7 km², while the installed capacity is 1,820 MW, therefore, the power density is 13.51 w/m² (calculation provided in Section B.6.1 of the PDD), which is greater than 4 W/m².</p> <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Consolidated Basic Project and the Concession Contract.</p>	<p>/19/ /20/ /25/ /73/</p>	CL-12	OK
	<p>In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m² all the following conditions must apply:</p> <ul style="list-style-type: none"> • The power density calculated for the 		<p>Not applicable. The implementation of the proposed project activity will result in a new single reservoir.</p> <p>The compliance with the applicability condition has been confirmed through the review of the</p>	<p>/25/ /19/ /75/</p>	CL-12	OK



VALIDATION CHECKLIST – vvs_v2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	entire project activity using equation 5 is greater than 4 W/m ² ;		PDD, Consolidated Basic Project and Feasibility Study of the Hydrological and Energetic potential for UHE Teles Pires from EPE.			
	<ul style="list-style-type: none"> • Multiple reservoirs and hydro power plants located at the same river and where are designed together to function as an integrated project¹ that collectively constitute the generation capacity of the combined power plant; • Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; • Total installed capacity of the power units, which are driven using water from the reservoirs with power density lower than 4 W/m², is lower than 15 MW; • Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m², is less than 10% of the total installed capacity of the project activity from multiple reservoirs. 					



VALIDATION CHECKLIST – vvsV2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	<p>The methodology is not applicable to the following:</p> <ul style="list-style-type: none"> • 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; • Biomass fired power plants; • A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m². 		<p>None of them are applicable to the project activity, since:</p> <ul style="list-style-type: none"> • The project activity is a Greenfield power plant at a site where there was no renewable energy project operating prior to implementation of this project. • The project activity is a hydro power plant. • The proposed project activity will have a power density of 13.51 w/m², which is greater than 4 W/m². <p>The compliance with the applicability condition has been confirmed through the review of the PDD, Consolidated Basic Project, Concession Contract, the government resolutions allowing the implementation of UHE Teles Pires and Feasibility Study of the Hydrological and Energetic potential for UHE Teles Pires from EPE.</p>	<p>/25/ /19/ /20/ /73/ /74/ /75/</p>	CL-12	OK
B.3.	Deviation for an approved methodology (03)					
B.3.1.	If, PP requested a deviation please confirm following	78	N/A		N/A	N/A



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	a. When was such request for deviation made?	78	N/A		N/A	N/A
	b. Is the request for deviation a resulting out of project-specific issue?	78-79	N/A		N/A	N/A
	c. Does the deviation requested would require revision in the methodology?	80	N/A		N/A	N/A
B.4. Clarification on Applicability of methodology (04)						
B.4.1.	If, assessment in B.2.2, results in the ambiguity that whether the methodology is applicable to the project activity or not confirm whether a Clarification is requested or not.	81	N/A		N/A	N/A
B.5. Project Boundary (05)						
B.5.1.	Based on Project boundary description in the PDD-form confirm following	82-85				
	a. Is the physical delineation of the proposed project activity clearly defined?	82	Project boundary description and diagram is providing exact information as required by methodology.	/1/ /52/	OK	OK
	b. Does the project boundary include all GHG emission sources as required by the methodology?	84	The validation of the GHGs and sources has been performed based on reviewed documented. The project boundary defined in the PDD section B3 includes all emission sources, in accordance with the applied methodology ACM0002.	/1/ /2/ /70/ /53/ /55/ /25/ /19/ /20/ /73/ /74/ /75/ /76/ /77/	OK	OK
	c. In case the methodology allows choosing whether a source and/or	84	For baseline, CO ₂ emissions from the grid electricity generation (including existing grid-	/1/ /2/ /70/ /53/	OK	OK



VALIDATION CHECKLIST – vvsV2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	gas is to be included, is the choice sufficiently explained and justified?		connected power plants and the addition of new grid-connected power plants) have to be accounted. For project activity (hydro electricity production) no greenhouse gas emissions have to be considered if the power density is greater than 10 w/m ² .			
	d. Does the implementation of the project activity involve any emissions sources within the project boundary that are expected to contribute more than 1% of the total expected annual average emission reductions which are not addressed/considered in the selected methodology? PI explain, if any.	87	Since the project activity consists of the installation of a renewable electricity generation plant (hydro power plant) that will be installed at a site where no renewable power plant was operated previously, project activity does not involved any emission within the project boundary that contribute to more than 1% of the total annual average emission reductions which are not considered in the methodology ACM0002.	/1/ /2/ /53/ /25/ /19/ /20/ /73/ /74/ /75/	OK	OK
B.6. Baseline scenario identification and description (06)						
B.6.1.	Please confirm whether the methodology provides a baseline scenario? Also, confirm	89	The approved methodology ACM0002 version 13.0.0 defines a specific baseline directly for the hydro power projects. It states that if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as	/1/ /2/ /53/	GL-2	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
			reflected in the combined margin calculations (PDD section B.6.1) and emission reduction calculation in PDD section B.6.3 as per the “Tool to calculate the emission factor for an electricity system”. The validation team has confirmed during the desk review and onsite visit that the baseline described in the PDD has been correctly applied with the methodology ACM0002.			
B.6.2.	Is methodology correctly applied with respect to baseline identification?	88 89	The methodology ACM0002 has been correctly applied, according to the baseline methodology procedure, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario 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”	/1/ /2/ /53/ /71/ /59/ /55/ /25/	CL-15	OK
B.6.3.	If, methodology requires several <u>alternative scenarios to be considered</u> for identification of most plausible baseline scenario then confirm following:	90	The approved methodology ACM0002 version 13.0.0 defines a specific baseline directly for the hydro power projects. The baseline described in the PDD is in accordance with the methodology ACM0002.	/1/ /2/ /53/	OK	OK
	a. What <u>possible alternative scenarios</u> have been considered for determination of baseline?	90	N/A		N/A	N/A



VALIDATION CHECKLIST – vvsv2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	b. Is the list of possible alternatives complete?	90	N/A		N/A	N/A
	c. Is the baseline scenario identified reasonable?	91	N/A		N/A	N/A
	d. What has been identified as baseline scenario?	91	N/A		N/A	N/A
	e. Is the <u>identified baseline scenario</u> in accordance to methodology and tools referred?	91	N/A		N/A	N/A
	f. Does the PDD provides a 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 project activity	92	N/A		N/A	N/A
B.6.4. Based on its knowledge of the sector and/or local expert confirm following:		93				



VALIDATION CHECKLIST – VVSv2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	a. Whether all applicable CDM requirements have been taken into account in the identification of the baseline scenario for the proposed CDM PA.	93	The validation team confirms that all applicable CDM requirements have been taken into account in the identification of the baseline scenario for the proposed CDM PA.	/1/ /2/ /53/ /58/	OK	OK
	b. Whether “relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector” have been considered.	93 94(d)	The validation team confirms that PP has demonstrated that all relevant policies and circumstances have been identified and correctly considered in the PDD-form in accordance with the guidance by the CDM EB, paragraph 93(a) & (b) of VVSv02.	/1/ /2/ /53/ /58/ /71/ /59/ /55/	OK	OK
B.6.5.	For Baseline identification confirm following:	94				



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	a. Does PDD enlist all the assumptions and data used by PP?	94(a)	The validation team can conclude that the assumptions, calculations, rationale and other sources described in the PDD used to determine the baseline scenario are reasonable and have correctly applied.	/1/ /2/ /53/ /58/	OK	OK
	b. Are all the assumptions & data used are justified, correctly quoted and interpreted in the PDD?	94(b)	All the assumptions & data used are justified, correctly quoted and interpreted in the PDD	/1/ /2/ /53/ /58/	OK	OK
	c. Are all assumptions & data used are justified with evidences?	94(c)	All assumptions & data used are justified with evidences	/1/ /2/ /53/ /58/	OK	OK
B.7. Identificaiton of Alternatives (10)						
B.7.1.	Where the baseline scenario is not prescribed in the approved methodology, assess the list of identified credible alternatives to the project activity in the PDD selected to determine the most realistic baseline scenario.	113 115	The approved methodology ACM0002 version 13.0.0 defines a specific baseline directly for the hydro power projects.	/1/ /2/ /53/	OK	OK
	a. Is the list of alternative includes as one of the options that “the project activity is undertaken without being registered as a proposed project activity”?	114(a)	N/A		N/A	N/A
	b. Is list complete with repset to all plausible alternatives	114(b)	N/A		N/A	N/A
	c. Confirm whether the alternatives comply with all applicable and	114(c)	N/A		N/A	N/A



VALIDATION CHECKLIST – vvsv2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	enforced legislations.					
B.8.	Algorithms and/or formulae used to determine emission reductions (07)					
B.8.1.	For baseline emissions confirm that steps taken, equations and parameters applied in PDD-form comply with requirements of selected methodology(ies) including tools:	96				
	a. Where the methodology allows for selection between options for equations or parameters	97	Options are allowed in the calculation of EF _{grid,CM,y} , which actually is determined by options provided in the “Tool to calculate the emission factor for an electricity system”	/1//2//3//19/ /20//53//13//59/	OK	OK
	b. Determine whether adequate justification has been provided for the choice of data and parameters used in the equations	97 98	The Brazilian DNA provides every year, updated information about the emission factor of operating margin and build margin, which is calculated according to the “Tool to calculate the emission factor for an electricity system”, considering only grid power plants (option I of Step 1). The Operating margin (EF _{grid,OM,y}) is calculated as per the dispatch data analysis OM from Option (c) of Step 3, therefore, shall be determined ex post. With respect to the Build margin (EF _{grid,BM,y}), PPs chose Option 1 of the tool/59/, determining BM ex-ante based on the most recent information available at the time of submission of the PDD for validation (Base year 2010).	/45/ /59/	OK	OK
	c. correct equations and parameters have been used, in accordance with the methodology selected including	97	Equations 4 to 8 and parameters reported in Section B.6.1 of the PDD are in accordance with ACM0002, v.13.0.0 and the “Tool to	/1/ /2/ /3/	CL-7	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	applicable tool(s)		calculate the emission factor for an electricity system”, v.2.2.1. However, the value used for transmission losses was not consistent with ANEEL reports. Therefore, CL 7 was raised.	/19/ /20/ /53/ /13/ /59/		
	d. For data & parameters that will not be monitored through the crediting period but have already been fixed, determine whether all data sources & assumptions are appropriate and calculations are correct.	98	The parameters determined ex-ante are reported in the table below: W _{OM} -Weighting of operating margin emissions factor for hydro projects – 0.5 W _{BM} - Weighting of build margin emissions factor for hydro projects – 0.5 EF _{grid,BM,y} - Build margin CO2 emission factor in year y - 0.1404 tCO2/MWh Cap _{BL} - Installed capacity of the hydro power plant before the implementation of the project activity – 0 w. A _{BL} - Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full – 0 m ² . However, there were some inconsistencies reported in the PDD with respect to EF _{grid,BM,y} and A _{BL} . CAR 7 was raised.	/1/ /4/ /53/ /45/ /59/ /71/ /25/ /19/ /20/ /73/ /75/	CAR 7	OK
	B.8.2. For project emissions confirm that steps taken, equations and parameters applied in PDD-form comply with requirements of selected methodology(ies) including tools:	96				
	a. Where the methodology allows for selection between options for equations or parameters	97	The approved methodology ACM0002 version 13.0.0 provides guidance for the calculation of project emissions based on the Power Density of the hydropower plant.	/1/ /53/	OK	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	b. Determine whether adequate justification has been provided for the choice of data and parameters used in the equations	97 98	Given the Power Density of the plant is greater than 10 w/m ² , PPs have adequately considered project emissions as zero as allowed by ACM0002, v.13.0.0	/1/ /4/ /53/ /45/ /31/ /69/	OK	OK
	c. correct equations and parameters have been used, in accordance with the methodology selected including applicable tool(s)	97	According to the approved methodology ACM0002 version 13.0.0 project emission PE _y = 0 if the power density (PD) is greater than 10 w/m ² . However, PPs have not demonstrated the PD as per equation 5 of the methodology.	/1/ /4/ /53/ /45/ /31/ /69/	CAR-9	OK
	d. For data & parameters that will not be monitored through the crediting period but have already been fixed, determine whether all data sources & assumptions are appropriate and calculations are correct.	98	Project emissions are zero as per ACM0002, v.13.0.0. Nevertheless parameter APJ (area of the reservoir) will be monitored to determine if project's power density remains greater than 10 w/m ² .	/1/ /4/ /53/ /45/ /31/ /69/	OK	OK
B.8.3.	For leakage emissions confirm that steps taken, equations and parameters applied in PDD-form comply with requirements of selected methodology(ies) including tools:	96				
	a. Where the methodology allows for selection between options for equations or parameters	97	According to the approved methodology ACM0002 version 13.0.0 no leakage emissions are to be considered for this project activity.	/1/ /4/ /53/	OK	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	b. Determine whether adequate justification has been provided for the choice of data and parameters used in the equations	97 98	N/A Please, refer to B.8.3.a.		N/A	N/A
	c. correct equations and parameters have been used, in accordance with the methodology selected including applicable tool(s)	97	N/A Please, refer to B.8.3.a.		N/A	N/A
	d. For data & parameters that will not be monitored through the crediting period but have already been fixed, determine whether all data sources & assumptions are appropriate and calculations are correct.	98	N/A Please, refer to B.8.3.a.		N/A	N/A
B.9. Assessment of prior consideration of the clean development mechanism (09)						
B.9.1.	Is the start date of the project activity reported is in accordance with “Glossary of CDM terms” latest version?	106	According to the CDM glossary the starting date of a CDM project activity means 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 chosen date refers to the EPC contract signed.	/1/ /5/ /6/ /7/ /8/ /9/ /10/ /34/ /16/ /37/ /19/	OK	OK



