



# VALIDATION REPORT

## FUNDÃO-SANTA CLARA ENERGETIC COMPLEX PROJECT (FSCECP)

REPORT No. BVQI/BRA/2006-16

REVISION No. 03

BUREAU VERITAS CERTIFICATION

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Approved by: <b>Ashok Mammen</b>	Organisational unit: <b>Bureau Veritas Certification Holding SA</b>
Client: <b>ELEJOR - CENTRAIS ELÉTRICAS DO RIOJORDÃO S.A.</b>	Client ref.: <b>Sérgio Luiz Lamy/ Nilson Marchioro</b>

**Summary:**  
Bureau Veritas Certification Holding S.A has made a validation of the Fundão-Santa Clara Energetic Complex Project (FSCECP) located at Jordão River, State of Paraná, Brazil, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan (July 21, 2006); ii) follow-up interviews with project stakeholders (August, 2006); iii) resolution of outstanding issues and the issuance of the validation report and opinion (September, 2006). Due to ITR results, the PDD was revised, originating PDD version 2, of December 21, 2006. Due to the revision of the PDD into version 3, a final validation report and opinion, were issued on February 23, 2007. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using internal procedures (BMS, September 2003), which were audited by the UN CDM Accreditation Team in December 2004.

The first output of the validation process is a list of Clarification and Corrective Actions Requests (CR and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document (September 14, 2006). PDD was also revised due to ITR results, originating PDD version 2 (December 21, 2006) and version 3 (February 22, 2007) due to the revision of the Tool for the demonstration of the additionality.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the Clean Development Mechanism Project Design Document Form (CDM-PDD) – Version 03; the Guidelines for completing the Project Design Document (CDM-PDD) and the proposed new baseline and monitoring methodologies CDM-NM, Version 06.2; the Approved Consolidated Baseline Methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" - Version 06; the Tool for the demonstration and assessment of additionality – Version 02; and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Report No.: <b>BVQI/BRA/2006-16</b>	Subject Group: <b>GHG/CDM</b>
Report title: <b>Fundão Santa Clara Energetic Project (FSCECP)</b>	
Work carried out by: <b>Antonio Daraya Sergio Carvalho</b>	
Work verified by: <b>Ashok Mammen</b>	
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## Indexing terms

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## Abbreviations

ACM	Approved Consolidated Methodology
BMS	Bureau Veritas Certification Management System
BVQI	Bureau Veritas Quality International
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CH <sub>4</sub>	Methane
CR	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
FSCECP	Fundão-Santa Clara Energetic Complex Project
GHG	Green House Gas(es)
I	Interview
IAP	Paraná Environmental Institute
IETA	International Emissions Trading Association
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organisation for Standardization
ITR	Internal Technical Review
LI	Installation License
LO	Operation License
LP	Preliminary License
MoV	Means of Verification
MP	Monitoring Plan
NGO	Non Government Organisation
OM	Operating Margin
ONS	Operador Nacional do Sistema Elétrico (Brazilian National Dispatch Center)
PCF	Prototype Carbon Fund
PDD	Project Design Document
S-SE-CO	South, Southeast, Midwest (Sul, Sudeste, Centrooeste)
UNFCCC	United Nations Framework Convention for Climate Change

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## 1 INTRODUCTION

ELEJOR - CENTRAIS ELÉTRICAS DO RIO JORDÃO (hereafter called “the client”) has commissioned Bureau Veritas Certification to validate its Fundação-Santa Clara Energetic Complex Project – FSCECP (hereafter called “the project”) at Jordão River, State of Paraná, Brazil.

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

### 1.1 Objective

The validation serves as a project design verification and is a requirement of all Client projects. The validation is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the Host Country criteria.

### 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. Bureau Veritas Certification has, based on the recommendations in the Validation and Verification Manual (IETA/PCF, v. 3.3, 2004), employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

### 1.3 GHG Project Description

FSCECP - Fundação-Santa Clara Energetic Complex Project activity consists of constructing a hydroelectric complex, composed by Fundação Hydroelectric and by Santa Clara Hydroelectric, both located at Jordão River, State of Paraná. The Fundação Hydroelectric is composed by two power plants: Fundação Hydro Power Plant and Fundação Small-Hydro Power Plant. The Santa Clara Hydroelectric is composed by two power plants: Santa Clara Hydro Power Plant and Santa Clara Small-Hydro Power Plant. With the implementation of this project, Elejor is able to sell electricity to the national grid, avoiding the

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dispatch of same amount of energy produced by fossil-fuelled thermal plants to that grid. By that, the initiative avoids CO<sub>2</sub> emissions, also contributing to the regional and national sustainable development.

The sponsors of the FSCECP are convinced that hydroelectricity is a sustainable source of energy that brings advantages for mitigating global warming. Using the available natural resources, the Elejor project activity helps to enhance the consumption of renewable energy.

Furthermore, hydroelectricity also plays an important role on the country's economic development, as these kinds of projects provide for approximately 10.000 jobs during the construction of reservoirs and dams, construction of new cities in replacement of the projected to be flooded and construction of transmission lines. The Brazilian heavy industry has developed the technology to supply the hydroelectricity projects with equipment to provide the production of high levels of electricity, therefore such heavy industry development also helps the country to create jobs and achieve sustainable development.

Hydroelectricity is important for the energy strategy of the country. It is an alternative that allows postponing the installation and/or dispatch of electricity produced by fossil-fuelled generation utilities. The sale of the CERs generated by the project will boost the attractiveness of hydroelectric projects, helping to increase the production of this energy and decrease dependency on fossil fuel.

Elejor also believes that sustainable development will be achieved not only by the implementation of a renewable energy production facility, but also by carrying out activities which correspond to the company social and environmental responsibilities.

### 1.4 Validation team

The validation team consists of the following personnel:

Eng. Antonio Daraya	GHG Auditor
Sergio Carvalho	GHG Auditor
Marcos Tashiro	Specialist
Dr Ashok Mammen	Internal Reviewer

A small resume of each member of the validation team is described below;

Antonio Daraya – is graduate in Chemical Engineering with a very large experience in Industrial and Environmental management in several industrial sectors. He is ISO 9001:2000, ISO 14001:2004 and OHSAS 18001 Lead Auditor and has also experience in the implementation of Quality and Environmental Management Systems. Antonio is qualified as Lead Verifier GHG – Green House Gases. He has been involved in the validation and verification process in many project activities.

Sergio Carvalho – is a graduate in Physics with MsC in materials sciences. Has a vast experience in the implementation of quality management systems in several industrial fields. He has been working for Bureau Veritas Certification for a long period developing certification schemes related to environment.

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Sergio is qualified as quality and environment lead auditor and as lead verifier GHG – Green House Gases.

Marcos Tashiro – Professional with 10 years of experience in the Finance/ Control Area, Corporate Finance, Risk Management and IRR Analysis. Presently works as Bureau Veritas Certification's Corporate Finance Manager, reporting to the Executive Board of the company, in charge of Project/Client's Results Analysis and Consolidation of Results.

Ashok Mammen - Ph.D (Oils & Lubricants), M.Sc (Analytical chemistry). Over 20 years of experience in petrochemical sector. He has been involved in the validation and verification processes of more than 30 CDM projects.

## 2 METHODOLOGY

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using internal procedures (BMS, September 2003) which were audited by the CDM Accreditation Team in December 2004.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual (IETA/PCF, v. 3.3, 2004). The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, 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.

The validation protocol consists of five tables. The different columns in these tables are described in Figure 1.

The completed validation protocol is enclosed in Appendix A to this report.

