



# VALIDATION REPORT

REGARDING CHANGES FROM THE  
PROJECT ACTIVITY AS DESCRIBED IN THE  
REGISTERED PDD

ELEJOR – CENTRAIS ELÉTRICAS DO RIO  
JORDÃO S. A.

FUNDÃO-SANTA CLARA ENERGETIC COMPLEX  
PROJECT (FSCECP)

UNFCCC Ref. No. : 1279

**Report No: 7773 – 11/123**

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P-No.: 7773 – 11/123

<b>Validation Report</b> on requested changes	<b>Report No.</b>	<b>Rev. No.</b>	<b>Date of 1<sup>st</sup> issue:</b>	<b>Date of this rev.</b>
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<b>Project:</b>	<b>Title:</b>		<b>Registration date:</b>	<b>UNFCCC-No.:</b>
	Fundão-Santa Clara Energetic Complex Project (FSCECP)		2008-05-25	<a href="#">1279</a>
<b>Project Participant(s):</b>	<b>Host party:</b>		<b>Other involved parties:</b>	
	Brazil		-	
<b>Applied methodology/ies:</b>	<b>Title:</b>		<b>No.:</b>	<b>Scope:</b>
	Consolidated methodology for grid-connected electricity generation from renewable sources		ACM0002 – v. 6	1
<b>Requested Changes:</b>	<b>Kind of requested changes</b>		<b>Effective as of:</b>	<b>Last issuance:</b>
	<input checked="" type="checkbox"/> From the start	<input type="checkbox"/> After implementation	-	2010-12-20
<b>Revised PDD:</b>	<b>Title:</b>		<b>Draft version:</b>	<b>Final version:</b>
	Fundão-Santa Clara Energetic Complex Project (FSCECP)		2011-07-07 – v. 4	2011-07-07 – v. 4
<b>Validation team / Technical Review and Final Approval</b>	<b>Validation Team:</b>		<b>Technical review:</b>	<b>Final approval:</b>
	Ricardo Lopes (TL) Sergio Cruz (TM)		Emilio Martin	Eric Krupp
<b>Validation Opinion:</b>	<p>The changes do not raise concerns with respect to aspects outlined in paragraph 10(c) of EB 48, Annex 66, i.e.:</p> <ul style="list-style-type: none"> <li>a. additionality of the project;</li> <li>b. scale of the CDM project activity; and</li> <li>c. applicability and application of the approved baseline methodology under which the project activity has been registered.</li> </ul> <p>Thus a notification of changes from the project activity as described in the registered PDD to the UNFCCC is deemed appropriate and in line with the requirements outlined in EB 48, Annex 66.</p>			
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## Abbreviations

<b>CA</b>	<b>Corrective Action / Clarification Action</b>
<b>CAR</b>	<b>Corrective Action Request</b>
<b>CCEE</b>	<b>Chamber of Commercialization of Electric Energy</b>
<b>CDM</b>	<b>Clean Development Mechanism</b>
<b>CER</b>	<b>Certified Emission Reduction</b>
<b>CO<sub>2</sub></b>	<b>Carbon dioxide</b>
<b>CO<sub>2</sub>e</b>	<b>Carbon dioxide equivalent</b>
<b>COPEL</b>	<b>Electric Energy Company of Paraná (State owned)</b>
<b>CL</b>	<b>Clarification Request</b>
<b>ER</b>	<b>Emission Reduction</b>
<b>FAR</b>	<b>Forward Action Request</b>
<b>GHG</b>	<b>Greenhouse gas(es)</b>
<b>GU</b>	<b>Generating Units</b>
<b>IAP</b>	<b>Environmental Institute of the State of Paraná</b>
<b>MP</b>	<b>Monitoring Plan</b>
<b>MR</b>	<b>Monitoring Report</b>
<b>ONS</b>	<b>Electric System National Operator</b>
<b>OSV</b>	<b>On site visit</b>
<b>PCH</b>	<b>Small Hydropower Plant</b>
<b>PDD</b>	<b>Project Design Document</b>
<b>PP</b>	<b>Project Participant</b>
<b>QA/QC</b>	<b>Quality Assurance / Quality Control</b>
<b>UHE</b>	<b>Hydropower Plant</b>
<b>UNFCCC</b>	<b>United Nations Framework Convention on Climate Change</b>
<b>XLS</b>	<b>Emission Reduction Calculation Spreadsheet</b>

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## 1 OBJECTIVE / SCOPE

ELEJOR – Centrais Elétricas do Rio Jordão S. A. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the verification of monitoring period # 2 of the project

“Fundação-Santa Clara Energetic Complex Project (FSCECP)”

In the context of this verification the need was identified to carry out a *validation regarding changes from the project activity as described in the registered PDD*.