VALIDATION CHECKLIST – vvsV2.0

Validation Requirement Checklist	Ref. (§§)	Validation Team Comments		Conclusion	
	VVS	Means of Validation	Evidence	Draft	Final
			/20/ /11/ /72/ /13/ /73/		
B.9.2. Is the Project activity start date is prior to the date of publication of the PDD for global stakeholder comments?	105	According to evidence documentation the starting date of the project activity is prior to the date of the publication of the PDD for global stakeholder consultation. Section C.1.1. of the PDD states starting date of the project is 19 August 2011 and PDD has been uploaded in the UNFCCC site on 25 January 2012.	/1/ /19/ /13/	OK	OK
B.9.3. “Whether a new methodology has been proposed to the Board before the project activity start date”	105	N/A		N/A	N/A
B.9.4. Is the start date on or after 2 nd August 2008?	106 (a) & (b)	Yes. The starting date of the project is 19 August 2011.	/1/ /19/ /13/	OK	OK
B.9.5. For new Project activities – Has PP informed UNFCCC secretariat and host DNA in writing about commencement of the project and their intention to seek CDM status?	107	The validation team has confirmed that this is a new project activity; the PP has submitted a letter of prior consideration dated of 22 December 2010 to UNFCCC and Brazilian DNA, the information is available on the UNFCCC website. A confirmation has been sent to PP by Brazilian DNA on 23 December 2010	/1/ /5/ /6/ /7/ /8/ /9/	CL-3 CL-4	OK OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST	REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
	VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
		and by UNFCCC on 20 January 2011. The validation team identified a slight difference between the GPS coordinates referred in the Prior Consideration form (9° 20'35" S; 56° 20'35"W) and the PDD (9°21'04"S; 56°46'39"W), being the first referred in the Consolidated Basic Project and the last referred in the ANEEL dispatch 3,504. Such difference is deemed acceptable, since both are referred in official documents and the distance between these points is less than 1km (850m checked through Google Earth), which clearly demonstrates that both coordinates are within UHE Teles Pires boundary.	/10/ /34/ /16/ /37/ /19/ /20/ /11/ /72/ /13/ /73/		
B.9.6. For an existing project activity, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation confirm following	108	N/A. The starting date of the project is 19 August 2011, hence after 02 August 2008 (new project activity).		N/A	N/A
a. Are details on the prior consideration given in the PDD?	108(a)	N/A		N/A	N/A
b. Do evidences indicate PP's awareness about CDM prior to start date of the project activity?	108(a)	N/A		N/A	N/A
c. How CDM affected the decision to go ahead with the Project activity?	108(a)	N/A		N/A	N/A
d. Was the decision to proceed with the project activity taken by authorized person?	108(a)	N/A		N/A	N/A
e. Do the evidences provided prove that continuing and real actions	108(b)	N/A		N/A	N/A
	109	N/A			



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	were taken to secure CDM status for the project in parallel with its implementation?	EB62 Annex13 Para 7				
	f. Is the gap between documented evidences to secure the CDM status less than 2 years?	110(a)-(c) 111 EB62 Annex13 8(a)-(c)	N/A		N/A	N/A
B.9.7.	Determine if, after initial notification, every subsequent two years PP has informed UNFCCC secretariat of the progress of the project activity?	EB62 Annex13 Para 5	N/A		N/A	N/A
B.9.8.	Did implementation of project activity ceased after commencement and was the implementation recommenced due to CDM consideration?	EB62 Annex05 Para 7	No. The project implementation started in 2011 and is expected to be concluded in 2015.	/3//13/ /19//20/	OK	OK
B.10. Additionality of a project activity (08)						
B.10.1.	For additionality demonstration confirm following					
	a. All assumptions and data used by the project participants are listed in the PDD and confirm to the related source document and/or justification.	102	The validation team confirms that all assumptions and data used by the project participants are listed in the PDD as well as the related source document and/or justification.	/64//58//26//13/ /83/ /81//84//97//79/ /82/ /85//87//89//86/ /25/ /27//19//72//73/ /16/ /98//99/	OK	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	b. All Documentation is relevant as well as correctly quoted and interpreted correctly.	102	The validation team confirms that all documentation is relevant as well as correctly quoted and interpreted correctly	/64//58//26//13/ /83/ /81//84//97//79/ /82/ /85//87//89//86/ /25/ /27//19//72//73/ /16/ /98//99/	OK	OK
	c. Assumptions and data can be deemed reasonable	102	The validation team confirms that the assumptions and data can be deemed reasonable.	/64//58//26//13/ /83/ /81//84//97//79/ /82/ /85//87//89//86/ /25/ /27//19//72//73/ /16/ /98//99/	OK	OK
	d. Does applicable methodology refer to tools and guidelines to demonstrate the additionality?	103	ACM0002 refers to the Tool for the demonstration and assessment of additionality, v.06.0.0 in the case of this project activity.	/58/	OK	OK
B.11. Investment analysis (11)						
B.11.1.	Is investment analysis used to demonstrate additionality?	117	Yes		OK	OK
B.11.2.	Has PP used the latest version of Guidelines on the assessment of investment analysis" as provided by the	118	Yes. PP has applied the Tool for the demonstration and assessment of	/58/	OK	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
Board and with other relevant provisions?			additionality, v.6.0.0.			
B.11.3. Is an appropriate analysis method chosen for the project (simple cost analysis, investment comparison analysis or benchmark analysis)?		120 EB62 Annex5 19	The investment analysis was conducted according to option III of the “Tool for the demonstration and assessment of additionality”. According to the Guidelines on the assessment of investment analysis, paragraph 19, the benchmark analysis is the appropriate method to demonstrate the additionality of this project activity as it is a hydro power plant. However, PPs shall justify the vintage used for the different parameters used in the WACC calculation.	/1/ /2/ /3/ /64/ /58/ /26/ /13/ /25/ /27/	CL-43 CL-46 CAR-11	OK OK OK
B.11.4. Verify the accuracy of financial calculations carried out for any investment analysis through following		120				
	a. Is the financial indicator suitable in the context of the project activity?	120(a)	Validation team was able to confirm that the Internal Rate Return (IRR) is the indicator as per Guidelines on the assessment of investment analysis version 5.0 paragraph 12.	/1/ /3/ /64/	OK	OK
	b. Has PP listed all parameters and assumptions used in calculating the financial indicator selected?	120(a)	According to guidelines of investment analysis, paragraph 19, benchmark analysis is the most appropriate method to demonstrate the additionality of the project Activity once the alternative to the implementation of the hydro power plant is the supply of electricity from the grid. According to PDD, PP has demonstrated and assessed the additionality by using the benchmark analysis. The validation team can conclude that data,	/1/ /3/ /64/ /58/ /26/ /13/ /25/ /27/	OK	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
			rationales, assumptions, justifications, documentation and sources presented in the PDD and used to demonstrate and assess the additionality are reliable and have correctly applied.			
	c. Verify the parameters and assumptions used by assessing the evidences available	120(a)	<p>The validation team conducted a thorough assessment of all parameters and assumptions used in financial calculations. Financial parameters used are available from the Basic Project Consolidated approved on 26 August 2011</p> <p>Some of the input values used in the spreadsheets/PDD needs to have its sources/calculation clarified. The validation team can conclude based on desk review and onsite visit that the assumptions, calculations, rationale and other sources described in the PDD used on the investment analysis are valid and have correctly applied.</p> <p>There are no sunk costs involved on this project activity.</p> <p>Fair value has been considered. However, although the fair value correctly considers land costs, its calculation was based on depreciation, which improperly included land costs for depreciation.</p> <p>There were properly considered to net profits for the purpose of calculating the financial indicators. However, PPs shall clarify why some items such as land and engineering services were included in the calculation of</p>	<p>/1/</p> <p>/3/</p> <p>/64/</p> <p>/58/</p> <p>/26/</p> <p>/13/</p> <p>/25/</p>	<p>CAR-4</p> <p>CAR-5</p> <p>CAR-6</p> <p>CL-5</p> <p>CL-6</p> <p>CL-7</p> <p>CL-13</p> <p>CL-14</p> <p>CL-16</p> <p>CL-17</p> <p>CL-18</p> <p>CL-19</p>	<p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p> <p>OK</p>



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
			depreciation. Financial expenditures have not been considered in IRR calculation. The portion of investment costs which is financed by equity considered is as the net cash outflow.			
	d. Are parameters being cross-checked against third party or publicly available sources?	120(b)	Validation team has visited websites, checked and assessed information used to demonstrate and assess the additionality presented by the various governmental and non-governmental entities.	/1/ /3//83//81/ /84//97//79//82/ /85//87//89//86/	OK	OK
	e. Is feasibility report and annual financial reports to the proposed project activity are available	120(c)	N/A			
	f. Are the calculations conducted by PP appropriate?	120(d)	Financials are presented transparently in separate spreadsheets with formulae readable accordingly. The period considered is 24 years, which is in accordance to the Guidelines on the Assessment of Investment Analysis - version 5, paragraph 3, given the fair value of the project activity assets has been included at the end of the assessment period.	/1/ /3/	OK	OK
	g. Sensitivity Analysis	120(e) EB62 Annex5 20-21				
	i Has PP provided justification	EB62	Yes. The sensitivity analysis has been carried	/1/	OK	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST			REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
				MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
		on the parameters that are covered for sensitivity?	Annex5 20	out for parameters that most likely to fluctuate over time and contributing for more than 20% to project costs or total revenues as per the Guidelines on the assessment of investment analysis. Considered variation is deemed proper and reasonable in the sensitivity analysis for this project activity.	/3/ /64/		
		ii Are there any parameters which constitutes less than 20% has a material impact on the analysis?	EB62 Annex5 20	No.	/1/ /3/	OK	OK
		iii Has PP considered reasonable variations?	EB62 Annex5 21	Hence, variations were done by altering the following parameters: - Reducing investment expenses (investment costs). - Increasing project's revenues (electricity tariff); - Increasing energy generation by the plant (power generation); - Reducing cost of operational (total operating costs)	/1/ /3/	OK	OK
		iv Are the results of the variations presented in the PDD and can such results be reproduced in the associated spreadsheets?	EB62 Annex5 20	Variables have been properly subjected to reasonable variation. The variation results presented in the PDD and the spreadsheets were reproducible by the team.	/1/ /3/	OK	OK
		v Confirm the accuracy of sensitivity analysis conducted	EB62 Annex5	All scenarios when variations of +- 10% were bellow the benchmark and PPs properly	/1/ /3/	OK	OK



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		by PP by assessing scenarios “under what conditions variations in the result would occur, and the likelihood of these conditions.”	21	justified that the likelihood of these conditions to cross the benchmark is very low. It was further confirmed and cross-checked by the validation team.			
B.11.5. If, PP has used benchmark analysis confirm following			121				
	a. Is the type of benchmark applied, suitable for the type of financial indicator?	121(a)	The investment analysis was conducted according to option III of the “Tool for the demonstration and assessment of additionality”. According to it project activity is not the most economically or financially attractive; nor economically or financially feasible, without the revenues from the sale of certified emission reductions (CER). According to the Guidelines on the assessment of investment analysis, paragraph 19, the benchmark analysis is the appropriate method to demonstrate the additionality of this project activity as it is a hydro power plant. However, PPs shall justify the vintage used for the different parameters used in the WACC calculation.	/1/ /2/ /3/ /64/ /58/ /26/ /13/ /25/ /27/	GL-13 GL-16 CAR-11	OK OK OK	
	b. Has PP applied any risk premiums in determining the benchmark?	121(b)	PPs applied a market premium based on the historical difference between the S&P 500 returns and the long term US bond returns. The spread over the risk-free rate is the average of the difference between those returns. The validation team confirmed that the calculation provided for the Equity risk	/26/ /87/.	OK	OK	



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			premium (from 1928 to 2010) in the WACC spreadsheet, Sheet “Returns by year”)/26/ for Stocks (11.23%) minus T. Bonds (5.28%) is correct and applicable at the time of investment decision and also cross-checked with the values provided in the Damodaran website/87/. The adoption of a period encompassing 82 years, provide a more consistent number since volatility on stocks is high therefore the longest period is better to have a most accurate average reasonable and appropriate for the project activity context. Therefore, PJR CES deem the determination of Equity risk premium by PPs correct and adequate for the project activity and the benchmark calculation context.			
	c. Determine whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark?	121(c)	The validation team checked the calculation in the WACC spreadsheet/26/ and found it accurate. In addition, the PJR CES team compared this calculation with other publications discussing capital cost of companies in the Brazilian electricity sector /81//82/ and found the value obtained for Ke by PPs to be conservative and suitable for the project activity and the benchmark calculation context.	/26/ /81//82/	OK	OK
B.11.6. Verify the accuracy of Investment analysis through (in-line with Investment guidance)		120				
	a. Does the period of assessment for the investment analysis reflect the	EB62 Annex5	The period considered is 24 years, which is in accordance to the Guidelines on the	/1/ /3//64/ /58//26//13//83/	OK	OK



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VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
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	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?	3–4	Assessment of Investment Analysis - version 5, paragraph 3, given the fair value of the project activity assets has been included at the end of the assessment period.	/81//84//97//79/ /82//85//87//89/ /86//25//27/		
	b. Is the (remaining) technical lifetime of existing or project equipment defined in accordance with the guidance of the <i>Tool to determine the remaining lifetime of equipment</i> ?	EB50 Annex15	The expected operational lifetime of the project activity is 35 years according to the Concession contract/20/, which is according to the <i>Tool to determine the remaining lifetime of equipment</i> .	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	OK	OK
	c. Is the fair value calculated in accordance with local accounting regulations where available, or international best practice?	EB62 Annex5 4	Fair value has been considered. However, although the fair value correctly considers land costs, its calculation was based on depreciation, which improperly included land costs for depreciation.	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	GL-14	OK
	d. Are the book value of the asset and the expectation of the potential profit or loss on realization of the asset included in the fair value calculation?	EB62 Annex5 4	Fair value has been considered. However, although the fair value correctly considers land costs, its calculation was based on depreciation, which improperly included land costs for depreciation.	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	GL-14	OK
	e. Are the depreciation and other non-cash items related to the project activity (which have been deducted in estimating gross profits on which tax is calculated) added back to net profits for the purpose of calculating the financial indicators (e.g. IRR, NPV)?	EB62 Annex5 5	There were properly considered to net profits for the purpose of calculating the financial indicators. However, PPs shall clarify why some items such as land and engineering services were included in the calculation of depreciation.	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	GL-14	OK
	f. Is taxation excluded in the	EB62	The portion of investment costs which is	/1/ /3//64/	GL-14	OK