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**Validation Protocol Table 1: Mandatory Requirements**

Requirement	Reference	Conclusion	Cross reference
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided ( <b>OK</b> ), <b>Corrective Action Request (CAR)</b> or <b>Clarification Request (CR)</b> of risk or non-compliance with stated requirements. The CAR's and CR's are numbered and presented to the client in the Validation Report.	Used to refer to the relevant protocol questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent validation process.

**Validation Protocol Table 2: Requirement checklist**

Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in several sections. Each section is then further subdivided. The lowest level constitutes a checklist question.	Gives reference to documents where the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided ( <b>OK</b> ), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question. (See below). <b>Clarification Request (CR)</b> is used when the validation team has identified a need for further clarification.

**Validation Protocol Table 3: Methodology checklist**

Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements of the baseline and monitoring methodologies are specified in this checklist. The checklist is organised in several sections. Each section is then further subdivided. The lowest level constitutes a checklist question.	Baseline and monitoring methodologies	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided ( <b>OK</b> ), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question. (See below). <b>Clarification Request (CR)</b> is used when the validation team has identified a need for further clarification.



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Validation Protocol Table 4: Legal requirements				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The national legal requirements the project must meet.	National Sustainable Policies.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question. (See below). <b>Clarification Request (CR)</b> is used when the validation team has identified a need for further clarification.

Validation Protocol Table 5: Resolution of Corrective Action and Clarification Requests			
Report clarifications and corrective action requests	Ref. to checklist question in tables 2, 3 and 4	Summary of project owner response	Validation conclusion
If the conclusions from the Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Tables 2, 3 and 4 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the validation team should be summarised in this section.	This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Tables 2, 3 and 4, under "Final Conclusion".

**Figure 1 Validation protocol tables**

## 2.1 Review of Documents

The Project Design Document (PDD), version 1 submitted by ELEJOR-CENTRAIS ELÉTRICAS DO RIO JORDÃO, The Project Design Document (PDD), version 2, submitted by ELEJOR-CENTRAIS ELÉTRICAS DO RIO JORDÃO / and additional background documents related to the project design and baseline, i.e., Resolução Interministerial 01/2003, Resolução Interministerial 02/2005, Clean Development Mechanism Project Design Document Form (CDM-PDD) – Version 03, the Guidelines for completing the Project Design Document (CDM-PDD) and the proposed new baseline and monitoring methodologies CDM-NM, Version 06.2, Approved Consolidated Baseline Methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" Version 06, Tool for the demonstration and assessment of additionality – Version 03, Kyoto Protocol to the United Nations Framework Convention on Climate Change, Clarifications on Validation Requirements to be Checked by a Designated Operational Entity, were reviewed.

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The following documents were used as references to the validation work, in addition to internal Bureau Veritas Certification procedures: IETA/PCF – Validation and Verification Manual (v. 3.3, Mar 2004) ; ISO/ 14064-3 - Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions ; ISO/ 14064-2 - Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements .

To address Bureau Veritas Certification corrective action and clarification requests ELEJOR-CENTRAIS ELÉTRICAS DO RIO JORDÃO revised the PDD and resubmitted it in September, 2006. PDD was also revised due to ITR results, originating PDD version 2 (December 21, 2006)

The validation findings presented in this report relate to the project as described in the PDD on July 21, 2006.

### 2.2 Follow-up Interviews

On August 16, 17 and 18, 2006 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of ELEJOR-CENTRAIS ELÉTRICAS DO RIO JORDÃO were interviewed (see References). The main topics of the interviews are summarised in Table 1.

**Table 1 Interview topics**

Interviewed organisation	Interview topics
ELEJOR-CENTRAIS ELÉTRICAS DO RIO JORDÃO	<ul style="list-style-type: none"><li>➤ Environmental legal requirements related to the project</li><li>➤ Technical characteristics of the project</li></ul>
ECONERGY BRASIL	<ul style="list-style-type: none"><li>➤ Project category</li><li>➤ Actual reduction of tons of GHG</li><li>➤ Barriers to the project</li><li>➤ Methodology</li><li>➤ Origin of data</li><li>➤ Invitation of stakeholders for comments</li></ul>

### 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

To guarantee the transparency of the validation process, the concerns raised are documented in more detail in the validation protocol in Appendix A.

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### 3 VALIDATION FINDINGS

In the following sections the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

- 1) The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Validation Protocol in Appendix A.
- 2) Where Bureau Veritas Certification had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, and documented in the Validation Protocol in Appendix A. The validation of the Project resulted in six Corrective Action Requests and eleven Clarification Requests.
- 3) The conclusions of the validation process are presented.

#### 3.1 Project Design

One fundamental goal of the project is the efficient use of resources, particularly natural resources, while minimizing impact on the environment.

FSCECP - Fundão-Santa Clara Energetic Complex Project activity consists of constructing a hydroelectric complex, composed by Fundão Hydroelectric and by Santa Clara Hydroelectric, both located at Jordão River, State of Paraná. The Fundão Hydroelectric is composed by two power plants: Fundão Hydro Power Plant and Fundão Small-Hydro Power Plant. The Santa Clara Hydroelectric is composed by two power plants: Santa Clara Hydro Power Plant and Santa Clara Small-Hydro Power Plant. With the implementation of this project, Elejor is able to sell electricity to the national grid, avoiding the dispatch of same amount of energy produced by fossil-fuelled thermal plants to that grid. By that, the initiative avoids CO<sub>2</sub> emissions, also contributing to the regional and national sustainable development.

The sponsors of the FSCECP are convinced that hydroelectricity is a sustainable source of energy that brings advantages for mitigating global warming. Using the available natural resources, the Elejor project activity helps to enhance the consumption of renewable energy.

Furthermore, hydroelectricity also plays an important role on the country's economic development, as these kinds of projects provide for approximately 10.000 jobs during the construction of reservoirs and dams, construction of new cities in replacement of the projected to be flooded and construction of transmission lines. The Brazilian heavy industry has developed the technology to supply the hydroelectricity projects with equipment to provide the production of high levels of electricity, therefore such heavy industry development also helps the country to create jobs and achieve sustainable development.

Hydroelectricity is important for the energy strategy of the country. It is an alternative that allows postponing the installation and/or dispatch of electricity produced by fossil-fuelled generation utilities. The sale of the CERs generated by the project will boost the attractiveness of hydroelectric projects, helping to increase the production of this energy and decrease dependency on fossil fuel.

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Elejor also believes that sustainable development will be achieved not only by the implementation of a renewable energy production facility, but also by carrying out activities which correspond to the company social and environmental responsibilities.

The revenues obtained from the sale of the CERs will help ELEJOR-CENTRAIS ELÉTRICAS DO RIO JORDÃO to continue supporting the community. ELEJOR-CENTRAIS ELÉTRICAS DO RIO JORDÃO has a strong social responsibility evidenced in numerous initiatives concentrated in: a) Contribution to the local environmental sustainability; b) Contribution to the improvement of working conditions and employment creation; c) Contribution to income distribution; d) Contribution to regional integration and cooperation with other sectors.

### 3.2 Baseline

The project baseline falls under methodology ACM0002 for grid-connected electricity generation from renewable sources. It reduces emissions by displacing electricity from the grid. It complies with all the conditions limiting the applicability of the methodology.

This methodology is applicable to FSCECP because (i) the power density of Fundão Complex is higher than  $10 \text{ W/m}^2$  ( $122,5 \text{ MW}$  of installed capacity and a flooded area of  $2,15 \text{ km}^2 = 56,97 \text{ W/m}^2$ ) and the power density of Santa Clara Complex is between  $4$  and  $10 \text{ W/m}^2$  ( $123,6 \text{ MW}$  of installed capacity and a flooded area of  $20,14 \text{ km}^2 = 6,13 \text{ W/m}^2$ ); (ii) it's not a fossil fuel switching project; and (iii) the geographical and system boundaries are clearly identified as the S-SE-CO grid.