This specific report covers the validation regarding changes from the project activity as described in the registered PDD with regard to the relevant requirements for CDM project activities (esp. EB 48, Annexes 66 / 67). The purpose of a validation regarding changes is to have an independent third party assess whether the project is still in compliance with the:

- approved CDM Methodology under which it was registered; esp. w.r.t. the applicability criteria,
- category of the CDM project activity,
- CDM additionality requirements.

The validation scope is given as a thorough independent and objective assessment to ensure that the CDM project activity still meets all relevant and applicable CDM criteria after the implementation of changes of the project design, as described in the registered PDD.



## 2 DESCRIPTION OF THE PROJECT AND REQUESTED CHANGES

### 2.1 Project Characteristics

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

**Table 2-1: Project Characteristics**

Item	Data
Project title	Fundão-Santa Clara Energetic Complex Project (FSCECP)
Project size	<input checked="" type="checkbox"/> Large Scale <input type="checkbox"/> Small Scale
Project Scope (according to UNFCCC sectoral scope numbers for CDM)	<input checked="" type="checkbox"/> 1 Energy Industries (renewable- /non-renewable sources)
	<input type="checkbox"/> 2 Energy distribution
	<input type="checkbox"/> 3 Energy demand
	<input type="checkbox"/> 4 Manufacturing industries
	<input type="checkbox"/> 5 Chemical industry
	<input type="checkbox"/> 6 Construction
	<input type="checkbox"/> 7 Transport
	<input type="checkbox"/> 8 Mining/Mineral production
	<input type="checkbox"/> 9 Metal production
	<input type="checkbox"/> 10 Fugitive emissions from fuels (solid, oil and gas)
	<input type="checkbox"/> 11 Fugitive emissions from production and consumption of halocarbons and hexafluoride
	<input type="checkbox"/> 12 Solvents use
	<input type="checkbox"/> 13 Waste handling and disposal
	<input type="checkbox"/> 14 Afforestation and Reforestation
	<input type="checkbox"/> 15 Agriculture
Applied Methodology	ACM0002 – Consolidated methodology for grid-connected electricity generation from renewable sources – version 6
Technical Area(s)	1.2 – Renewable Hydro
CDM registration No.	1279
Crediting period	<input checked="" type="checkbox"/> Renewable Crediting Period (7 y) <input type="checkbox"/> Fixed Crediting Period (10 y)

### 2.2 Project Verification History

According to the registered PDD, the project activity involves hydroelectric complex power plants, composed by Fundão Complex (UHE and PCH Fundão) and Santa Clara Complex (UHE and PCH Santa Clara), both located in Jordão River, state of Paraná.

By the validation process, the installed capacity of the project activity has been described as follows:

- PCH Santa Clara: 1 turbo-generator of 3.6 MW;



- UHE Santa Clara: 2 turbo-generators of 60 MW each;
- PCH Fundão: 1 turbo-generator of 2.5 MW;
- UHE Fundão: 2 turbo-generators of 60 MW each.

By the time of the site visit for the 2<sup>nd</sup> Monitoring Period, it was detected that there is a difference in the power of the turbo-generators, although they have been never changed or modified, from the registered PDD, which need to be reported:

Essential events since the registration of the project are presented in the following Table 2-2.

**Table 2-2: Project verification history**

#	Item	Time	Status
1	Date of registration	2008-05-25	-
2	Start of crediting period	2008-05-25	-
3	1 <sup>st</sup> Monitoring period	2008-05-25 to 2009-04-30	Issued
4	2 <sup>nd</sup> Monitoring period	2009-05-01 to 2010-04-30	Ongoing

## 2.3 Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table 2-3).

**Table 2-3: Project Parties and project participants]**

Characteristic	Party	Project Participant
Host party	Brazil	Elejor – Centrais Elétricas do Rio Jordão S. A.

## 2.4 Project Location

The details of the project location are given in table 2-4:

**Table 2-4: Project Location**

No.	Project Location
Host Country	Brazil

Region:	State of Paraná – South region
Project location address:	Cities of Candói, Foz do Jordão and Pinhão
Latitude:	25° 42' S
Longitude:	52° 00' W

## 2.5 Technical Project Description

The technical project description is the same of the registered PDD.