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VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	investment analysis or is the benchmark intended for post tax comparisons?	Annex5 5	financed by equity considered is as the net cash outflow.	/58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/		
	g. Were the input values used in the investment analysis valid and applicable at the time of the investment decision?	EB62 Annex5 6 122(a)	Some of the input values used in the spreadsheets/PDD needs to have its sources/calculation clarified. The validation team can conclude based on desk review and onsite visit that the assumptions, calculations, rationale and other sources described in the PDD used on the investment analysis are valid and have correctly applied.	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	CL-44	OK
	h. Are there any sunk costs considered in the analysis?	EB62 Annex5 6	There are no sunk costs involved on this project activity.	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	OK	OK
	i. Is the chosen plant load factor in conformity with latest available <i>Guidelines for reporting and validation of plant load factors</i>	EB48 Annex11 3(a)-(b)	The set of 05 turbines/generators referred above conferred to a total firm energy of 940.6 MWavg/year/17/ and a final plant load factor of 51.68%, which will generate a total electricity of 8,239,656 MWh/year (940.6 MWh * 8760hs/year * 51.68% PLF). The net electricity dispatched to the grid calculates as 8,056,736 MWh/year after deducting the grid transmission losses (2.22%). PJRCES reviewed both documents/17//19/ and also considering that the firm energy has been approved by the Brazilian Electricity Regulatory Agency (ANEEL from Portuguese language), while applying the project activity	/17/ /17//19/ /73/ /62/	OK	OK



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VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
			for implementation approval/73/, it is considered to be complying with the requirements of 'Guidelines for the reporting and validation of plant load factors'/62/.			
	Has PP supplied spreadsheets versions of all Investment analysis where	EB62 Annex5 8	☞			
	i All formulas used in the analysis are readable	EB62 Annex5 8	Financials are presented transparently in separate spreadsheets with formulae readable accordingly.	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	OK	OK
	ii All relevant cells are viewable and unprotected	EB62 Annex5 8	All relevant cells are viewable and unprotected	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	OK	OK
	j. In case of project IRR: Are the costs of financing expenditures (loan repayments and interests) excluded from the calculation of project IRR?	EB62 Annex5 9	Financial expenditures have not been considered in IRR calculation.	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	OK	OK
	k. 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?	EB62 Annex5 10	The portion of investment costs which is financed by equity considered is as the net cash outflow.	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	OK	OK
	l. In cases where a post-tax benchmark is applied please ensure	EB62 Annex5	Yes.	/26/ /81//82/	OK	OK



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VALIDATION REQUIREMENT CHECKLIST		REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
		VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
	that actual interest payable is taken into account in the calculation of income tax.	11				
	m. In case benchmark approach is used, is the benchmark selected by PP suitable to the type of IRR calculation presented?	EB62 Annex5 12	The validation team checked the calculation in the WACC spreadsheet/26/ and found it accurate. In addition, the PJR CES team compared this calculation with other publications discussing capital cost of companies in the Brazilian electricity sector /81//82/ and found the value obtained for Ke by PPs to be conservative and suitable for the project activity and the benchmark calculation context.	/26/ /81//82/	OK	OK
	n. Can the project be developed by any entity other than PP?	EB62 Annex5 13	Yes	/26/ /81//82/	OK	OK
	o. Have internal company benchmarks/expected returns (including those used as the expected return on equity in the calculation of a weighted average cost of capital - WACC) been applied in cases where there is only one possible project developer?	EB62 Annex5 14	N/A.		N/A	N/A
	p. If, the benchmark is based on the parameters that are standard in the market, then confirm following	EB62 Annex5 15				
	i What has been considered as cost of equity?	EB62 Annex5 15	Ke = 12.67%. The validation team checked the calculation in the WACC spreadsheet/26/ and found it accurate. In addition, the PJR CES team compared this calculation with	/26/ /81//82/	OK	OK



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VALIDATION REQUIREMENT CHECKLIST			REF. (§§) VVS	VALIDATION TEAM COMMENTS		CONCLUSION	
				MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
				other publications discussing capital cost of companies in the Brazilian electricity sector /81//82/ and found the value obtained for Ke by PPs to be conservative and suitable for the project activity and the benchmark calculation context.			
		ii What has been considered as cost of debt?	EB62 Annex5 16	Kd = 1.86%. The validation team checked the calculation in the WACC spreadsheet/26/ and found it accurate. In addition, the PJR CES team compared this calculation with other publications discussing capital cost of companies in the Brazilian electricity sector /81//82/ and found the value obtained for Kd by PPs to be conservative and suitable for the project activity and the benchmark calculation context.	/26/ /81//82/	OK	OK
		iii What has been considered as debt/equity structure?	EB62 Annex5 18	We and Wd are, respectively, the weights of equity and debt typically observed at the sector. PP applied We of 50.00% and Wd of 50.00%, which are in accordance with paragraph 18 of the “Guidelines on the assessment of investment analysis”, version 5/64/.	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/ /82//85//87//89/ /86//25//27/	OK	OK
		q. In cases, if a company's internal benchmark is used for expected return on equity,	EB62 Annex5 16-17				
		i Confirm “What has been considered as cost of debt?” from following:	EB62 Annex5 16	N/A		N/A	N/A
		ii In case the loans are considered	EB62 Annex5	N/A		N/A	N/A



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VALIDATION REQUIREMENT CHECKLIST			REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
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			16				
		iii In case the bonds are considered	EB62 Annex5 16	N/A		N/A	N/A
		iv In cases where the debt finance structure of the project is not yet available (e.g. a letter of intent for debt funding is not available)	EB62 Annex5 16	N/A		N/A	N/A
		v Please confirm if, PDD clearly justifies and documents the option chosen:	EB62 Annex5 16	N/A		N/A	N/A
		vi What has been considered as debt/equity structure?	EB62 Annex5 17	N/A		N/A	N/A
B.11.7. Where project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed project activities, determine following			122	N/A		N/A	N/A
	a.	Is the FSR basis for decision to proceed with the investment in the project?	122(a)	N/A		N/A	N/A
	b.	Values in used in the PDD are fully consistent with the FSR	122(b)	N/A		N/A	N/A
	c.	Are, input values from the FSR, valid and applicable at the time of investment decision?	122(c)	N/A		N/A	N/A
B.11.8. Does assessment of investment analysis and PDD conclude that the project activity is not the most economically or financially			119	The validation team can conclude that data, rationales, assumptions, justifications, documentation and sources presented in the	/1/ /3//64/ /58//26//13//83/ /81//84//97//79/	OK	OK



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attractive option or economically or financially feasible, without CDM?			PDD and used to demonstrate and assess the additionality are reliable and have correctly applied.	/82//85//87//89/ /86//25//27/		
B.12. Barrier analysis (12)						
B.12.1. If, PP used barrier analysis, confirm following		124				
	What are the barriers faced by project activity?	124	N/A. PP has selected the investment analysis to demonstrate the additionality of the proposed project activity.		N/A	N/A
	How is it justified and evidenced in the PDD that the barriers are real?	126(a)	N/A		N/A	N/A
	How is it justified that real barrier(s) identified prevent(s) the implementation of the project activity?	124(a) 126(b)	N/A		N/A	N/A
	Is it justified that the real barrier(s) identified do not prevent implementation of at least one of alternatives.	124(b) 126 (b)	N/A		N/A	N/A
	Do any of the issues identified have a clear direct impact on the financial returns of the project activity? While answering to the above question exclude following Risk related barriers, for example risk of technical failure, that could have negative effects on financial performance or Barriers related to the unavailability of sources of finance for the project activity	125(a)-(b)	N/A		N/A	N/A



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B.13. Common Practice Analysis (13) (In case of SSC project skip this step)						
B.13.1. For project activities falling under paragraph 6 of the methodological tool “Demonstration and assessment of additionality” version 06.0.0, following procedure			PP has not applied paragraph 47 the tool for the demonstration and assessment of additionality/58/, for the common practice analysis Therefore, CAR 2 was raised.	/1/ /58/ /116/	CAR-2	OK
	a. Step 1: Has the PP calculated the applicable output range as $\pm 50\%$ of the design output or capacity of the proposed project activity.	EB65 Annex21 47	No.	/1/ /58/ /116/	CAR-2	OK
	b. Step 2:					
	i What has been identified as geographical area	EB65 Annex21 5	No.	/1/ /58/ /116/	CAR-2	OK
	ii ii. Has the PP identified all the plants that deliver the same output or capacity, within the applicable range calculated in Step 1?	EB65 Annex21 47	No.	/1/ /58/ /116/	CAR-2	OK
	iii What is the number of the identified plants that have started their commercial operations prior to the start date of the project activity?	EB65 Annex21 47	No.	/1/ /58/ /116/	CAR-2	OK
	c. Step 3: what is the number of the plants as identified in Step 2 above that apply technologies different	EB65 Annex21 47	No.	/1/ /58/	CAR-2	OK



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	than the technology applied by the proposed project activity.			/116/		
	d. Step 4: What is the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity?	EB65 Annex21 47	No.	/1/ /58/ /116/	CAR-2	OK
B.13.2.	Is the defined region for the common practice analysis appropriate for the technology/industry type?	129 (a)	N/A		N/A	N/A
B.13.3.	Describe, to what extent similar projects have been undertaken in the relevant region?	129 (b)	N/A		N/A	N/A
B.13.4.	In case similar projects are identified, are there any key differences between the proposed project and existing or ongoing projects and what kinds of differences are observed?	129 (c)	N/A		N/A	N/A
B.13.5.	Confirm that the project activity is not a common practice	130 (d)	PP has not applied paragraph 47 the tool for the demonstration and assessment of additionality/58/, for the common practice analysis Therefore, CAR 2 was raised.	/1/ /58/ /116/	CAR-2	OK
B.14. Monitoring Plan (14)						
Baseline Emissions						
B.14.1.	Does monitoring plan described cover all monitoring parameters required by the applied methodology including applicable	132(a)	The monitoring plan described in the PDD includes the quantity of net electricity generation supplied by the project plant/unit to	/1/ /2/ /3/	GL-7 CAR-7	OK OK



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tool(s)?		<p>the grid in year and it will be monitored in accordance with monitoring methodology of the approved methodology ACM 0002 version 13.0.0.</p> <p>There will be 5 turbine generator sets and will follow the official procedures from ANEEL, ONS and CCEE. The electricity supplied to the grid will be controlled in real time by CCEE. The measurement points will be registered in the SCDE (system of energy data collection) as soon as they will be defined.</p> <p>There will be at least 2 energy meters (main and backup) that will be specified by ONS (model and type). Meters will be calibrated as per ONS requirements by the Brazilian Calibration Network (RBC) entity.</p> <p>The net electricity will be monitored using the meters and the amount of electricity generated will be cross checked with energy company invoice.</p> <p>Electric Energy Commercialization Chamber (CCEE) should carry out the electricity payment in a monthly basis.</p>	<p>/19/ /20/ /53/ /13/ /59/</p>		
B.14.2. Does the description of monitoring parameters include the means of monitoring of all parameters contained in the monitoring plan in accordance with the requirements of the applied methodology including applicable tool(s)	132(a)				



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EG _{facility} -Quantity of net electricity generation supplied by the project plant/unit to the grid in year y		132(a)	<u>Source:</u> Measured with bi-directional electricity meters – Main and Back up (Accuracy: 0.2%) located at the substation that will monitor: (i) The quantity of electricity supplied by the project plant to the grid and (ii) The quantity of electricity delivered to the project plant from the grid. <u>Monitoring frequency:</u> Energy will be measured continuously, aggregated each 15 minutes and will be monthly consolidated. /46/. <u>Calibration:</u> every 2 years /46/. <u>Cross-check:</u> Electricity generation by the plant as published by CCEE will be used to cross check project participant's information.	/46/ /71/ /45/ /19/ /72/	CL-7 CAR-7 CAR-8	OK OK OK
	EF _{grid,OM,y} -Operating margin CO2 emission factor in year y		Source: OM is calculated by CIMGC (Brazilian DNA/71/), according to methodology ACM0002 and the "Tool to calculate the emission factor for an electricity system", Option (c): Dispatch data analysis OM. The emission factor is provided at the CIMGC website every year /45/. <u>Monitoring frequency:</u> Annually.			
Project Emissions						
B.14.3. Does monitoring plan described cover all monitoring parameters required by the applied methodology (including applicable		132(a)	According to the approved methodology ACM0002 version 13.0.0 project emission PE _y = 0 if the power density (PD) is greater	/1/ /4/ /53/	CAR-9	OK



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tool(s)?			than 10 w/m ² . However, PPs have not demonstrated the PD as per equation 5 of the methodology.	/45/ /31/ /69/		
B.14.4. Does the description of monitoring parameters include the means of monitoring of all parameters contained in the monitoring plan in accordance with the requirements of the applied methodology?		132(a)				
	Cap _{PJ} -Installed capacity of the hydro power plant after the implementation of the project activity.	132(a)	<u>Source:</u> Determined based on recognized standards in the PBC/19/ and approved by ANEEL/72/. <u>Monitoring frequency:</u> Annually.	/46/ /71/ /45/ /19/ /72/	CAR-9	OK
	A _{PJ} - Area of the reservoir measured on the surface of the water, after the implementation of the project activity, when the reservoir is full.		<u>Source:</u> Determined under maximum water level of 220 m in the PBC/19/ and approved by ANEEL/72/. <u>Monitoring frequency:</u> Annually.			
Leakage Emissions						
B.14.5. Does monitoring plan described coverall monitoring parameters required by the applied methodology (including applicable tool(s)?		132(a)	N/A. According to the approved methodology ACM0002 version 13.0.0 no leakage emissions are considered.		N/A	N/A
B.14.6. Does the description of monitoring parameters include the means of monitoring of all parameters contained in the monitoring plan in accordance with		132(a)	N/A		N/A	N/A