The project activity follows the steps provided by the methodology taking into account the (b) Simple Adjusted OM calculation for the STEP 1, since there would be no available data for applying to the preferred option – (c) Dispatch Data Analysis OM. For STEP 2, the option 1 was chosen. There are no evidences of the calculations of the variables  $EF_y$ ,  $EF_{om,y}$ ,  $EF_{bm,y}$  and  $\Lambda_y$ , used to determine the baseline scenario.

The definition of the project boundary related to the baseline methodology is applied to the project activity in the following way:

For FSCECP, the South-Southeast and Midwest subsystem of the Brazilian grid is considered as a boundary, since it is the system to which Santa Clara and Fundão are connected. The Santa Clara Hydroelectric and its reservoir and the Fundão Hydroelectric and its reservoir considered as boundary comprises the site where the facility is located.

The additionality of the project is demonstrated by applying the “Tool for the demonstration and assessment of additionality” as required by ACM0002 as follows:

#### **Step 1. Identification of alternatives to the project activity consistent with current laws and regulations.**

The possible baseline scenarios considered are:

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- a) The proposed project activity undertaken without being registered as a CDM project activity;
- b) Continuation of current situation (no project activity or other alternatives undertaken).

Both scenarios are in compliance with all applicable legal and regulatory requirements.

### Step 2. Investment analysis

#### Sub-step 2a. Determine appropriate analysis method

The project activity generates other financial or economic benefits than CDM related income. Therefore, project participants are opting for the benchmark analysis (Option III).

#### Sub-step 2b – Option III. Apply benchmark analysis

The most appropriate financial indicator for the decision context is the Project Internal Rate of Return (project IRR). For the investment benchmark analysis the IRR is the main indicator for comparing all the scenarios under the analysis.

The relevant benchmark value considered by Elejor to compare the project IRR has been derived from the minimum required rate of return of the Brazilian electrical sector, which corresponds to 12%.

#### Sub-step 2c. Calculation and comparison of financial indicators (only applicable to options II and III):

Elejor developed a cash flow analysis for the FSCECP in a transparent manner, including all relevant costs and revenues (excluding CER revenues), in order to calculate the suitable financial indicator.

The assumptions made for the analysis include capital and operating expenses and the IGPM (the inflation rate).

Elejor received financing from BNDES of USD 120 millions (51% of total investment), with a tax rate of TJLP (long term tax rate) plus 4% per year.

The Cash flow for FSCECP was presented to the Designated Operational Entity with detailed financial calculations. It resulted in an IRR (36 years) of 11,237%.

As can be seen, the project is expected to have a low IRR. According to the Elejor's investment IRR threshold of 12%, this would not be an acceptable project. Based on this criteria, the project cannot be considered as financially attractive.

#### Sub-step 2d. Sensitivity analysis (only applicable to options II and III):

The following sensitivity analysis was performed for the project:

1. Fluctuation of the total investment's cost (CAPEX)
  2. Fluctuation of the project's operating costs (OPEX)
  3. Fluctuation of the Brazilian inflation (IGPM)
- and the impact on the IRR is presented in the Table 2 of PDD.

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As can be seen, based on the project's sensitive aspects, the project would require a significant reduction in investment price (highly unlikely) or would require a significant increase in yield (also highly unlikely) to be just over the Financial Index requirement of 12%.

Based on the sensitivity analysis, it remains quite unlikely that the project will be able to satisfy its requirements without the assistance of revenue from the CERs. Then, this emphasizes the project activity is unlikely to be the most financially attractive.

### Step 3. Barrier analysis

#### **Sub-step 3a: Identify barriers that would prevent the implementation of type of the proposed project activity**

The PDD identifies barriers that would prevent the implementation of the project, which are climatic, institutional and political, social and investment. For each of the barriers is presented a rationale to justify its applicability, as follows:

- Climatic – the barriers presented are related to the dependence of the project to the rainfall which varies from the summer to winter. The comments presented in the PDD are adequate and are based on reliable data.
- Institutional and political – The regulatory environment for the electricity sector undergoes frequent changes in Brazil, which causes uncertainties for investors and developers of similar projects.
- Social – The construction of hydroelectric power plant including its dam implicate in a big social impact due to the removal of the population living close to the river course because this area is projected to be flooded.

#### **Sub-step 3b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity)**

The thermoelectric power plants are not belted by Climatic barriers. They may work along the whole year although they are preferentially dispatched after the hydroelectric units.

According to BEN (Balanço Energético Nacional), the Brazilian energetic balance, the thermoelectric generation, in 2004, has increased 17% while hydroelectric generation has increased only 4,9%<sup>3</sup> in comparison with the year 2003. This shows the feasibility of the construction of new thermoelectric units and that they are in fact a plausible scenario when considering new investments on the energy sector.

In another study from ANEEL (Agência Nacional de Energia Elétrica), the Brazilian National Electric Energy Agency) called "PNE 2030 – Plano Nacional

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Energético”, the long term energetic plan for 2030, it is estimated that Brazil has a potential of 28.000MW for the construction of new thermoelectric power plants. The study also mentions the constructions of 4 thermoelectric power plants that, together, add 1.640 MW (USITESC, Seival, Candiota III and Jacuí).

In concern to Social Barriers, the construction of thermoelectric new power plants would not face the barriers that new hydroelectric power plants face, due to the removal of local population that live close to the areas to be flooded. Hydroelectric power plants also face several issues concerning environmental licensing.

Furthermore, the construction of a thermoelectric unit in comparison with the construction of a Hydroelectric involves low investment costs. In summary, the construction of hydroelectric units involves the acquisition of new equipments (turbo generators etc...) and high costs of engineering activities while thermoelectric costs are mainly related to the acquisition of new equipments.

### **Step 4. Common practice analysis.**

#### **Sub-step 4a: Analyze other activities similar to the proposed project activity**

Although the main source of electricity production is made via hydro sources, projects with an installed capacity of more than 200 MW for grid dispatch is not a common practice. Most hydro projects in Brazil have small capacity (ANEEL defines a small-hydro as a hydro power plant with an installed capacity below 30 MW). So, FSCCEP can be considered as the only large hydro project in Brazil which is considering the CDM.

#### **Sub-step 4b: Discuss any similar options that are occurring**

As mentioned previously, from the 148 hydro power plants installed in Brazil, only 46 have installed capacity above 50 MW, and most of these power plants belong to the public sector. So, the initiative of Elejor, a company composed by the public and private sector can't be seen as a sector's common practice.

### **Step 5. Impact of CDM registration**

The frequent political and institutional's rules changes, for example, the more expendable Environmental Licensing Process will be amortized by the expected revenues from CERs.

The climate imposes a significant risk to the project. Every time that the Hydroelectric power plant is not able to generate electric energy, the company isn't able to comply with its PPA (Power Purchase Agreement), the contract for the energy's sale. If that happens, Elejor has to buy the contractual energy from CCEE (Câmara de Comercialização de Energia Elétrica), the Electric Energy Sales Chamber in Brazil, in the short term market. The prices from electric energy change according to market rules, in other words, supply and demand. Therefore, Elejor has to deal with an unexpected cost related to the variation of the prices of the electric energy. The revenues from the commercialization of CERs may also amortize this balance and help Elejor to overcome the risks.



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In what concerns to social barrier, the revenue from CERs commercialization can cover unexpected costs, such as indemnities to the removed people, acquisition of lands, environmental programs and compensatory measures (environmental monitoring programs and educational programs).

The impact of registration of this CDM project activity will contribute to overcoming all the barriers described in this tool: climatic, institutional and political and social barriers by reducing the risks of electricity generation and bringing more solidity to the investment itself and, therefore, fostering and supporting the project owners' breakthrough decision to expand their business model.