The technical key data are provided in table 2-5 below.

**Table 2-5.1:** Technical data of the plant – UHE Santa Clara

Parameter	Unit	Value
Turbine Impsa		2
- Power (each)	MW	61
Generator Impsa		2
- Power (each)	MVA	66.76
- Power factor		0.9

**Table 2-5.2:** Technical data of the plant – UHE Fundão

Parameter	Unit	Value
Turbine Impsa		2
- Power (each)	MW	61
Generator Impsa		2
- Power (each)	MVA	66.76
- Power factor		0.9

**Table 2-5.3:** Technical data of the plant – PCH Santa Clara

Parameter	Unit	Value
Turbine Moeller		1
- Power	MW	3.5
Generator WEG		1
- Power	kVA	4,000
- Power factor		0.9

**Table 2-5.4:** Technical data of the plant – PCH Fundão

Parameter	Unit	Value
Turbine Moeller		1
- Power	MW	2.5



Parameter	Unit	Value
Generator WEG		1
- Power	kVA	2,750
- Power factor		0.9

## 2.6 Requested changes

### 2.6.1 Type of Changes

The “*Procedure for notifying and requesting approval of changes from the project activity as described in the registered PDD*” distinguishes 2 situations as per table 2-6:

**Table 2-6:** Type of changes – implementation stage

Category	Implementation stage
a	Changes occur from the start of the project activity, i.e. the project has never been implemented in accordance with the description in the registered PDD
b	Permanent changes occur after the project activity has been implemented in accordance with the description in the PDD and issuance of CERs has taken place.

The changes within this project activity fall under category ‘a’

### 2.6.2 Description of requested changes

The validation addresses the following changes from the registered PDD:

- at the registered PDD, the installed capacity of the project activity has been described as follows:
  - a. UHE Santa Clara: 120 MW (2 turbo-generators of 60 MW each);
  - b. UHE Fundão: 120 MW (2 turbo-generators of 60 MW each);
  - c. PCH Santa Clara: 3.6 MW (1 turbo-generator);
  - d. PCH Fundão: 2.5 MW (1 turbo-generator).

But in fact, the equipment that was purchased and installed at the Fundão and Santa Clara Complex since its very start is:

- a. UHE Santa Clara: 120.168 MW (2 turbo-generators of 60.084 MW each);

- b. UHE Fundão: 120.168 MW (2 turbo-generators of 60.084 MW each);
- c. PCH Santa Clara: 3.6 MW (1 turbo-generator);
- d. PCH Fundão: 2.475 MW (1 turbo-generator).

The changes are described in detail in the revised PDD and the supporting documents.

The capacities of the turbo-generators for the requested changes are given in table 2-7:

**Table 2-7:** Technical data of the registered project activity and requested changes

Plant	Quantity of turbo-generators	PDD value (each)	Requested Changes value (each)
UHE Santa Clara	2	60 MW	60.084 MW <sup>1</sup>
UHE Fundão	2	60 MW	60.084 MW
PCH Santa Clara	1	3.6 MW	3.6 MW
PCH Fundão	1	2.5 MW	2.475 MW

With the new values, there are also changes in the calculated power densities. The power density of the complexes is given below:

- Santa Clara Complex (UHE and PCH Santa Clara): 6.14 W/m<sup>2</sup> (123.768 MW of installed capacity and a reservoir area of 20.14 km<sup>2</sup>);
- Fundão Complex (UHE and PCH Fundão): 57.04 W/m<sup>2</sup> (122.643 MW of installed capacity and a reservoir area of 2.15 km<sup>2</sup>).

The power densities for the requested changes are given in tables 2-8.

**Table 2-8a:** Technical data of the power density calculation – Santa Clara Complex

Parameter	PDD	Requested Changes
Installed capacity	123.6 MW	123.768 MW
Reservoir area	20.14 km <sup>2</sup>	20.14 km <sup>2</sup>
Power density	6.13 W/m <sup>2</sup>	6.14 W/m <sup>2</sup>

**Table 2-8b:** Technical data of the power density calculation – Fundão Complex

Parameter	PDD	Requested Changes
Installed capacity	122.5 MW	122.643 MW

<sup>1</sup> The determination of the rated/installed capacity was based on the installed/rated capacity of generator, which has been confirmed during the on-site visit..



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Parameter	PDD	Requested Changes
Reservoir area	2.15 km <sup>2</sup>	2.15 km <sup>2</sup>
Power density	56.97 W/m <sup>2</sup>	57.04 W/m <sup>2</sup>

The other technical data remains the same.