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the requirements of the applied methodology?					
Parameter 1	132(a)	N/A		N/A	N/A
B.14.7. Confirm whether the monitoring arrangements described in the PDD can properly be implemented in the context of the project activity?	132(b)(i)	<p>The monitoring plan described in the PDD includes the quantity of net electricity generation supplied by the project plant/unit to the grid in year and it will be monitored in accordance with monitoring methodology of the approved methodology ACM 0002 version 13.0.0.</p> <p>There will be 5 turbine generator sets and will follow the official procedures from ANEEL, ONS and CCEE. The electricity supplied to the grid will be controlled in real time by CCEE. The measurement points will be registered in the SCDE (system of energy data collection) as soon as they will be defined.</p> <p>There will be at least 2 energy meters (main and backup) that will be specified by ONS (model and type). Meters will be calibrated as per ONS requirements by the Brazilian Calibration Network (RBC) entity.</p> <p>The net electricity will be monitored using the meters and the amount of electricity generated will be cross checked with energy company invoice.</p> <p>Electric Energy Commercialization Chamber (CCEE) should carry out the electricity payment in a monthly basis.</p>	/1/ /53/ /46/ /71/ /72/ /18/ /19/	OK	OK



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B.14.8. Does description of the QA/QC procedures is sufficient to ensure that the emission reductions achieved from the project activity can be reported ex-post and verified?	132(b)(ii)	Yes. They will be performed according to ONS and CCEE national regulation.	/1/ /53/ /46/ /71/ /72/ /18/ /19/	OK	OK
B.14.9. Does PDD identify the procedures for data management?	132(b)(ii)	Yes. They will be performed according to ONS and CCEE national regulation.	/1/ /53/ /46/ /71/ /72/ /18/ /19/	OK	OK
C. Environmental Impacts (Section M – VVSv02)					
C.1.1. Has the PP conducted an analysis of the environmental impacts of the proposed project activity?	134	The PP has undertaken an Environmental Impact Assessment (EIA) which was approved as per the environmental installation license issued.	/1/ /35/ /36/ /30/	CL-2 CL-8	OK OK
C.1.2. Are there any transboundary environmental impacts considered in the environmental analysis?	134	No.	/1/ /35/ /36/ /30/	OK	OK
C.1.3. Are there any Host Party requirements for an Environmental Impact Assessment (EIA) for type and technology of the project activity?	135	Some adverse environmental effects could occur mainly during the construction and environmental programs have been implemented in order to avoid or minimize them.	/75//14//30/	OK	OK



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C.1.4. In case an Environmental Impact Assessment (EIA) is requested by the host Party, has it been carried out and if applicable duly approved by the relevant body?	135	The EIAs approval means the compliance with host country environmental legislation.	/34//35//36/ /104/	CL-2 CL-8	OK OK
C.1.5. Does PDD sufficiently describe analysis of the environmental impact assessment of the project activity in line with the host Party environmental legislation?	135	Yes. The PDD sufficiently describes analysis of the environmental impact assessment of the project activity in line with the host Party environmental legislation. Further details are also provided by PPs in Appendix 4 - Final – Public comments./29/	/1/ /29/	OK	OK
C.1.6. Are there any transboundary environmental impacts considered in the EIA?	134	The project does not imply in negative transboundary environmental impacts, on the contrary, otherwise the license would not be issued	/1/ /29//75/ /14//30/	OK	OK
D. Local Stakeholder Consultation (Section N – VVSv02)					
D.1.1. Has the local stakeholder consultation been conducted prior to the publication of the PDD for global stakeholder consultation?	138 (PS: 69)	<p>Validation team checked during the onsite visit that letters/21//22/ were sent by all required stakeholders and the Portuguese version of the PDD is available in the website:</p> <p>https://sites.google.com/site/consultadcp/proje-to-uhe-teles-pires</p> <p>Portuguese version of PDD was available in the site above mentioned on 30 December 2011.</p> <p>Both (invitation letters and website with Portuguese version of the PDD) have met the required deadline of 15 days previous to the</p>	/1/ /21/ /22/ /23/ /24/ /29/ /106/	CL-2	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST	REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
	VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
		starting of the global stakeholder process.			
D.1.2. Has PP identified & invited relevant local stakeholders to local stakeholder consultation?	139(a)	The local stakeholders process in Brazil is regulated by Brazilian DNA resolutions. Letters inviting stakeholders to comment the project shall be sent to: Federal Attorney for the Public Interest; State Attorneys for the Public Interest of states involved (Mato Grosso and Pará); Environmental Agencies of states involved (Mato Grosso and Pará); Brazilian Forum of NGOs and Social Movements for Environment and Development; City Hall of cities involved (Paranaíba and Jacareacanga); City Council of cities involved (Paranaíba and Jacareacanga); Environmental Agencies of cities involved (Paranaíba and Jacareacanga); Community Associations of cities involved (Paranaíba and Jacareacanga).	/1/ /21/ /22/ /23/ /24/ /29/ /106/	OK	OK
D.1.3. Does PDD clearly summarize the comments received during consultation?	139(b)	PDD/25 refers to Appendix 4/106/, where all comments and the responses are included.	/1/ /21/ /22/ /23/ /24/ /29/ /106/	CL-9	OK
D.1.4. Is it demonstrated that PP considered all the comments received for the proposed project activity?	139(c) (PS: 68)	PDD/25/ refers to Appendix 4/106/, where all comments are included and duly answered.	/1/ /21/ /22/	CL-9	OK



VALIDATION CHECKLIST – vvs2.0

VALIDATION REQUIREMENT CHECKLIST	REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
	VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
			/23/ /24/ /29/ /106/		
E. Specific Validation requirements (Section N – VVSv02)					
E.1. Small Scale Project Activities					
E.1.1. Does Project qualify as small scale CDM project activity as defined in “decision 4/CMP.1, annex II”.	150	N/A		N/A	N/A
E.1.2. For a project activity that is within the small-scale project activity threshold but applies a large-scale approved methodology, confirm whether this project activity follows the modalities and procedures for large-scale project activities.	151	N/A		N/A	N/A
E.1.3. Confirm that the project activity qualifies within the thresholds of the three possible types of small scale project activities.	152(a)	N/A		N/A	N/A
E.1.4. Does the project activity conforms to one of the approved small scale categories and applies the relevant tool or methodology?	152(b)	N/A		N/A	N/A
E.2. De-bundling					
Is it demonstrated that the small scale project activity not a de-bundled component of a larger project activity?	154 155 156	N/A		N/A	N/A
E.3. Additionality for a SSC Project activities					
Does the additionality justification follow the	158	N/A		N/A	N/A



VALIDATION CHECKLIST – vvs_v2.0

VALIDATION REQUIREMENT CHECKLIST	REF. (§§)	VALIDATION TEAM COMMENTS		CONCLUSION	
	VVS	MEANS OF VALIDATION	EVIDENCE	DRAFT	FINAL
requirements of the applied methodology and/or methodological tools?					
Does the project activity qualifies as micro scale activity	158 159 160	N/A		N/A	N/A

VALIDATION FINDINGS – vvsV2.0

Table 3: Resolution of issues identified in Table 2 of the Validation Checklist

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL №	Description of CAR/CL	Reference		
CAR 1	Host country LoA has not been presented by the PP.	A	<p>According to the Brazilian DNA resolution #1 (copy submitted to the DOE), art. 3., “in order to obtain the approval for project activities under the CDM, project proponents shall submit... the project validation report prepared by the DOE ...for submission to the CDM Executive Board under the UNFCCC (in English and in Portuguese).”</p> <p>Therefore, the LoA can only be obtained after the issuance of the final validation report.</p>	<p>It is regular procedure in Brazil. After having the positive validation opinion from DOE, Brazilian DNA issues LoA and having this host country LoA the Annex I country will issue its LoA.</p> <p>CAR 1 is closed (after submitting PDD and the validation report to the DNA and having its approval).</p>
CAR 2	PP is required to Consider the guideline on common practice (Ref. 25) in the additionality analysis.	B.13	<p>The latest version of the “Tool for the demonstration and assessment of additionality” (version 6.0.0), which already incorporates the “Guidelines on Common Practice” (version 01.0), is used.</p> <p>However, the PDD was revised to consider the latest version of ACM0002 (version 13.0.0) and the “Tool to calculate the emission factor for an electricity system” (version 2.2.1).</p> <p>Please refer to the second version of the PDD attached to this response.</p> <p><i>PP answer(2nd round):</i></p>	<p>PPs have updated the PDD with the “Tool for the demonstration and assessment of additionality” (version 6.0.0) also to perform the common practice analysis. However, Step 2 of paragraph 47 has not been followed according to the tool guidance, which requests to identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity, except for other CDM projects.</p> <p>CAR 2 remains open.</p> <p><i>DOE response to 2nd round</i></p>



VALIDATION FINDINGS – VVSv2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>As requested in Step 2 of the Tool for the demonstration and assessment of additionality (version 6.0.0), all plants that present the same installed capacity that Teles Pires Project was included in the common practice analysis.</p> <p>Please, refer to the third version of the PDD and to the revised common practice spreadsheet attached to this response.</p> <p><i>PP answer(3rd round):</i></p> <p>Project participants revised the common practice analysis and considering that the UTE Governador Leonel Brizola (Ex TermoRio) has an installed capacity of 1,058 MW, it was included in the common practice analysis.</p> <p>Please, refer to the revised common practice spreadsheet and to the forth version of the PDD.</p>	<p>Power Plant UTE Governador Leonel Brizola (Ex TermoRio) with capacity 1,058 MW was not considered in the analysis. Please, clarify.</p> <p><i>DOE response to 3rd round</i></p> <p>Project participants have properly revised the common practice analysis according to the paragraph 47 of the “Tool for the demonstration and assessment of additionality” (version 6.0.0), which included all plants that present the same installed capacity that Teles Pires Project.</p> <p>CAR 2 is closed.</p>
CAR 3	Indicate in section B.8 of the PDD if the advisor is also a PP as per PDD guidelines (Ref: 3).	A.7	<p>The PDD was revised considering the publication of the CDM Project Standard (PS), the Validation and Verification Standard (VVS) and the Project Cycle Procedure (PCP) (“VVS Track”).</p> <p>Therefore, the PDD form (version 4.1) and the “Guidelines for completing the project design form” (version 1.0) were used. Since version 4.1 of the PDD form</p>	<p>The PDD was revised considering the VVS track, therefore requirement from section B.8 of the PDD Guidelines is no longer applicable.</p> <p>CAR 3 is closed.</p>



VALIDATION FINDINGS – vvs2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			does not require information indicated in section B.8 of the previous version of the PDD form, it is not included.	
CAR 4	Explain the change of 940.6 MW in the additionality analysis instead of 915,40 MW (auction value).	B.11	<p>At the moment of the energy auction and signature of the concession contract, the project activity had a configuration of 6 generation units and firm energy of 915.4 MWaverage. After that, the project was optimized; increasing the firm energy to 940.6 MWaverage and reducing the number of generation units to five (see ANEEL Resolution nr. 3,324, dated on January 31th, 2012). Consequently, the assured energy was revised and the approval was requested to the ANEEL.</p> <p>Although the information was not available at project starting date, it is used in the investment analysis for conservative reasons. This information was included in the section A.4.3 of the PDD.</p> <p>Please refer to the version 2.0 of the PDD.</p>	<p>Firm energy value has been updated to 940.6 MWavg and the number of Turbines to 5, as per the latest version of the Consolidated Basic Project (Report of August 2011), which has been approved by ANEEL Resolution nr. 3,324, dated on January 31th, 2012.</p> <p>The use of the higher value in the investment analysis is conservative, since it increases the revenue stream of the project.</p> <p>CAR 4 is closed.</p>
CAR 5	Mention source and explain the use of the value of 0.2% for the internal energy consumption.	B.11	According to CCEE's commercialization rules ("CCEE, 2010. Regras de Comercialização Contabilização – Módulo 2 – Determinação da Geração e Consumo de Energia"; publicly available at http://www.ccee.org.br/ and also	<p>The referred evidence does not address the CAR issue.</p> <p>CAR 5 remains open.</p>



VALIDATION FINDINGS – vvs2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>submitted to the DOE) internal consumption has to be estimated by the PPs before operation start and the prescribed CCEE's internal consumption metering procedures are implemented.</p> <p><i>PP answer(2nd round):</i></p> <p>Project participants clarify that the value of 0.2% of internal energy consumption is an estimative based on project participant experience and internal estimative. Nevertheless, due to the lack of documented evidence, the internal consumption is conservatively considered zero in the calculation of the project IRR.</p>	<p><i>DOE response to 2nd round</i></p> <p>PP declined to deduct internal energy consumption from the electricity output, given the lack of evidences for its estimation. Although the value has low impact on the plant net electricity generation, given it would favor higher IRR to the project, this decision is conservative for the investment analysis, therefore accepted.</p> <p>CAR 5 is closed.</p>
CAR 6	<p>PP shall clarify the value used for the TFSEE parameter; in PDD is 0.5% and IRR spreadsheet is 363.60.</p> <p>PP is also required to mention the source of this parameter.</p>	B.11	<p>According to Law nr. 9427 from 12-Dec-1996 (publicly available at http://www.aneel.gov.br/cedoc/lei19969427.pdf and submitted to the DOE), TFSEE (inspections tariff) is equivalent to 0.5% of annual economic benefit of the agents. In the meantime the tariff was modified and the figure considered in the IRR spreadsheet corresponds to the 2010 value charged by ANEEL (Dispatch nr. 4774/2009; publicly available at http://www.aneel.gov.br/cedoc/dsp20094</p>	<p>TFSEE percentage of 0.5% used by PPs is according to Law nr. 9427 from 12-Dec-1996, Article 12 § 1º. However, the value of the economic benefit used in the calculation of TSEE is not updated with ANEEL Dispatch of December 2010. Please, update the value accordingly.</p> <p>CAR 6 remains open.</p> <p><i>DOE response to 2nd round</i></p> <p>TFSEE fee has been updated according to</p>