Finally the project will achieve the aim of anthropogenic GHG reductions.

### 3.3 Monitoring Plan

The project falls under methodology ACM0002 for grid-connected electricity generation from renewable sources.

The methodology considers monitoring emissions reductions generated from renewable sources, excluding biomass. The energy produced by the project could be electricity exported to a grid-connected system. That is exactly the case with FSCECP: the project exploits water stored at the reservoirs to produce and commercialize renewable electricity connected to a regional Brazilian grid. The methodology is therefore fully applicable to FSCECP, and justification for choosing it.

This methodology is applicable to FSCECP because (i) the power density of Fundão Complex is higher than 10 W/m<sup>2</sup> (122,5 MW of installed capacity and a flooded area of 2,15 km<sup>2</sup> = 56,97 W/m<sup>2</sup>) and the power density of Santa Clara Complex is between 4 and 10 (123,6 MW of installed capacity and a flooded area of 20,14 km<sup>2</sup> = 6,13 W/m<sup>2</sup>); (ii) it's not a fossil fuel switching project; and (iii) the geographical system and boundaries are clearly identified as the S-SE-MW grid.

By dispatching renewable electricity to a grid, electricity that would otherwise be produced using fossil fuel is displaced. This electricity displacement will occur at the system's margin, i.e. this CDM project will displace electricity that is produced by marginal sources (mainly fossil fueled thermal plants) which have higher electricity dispatching costs and are solicited only over the hours that baseload sources (low-cost or must-run sources) cannot supply the grid (due to higher marginal dispatching costs or fuel storage – in case of hydro sources – constraints).

The water used to produce electricity is a renewable source of energy that is replaced to the reservoir due to the natural water cycle. However, during fall and winter the level of the reservoir may drop considerably due to the lack of rainfall depending on the location of the dam. According with ANEEL (Accessed on November 24th, 2005)<sup>1</sup>, from the 148 hydro power plants installed in Brazil,



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only 46 has an installed capacity above 50 MW, and most of these power plants belong to the public sector.

The Brazilian electric sector legislation currently recognizes the role of independent power producers, which has triggered interest in constructing hydroelectric power plants, allowing the production of enough electricity for selling to the market. Furthermore, the ever increasing electricity demand opens an opportunity for some hydroelectric power plants in Brazil. Additionally, the feature of electricity generation from hydro sources is not intermittent, occurring during the whole year, despite of the rainfall problem during the fall and the winter, as discussed above.

The monitoring plan is based on monitoring the amount of electricity supplied to the grid. Details of the monitoring plan are presented in section B.7 and in the annex 4 of the PDD.

All the requirements of the applicable methodology ACM0002 are fulfilled by the project activity.

### 3.4 Calculation of GHG Emissions

The only source of emission of this project activity is an estimative of GHG emissions due to the reservoir of the Santa Clara. According with ACM0002 – version 6, a new hydro electric power projects with reservoirs, with a power density between 4 and 10 must use the formulae below:

$PE_{y, \text{santa clara}} = ER_{\text{res}} * EG_y / 1000$ , where:

$PE_y$  = emissions from the Santa Clara reservoir (tCO<sub>2</sub>e/year);

$ER_{\text{res}}$  = is the default emission factor for emissions from reservoirs (90 Kg CO<sub>2</sub>e /MWh);

$EG_y$  = Electricity produced by UHE Santa Clara in year y (MWh)

As the Fundão Complex has a power density higher than 10 (122,5 MW / 2,15 km<sup>2</sup> = 56,97 W/m<sup>2</sup>), there are no emissions due to the reservoir.

Thus,  $PE_y = PE_y, \text{ Santa Clara} = 0,09 * EG_y$

#### Leakage:

According with ACM0002 – version 6 “The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction, fuel handling (extraction, processing, and transport), and land inundation (for hydroelectric projects – see applicability conditions above). Project participants do not need to consider these emission sources as leakage in applying this methodology. Project activities using this baseline methodology shall not claim any credit for the project on account of reducing these emissions below the level of the baseline scenario.”

Thus,  $Ly_{\text{Santa Clara}} = Ly_{\text{Fundão}} = 0$

$Ly_{\text{Fundão}} + PE_{y, \text{Fundão}} = 0$

$Ly_{\text{Santa Clara}} + PE_{y, \text{Santa Clara}} = 0 + 0,09 * EG_y$

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### Baseline Emissions:

The baseline emissions are the emissions related to the energy that would be delivered to the grid, in the absence of the project. This energy is associated with an emission that is calculated multiplying the energy by an emission factor. It's the same quantity of electric energy that the project will produce and dispatch to the grid:

$BE_{Electricity,y} = E_{Electricity} \cdot EG_y$ , where:

$BE_{Electricity,y}$  Are the baseline emissions due to displacement of electricity during the year  $y$  in tons of  $CO_2$ ;

$EG_y$  Is the net quantity of electricity generated in the bagasse-based cogeneration plant due to the project activity during the year  $y$  in MWh;

$E_{Electricity,y}$  Is the  $CO_2$  baseline emission factor for the electricity.

$$E_{Electricity} \text{ ,2003- 2005} = 0,5 \cdot 0,4349 + 0,5 \cdot 0,0872 = 0,2611 \text{ tCO}_2/\text{MWh}$$

Therefore, for the first crediting period, the baseline emissions will be calculated as follows:

$$BE_{Electricity,y} = 0,2611 \text{ tCO}_2/\text{MWh} \cdot EG_y \text{ (in tCO}_2\text{e)}$$

The emissions reductions of this project activity are:

$$ER_y, \text{ Elejor} = BE_{Electricity,y, \text{ Santa Clara}} - (Ly, \text{ Santa Clara} + PE_y, \text{ Santa Clara}) + BE_{Electricity,y, \text{ Fundão}} - (Ly, \text{ Fundão} + PE_y, \text{ Fundão})$$

$$ER_y, \text{ Elejor} = 0,2611 \cdot EG_y, \text{ Santa Clara} - 0,09 \cdot EG_y, \text{ Santa Clara} + 0,2611 \cdot EG_y, \text{ Fundão}$$

$$ER_y, \text{ Elejor} = 0,2611 \cdot (EG_y, \text{ Santa Clara} + EG_y, \text{ Fundão}) - 0,09 \cdot EG_y, \text{ Santa Clara}$$

The baseline emissions are proportional to the electricity delivered to the grid throughout the project's lifetime. Baseline emissions due to displacement of electricity are calculated by multiplying the electricity baseline emissions factor with the electricity generation of the project activity, that is composed by the addition of the electricity generated by UHE Santa Clara and the electricity generated by UHE Fundão.

The full implementation of the Fundão-Santa Clara Energetic Complex Project (FSCECP) connected to the Brazilian electricity interconnected grid will avoid an average estimated yearly emission of around 265,584  $tCO_2e$ , and a total reduction of about 1,859,094  $tCO_2e$  over the first 7 years crediting period (up to and including 2014. see item A.4.4 of the PDD.).

### 3.5 Sustainable Development Impacts

According to the Brazilian laws, the possible environmental impacts are to be analyzed by IAP – Instituto Ambiental do Paraná. The environmental licensing process comprises the development of a RAP – Relatório Ambiental Preliminar

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(Preliminary Environmental Report) to Fundão and Santa Clara Hydroelectric Power Plant and through a RAS – Relatório Ambiental simplificado (Simplified Environmental Report) to Santa Clara and Fundão Small-Hydro Power Plant. These studies are detailed on the PBA's – Planos Básicos Ambientais. IAP evaluated these documents and emitted all Environmental Licenses of the Santa Clara Complex and of the Fundão-Santa Clara Complex (Preliminary, Installation and Operational Licenses). The Environmental Licenses were emitted based on the accomplishment of all environmental requirements.