The above listed changes are described in detail in the revised PDD and the supporting documents.

Furthermore, the PP has taken the opportunity to eliminate some editorial inconsistencies in the registered PDD. These changes are only of editorial nature.

### **2.6.3 Reasons for requested changes**

The changes from the previous project design have been carried out because a mistake about the power capacities of the equipment has occurred and different values have been used during the validation process.

### **2.6.4 Occurrence of changes**

Actually there were no changes but a mistake when reporting the power capacity of the installed turbo-generators of the project activity. So, since the installation, therefore since the starting of the project activity the values are different from the ones of the registered PDD.

Due to the above explanations the occurrence of changes has always existed.

### **2.6.5 Impact of changes on the ability to deliver emission reductions**

The changes have no potential to affect the ability of the project to generate emission reductions as the calculations have been made based on the assured capacity (the committed energy to be delivered to the grid) and not on the installed capacity of the project activity. In addition, the minimal increase of the power density of Santa Clara Complex has no impact for the whole calculations since the project emissions depend on the electricity generated.

With these assumptions, the estimate of total emission reductions to be realized continues being 1,859,094 tCO<sub>2</sub>e over the first crediting period (from 2007-10-01 to 2014-09-30 – both days included) as forecasted in the registered PDD.

### 3 METHODOLOGY AND VALIDATION SEQUENCE

#### 3.1 Validation Steps

The *validation of requested changes from the project activity as described in the Registered PDD* consisted of the following steps:

- Appointment of team members and technical reviewers
- A desk review of the original and revised PDD<sup>/PDD/</sup> submitted by the client and additional supporting documents
- On-Site assessment (if required)
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft validation reporting – in case of CARs or CLs
- Resolution of corrective actions (if any)
- Final validation reporting
- Technical review
- Final approval of the validation,

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

**Table 3.1:** Validation sequence

Topic	Date
On-site visit	from 2011-05-02 to 2011-05-05
Draft reporting finalized	2011-09-12
Final reporting finalized	2011-09-23
Technical review on final reporting finalized	2011-09-23

### 3.2 Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a validation team, consistent of one team leader and 2 additional team members, were appointed. Furthermore also the personnel for the technical review and the final approval were determined.

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

**Table 3-2:** Involved Personnel

	Name	Company	Function <sup>1)</sup>	Qualification Status <sup>2)</sup>	Scheme competence <sup>3)</sup>	Technical competence <sup>4)</sup>	Verification competence <sup>5)</sup>	Host country Competence	Team Leading competence
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Ricardo Lopes	BRTÜV, Sao Paulo	TL	LA	<input checked="" type="checkbox"/>	TA 1.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Sergio Cruz	BRTÜV, Sao Paulo	TM	A	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Emilio Martin	TÜV NORD, Germany	TR <sup>3)</sup>	LA	<input checked="" type="checkbox"/>	TA 1.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Eric Krupp	TÜV NORD, Germany	FA <sup>3)</sup>	SA	<input checked="" type="checkbox"/>	TA 1.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<sup>1)</sup> TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

<sup>2)</sup> GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

<sup>3)</sup> GHG auditor status (at least Assessor)

<sup>4)</sup> As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, ...)

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

### 3.3 Review of Documents

The registered as well as the revised PDD and supporting background documents related to the project design and the requested changes were reviewed.

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



### 3.4 Follow-up Interviews

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

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

**Table 3-3:** Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Project consultant	<ul style="list-style-type: none"> <li>- Details of the project validation and earlier verifications</li> <li>- Project history</li> <li>- Technical details of plant</li> <li>- Intended / implemented changes from the previous project design</li> <li>- Impact of changes on the additionality justification</li> <li>- Impact on the monitoring of the project</li> <li>- Editorial issues of the revised PDD</li> </ul>

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

### 3.5 Resolution of Clarification and Corrective Action Requests

#### 3.5.1 Definition

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

- mistakes have been made in assumptions, application of the methodology or project documentation which will have a direct influence on the project results,
- the requirements deemed relevant for validation of the intended / implemented changes are not fulfilled,
- there is a risk that the changes cannot be approved by the UNFCCC or that emission reductions would not be able to be verified and certified after the implementation of the changes.

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

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

### **3.5.2 Draft Validation**

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

### **3.5.3 Final Validation**

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

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

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

## **3.6 Technical review**

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

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

## **3.7 Final approval**

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



Only after this step the notification or the request for approval of the changes on the project activity can be forwarded to the UNFCCC (in case of a positive validation opinion).