VALIDATION FINDINGS – vvsv2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>774.pdf and submitted to the DOE).</p> <p>The PDD and IRR spreadsheet were revised accordingly.</p> <p><i>PP answer(2nd round):</i></p> <p>Project participants revised the PDD and updated the TFSEE fee according to IRR spreadsheet and the Dispatch nr. 4,080, dated 27/12/2010.</p> <p>Please, refer to the third version of the PDD.</p>	<p>the Dispatch nr. 4,080, dated 27/12/2010, which was the latest data available at the time of investment decision.</p> <p>CAR 6 is closed.</p>
CAR 7	Project considered Emission Factor ex post however it is mentioned on table on section B.6.2 of the PDD. Please review.	B.14	<p>EF_{grid,BM,y} (grid build margin) is a monitored data/parameter and, therefore, is moved to section B.7.1.</p> <p><i>PP answer(2nd round):</i></p> <p>The PDD was revised and the build margin emission factor (EF_{grid,BM,y}) was included at Section B.6.2 – <i>Data and parameters fixed ex ante</i>. Also, Option 1 of Step 5 of the <i>Tool to calculate the emission factor for an electricity system</i> was chosen: calculate the build margin emission factor ex-ante based on the most recent information available on units already built for sample group <i>m</i> at</p>	<p>EF_{grid,BM,y} (grid build margin) has been moved to section B.7.1, referring to Option 2 of Step 5 of the tool. However, in Section B.6.1 the option chosen is Option 1. Please, provide the due corrections.</p> <p>CAR 7 remains open.</p> <p><i>DOE response to 2nd round</i></p> <p>Information reported by PPs regarding EF_{grid,BM,y} in Sections B.6.1 and B.6.2 are now consistent and complies with option allowed by the <i>Tool to calculate the emission factor for an electricity system.v.02.2.1</i>.</p> <p>CAR 7 is closed.</p>



VALIDATION FINDINGS – vvs2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>the time of CDM-PDD submission to the DOE for validation.</p> <p>Please, refer to the third version of the PDD.</p>	
CAR 8	Explain the use of the backup meter in the monitoring plan and the definition of responsibilities as per PDD guidelines (Ref: 3).	B.14	<p>From what is established in the relevant regulation of the energy sector in Brazil, all the plants delivering electricity to the grid have to implement a “invoice metering system” (from the Portuguese Sistema de Medição e Faturamento – SMF) in accordance with specifications defined by the National Electric System Operator (ONS). According to the relevant grid procedure (“sub-module 12.2: Installation of the SMF”, publicly available at link and submitted to the DOE) principal and backup meters are components of the system. The PPs (generation agents in the ONS document) are responsible for the design (to be approved by ONS), operation and maintenance of the SMF.</p> <p>The above explanation was included in the Section B.7.2. Please refer to the second version of the PDD.</p> <p><i>PP answer(2nd round):</i></p> <p>As requested, project participants added</p>	<p>PPs provided in Section B.7.3 further details on the roles and responsibilities of the operational and management structure and explained the use of electricity meters, which will be according to requirements provided by ONS - Electric System National Operator in Brazil regulated by ANEEL. However, as required by the PDD Guidelines /54/ further details shall be provided for EG_{facility,y} with respect to the type, accuracy and calibration procedure/frequency of the meters in Section B.7.1</p> <p>CAR 8 remains open.</p> <p><i>DOE response to 2nd round</i></p> <p>Details concerning accuracy, calibration, etc. for the electricity meters were provided in the monitoring plan as required by the PDD Guidelines /54/.</p> <p>CAR 8 is closed.</p>



VALIDATION FINDINGS – vvs2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>detailed information about the meters calibration procedures, frequency, accuracy and type of Teles Pires Project at Section B.7.1 and B.7.3.</p> <p>Please, refer to the third version of the PDD to access the revised information.</p>	
CAR 9	The power density (PD) is not demonstrated according to ACM0002 v.13.0.0. Please, calculate PD according to Equation 5 of the methodology and clarify the value used for A_{BL} and A_{PJ} accordingly.	B.14	<p><i>PP answer(2nd round):</i></p> <p>The project's reservoir area under the normal maximum water level of 220 m is 137.40 km², of which 40.6 km² is part of the normal river bed and, therefore, the increased flooded area is 111.20 km². In spite of the methodology determination for A_{BL} to be zero for new reservoirs, a few projects were registered discounting the river bed. All of them base their procedure in a clarification approved by the CDM EB (AM_CLA_0049), where one reads: "in order to calculate power density, the correct equation will be the increased power capacity divided by the increased flooded area measured in the water surface". Additionally, there is at least one case of a project with new reservoir and using ACM0002, version 7 - where the provision for A_{BL} to be zero for new reservoirs, that changed its power density post-registration, discounting the surface area of the river</p>	<p><i>DOE response to 2nd round</i></p> <p>PPs included demonstration of Power Density calculation as per ACM0002 v.13.0.0. However, the value considered for A_{PJ} is not consistent among the PDD Sections and also the ERs spreadsheet (App. 3). Please, revise.</p> <p><i>DOE response to 3rd round:</i></p> <p>There is still inconsistency with respect to Power Density in the ERs spreadsheet. Please, revise cell B17 of sheet "Project Description".</p> <p>In addition, please clarify why the value of 134.7km² has been used instead of 151.8km², which is also referred in the same document of the same date 26 August 2011 (see Summary Sheet – Basic Project).</p>



VALIDATION FINDINGS – vvs2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>(see project 2539).</p> <p>Here the most conservative figure will be used - 13.51 W/m^2 – and, if applicable, it will be revised in the first monitoring period.</p> <p>Please, refer to the third version of the PDD.</p> <p><i>PP answer (3rd round):</i></p> <p>The PDD and the CERs calculation spreadsheet were revised according to the ANEEL Dispatch nr. 3,504, dated 26/08/2011, that states that the reservoir area is 134.70 km^2.</p> <p>Please, refer to the forth version of the PDD and to the revised Appendix 3.</p> <p><i>PP answer (4th round):</i></p> <p>As requested, project participants revised the power density in the ERs spreadsheet and updated the cell B17 from 19.34 W/m^2 to 13.59 W/m^2 according to the calculation proposed by the ACM0002, version 13.0.0.</p> <p>In addition, project participants clarify that the project reservoir area was revised from 151.8 km^2 to 134.7 km^2 as established in the ANEEL Dispatch nr. 3,504, dated August, 26th 2011.</p>	<p><i>DOE response to 4th round:</i></p> <p>PPs adequately revised the power density in the ERs spreadsheet/28/ and explained the inconsistency regarding reservoir area of the project between the ANEEL Dispatch N° 3,504/72/ (134.7 km^2) and the Summary Sheet- Basic Project /18/(151.8 km^2) referred in the same document/72/. Even though, the validation team checked that if the A_{PJ} of 151.8 km^2 would be considered, the power density of the project would result in 11.99 W/m^2, which is still greater than the threshold of 10 W/m^2 established by ACM0002, version 13.0.0. However, the validation team verified that the last Monthly Reports/74/, that CHTP need to submit to ANEEL to inform the progress of the project implementation, confirms the value of 134.7 km^2 for A_{PJ}. Therefore, PJR CES validated that PPs correctly used in the PDD the most recent value approved by the official authorities for A_{PJ} (134.7 km^2).</p> <p>CAR 9 is closed.</p>



VALIDATION FINDINGS – vvsv2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>However, the Dispatch is linked to the Summary Sheet- Basic Project that presents the previous reservoir area, which is 151.8 km².</p> <p>Therefore, in order to demonstrate that the project was revised and present the reservoir area that is stated in the Dispatch nr. 3,504, project participants forwarded the Monthly Reports issued by Companhia Hidrelétrica Teles Pires From May, June and July 2012 (see “<i>Relatório Mensal.rar</i>”), which present the Summary Sheet of the project and determines that the project reservoir area is as of 134.70km².</p> <p>In addition it was published at the Union Official Journal (from the Portuguese Diário Oficial da União) Nr. 170, September, 2nd 2011⁶, a note stating that the Dispatch nr. 3,507 Annex shall be rectified.</p>	
CAR 10	Please, revise editorial errors in the PDD and in the spreadsheets, translate to English the items which remained in Portuguese.	A.7	<p><i>PP answer(2nd round):</i></p> <p>The editorial errors contained in the PDD were revised and the spreadsheets were translated to English.</p> <p>Refer to the third version of the PDD and</p>	<p><i>DOE response to 2nd round</i></p> <p>The editorial errors contained in the PDD were revised accordingly and the spreadsheets were translated to English.</p> <p>CAR 10 is closed.</p>

⁶ Available at: <http://www.in.gov.br/imprensa/visualiza/index.jsp?jornal=1&pagina=102&data=02/09/2011>



VALIDATION FINDINGS – vvs2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			to the latest versions of the spreadsheets supplied to the DOE.	
CAR 11 (ITR)	The formula used to calculate Ke (Cost of Equity) in the WACC spreadsheet (App. 1) is dividing values presented in percentage again by 100. Please revise.	B.11	<p><i>PP answer (6th round):</i></p> <p>The formula applied in the Ke calculation was revised in the WACC spreadsheet excluding the division by 100 for percentage values. Due to the revision the Ke value changed from 12.77% to 12.67% and consequently the WACC varied from 7.32% to 7.27%.</p> <p>Please, refer to the revised WACC spreadsheet and to the PDD version 7th attached to this response.</p>	<p><i>DOE response to 6th round (ITR)</i></p> <p>PPs corrected Ke calculation in the WACC spreadsheet/26/ and adjusted related values in the IRR spreadsheet/27/ and PDD/25/, including the values reported in the sensitivity analysis.</p> <p>CAR 11 is closed.</p>
CL 1	Parties participating in the CDM shall designate a national authority for the CDM as per Modalities & Procedures paragraph 29.	A.5	<p>The only Party involved in the project activity is Brazil (see section A.3). The Brazilian designated national authority for the CDM is the Brazilian Interministerial Commission on Global Climate Change (from the Portuguese “Comissão Interministerial sobre Mudança Global do Clima”). Additional information is publicly available in http://www.mct.gov.br/index.php/content/view/14666.html and http://cdm.unfccc.int/DNA/view.html?CID=30).</p> <p>Furthermore, as defined in the</p>	<p>PPs explained the MOC will be provided together with the LoA before the request for registration is submitted. As per the LoA, this is a regular procedure in Brazil.</p> <p><i>DOE response to 2nd round</i></p> <p>MOC file “Teles Pires_MoC_2012.07.16” has not been provided to DOE yet.</p> <p><i>DOE response to 3rd round</i></p> <p>PP has defined the authority and presented FCDM- MOC/33/ properly filled.</p>



VALIDATION FINDINGS – vvsv2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>Procedures for Modalities of Communication between the Project Participants and the Executive Board Project, the project participants shall complete a MoC Form (F-CDM-MOC) that will be submitted by a nominated operational entity (DOE) when the request for registration is submitted.</p> <p><i>PP answer(2nd round):</i></p> <p>The MoC will be submitted with Teles Pires Project to the UNFCCC at the project request for registration. Even this, project participants already provided the signed document. Please, refer to attached file “<i>Teles Pires_MoC_2012.07.16</i>”</p>	CL 1 is closed.
CL 2	Provide footnotes in English	C D	<p>The footnotes were translated into English.</p> <p>Please refer to the second version of the PDD.</p> <p><i>PP answer (3^d round):</i></p> <p>As requested project participants provided the MoC Form do the DOE. Please, refer to the attached file “<i>Teles Pires_MoC_2012.07.16.pdf</i>”.</p>	PDD footnotes were revised accordingly. CL 2 is closed.
CL 3	Mention in which sections the prior consideration are considered in PDD	B.9	The prior consideration of the CDM is already mentioned in the section B.5 of	Prior consideration of the CDM has been adequately provided by PPs in Sections



VALIDATION FINDINGS – VVSv2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			the PDD. In addition, the same information is included in the section C.1.1. Please refer to the second version of the PDD.	B.5 and C.1.1 (Table 13). CL 3 is closed.
CL 4	State how the CDM benefits were considered in the decision to undertake the project as a CDM project activity (Ref: 6)	B.9 B.11	Compliance with the requirement to show how CDM benefits were considered necessary in the decision to undertake the as a CDM project activity are demonstrated in accordance with the “CDM Project Cycle Procedure” (Annex 64, EB 66), i.e., by informing the Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of the PPs intention to seek CDM status within 180 days of the start date (see sections C.1.1 and B.5 of the PDD).	PPs demonstration of the CDM prior consideration complies with the requirements of “CDM Project Cycle Procedure” (Annex 64, EB 66) and VVS version 02.0, paragraph 107. CL 4 is closed.
CL 5	Explain the meaning of TUST, UBP, TFSEE and CS mentioned in table 6 of the PDD (additionality).	B.11	TUST is the tariff for the use of electric energy transmission lines (clarification and references in item “I”, “total operating costs”, “sub-step 2d-sensitivity analysis”). “UBP” is the tariff for the use of a public good (clarification and references in item “II”, “total operating costs”, “sub-step 2d-sensitivity analysis”). “TFSEE” is the inspection tariff (clarification and references in item “III”, “total operating costs”, “sub-step 2d-	PPs provided sufficient explanations of the Acronyms referred in Table 5 of the PDD v.02, through footnotes and also in Section B.5. CL 5 is closed.