There will be no transboundary impacts resulting from FSCECP. All the relevant impacts occur within Brazilian borders and have been mitigated to comply with the environmental requirements for project's implementation. Therefore FSCECP will not affect by any means any country surrounding Brazil.

Environmental impacts were analyzed by IAP, which made technical requirements in the Operation License for the project to comply with:

- Present and implement the Risk Management Plan;
- Rescue and monitor both fauna and flora aquatic or terrestrial;
- Monitor the depleting line;
- Monitor the water quality;
- Sign the Compensatory Measures Compromise Term;
- Maintain the Environmental Education Program;
- Maintain the Communication Social Program;
- Continue with the Archeological Rescue Program;
- Maintain an itinerating museum, with the State Secretariat of Culture and Education;
- Maintain the Development Support to the affected municipalities;
- Continue with the pluviometric monitoring;
- Follow the adaptation and production of the resettled families;
- Send to IAP an annual report about the self-monitoring of the Programs;

These demands are to be complied by Elejor in order to the project be operating under the environmental agency's requirements.

### 3.6 Comments by Local Stakeholders

As a requirement of the Brazilian Interministerial Commission on Global Climate Change, the Brazilian DNA (Designated National Authority), Elejor invited several organizations and institutions to comment the CDM project being developed. Letters were sent to the following recipients:

- Prefeitura Municipal de Candói – PR / Municipal Administration of Candói – PR;
- Câmara Municipal de Candói – PR / Municipal Legislation Chamber of Candói – PR;
- Prefeitura Municipal de Pinhão –Municipal Administration of Pinhão – PR;
- Câmara Municipal de Pinhão – Municipal Legislation Chamber of Pinhão – PR;
- Prefeitura Municipal de Foz do Jordão –Municipal Administration of Foz do Jordão – PR;
- Câmara Municipal de Foz do Jordão – Municipal Legislation Chamber of Foz do Jordão – PR;
- Ministério Público / Federal Prosecutor's Office ;

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- Fórum Brasileiro de ONGs / Brazilian NGO Forum ;
- IAP – Instituto Ambiental do Paraná/ Parana's Environmental Institute.

### 4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

Two comments were received: an e-mail from the Municipal Administration of Pinhão and a letter from the Brazilian NGO Forum.

The Municipal Administration of Pinhão asked for more information about the project regarding the benefits and compensatory measures that the project would bring to the city of Pinhão. The Brazilian NGO Forum commented that it supported projects under CDM and was aware of the importance of the public stakeholder consultation to the improvement of the project's qualities and sustainability. The FBOMS suggested the adoption of additional sustainability criteria such as the "Gold Standard". It mentioned also that period for stakeholder's comments does not allow a more detailed analysis of the project.

Regarding the comments of the Municipal Administration of Pinhão, Elejor answered that the city of Pinhão was benefited with several measures such as: the creation of employees, environmental quality maintenance in the Jordão river surroundings, educational programs, archaeological patrimony preserving, implementation of ecological stations etc. Elejor enhanced that all the information concerning the compensatory measures are in the Basic Environmental Plans (PBA – Plano Básico Ambiental) of the hydro power plants of Santa Clara and Fundão.

Regarding the comments of FBOMS, Elejor informed that, although all verification processes of CDM projects already take into account the evaluation and monitoring of environmental criteria, it would study the possibility of implement an evaluation-certification system for such criteria.

Elejor also mention in both that it was ready to answer any other doubts that stakeholders could have and that they could contact the company anytime. According to the modalities for the Validation of CDM projects, the validator shall make publicly available the project design document and receive, within 30 days, comments from Parties, stakeholders and UNFCCC accredited non-governmental organisations and make them publicly available.

Bureau Veritas Certification published the project documents on the UNFCCC CDM website (<http://cdm.unfccc.int>) from 2006-08-02 until 2006-08-31 and from 2006-10-26 until 2006-11-24 and invited for comments by Parties, stakeholders and non-governmental organisations.

Comments were received from an individual Mrs Ana Luiza Santos and these comments as well as responses are attached in an Appendix B.

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### 5 VALIDATION OPINION

Bureau Veritas Certification Holding S.A has performed a validation of the Fundão-Santa Clara Energetic Complex Project (FSCECP) in Brazil. The validation was performed on the basis of UNFCCC criteria and host country criteria, also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan (July, 2006); ii) follow-up interviews with project stakeholders (August 2006); iii) the resolution of outstanding issues and the issuance of the validation report and opinion (September 2006). PDD was also revised due to ITR results, originating PDD version 2 and due to the revision of the Tool for demonstration of additionality originating version 3, consequently, the validation report was revised in the versions 2 and the 3.

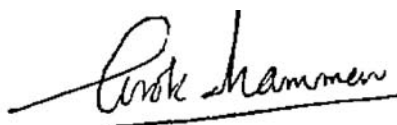
FSCECP - Fundão-Santa Clara Energetic Complex Project activity consists of constructing a hydroelectric complex, composed by Fundão Hydroelectric and by Santa Clara Hydroelectric, both located at Jordão River, State of Paraná. The Fundão Hydroelectric is composed by two power plants: Fundão Hydro Power Plant and Fundão Small-Hydro Power Plant. The Santa Clara Hydroelectric is composed by two power plants: Santa Clara Hydro Power Plant and Santa Clara Small-Hydro Power Plant. With the implementation of this project, FSCECP - Fundão-Santa Clara Energetic Complex Project is able to sell electricity to the national grid, avoiding the dispatch of same amount of energy produced by fossil-fuelled thermal plants to that grid. By that, the initiative avoids CO<sub>2</sub> emissions, also contributing to the regional and national sustainable development.

The review of the project design documentation (July 21, 2006 version) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project correctly applies the Clean Development Mechanism Project Design Document Form (CDM-PDD) – Version 03; the Guidelines for completing the Project Design Document (CDM-PDD) and the proposed new baseline and monitoring methodologies CDM-NM, Version 06.2; the Approved Consolidated Baseline Methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Version 06, the Tool for the demonstration and assessment of additionality – Version 03, and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

The validation is based on the information made available to us and the engagement conditions detailed in this report.

Date: 28/February/2007

Date: 28/February/2007



Ashok Mammen



Antonio Daraya

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### 6 REFERENCES

#### Category 1 Documents:

Documents provided by ELEJOR-CENTRAIS ELÉTRICAS DO RIO JORDÃO, that relates directly to the GHG components of the project.

- /1/ **Clean development mechanism – Project design document (CDM-PDD) – Fundão-Santa Clara Energetic Complex Project (FSCECP)– Version 1, July 21, 2006.**
- /2/ **Clean development mechanism – Project design document (CDM-PDD) – Fundão-Santa Clara Energetic Complex Project (FSCECP)– Version 2, December 21, 2006 and version 3, February 22, 2007**

#### Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

- /3/ **Resolução Interministerial 01.** Comissão Interministerial de Mudança Global do Clima, Sep, 2003.
- /4/ **Resolução Interministerial 02.** Comissão Interministerial de Mudança Global do Clima, Aug 2005.
- /5/ **Clean Development Mechanism Project Design Document Form (CDM-PDD) – Version 03**
- /6/ Guidelines for completing the Project Design Document (CDM-PDD) and the proposed new baseline and monitoring methodologies CDM-NM, Version 06.2
- /7/ **Approved Consolidated Baseline Methodology ACM0002** “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” - Version 06
- /8/ **Tool for the demonstration and assessment of additionality – Version 03**
- /9/ **Kyoto Protocol to the United Nations Framework Convention on Climate Change.** United Nations, Dec, 1997
- /10/ **Clarifications on validation requirements to be checked by a Designated Operational Entity.** UNFCCC/CCNUCC, Sep, 2004
- /11/ **IETA/PCF – Validation and Verification Manual (v. 3.3, Mar 2004)**
- /12/ **ISO/ 14064-3 - Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions**
- /13/ **ISO/ 14064-2 - Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements**
- /14/ **Resolução SEMA 41/2002**
- /15/ **EIA-RIMA – Environmental Impact Assessment for Fundão-Santa Clara**