## **4 VALIDATION FINDINGS**

No findings (CARs, CLs and FARs) have been identified at the validation process.

## 5 VALIDATION ASSESSMENT SUMMARY

### 5.1 General

ELEJOR – Centrais Elétricas do Rio Jordão S. A. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to conduct a *validation regarding changes from the Project Activity as Described in the Registered PDD* of the project:

“Fundação-Santa Clara Energetic Complex Project (FSCECP)”

with regard to the relevant requirements of the UNFCCC esp. the *Procedure for notifying and requesting approval of changes from the project activity as described in the registered project design document (EB 48, Annex 66)<sup>/PNRAC/</sup>* and the *Guidelines on assessment of different types of changes from the project activity as described in the registered PDD<sup>/GADTC/</sup>*.

In the course of the validation, no Correction Action Requests (CARs), Clarification Requests (CLs) or Forward Action Requests (FARs) were raised.

The review of the revised project design documentation and additional documents related to changes to the project design and monitoring plan; the subsequent background investigation and follow-up interviews have provided TÜV NORD JI/CDM CP with sufficient evidences for assessment.

### 5.2 Additionality

#### 5.2.1 Methodology

In the original project documentation the additionality was justified in line with the requirements of ACM0002 ver. 6 applying the additionality tool.

#### 5.2.2 Decisive Route of Additionality Justification

During the original validation of the project the additionality was justified on the basis of an investment analysis (Benchmark analysis). A corresponding Excel file was presented and attached to the validation report.

The identified project IRR of 11.237% was below the minimum required rate of return of the Brazilian electrical sector of 12% adopted by the PP by the time of the validation process.

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This analysis is still the same and could prevent the implementation of the project were, even with the actual changes, as the power generation has no influence in the financial attractiveness of the project because it is fixed in the Power Purchase Agreement (PPA). So, it would have no impact in the financial analysis.

### **5.2.3 Re-Assessment of Additionality**

During this validation regarding changes, a revised version of the original validated PDD was provided by the PPs and considered by the validation team. The modifications mainly reflect the technical characteristics of the equipment not observed during the validation process.

In addition, the power generation has no influence in the financial attractiveness of the project because it is fixed in the Power Purchase Agreement (PPA).

The additionality justification is based on a Benchmark Analysis which is the same. So, there is no impact in the additionality of the project activity.

### **5.2.4 Result of Additionality Re-Assessment**

Based on the facts below:

- as there was no change in equipment since the installation and the change is necessary just to correct the power capacities of the original equipment; and
- as the power generation has no influence in the financial attractiveness of the project because it is fixed in the Power Purchase Agreement with no impact to the financial analysis,

the validation team has arrived to the conclusion that the additionality of the project is not affected by the changes carried out as a deviation from the project design originally validated and registered.

## **5.3 Scale of the Project activity**

This is a large scale project activity; therefore this criterion is not applicable in this case.

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## **5.4 Applicability and application of the Approved Baseline Methodology**

As the changes only refer to the correction of the power capacities of the original equipment, they do not affect the applicability and the application of the approved baseline methodology.

## **5.5 Other issues**

Along with this validation regarding changes, the PP has taken the initiative to correct inconsistencies in the registered PDD which are not related to the technical changes done. The validation team confirms that the changes are:

- (i) only of editorial nature and not related to the technical features, and
- (ii) the editorial changes are justified and correct.

Moreover, no changes in the monitoring plan is required as the changes have no impact in the project emissions as only the emissions of the reservoir of Santa Clara Complex continue being monitored as already predicted in the registered PDD.

## 6 VALIDATION OPINION

The changes do not raise concerns with respect to aspects outlined in paragraph 10c) of EB 48, Annex 66, i.e.:

- a. additionality of the project;
- b. scale of the CDM project activity; and
- c. applicability and application of the approved baseline methodology under which the project activity has been registered.

Thus, a notification of changes from the project activity as described in the registered PDD to the UNFCCC is deemed appropriate and in line with the requirements outlined in EB 48, Annex 66.

Essen, 2011-09-23

A handwritten signature in black ink that reads "Ricardo Ribeiro Lopes". The signature is written in a cursive style and is placed on a light grey rectangular background.

Ricardo Lopes  
TÜV NORD JI/CDM CP  
Validation Team Leader

Essen, 2011-09-23

A handwritten signature in black ink that reads "Eric Krupp". The signature is written in a cursive style.