VALIDATION FINDINGS – vvs2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>sensitivity analysis”).</p> <p>“CSLL” is the social insurance.</p> <p>Definitions were included also as footnotes in the Table 6.</p> <p>Please refer to the second version of the PDD.</p>	
CL 6	Clarify and align the calculations for the tariffs in the PDD and CER IRR spreadsheet.	B.11	<p>Considering the DOE comments, the project participants clarify that TUST, UBP and TFSEE are applicable tariffs for hydropower projects as explained below:</p> <ul style="list-style-type: none"> - TUST is the tariff for the use of electric energy transmission lines (from the Portuguese Tarifa do Uso do Sistema de Transmissão). For the TUST calculation, it was considered the values established by ANEEL Resolution nr. 1,086 dated November 16th, 2010 in R\$/kW month. - UBP is the tariff for the use of a public good (“UBP” from the Portuguese Uso do Bem Público) and this value was considered in the project cash flow as presented in the finance request report submitted to the Brazilian Development Bank. - TFSEE is the inspection tariff charged by ANEEL (from the Portuguese 	<p>Tariffs have been properly explained and justified in the PDD. However, some of the values used in the IRR spreadsheet are not aligned with information provided in the PDD, in particular: TFSEE; TUST; CFURH.</p> <p>DOE response to 2nd round</p> <p>PPs revised the PDD and IRR spreadsheet with respect the tariffs TFSEE; TUST; CFURH, which now are consistent and according to the data available at the time of investment decision.</p> <p>CL 6 is closed.</p>



VALIDATION FINDINGS – vvs2.0

Draft report clarification requests, corrective action requests and forward action request			Summary of project participants response	Validation team conclusion
CAR/CL No	Description of CAR/CL	Reference		
			<p>Taxa de Fiscalização de Serviços de Energia Elétrica). As mentioned in CAR 06, the inspections tariff is equivalent to 0.5% of annual economic benefit of the agents. The value considered in the IRR spreadsheet corresponds to the 2010 value charged by ANEEL. Please refer to CAR 06 above.</p> <p>PIS, CONFIS and CSLL are applicable taxes under Brazilian laws for social contribution:</p> <ul style="list-style-type: none"> - PIS is the social integration program (from the Portuguese Programa de Integração Social). - COFINS is the social security financing contribution (from the Portuguese Contribuição para o Financiamento da Seguridade Social). - CSLL is the social contribution on net profits (from the Portuguese Contribuição Social sobre o Lucro Líquido). <p>Clarifications regarding tariffs and taxes were included in section B.5. Please refer to the second version of the PDD.</p> <p><i>PP answer(2nd round):</i></p> <p>Project participants revised the PDD, the</p>	



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			<p>IRR spreadsheet and clarify that the IRR spreadsheet presents the average value for the years that Teles Pires Project is operational. For an example, the first semester of 2015, the TUST value is of 9.07 BRL/kW/month and for the second semester is 8.849 BRL/kW/month. The result is an average value of 8.96 BRL/kW/month for the year of 2015 as it is determined in the IRR spreadsheet.</p> <p>The TFSEE value was revised considering the most recent data available at the time of the investment decision (19/08/2011) which is the year of 2011 and is given by the ANEEL Dispatch nr. 4,080, dated December, 27th 2010.</p> <p>The CFURH is calculated multiplying the Royalties [6.75%] of the generated electricity by <i>Teles Pires</i> in MWh by the Updated Reference Tariff (from the Portuguese <i>Tarifa Atualizada de Referência – TAR</i>) [68.34 BRL/MWh] which is given by ANEEL Resolution nr. 1,096 from 14/12/2010.</p> <p>Please, refer to the third version of the PDD and to the revised IRR spreadsheet.</p>	
CL 7	Refer in the CER spreadsheet the	B.11	Source for the energy output are the	The IRR spreadsheet contains the



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	calculation used for energy generated.		<p>figures calculated in the IRR spreadsheet (where all the formulas are readable and all relevant cells are viewable and unprotected). Reference to the calculation in the IRR spreadsheet is included in the CER calculation spreadsheet. Please refer to the new version of the CER spreadsheet.</p> <p><i>PP answer(2nd round):</i></p> <p>The difference between the energy output for the year of 2024 in the IRR and CERs spreadsheets is due to the revision of the calculation in the transmission losses and internal consumption of Teles Pires Project. Therefore, the CERs spreadsheet was revised according to the energy output calculated in the IRR spreadsheet.</p> <p>Please, refer to the revised IRR, CERs and Transmission Losses spreadsheets attached to this response.</p>	<p>calculation and sources used in table CER spreadsheet. However, the energy output for year 2024 (8,262,230.4 MWh) is not according to the value calculated in the IRR spreadsheet. Please, clarify.</p> <p><i>DOE response to 2nd round</i></p> <p>PPs revised IRR and ERs spreadsheets according to the revised value for transmission losses.</p> <p>CL 7 is closed.</p>
CL 8	Give details of the environmental licenses issued for the project activity in section D of the PDD	C	<p>Details of the project licenses were included in the PDD. Please refer to the second version of the document. More information regarding the project licensing process can be obtained in the project participants' answers based on the global stakeholder consultation</p>	<p>Details of the project licenses were included in the PDD.</p> <p>CL 8 is closed.</p>



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			(attached to this response).	
CL 9	Consider in the PDD all the comments received both from the local and global stakeholders.	A.1	<p>Detailed answer submitted as an annex to the PDD.</p> <p><i>PP answer(2nd round):</i></p> <p>As stated in the PDD, the stakeholder local comments is included in the “Summary and consideration of received comments” annexed to this response.</p> <p>Please, refer to the file “UHE Teles Pires-PDD-App 4-Public comments.doc”</p>	<p>There is no information regarding local comments in sections E.2 and E.3 of the PDD, as required by the PDD guidelines.</p> <p>DOE response to 2nd round</p> <p>Information regarding stakeholders local comments were duly provided by PPs in the Appendix 4 (file “UHE Teles Pires-PDD-App 4-Public comments.doc”).</p> <p>CL 9 is closed</p>
CL 10	Please, describe the scenario existing prior to the implementation of the project activity as per the PDD guidelines /54/ in Section A.1.	A.7	<p><i>PP answer(2nd round):</i></p> <p>Project participants revised the PDD and included at Section A.1 the description of the scenario existing prior to the implementation of the project activity.</p> <p>Please, refer to the third version of the PDD.</p>	<p><i>DOE response to 2nd round</i></p> <p>PPs revised Section A.1. of the PDD accordingly.</p> <p>CL 10 is closed.</p>
CL 11	<p>In Section A.3, provide further details with respect to the energy and mass flows and balances of the systems and equipment included in the project activity and in case the project will be implemented in phases, please provide more details, as required by the PDD Guidelines /54/.</p> <p>In addition, please clarify:</p>	A.7	<p><i>PP answer(2nd round):</i></p> <p>As requested, project participants included at Section A.3 a diagram related to the electricity generation and distribution to the National Grid.</p> <p>Furthermore, the nominal power capacity of the generators is revised from 404.45 kVA to 404.45 MVA and the reservoir area level at the maximum level (220 m)</p>	<p><i>DOE response to 2nd round</i></p> <p>Section A.3 was adequately revised by PPs.</p> <p>PPs adequately explained the inconsistency regarding reservoir area of the project between the ANEEL Dispatch N° 3,504/72/ (134.7 km²) and the Summary Sheet- Basic Project /18/(151.8 km²) referred in the same document/72/ (for</p>



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	<ul style="list-style-type: none"> - the nominal capacity of the power generators; - the value used for the reservoir area at maximum level (220 m), while the L.I. refers to 150 km². 		<p>is determined according to the Consolidated Basic Project (August, 2011) ANEEL Dispatch nr. 3,504, dated 26/08/2011. However, the Dispatch is linked to the Summary Sheet- Basic Project that presents the previous reservoir area, which is 151.8 km². Therefore, in order to demonstrate that the project was revised and present the reservoir area that is stated in the Dispatch nr. 3,504, project participants forwarded the Monthly Reports issued by Companhia Hidrelétrica Teles Pires From May, June and July 2012 (see “<i>Relatório Mensal.rar</i>”), which present the Summary Sheet of the project and determines that the project reservoir area is as of 134.70km².</p>	<p>more details of the DOE assessment to the calculation of Power Density, please refer to CAR 9).</p> <p>CL 11 is closed.</p>
CL 12	In Section B.2, please explain documentation that has been used to justify the applicability of the methodology and provide the references, as per required by the PDD guidelines /54/.	B.2	<p><i>PP answer (2nd round):</i></p> <p>Project participants indicated in the PDD, the documentation used to justify the applicability criteria of the methodology. Please, refer to Section B.2 of the third version of the PDD.</p> <p><i>PP answer (3^d round):</i></p> <p>Project participants used the ANEEL Dispatch nr. 3,504, dated 26/08/2011 in</p>	<p><i>DOE response to 2nd round</i></p> <p>PPs included the documentation used to justify each applicability criteria of the methodology as per the PDD guidelines /54/. However, the documentation used to justify the project activity is not a hydro power plant using multiple reservoirs is not consistent. Please, revise.</p> <p><i>DOE response to 3rd round</i></p> <p>PPs have properly referred to the documentation used to justify each</p>



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			order to demonstrate that the hydropower plant does not present multiple reservoirs. Please, refer to the forth version of the PDD.	applicability criteria of the methodology as per the PDD guidelines /54/. CL 12 is closed.
CL 13	<p>Please, provide evidences applicable at the time of the investment decision and clarification of the input values used in the investment analysis, including among others:</p> <ul style="list-style-type: none"> - IRR spreadsheet a) Transmission Losses; b) Internal consumption; c) ACL price; d) CCEE Base; e) CFURH; f) Insurance (% of assets); g) TUSD (or should it be TUST in the spreadsheet)? h) UBP; i) TFSEE; j) ONS; k) O&M; l) CAPEX (please, provide evidences for the several items considered for CAPEX and explain the total value used of 	B.11	<p><i>PP answer(2nd round):</i></p> <p>As requested, project participants provided evidences applicable at the time of investment decision for all inputs applied in the project IRR calculation:</p> <ul style="list-style-type: none"> a) Transmission Losses: estimated average from the CCEE Reports from 2007 (page 14), 2008 (page 9), 2009 (page 12) and 2010 (pages 12) and spreadsheet "UHE Teles Pires_Perdas de Transmissão" b) Internal consumption: an estimative of 0.2% of internal energy consumption was determined based on project participant experience and internal estimative. Nevertheless, due to the lack of documented evidence, the internal consumption is conservatively considered zero in the calculation of the project IRR. 	<p><i>DOE response to 2nd round</i></p> <p>a. The revised financials have been reviewed and explanation given by PP is accepted; issue is now closed.</p> <p>b. The revised financials have been reviewed and PP has considered zero percent as internal consumption, which is conservative; issue is now closed.</p> <p>c. The revised financials have been reviewed and PP has sourced ACL price from the finance request report of March 2011 submitted to Brazilian Development Bank, which is accepted as a valid evidence applied at the time of investment decision; issue is now closed.</p> <p>d. PPs included the CCE base calculation into App 2 – IRR spreadsheet in a transparent manner. Please, provide the source of the input value of 68,800,000 used for the CCEE budget in 2010; issue remains open.</p>



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	<p>BRL3.587 billion, while in the Installation License (818/2011) it is referred BRL 3.194 billion as a reference value) .</p> <ul style="list-style-type: none"> - WACC spreadsheet m) Credit Risk Rate applicable to the circumstances of the Project owner; n) BNDES Spread and Financial Intermediation Rate, since no date is referred in the cited web link. o) Please check tax rate of 34% considered in cost of debt (after taxes) as it is stated that taxes calculated based on an assumed percentage over the gross revenue in the WACC Spreadsheet. 		<ul style="list-style-type: none"> c) ACL price: Finance request report submitted to the Brazilian Development Bank (p.46) d) CCEE Base: CCEE spreadsheet e) CFURH: corresponds to the financial compensation for the hydrological exploitation of water resources and are established as 6.75% of effective measured generated electric energy multiplied by the Updated Reference Tariff ("TAR"). f) Insurance (% of assets): an estimative of 0.08% of the investment was determined based on project participant experience and internal estimative. Nevertheless, due to the lack of documented evidence, the investment will be considered zero in the calculation of the project IRR. g) TUST: ANEEL Resolution nr. 1,086, dated November, 16th 2010. h) UBP: Concession Contract and 	<ul style="list-style-type: none"> e. The revised financials have been reviewed and PP has sourced the CFURH values for TAR from ANEEL Resolution nr. 1096 dated 14 December 2010 and Royalties from ANEEL Electric Energy Atlas as the same was available at the investment decision time; thus issue is now closed. f. The revised financials have been reviewed and PP has considered zero percent as insurance (on assets) cost; issue is now closed. g. The revised financials have been reviewed and PP has sourced the value of TUST from ANEEL Resolution nr. 1,086, dated 16 November 2010 which is accepted as the same was available at the investment decision time; thus issue is now closed. h. The revised financials have been reviewed and PP has source the value of UBP from Concession Contract and MME Ordinance nr. 27/2010 which is accepted as the same was available at the investment decision time; thus issue is now closed. i. The revised financials have been reviewed and PP has sourced the value of TFSEE from ANEEL Dispatch nr.4080