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### **Energetic Complex.**

- /16/ **PBA – Environmental Basic Project for Fundão-Santa Clara Energetic Complex. November, 2001.**
- /17/ **LO – Operational License Number 7093 for UHE Santa Clara, valid until April 12, 2009.**
- /18/ **LO – Operational License Number 7094 for PCH Santa Clara, valid until April 12, 2009.**
- /19/ **LO – Operational License Number 10328 for UHE Fundão, valid until March 31, 2010.**
- /20/ **LO – Operational License Number 10331 for PCH Fundão, valid until March 31, 2010.**
- /21/ **ANEEL Dispatch number 930, from July 29, 2005 – Giving authorization to UG 1 of Santa Clara UHE to commercialize electrical energy as an Independent Electrical Energy Producer, with installed capacity of 60 MW.**
- /22/ **ANEEL Dispatch number 1102, from Aug. 30, 2005 – Giving authorization to UG 2 of Santa Clara UHE to commercialize electrical energy as an Independent Electrical Energy Producer, with installed capacity of 60 MW.**
- /23/ **ANEEL Dispatch number 1010, from Aug. 08, 2005 – Giving authorization to Santa Clara PCH to commercialize electrical energy as an Independent Electrical Energy Producer, with installed capacity of 3.6 MW.**
- /24/ **ANEEL Dispatch number 1336, from June 22, 2006 – Giving authorization to UG 1 of Fundão UHE to commercialize electrical energy as an Independent Electrical Energy Producer, with installed capacity of 60 MW.**
- /25/ **ANEEL Dispatch number 1757, from Aug. 03, 2006 – Giving authorization to UG 2 of Fundão UHE to commercialize electrical energy as an Independent Electrical Energy Producer, with installed capacity of 60 MW.**

### **Persons interviewed:**

List persons interviewed during the validation, or persons that contributed with other information that are not included in the documents listed above.

- /01/ **ELEJOR – CENTRAIS ELÉTRICAS DO RIO JORDÃO**
  - Nilson P. X. Marchioro
  - Carlos Alberto Guelbert
  - Luiz E. Wolf
  - Osvaldo J. Albuquerque Jr.
  - Paulo César Manfron
- /02/ **ECONERGY BRASIL LTDA**
  - Eduardo Cardoso Filho
  - Marcos C. Sanches

## Appendix A – Validation Protocol

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

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	The project will result in fewer GHG emissions than the baseline scenario.	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country.	Kyoto Protocol Art. 12.2, Marrakesh Accords, CDM Modalities §40a	The final decision from the DNA will be available only after its first meeting after the receiving of all the documents necessary for evaluation, including this validation report, according to Article 6 <sup>th</sup> of Resolução Interministerial 01/03.	Table 4, Section 1.4
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	The project will result in fewer GHG emissions than the baseline scenario.	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved, including confirmation by the host party that the project activity assists it in achieving sustainable development	Kyoto Protocol Art. 12.5a, Marrakesh Accords, CDM Modalities §40a, §28	The final decision from the DNA will be available only after its first meeting after the receiving of all the documents necessary for evaluation, including this validation report,	Table 4, Section 1.4



REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
		according to Article 6 <sup>th</sup> of Resolução Interministerial 01/03.	
<b>5.</b> The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	The project will result in fewer GHG emissions than the baseline scenario.	Table 2, Section E
<b>6.</b> Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, Marrakesh Accords, CDM Modalities §43 and 44	There are some doubts about additionality concepts of this project. Regarding to this requirement, Clarification Requests have been asked. After the receipt of the responses from the project participants the clarification request was closed	Table 2, Section B.3
<b>7.</b> Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Marrakech Accords	There is no public funding involved. See annex 2 of PDD.	Table 2, Section A.4.5
<b>8.</b> Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	Comissão Interministerial de Mudança Global do Clima	-
<b>9.</b> The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	Comissão Interministerial de Mudança Global do Clima	-
<b>10.</b> Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	Marrakech Accords, CDM Modalities §37b	There are evidences that stakeholders have been consulted. Two comments have been received. Two	Table 2, Section G

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
		Clarification requests have been asked.	
<b>11.</b> Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	Marrakech Accords, CDM Modalities §37c	There are environmental impacts identified for the project activity. As required by the Host Party, an Environmental Impact Assessment has been carried out.	Table 2, Section F Documents 14 and 15 of the Reference.
<b>12.</b> Baseline and monitoring methodology shall be previously approved by the CDM Methodology Panel	Marrakech Accords, CDM Modalities §37e	ACM0002 – Approved consolidated baseline/monitoring methodologies for grid-connected electricity generation from renewable sources. Version 06, of May 19, 2006.	Table 2, Section B.1.1 and D.1.1
<b>13.</b> Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	Marrakech Accords, CDM Modalities §37f	There are no evidences of a description of authority and responsibility for the project management. There are no evidences of a description of authority and responsibility for registration, monitoring, measurement and reporting.	Table 2, Section D.4.2.
<b>14.</b> Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	Regarding to these requirement two comments have been received from stakeholders. Two Clarification	Table 2, Section G.

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
		Requests have been asked. After the receipt of the responses from the project participants the clarification requests were closed	
<b>15.</b> A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, CDM Modalities, §45 b, c, e	Baseline methodology has been established.	Table 2, Section B.2
<b>16.</b> The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, CDM Modalities, §47	OK.	Table 2, Section B.2
<b>17.</b> The project design document shall be in conformance with the UNFCCC CDM-PDD format and fulfilled according to the guidelines for completing CDM-PDD, CDM-NMB, and CDM-NMM	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	OK	-

**Table 2 Requirements Checklist**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>A. General Description of Project Activity</b> <i>The project design is assessed.</i>					
A.1. Title of the project activity, version number and date of the document	1	DR	Fundão-Santa Clara Energetic Complex Project (FSCECP) Version: 1. Date: 21/07/2006.	OK	OK
<b>A.2. Description of the project activity</b>					
A.2.1. Is the purpose of the project activity included?	1	DR	The project activity consists of constructing a hydroelectric complex, composed by Fundão Hydroelectric and Santa Clara Hydroelectric, both located at Jordão River, state of Pará. The Fundão Hydroelectric is composed by two power plants: Fundão Hydro Power Plant and Fundão Small Hydro Power Plant. The Santa Clara Hydroelectric is composed by two power plants: Santa Clara Hydro Power Plant and Santa Clara Small Hydro Power Plant. With the implementation of this project, Elejor is able to sell electricity to the national grid, avoiding the dispatch of same amount of energy produced by fossil-fuelled thermal plants to that grid. By that, the initiative avoids CO <sub>2</sub> emissions, also contributing to the regional and national sustainable development.	OK	OK