Eric Krupp  
TÜV NORD JI/CDM CP  
Final Approval



## 7 REFERENCES

**Table 7-1:** Documents provided by the project participant

Reference	Document
<b>/MAN/</b>	<p><u>Equipment, Operation and Management Manuals:</u></p> <ul style="list-style-type: none"> <li>- Operation manuals of the plants</li> <li>- Equipment manuals:                             <ul style="list-style-type: none"> <li>o UHE Santa Clara:                                     <ul style="list-style-type: none"> <li>• Generator: 66,76 MVA – IMPSA Hydro – Document #62611 – MO8030</li> <li>• Turbine: 61 MW – IMPSA Hydro – Document #62601 – MO8030</li> </ul> </li> <li>o PCH Santa Clara:                                     <ul style="list-style-type: none"> <li>• Generator: SPA900 – 4,000 kVA – WEG – Document #63613 – MO8030</li> <li>• Turbine: IMPSA Hydro – 3.5 MW – Document #63601 – MO8030</li> </ul> </li> <li>o UHE Fundão:                                     <ul style="list-style-type: none"> <li>• Generator: 66,76 MVA – IMPSA Hydro – Document #62811 – MO8030</li> <li>• Turbine: 61 MW – IMPSA Hydro – Document #62801 – MO8030</li> </ul> </li> <li>o PCH Fundão:                                     <ul style="list-style-type: none"> <li>• Generator: SPA900 – 2,750 kVA – WEG – Document #63629 – MO8030</li> <li>• Turbine: IMPSA Hydro – 2.5 MW – Document #63619 – MO8030</li> </ul> </li> </ul> </li> </ul>
<b>/PDD1/</b>	Registered Project Design Document, issued on 2008-05-05, version 3a
<b>/PDD2/</b>	Revised PDD reflecting the intended / implemented changes, issued on 2011-07-07, version 4
<b>/XLS/</b>	Excel calculation spreadsheet

**Table 7-2: Background investigation and assessment documents**

<b>Reference</b>	<b>Document</b>
<b>/ACM02/</b>	Approved CDM Methodology ACM0002 - version 6: “Consolidated methodology for grid-connected electricity generation from renewable sources”
<b>/CPM/</b>	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
<b>/GADTC/</b>	Guidelines on assessment of different types of changes from the project activity as described in the registered PDD (EB 48; Annex 67)
<b>/IPCC/</b>	<ul style="list-style-type: none"> <li>- 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book</li> <li>- 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book</li> </ul>
<b>/KPI/</b>	Kyoto Protocol (1997)
<b>/MA/</b>	Decision 3/CMP. 1 (Marrakesh – Accords)
<b>/PNRAC/</b>	Procedures for notifying and requesting approval of changes from the project activity as described in the registered PDD (EB 48, Annex 66)
<b>/TOOL/</b>	Tool for the demonstration and assessment of additionality – v. 3
<b>/VAL/</b>	Validation Report for CDM project “Fundão-Santa Clara Energetic Complex Project (FSCECP)” – version 03a – BVQI – Date: 2008-05-06
<b>/VER/</b>	Verification and Certification Report for CDM project “Fundão-Santa Clara Energetic Complex Project (FSCECP)” – version 1 – 1 <sup>st</sup> Monitoring Period – SGS United Kingdom Limited – Date: 2010-07-05
<b>/VVM/</b>	Validation and Verification Manual (Version 1.2, Annex 1; EB 55)

**Table 7-3: Websites used**

Reference	Link	Organization
<b>/copel/</b>	www.copel.com	Copel – Companhia Paranaense de Energia
<b>/dna/</b>	http://www.mct.gov.br	DNA of Brazil
<b>/elejor/</b>	www.elejor.com.br	Elejor – Centrais Elétricas do Rio Jordão S. A.
<b>/iap/</b>	www.iap.pr.gov.br	IAP – Instituto Paranaense de Energia
<b>/ipcc/</b>	www.ipcc-nggip.iges.or.jp	IPCC publications
<b>/unfccc/</b>	http://cdm.unfccc.int	UNFCCC

**Table 7-4:** List of interviewed persons

Reference	Mol <sup>1</sup>		Name	Organization / Function
<b>/IM01/</b>	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Emerson Luís Alberti	Elejor / Electrical Engineer
<b>/IM02/</b>	V	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms.	Bruna Marigheto	EQAO / Project Analyst

<sup>1)</sup> Means of Interview: (Telephone, E-Mail, Visit)