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			<p>MME Ordinance nr. 27/2010 (page 5)</p> <p>i) TFSEE: ANEEL Dispatch nr. 4,080, dated December, 27th 2010.</p> <p>j) ONS: ONS spreadsheet</p> <p>k) O&M: EPC contract</p> <p>l) CAPEX (please, provide evidences for the several items considered for CAPEX and explain the total value used of BRL3.587 billion, while in the Installation License (818/2011) it is referred BRL 3.194 billion as a reference value) .</p> <p>Related to the WACC calculation, project participants clarify that:</p> <p>a) Credit Risk Rate represents the specific remuneration tax of a specific project and reflects the risk perception of the creditor insolvency, based on the project cash flow assessment and on the payment capacity and debt interests. See the BNDES website for further information: http://www.bndes.gov.br/SiteBNDE</p>	<p>dated 27 December 2010 which is accepted as the same was available at the investment decision time; thus issue is now closed.</p> <p>j. PPs included the ONS calculation into App 2 – IRR spreadsheet in a transparent manner. However, it is not clear why plant capacity is divided by 100,000 in cell E:21 of ONS spreadsheet. Please, clarify. Issue remains open.</p> <p>k. The revised financials have been reviewed and PP has sourced O & M cost from EPC Contract which provides the values for first three years, the same is accepted as this was the document available at the investment decision time; thus issue is now closed</p> <p>l. The response is not relevant to the CL raised. Furthermore, please substantiate for considering the break up of investment that are made for each of the years beginning with the year 2011 to 2019; issue is still open.</p> <p>m. The web link reference provided has been verified; PP shall substantiate for considering credit risk rate of 3.57% when the reference states a range of 0% to 4.18%; issue is still open.</p>



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			<p>S/bndes/bndes_pt/Institucional/Ap_oio_Financeiro/Produtos/FINEM/energia_eletrica_geracao.html</p> <p>b) Project participants revised the BNDES Spread and Financial Intermediation Rate according to the data available at the project investment decision. Refer to the file: “Financiamento BNDES_en alternativas.pdf”</p> <p>The tax rate of 34% is calculated over the EBIT – Earnings Before Interests and Taxes. Please, refer to the revised WACC spreadsheet.</p> <p><i>PP answer (3^d round):</i></p> <p>As requested, project participants clarify the following items:</p> <p>d. The CCEE budget in 2010 was of 94,000,000 BRL. The documented evidence that supports the mentioned value is attached to this response. Furthermore, the CCEE spreadsheet was revised and the CCEE fee updated to 0.1868 BRL/MWh. Please, refer to the file “CCEE-Orcamento 2010-confidencial.pdf” and to the revised IRR</p>	<p>n. The revised benchmark, WACC calculations have been reviewed and PP has now considered values of BNDES Spread and financial intermediation rate as per the data available at the investment decision time. Issue is closed;</p> <p>o. The tax rate of 34% is now made consistent with the IRR spreadsheet and benchmark (WACC) calculation sheet; however PP shall provide reference for marginal rate of 40% considered in Beta US spreadsheet; issue is still open.</p> <p><i>DOE response to 3rd round</i></p> <p>d) Evidence of CCEE budget for 2010 has been provided and accepted as a reliable reference with a conservative and adequate value considered at the time of investment decision. Issue is closed</p> <p>j) PPs provided evidences of the inputted parameters with respect to the ONS contribution, which are adequate to the time of investment decision. However, PPs shall clarify the value used in the calculation for the Member Associate Contribution. Issue remains open.</p> <p>l) The total CAPEX cost distributed for the years 2011 to 2015 is as per EPC contract</p>



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			<p>calculation spreadsheet.</p> <p>j. In fact, UHE Teles Pires installed capacity shall be divided by the total installed capacity of Brazil. Considering the Brazilian National Energetic Balance (from the Portuguese Balanço Energético Nacional – BEN), in 2010 Brazil's total installed capacity was of 113,327 MW. Therefore, the value dividing Teles Pires project installed capacity was revised. Also, the ONS contribution for the period between June, 2010 and June, 2011 was revised according to the ANEEL Resolution nr. 2,459, dated 29/06/2010⁷. Please, refer to the revised IRR calculation spreadsheet and to the file "BEN_2011.pdf".</p> <p>l. The CAPEX was determined considering the information available in the EPC Contract and in the Finance request report submitted to the Brazilian Development Bank (from the Portuguese Relatório de Enquadramento de Teles Pires). Taking into account that the EPC signature is considered the project investment decision, the following items</p>	<p>and Finance request report is accepted as the same was available at the investment decision date. PP to justify for considering total CAPEX of 3,567,628,000 BRL as investment and 3,587,627,931 BRL as long term loan. Issue remains open.</p> <p>m) PPs revised the credit risk rate, using the mean value of 2.09% of BNDES range (0% to 4.18%) provided to non-fossil fuel power generation companies. This value is deemed conservative and adequate to the time of investment decision. Issue is closed.</p> <p>o) The revised benchmark calculations have been reviewed and PP has now considered those power companies which have positive income for the year 2010/88/, which is accepted and issue is now closed.</p> <p><i>DOE response to 4th round</i></p> <p>j) PPs adequately revised the value used for the Member Association Contribution according to the ANEEL Authoritative Resolution nr. 2459, dated 29/06/2010. Issue is now closed.</p> <p>l) The revised financials have been</p>

⁷ Available at: <http://www.aneel.gov.br/cedoc/rea20102459.pdf>



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			<p>were determined according to the EPC Contract: EPC Project/Engineering; EPC Equipments – Supply; EPC equipments – Installation and EPC Civil works and Management. On the other hand, the environmental, land and owners engineering costs were determined according to the Finance request report send to the BNDES.</p> <p>Furthermore, the EPC contract present a payment schedule, related to the equipments and services provision. For the “investment items” included in the EPC Contract, project participants taking into accounted what is established in the Annex 23.2.1 of the EPC Contract (“<i>Cronograma de Pagamentos.pdf</i>”) and calculated the distribution of the investment for the years from 2011 to 2015.</p> <p>The distribution of the investments for the environmental, land and owners engineering costs is not presented in the Finance request send to the BNDES. Therefore, aim to be conservative, project participants adopted an average percentage per year, based on the distribution determined by the EPC Contract. Please, refer to the Payment Schedule sheet included in the IRR calculation spreadsheet to access the</p>	<p>reviewed and PP has now considered 70% of CAPEX as financing which is accepted; issue is closed.</p> <p>CL 13 is closed</p>



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			<p>revised information.</p> <p>m. In order to be more conservative, project participants revised the credit risk rate and considering an average between 0 and 4.18%. Therefore, the credit risk rate was updated to 2.09%.</p> <p>o. Project participants clarify that some companies which information was available to calculate the sectoral risk, did not present the marginal tax rate. Then, in order consider a larger number of companies in order to calculate the sectoral risk, a standard value of 40% was adopted for the marginal tax rate. However, for conservativeness reasons, project participants revised the list of companies used to calculated the sectoral risk and excluded the companies that do not present the marginal rate. In this approach, the number of companies used to estimate the sectoral risk reduced from 56 to 16 which caused a decrease of the sectoral risk from 1.45 to 1.41. Also, the WACC varied from 7.96% to 7.32%</p> <p>Please, refer to the revised WACC calculation spreadsheet from 16/08/12</p>	



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			<p>attached to this response.</p> <p><i>PP answer (4th round):</i></p> <p>Related to the items j) and l) project participants clarify that:</p> <p>j) As requested, project participants revised the Member Association Contribution according to the ANEEL Authoritative Resolution nr. 2459, dated 29/06/2010, which states in page 3 that the total associated contribution is 12,784,000 BRL. Please, refer to the revised ONS spreadsheet and to the IRR calculation in Appendix 2 and in the PDD.</p> <p>l) Project participants revised the financing simulation spreadsheet and considered 70% of the total CAPEX, which is the maximum participation of BNDES in renewable electricity projects. Then, the financing was performed considering a total of 2,497,339,920 BRL and the IRR spreadsheet was revised. Please, refer to the revised IRR calculation spreadsheet and to the PDD.</p>	



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CL 14	Please, clarify why some items such as land and engineering services were included in the calculation of depreciation and why depreciation of equipment has been applied for 14 years. In addition, provide the accountable rules, which the depreciation was based on.	B.11	<p><i>PP answer (2nd round):</i></p> <p>According to the countable rules, every investment related to the project that is directly related to its implementation and installation shall be included in the calculation of depreciation. For this reason, the costs specified in the IRR spreadsheet for EPC Project, EPC equipments, EPC civil works, environmental, land, management and owners engineering shall be depreciated according to Normative Instruction nr. 162 dated 31/12/1998 and the Normative Instruction nr 130 dated 10/11/1999.</p> <p>Also, the depreciations of the items mentioned above were included in the IRRs spreadsheet and the equipments depreciation was updated for 10 years.</p> <p>Please, refer to the revised IRR spreadsheet.</p> <p><i>PP answer (3^d round):</i></p> <p>Project participants revised the IRR calculation spreadsheet and included the depreciation of all “investment items”, i.e., EPC project/engineering, EPC equipments - supply, EPC equipments – installation, EPC civil works and</p>	<p>DOE response to 2nd round</p> <p>The revised financials have been reviewed and PP has now considered depreciation on EPC equipments for 10 years and on EPC Civil Works for 25 years (for 20 years in the analysis as the assessment period considered is for 20 years) on straight line basis. However PP has stated in the response that cost of environmental, land, management and owners engineering shall be depreciated and the same has not been depreciated; issue is still open.</p> <p>Furthermore, please justify the fair value cost considered as at the end of 20th year in cash flow statement.</p> <p><i>DOE response to 3rd round</i></p> <p>The revised IRR calculation spreadsheet has been reviewed and PP has now considered all “investment items” for depreciation. PP to justify with evidences for considering depreciation of environmental expenses and land in the project activity context.</p> <p><i>DOE response to 4th round</i></p> <p>PP shall further explain the nature of</p>



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			<p>management, environmental, land and owners engineering costs according to the Normative Instruction nr. 162 dated 31/12/1998 and the Normative Instruction nr 130 dated 10/11/1999.</p> <p>Considering that some items was not depreciate in 20 years, which is the adopted period of the cash flow analysis, the IRR calculation present a fair value in the last year (2034). The fair value derives from the EPC project/engineering and EPC civil works and management for which is considered a depreciation tax of 4% per year.</p> <p>Please, refer to the revised IRR calculation spreadsheet.</p> <p><i>PP answer(4th round):</i></p> <p>Project participants revised the project cash flow and excluded the depreciation of land and environmental expenses since they are not mentioned in the Normative Instruction 162 dated 31/12/1998 and the Normative</p>	<p>environmental and owner engineering costs and substantiate why these costs have just been considered as cash outflow, while were neither depreciated nor written off in the profitability statement nor considered as part of fair value.</p> <p><i>DOE response to 5th round</i></p> <p>The revised financials have been reviewed along with the explanation as to the nature of environmental and owners engineering expenses; PP is conservative in considering these costs as part of fair value; issue is closed.</p> <p>CL 14 is closed.</p>



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			<p>Instruction nr 130 dated 10/11/1999.</p> <p>Furthermore, the Accounting Manual of the Public Service of Electric Power⁸ (from the Portuguese Manual de Contabilidade do Serviço public de Energia) developed by ANEEL states in page 80 that land presents an undefined lifetime period and for this reason is considering an operational lease. Considering that the depreciation shall encompass “investment items”, land shall not be depreciated. However, in order to be conservative, project participants added to the fair value the total value of land expenditure.</p> <p>The environmental and owners engineering expenses were also excluded since they also occur at the project time operational life and therefore shall not be depreciated.</p> <p><i>PP answer(5th round):</i></p> <p>Project participants revised the project cash flow and excluded the depreciation tax of land, environmental and owner engineering expenses since they are not</p>	

⁸ Available at: http://www.aneel.gov.br/aplicacoes/leitura_arquivo/arquivos/Manual-jan-2007.pdf



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			<p>mentioned in the Normative Instruction 162 dated 31/12/1998 and the Normative Instruction nr 130 dated 10/11/1999.</p> <p>Nevertheless, the Accounting Manual of the Public Service of Electric Power⁹ (from the Portuguese <i>Manual de Contabilidade do Serviço public de Energia</i>) developed by ANEEL states in page 80 that land presents an undefined lifetime period and for this reason is considering an operational lease. Considering that the depreciation shall encompass “investment items”, land shall not be depreciated. Then, aim to be conservative, project participants added the value related to land costs (102,343 x 1000 BRL) to the fair value of the project activity.</p> <p>Regarding the environmental expenditures, project participants clarify that the costs are related to the Permits process (Preliminary and Installation Permits), the Environmental Impact Assessment Report and associated studies and the Basic Environmental Plan (Environmental Programs performed by Companhia Hidrelétrica Teles Pires as part of the requirements in</p>	

⁹ Available at: http://www.aneel.gov.br/aplicacoes/leitura_arquivo/arquivos/Manual-jan-2007.pdf



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			<p>order to obtain the Installation Permit). On the other hand the owners engineering expenditure are related to the admission of qualified personnel to coordinate and implement Teles Pires Hydropower Plant.</p> <p>Then, in lightning with the assumption considered for the land expenditure, environmental and owners engineering costs were also added to the fair value of the project cash flow.</p> <p>Please, refer to the IRR calculation spreadsheet and to the PDD to access the revised information.</p>	
CL 15	Please, provide more details in section B.5 regarding the national policies and conditions that characterize the project as an E- Type.	B.6	<p><i>PP answer(2nd round):</i></p> <p>Text indicating actions carried out to by the Brazilian government to demonstrate the promotion of hydropower as a low greenhouse gas emitting technology for power generation is included in the PDD.</p> <p>Please, refer to Section B.5 of the third version of the PDD.</p>	<p><i>DOE response to 2nd round</i></p> <p>PPs revised Section B.5, providing more information regarding the national policies, which characterize E- policies practiced by Brazilian government in the power sector.</p> <p>CL 15 is closed.</p>
CL 16	<p>With respect to the WACC calculation for the benchmark, please, justify why:</p> <p>a) an average value for past one year prior to investment decision date has been considered for risk free</p>	B.11	<p><i>PP answer(2nd round):</i></p> <p>The justification of the parameters used to calculate the benchmark (WACC) are detailed below:</p> <p>a) The risk free rate is a long term (30</p>	<p><i>DOE response to 2nd round</i></p> <p>a. The explanation that US treasury bond volatilities are historically low and a one year period prior to investment decision date to estimate risk free rate is accepted</p>