\* MoV=Means of Verification, DR=Document Review, I=Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A.2.2. Is the view of the project participants on the contribution of the project activity to sustainable development included?	1	DR	Yes. Please, see item A.2 of PDD.	OK	OK
A.2.3. Will the project create other environmental or social benefits than GHG emission reductions?	1	DR	Yes. Please, see item A.2 (a, b, c and e) of PDD.	OK	OK
<b>A.3. Project participants</b>					
A.3.1. Are Party(ies) and private and/or public entities involved in the project activity listed?	1	DR	Yes. Please, see table A.3 of PDD.	OK	OK
A.3.2. Is the contact information provided in annex 1 of the PDD?	1	DR	Yes.	OK	OK
A.3.3. Is this information indicated using the tabular format?	1	DR	Yes.	OK	OK
<b>A.4. Technical description of the project activity</b>					
<b>A.4.1. Location of the project activity</b>					
A.4.1.1. Host country Party(ies)	1	DR	Brazil.	OK	OK
A.4.1.2. Region/State/Province etc.	1	DR	Paraná.	OK	OK
A.4.1.3. City/Town/Community etc.	1	DR	Yes. Candói, Foz do Jordão and Pinhão.	OK	OK
A.4.1.4. Detailed description of the physical location, including information allowing the unique identification of this project activity.	1	DR	FSCECP is located at Jordão River, at the following coordinates: 25° 42' South 52° 00' West.	OK	OK
<b>A.4.2. Category of the project activity</b>					
A.4.2.1. Is the category of the project activity specified?	1	DR	Yes. Energy and Power. Sectorial Scope: 1 – Energy Industries (renewable/non-renewable sources).	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A.4.2.2. Is it justified how the proposed project activity conforms to the project category selected?	-	DR	Category: Renewable electricity generation for a grid (energy generation, supply, transmission and distribution).	OK	OK
<b>A.4.3. Technology to be employed</b> <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.4.3.1. Does the project design engineering reflect current good practices?	-	DR I	Yes.	OK	OK
A.4.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	-	DR I	Yes.	OK	OK
A.4.3.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	-	DR I	No.	OK	OK
A.4.3.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	1	DR I	Yes.	OK	OK
A.4.3.5. Does the project make provisions for meeting training and maintenance needs?	1	DR I	Please, inform which provisions were made to meet training and maintenance activities necessary for the project.	CR 01	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>A.4.4. Brief statement of how anthropogenic emissions of GHG by sources are to be reduced by the proposed CDM project activity</b>					
A.4.4.1 Is it stated how anthropogenic GHG emission reductions are to be achieved?	1	DR	The project will result in GHG emission reductions by displacing electricity generation from fossil-fuel thermal plants that would have otherwise been dispatched to the grid. This electricity displacement will occur at the system's margin, i.e., this CDM project will displace electricity that is produced by marginal sources (mainly fossil fuelled thermal plants) which have higher electricity dispatching costs and are solicited only over the hours that baseload sources (low-cost or must-run sources) cannot supply the grid (due to higher marginal dispatching costs or fuel storage-in case of hydro sources-constraints).	OK	OK
A.4.4.2 Is the estimate of total anticipated reductions of tons of CO <sub>2</sub> equivalent provided? Is this information indicated using the tabular format?	1	DR	A total reduction of 1,859,095 tonnes of CO <sub>2</sub> equivalent is estimated for the first 7 year crediting period, or an average of 265,585 tonnes of CO <sub>2</sub> per year. Information is indicated using the tabular format.	OK	OK
<b>A.4.5. Public funding of the project activity</b>					
A.4.5.1. Is it indicated whether public funding from Parties included in Annex I is involved in the proposed project activity?	1	DR	There is no public funding involved. See annex 2 of PDD.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A.4.5.2. If public funding is involved, is information on sources of public funding for the project activity provided in Annex 2, including an affirmation that such funding does not result on a diversion of official development assistance and is separate from and is not counted towards the financial obligations of those Parties?	1	DR	N.A.	-	-
<b>B. Project Baseline</b> <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
<b>B.1. Baseline Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Are the title and the reference of the baseline methodology applicable to the project activity defined? Does the proposed project activity meet the applicability conditions of the methodology?	1	DR I	ACM0002 – Approved consolidated baseline methodology for grid-connected electricity generation from renewable sources. Version 06 of May 19, 2006. This methodology is applicable to FSCECP because:	OK	OK