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	<p>rate;</p> <p>b) an average value for the past one year prior to investment decision date has been considered for 10 year Treasury note and TIPS to calculate the expected US inflation;</p> <p>c) PP has considered arithmetic average (annual returns) on T.Bonds annualized for 82 years, while the project lifetime is 35 years.</p> <p>d) An average of 5 years for the country risk premium.</p>		<p>years) bond rate based on the US Treasury bond, which are long term assets of a mature market. For this reason, project participants considered reasonable consider a period of one year to estimate the risk free rate since US treasury bond volatilities are historically low once are one of the lowest risk assets.</p> <p>b) In lightning with the determination of the risk free rate, the US expected inflation is also determined by the treasury through spot TIPS (Treasury Inflation Protected Securities) which are readily quoted in the market. Therefore, considering that the US is a mature market and the reasons stated above, a period for a year was applied to calculate the inflation.</p> <p>c) The equity risk premium is calculated based on the historical average of annual returns on investment in stocks minus the returns on Investments in T. Bonds. In the best understanding of project participants, the adoption of a period encompassing 82 years, provide a more consistent number since volatility on stocks is high therefore the longest period is better to have a most accurate average. 82 years is the longest time</p>	<p>and issue is now closed.</p> <p>b. As PP has considered one year period to estimate risk free rate; thus considering one year period for expected US inflation is also accepted and issue is now closed.</p> <p>c. The explanation that considering data of stock values for longer years provide most accurate values for equity risk premium is accepted and PP has issue is now closed.</p> <p>d. The explanation that considering a period of 5 years provides more realistic values of country risk premium is accepted and issue is now closed.</p> <p>CL 16 is closed.</p>



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			<p>period one can use.</p> <p>d) The country risk premium represents the risk associated in investing in Brazil. Considering that there is a higher risk in investing in Brazil when comparing to a mature market as US, the range adopted by project participants aim to be more realistic is of 5 years.</p>	
CL 17	<p>Regarding the Beta calculation, please:</p> <p>a) provide the web link reference for equity beta considered as per value line (if not web link reference, snapshots for the same) time period considered and the reference for the beta, since the table provided in the in the “Beta US” tab of WACC spreadsheet doesn’t seem to consider all companies referred in Damodaran spreadsheet for power sector.</p> <p>b) specify the time period considered in arriving at equity beta (value line beta)</p> <p>c) state the time period for which market cap, debt-equity and</p>	B.11	<p><i>PP answer(2nd round):</i></p> <p>Related to the Beta calculation, project participants clarify that:</p> <p>a) The information used to the Beta calculation corresponds to the data available in January, 2011 which reflect the information from January to December, 2010, only for power industries. In addition, “Beta US” sheet was revised and all the companies referred in Damodaran website were listed (http://pages.stern.nyu.edu/~adamodar/).</p> <p>b) As stated above, the period considered in the Beta calculation corresponds to the months from January to December 2010.</p>	<p><i>DOE response to 2nd round:</i></p> <p>a. The web link reference has been verified with the values considered in Beta US spreadsheet for the year 2010; issue is now closed.</p> <p>b. PP has considered 56 listed power companies for a period of one year prior to investment decision date (year 2010) in estimation of levered beta values; issue is now closed.</p> <p>c. PP has considered value of market cap, debt-equity ratio and market debt to capital for the year 2010 of all the 56 power companies; issue is now closed.</p> <p>d. The explanation by PP for considering re-levered beta in calculation of WACC is accepted and issue is now closed.</p>



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	<p>market debt to capital is considered in the analysis.</p> <p>d) Justify for considering re-levered beta compared to equity beta (as equity beta is conservative). How re-levered bet is appropriate for this project.</p>		<p>c) The period applied for market cap, debt-equity and market debt to capital corresponds for the year of 2010.</p> <p>d) Beta is a measure of sensitivity which calculates the covariance of a company's stock to the variance of the underlying market. This allows one to gauge the expected reaction or impact of a general market movement on an industry or group of individual companies. By finding companies comparable to the project in question (the project whose hurdle rate is being sought) and achieving an average of their betas, one can further assess the equity portion of the CAPM model by assessing the projects expected volatility or market sensitivity. A beta greater than one indicates an asset that is riskier than the market, while assets with betas lower than one are esteemed to be safer. The multiplication of the beta times the market premium magnifies or discounts the expected equity premium investors should expect.</p> <p>Further differences in the beta calculation arise in the process of leveraging and deleveraging of the beta. Beta is composed of the specificities of the sector or industry in which the company does business (β_u) as well as</p>	CL 17 is closed.



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			<p>the financial risk (β-β_u). These factors help create further specificity to the project in question by taking into account the industry specifics and its capital structure (leverage). The marginal tax rate of the sector is considered in unlevering and re-levering Beta. In Brazil the marginal tax rate varies according to the tax regime adopted by the company, and could be either zero (when taxation is incurred against a presumed portion of revenue – Deemed Profit “Lucro Presumido”), or 34% (in the case that taxes incur against the project profits, EBT – “Lucro Real”), which is the case of this project.</p> <p>In our application, the average unlevered beta of the U.S. electric power sector has been used to account for the business risk. The process of re-levering beta was then applied respecting Brazilian tax structure and financing structure observed in the sector. The beta we arrived at accounts then for the peculiar financial and tax structures of the sector in Brazil.</p>	
CL 18	Please, clarify why the IRR spreadsheet does not include escalating costs, while the benchmark based on WACC is	B.11	<p><i>PP answer(2nd round):</i></p> <p>Project participants clarify that the IRR project calculation is presented in real</p>	<p><i>DOE response to 2nd round:</i></p> <p>It is accepted that the financial analysis is presented in real terms and is compared</p>



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	calculated in nominal terms.		<p>terms, i.e., it does not considering the inflation during the presented period.</p> <p>On the other hand, the Kd (cost of debt) calculation is presented in nominal (cell C10) and real terms (cell C12). Nevertheless, the WACC is calculated in real terms and therefore it is properly compared with the real terms IRR spreadsheet presented.</p>	<p>with the benchmark (WACC) which is also presented in real terms; issue is now closed.</p> <p>CL 18 is closed.</p>
CL 19	PP has considered interest on term loan, which means that the project is 100% equity funded. Please, justify how re-levered beta is applicable for 100% equity funded project.	B.11	<p><i>PP answer (2nd round):</i></p> <p>The project IRR was calculated through the project cash flow. When considering the project cash flow, the interests are not included in the IRR calculation.</p> <p><i>PP answer (3rd round):</i></p> <p>As requested, project participants clarify that:</p> <p>a. The project was financed by and external financial institution. Nevertheless, considering that this information is not readily available, a financing simulation was conducted by project participants, considering the information public available at the BNDES website</p>	<p><i>DOE response to 2nd round</i></p> <p>Following paragraph 11 of the “Guidelines on the assessment of investment analysis” (ref. 24), please:</p> <p>a) Clarify whether the project is funded by external financial institution such as bank as interest payments has impact on income tax payments and ultimately cash flows.</p> <p>b) Provide response as to how re-levered beta is appropriate for this project activity.</p> <p>Issue is open.</p> <p><i>DOE response to 3rd round</i></p> <p>a) The revised financials have been reviewed and PP has considered</p>



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			<p>(http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financieiro/Produtos/FINEM/energia_eletrica_geracao.htm). The financing was calculated and included in the IRR calculation spreadsheet. For this reason, the project IRR changed from 2.80% to 3.50%. Please, refer to the revised IRR calculation spreadsheet.</p> <p>Beta calculation arises in the process of leveraging and deleveraging of the beta. Beta is composed of the specificities of the sector or industry in which the company does business as well as the financial risk. These factors help create further specificity to the project in question by taking into account the industry specifics and its capital structure (leverage). The Brazilian Development Bank (BNDES) offers up to 50% of a project's finance. BNDES' involvement, which is common for Brazilian based infrastructure projects, results in higher betas since most companies take carry high debt to equity ratios. All in all – these companies therefore have high equity rates, due to a greater financial risk. In addition to the debt, the marginal tax rate of the sector is considered in un-</p>	<p>3,587,627,931 BRL as finance cost as compared to investment cost of 3,567,628,000 BRL. PP to also justify for considering credit risk rate of 3.57% as part of cost of debt in financing spreadsheet and 2.09% for WACC calculation; issue is open.</p> <p>b) The explanation provided by PP is accepted and issue is now closed.</p> <p><i>DOE response to 4th round</i></p> <p>The revised financials have been reviewed and PP has now considered 70% of the CAPEX as financing which is accepted and issue is closed.</p> <p>The credit risk rate is now made consistent for WACC calculations and cost of debt (financing); issue is now closed.</p> <p>CL 19 is closed.</p>



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			<p>levering and re-levering Beta. In Brazil the marginal tax rate varies according to the tax regime adopted by the company 34% (in the case that taxes incur against the project profits, EBT – “Lucro Real”). In our application, the average unlevered beta of the U.S. electric power sector has been used to account for the business risk. The process of re-levering beta was then applied respecting Brazilian tax structure and financing structure observed in the sector. The beta we arrived at accounts then for the peculiar financial and tax structures of the sector in Brazil.</p> <p><i>PP answer (4th round):</i></p> <p>As explained at CL 13, item I), the financing simulation shall considering 70% of the total CAPEX of UHE Teles Pires, which is 3,567,628,457 BRL. Then, the total financed amount considered is 2,497,339,920 BRL. Furthermore, in order to be consistent with the WACC calculation, project participants revised the credit risk rate and adopted an average value between 0 and 4.18%, which is 2.09%. For this reason the interest tax rate applied changed from 5.97% to 4.55% and the IRR was updated.</p>	



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			Please, refer to the IRR calculation spreadsheet and to the revised PDD.	
CL 20	The values for (Nominal water flow per unit and Nominal net head) reported in the PDD v.06 (16aug12) are not consistent with the Technical Sheet from 26ago12 referred in the ANEEL Dispatch no. 3,504. Please, clarify.	A.7	<p><i>PP answer (6th round):</i></p> <p>As mentioned in CAR 9 above, the Dispatch nr. 3,504, dated August, 26th 2011 is linked to the Summary Sheet-Basic Project (August, 26th 2011). This Summary Sheet presents an outdated value for the Nominal water flow per unit and for the Nominal net head, which are 757 m³/s and 57.8 m, respectively.</p> <p>The most recent updated data for the Nominal water flow per unit and the Nominal net head is identified in the Monthly Reports issued by Companhia Hidrelétrica Teles Pires to ANEEL from May, June and July 2012 (see “<i>Relatório Mensal.rar</i>”), which present the Summary Sheet of the project and determines that the project Nominal water flow per unit and the Nominal net head are 764 m³/s and 52.2 m, respectively.</p> <p>Please, refer to the revised PDD attached to this response.</p>	<p><i>DOE response to 6th round (ITR)</i></p> <p>PPs properly justified with evidences the actual values of the project for Nominal net Head of 52.2 m and Nominal water flow of 52.2 m³/s. Given the recent Monthly reports/31/ are part of official communication to ANEEL, the actual values are deemed adequate and correct by the DOE.</p> <p>CL 20 is closed.</p>



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APPENDIX B – VALIDATION TEAM DETAILS

TEAM MEMBER NAME	COMPETENCY /ROLE	EXPERIENCE
Ricardo Costa	CDM Lead Validator	He is Environmental Engineer working in the environmental field since 1996. My more important experiences are in the management, construction and operation of wastewater treatment plants and landfill biogas recovery plants and its respective environmental licensing at competent agencies. He performed several activities controlling operational treatment processes; and instrumental, microbiological, physical and chemical analysis. Moreover, he has played important roles in international environmental monitoring during the past decade. He has experience regarding the implementation of ISO 9001, 14001 and OHSAS 18001 standards
Rodrigo Gatti	Team member	Rodrigo graduated in Veterinary Medicine and has been involved with CDM project since 2005, working on capacity building, elaboration of technical studies and carbon project development. He is CDM Expert (external Assessor) of the Secretariat of the UNFCCC, collaborating in the evaluation of CDM projects related to: renewable energy generation (Scope1); methane capture/destruction or methane avoidance (Scope 13; 15), when submitting for registration or issuance of CERs.
Luiz Cardoso	CDM Technical Expert	He has a degree in Electrical Engineering and around 20 years of experience in operation and maintenance of hydroelectric power plants. For the past six years he is providing consultancy in the areas of electrical power transmission and distribution and also energy efficiency improvement.
Anuradha.S	Financial Expert	She is a Commerce graduate and a Chartered Accountant. She is also an Information System Auditor (ISA). She has a work experience in: Statutory Audits; Test check, random verification of transactions, preparation of financial statements, and verification of compliance of various statutory requirements. Internal Audits: Detail verification of transactions, preparation of Bank Reconciliation Statement, Branch reconciliation. Handling internal, statutory and tax audits of 75 entities Income tax assessments. She handled income tax assessments and finalization of financial statements of individuals, firms and corporate (around 10 corporate and over 150 entities). She was involved in preparation of project reports (financials) for borrowings from financial institutions and verification of project reports with regard to the investment feasibility. She has worked on financial expert for around 30 CDM and 70 VCS projects.”



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Claudia Freitas	Team member	Chemical Engineering with MBA at Getúlio Vargas Foundation, post graduation in Industrial Administration and specialization in instruments of environmental management in Germany. Lead auditor and expert in climate change (Science and Technology Minister and UN). Validation and verification of green house gases and clean development mechanism. Lead auditor in environmental management systems – standard ISO 14001:2004.
Bilal Anwar	Technical reviewer	Bilal Anwar has over twelve years of experience in International Climate Change Policy, global regimes of greenhouse gas reduction projects and corporate sector greenhouse strategies. A significant part of his experience is in Clean Development Mechanism (CDM) in which he got involved from its inception. He worked in the United Nations Framework Convention on Climate Change Secretariat (UNFCCC). He was the team leader of CDM Accreditation Unit in the secretariat. Currently, Bilal is responsible for final approval of CDM reports in Perry Johnson Registrars Carbon Emission Services, Inc.