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	1	DR	(i) The power density of Fundão Complex is higher than 10 W/m <sup>2</sup> (122,5 MW of installed capacity and a flooded area of 2,15 Km <sup>2</sup> = 56,97 W/m <sup>2</sup> ) and the power density of Santa Clara Complex is between 4 and 10 (123,6 MW of installed capacity and a flooded area of 20,14 Km <sup>2</sup> = 6,13 W/m <sup>2</sup> ); (ii) it is not a fossil fuel switching project; (iii) the geographical system and boundaries are clearly identified as the S-SE-CO grid.	OK	OK
<b>B.2. Description of how the methodology is applied in the context of the project activity</b>					
B.2.1. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	1	DR	The project activity follows the steps provided by the methodology taking into account the (b) Simple Adjusted OM calculation for the Step 1, since there are not available data for applying the preferred option – (c) Dispatch Data Analysis OM. For Step 2, the option 1 was chosen. The table of the item B.2 of the PDD presents the key information and data used to determine the baseline scenario. There are no evidences of which were the basic assumptions of the baseline methodology in the context of the project activity and of the key methodological steps that were followed in determining the baseline scenario.	CAR 01	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>B.3. Description of how the anthropogenic GHG emissions by sources are reduced below those that would have occurred in the absence of the proposed project activity</b>					
B.3.1. Is the proposed project activity additional?	1	DR	Item B.3. Please, explain why additionality is for FSCCHP and not for FSCECP. Please, explain what kind of new power generation units are being considered as alternatives to the project activity. Please, explain on item IV. Investment Barrier, of Step 3. Barrier Analysis, the cost and the impact of the BNDES financing of USD 120 millions for the project. Please, explain why financial application in safe investment funds was not considered as an alternative to the project activity in Step 1a.	CR 02  CR 03  CR 04  CR 05	OK  OK  OK  OK
B.3.2. Are national policies and circumstances relevant to the baseline of the proposed project activity summarised?	-	I	.Yes	OK	OK
<b>B.4. Description of the project boundary for the project activity</b>					
B.4.1. Are the project's spatial (geographical) boundaries clearly defined?	1	DR	For FSCECP, the South/ Southeast and Midwest subsystem of the Brazilian grid is considered as a boundary, since it is the system to which it is connected. The Santa Clara Hydroelectric and its reservoir and the Fundão Hydroelectric and its reservoir considered as boundary, comprise the site where the facility is located.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
B.4.2.Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	1	DR	The project boundaries are defined by the emissions targeted or directly affected by project activities, construction and operation. It encompasses the physical, geographical site of the Hydroelectric Plant and the Energy Grid to which the power plant is connected to.	OK	OK
<b>B.5. Details of the baseline and its development</b>					
B.5.1.Is the date of completion provided?	1	DR	Yes. September 14, 2006.	OK	OK
B.5.2.Is contact information provided?	1	DR	Yes. Econergy Brasil (contact information in Annex I), which is not a participant in this project, is responsible for the technical services related to GHG emission reductions, and is therefore, in behalf of Elejor, the developer of this document, and all its contents.	OK	OK
<b>C. Duration of the Project/ Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1.Are the project's starting date and operational lifetime clearly defined and reasonable?	1	DR	Starting date is July, 31st, 2005. Operational lifetime is 25 years.	OK	OK
C.1.2.Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)?	1	DR	It is a renewable crediting period of two times 7 years.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>D. Monitoring Plan</b> <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.</i>					
<b>D.1. Monitoring Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Did the CDM Methodology Panel previously approve the monitoring methodology?	1	DR	Approved monitoring methodology ACM0002 – Consolidated baseline methodology for grid – connected electricity generation from renewable sources. Version 06.	OK	OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	1	DR	The methodology considers monitoring emissions reductions generated from renewable sources, excluding biomass. The energy produced by the project could be electricity exported to a grid connected system. That is exactly the case with FSCECP: the project exploits water stored at the reservoirs to produce and commercialise renewable electricity connected to a regional Brazilian grid. The methodology is therefore fully applicable to FSCECP and appropriately justified. Therefore, besides being a methodology to be used in conjunction with the approved baseline methodology ACM0002, the same applicability conditions are described and justified in item B.1.1 of PDD.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>D.2. Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Is ACM0002, version 06, the Monitoring methodology for the project?	1	DR	Please, confirm the methodology utilized for the project.	CR 06	OK
D.2.2 Which are the relevant data necessary for determining the baseline of anthropologic emissions by sources of GHG within the project boundary and how such data will be collected and archived?	1	DR	Table 2.1.3 of PDD defines which are the relevant data to be collected and how they will be archived.	OK	OK
D.2.3 Is the formulae to be used to estimate baseline emissions defined?	1	DR	Yes. Section D.2.1.4. defines the formulae to estimate baseline emissions and all the variables involved.	OK	OK
D.2.4. Is the description of the formulae used to estimate emission reductions for the project activity defined?	1	DR	Yes. See Section 2.4 of PDD.	OK	OK
<b>D.3. Quality Control (QC) and Quality Assurance (QA)</b> <i>Quality Control (QC) and Quality Assurance (QA) procedures undertaken for data monitored</i>					
D.3.1.Does the monitoring plan provide information related to uncertainty level of data and the procedures planned for these data, or why such procedures are not necessary?	1	DR	See Table D.3. of PDD.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>D.4. Operational and management structure</b> <i>It is checked the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity</i>					
D.4.1. Is the authority and responsibility of project management clearly described?	1	DR I	There are no evidences of a description of authority and responsibility for the project management	CAR 02	OK
D.4.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	1	DR I	<p>The monthly readings of the calibrated meter equipment will be recorded in the electronic spreadsheet.</p> <p>Sales receipt will be archived for double checking the data. In case of inconsistency, these are the data to be used.</p> <p>There are no evidences of a description of authority and responsibility for registration, monitoring, measurement and reporting the amount of energy sold to the grid.</p>	CAR 03	OK
D.4.3. Are procedures identified for training of monitoring personnel?	1	I	See item A.4.3.5 of this table.	OK	OK
D.4.4. Are procedures identified for calibration of monitoring equipment?	1	I	<p>According to the law, the metering equipment shall be periodically calibrated to comply with the regulations for independent power producers connected to the grid.</p> <p>There are no evidences of procedures for calibration of monitoring equipment.</p>	CAR 04	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.4.5. Are procedures identified for maintenance of monitoring equipment and installations?	1	I	There are no evidences of procedures for maintenance of monitoring equipment and installations.	CAR 05	OK
<b>D.5. Monitoring methodology</b>					
Is it defined and indicated the person/entity responsible for determining the monitoring methodology?	1	DR	The entity responsible for determining the monitoring methodology is ECONERGY, which is the developer of this project.	OK	OK
<b>E. Calculation of GHG Emissions by Source</b> <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
<b>E.1. Predicted Project GHG Emissions</b> <i>The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions, including leakage, captured in the project design?	1	DR	Yes.	OK	OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	1	DR	Yes.	OK	OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	1	DR	Yes.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
E.1.4.Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	1	DR	Yes	OK	OK
E.1.5.Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	1	DR	Yes.	OK	OK
E.1.6.Are uncertainties of external data sources for emissions reduction estimated?	1	DR	Yes.	OK	OK
<b>E.2. Leakage</b> <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.</i>					
E.2.1.Are potential leakage effects beyond the chosen project boundaries properly identified?	1	DR	Yes.	OK	OK
E.2.2.Have these leakage effects been properly accounted for in calculations?	1	DR	Yes.	OK	OK
E.2.3.Does the methodology for calculating leakage comply with existing good practice?	1	DR	Yes.	OK	OK
E.2.4.Are the calculations documented in a complete and transparent manner?	1	DR	Yes.	OK	OK
E.2.5.Have conservative assumptions been used when calculating leakage?	1	DR	Yes.	OK	OK
E.2.6.Are uncertainties in the leakage estimates properly addressed?	1	DR	Yes.	OK	OK



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>E.3. Baseline Emissions</b> <i>The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1.Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	1	DR	Yes.	OK	OK
E.3.2.Are the GHG calculations documented in a complete and transparent manner?	1	DR	Yes.	OK	OK
E.3.3.Have conservative assumptions been used when calculating baseline emissions?	1	DR	Yes.	OK	OK
E.3.4.Are uncertainties in the GHG emission estimates properly addressed in the documentation?	1	DR	Yes.	OK	OK
E.3.5.Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	1	DR	Methodology ACM0002, version 06, May 19, 2006	OK	OK
<b>E.4. Emission Reductions</b> <i>Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.</i>					
E.4.1.Will the project result in fewer GHG emissions than the baseline scenario?	1	DR	Yes.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>F. Environmental and Social Impacts</b> <i>Documentation on the analysis of the environmental and social impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1.Has an analysis of the environmental and social impacts of the project activity been sufficiently described?	1	DR	Yes. Environmental impacts are presented in section F.2 of the PDD and the social impacts are defined in section A.2.	OK	OK
F.1.2.Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	14 15	DR	Yes. EIA was submitted and approved by IAP to issue the Installation License. The project has also an Operation License issued by IAP.	OK	OK
F.1.3.Will the project create any adverse environmental or social effects?	1	DR I	Yes. Compensatory measures were taken by the project owner and IAP follows their implementation. Please, see section F.1 of PDD.	OK	OK
F.1.4.Are transboundary environmental and social impacts considered in the analysis?	1	DR I	Yes. There will be no transboundary impacts resulting from FSCECP. All the relevant impacts occur within Brazilian borders and have been mitigated to comply with the environmental requirements for project's implementation. Therefore FSCECP will not affect by any means any country surrounding Brazil.	OK	OK
F.1.5.Have identified environmental and social impacts been addressed in the project design?	1	DR I	Yes. Environmental impacts have been addressed in section F.2 of the PDD and social impacts section A.2.	OK	OK
F.1.6.Does the project comply with	1	I	See Table 4 of Validation Report.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
environmental legislation in the host country?					
<b>G. Stakeholder Comments</b> <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	1	DR	Yes. There are evidences that relevant stakeholders have been consulted.  PDD had been made available in the UNFCCC website from 2 August 2006 to 31 August 2006 and latter from 26 October 2006 to 24 November 2006. Comments were received from a stakeholder.  Explanations how the comments have been taken are presented in Appendix B.	OK	OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	1	DR	Yes. Letters have been sent to ask for comments from the relevant stakeholders. See item G.1 of the PDD.	OK	OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	1	DR	See item G.1 of the PDD.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
G.1.4. Is a summary of the stakeholder comments received provided?	1	DR	During the Visit to the Fundão-Santa Clara Energetic Complex an information has been given that two stakeholder comments have been received. Please, send information about those comments and which were the actions taken related to those comments.	CR 07	OK
G.1.5. Has due account been taken of any stakeholder comments received?	1	DR	Yes. Two comments were received: an e-mail from the Municipal Administration of Pinhão and a letter from the Brazilian NGO Forum. The Municipal Administration of Pinhão asked for more information about the project regarding the benefits and compensatory measures that the project would bring to the city of Pinhão. The Brazilian NGO Forum commented that it supported projects under CDM and was aware of the importance of the public stakeholder consultation to the improvement of the project's qualities and sustainability. The FBOMS suggested the adoption of additional sustainability criteria such as the "Gold Standard". It mentioned also that period for stakeholder's comments does not allow a more detailed analysis of the project. Elejor thanked for the comments and answered both letters. The answers are in item G.3 of PDD.	OK	OK

**Table 3 Approved Consolidated Baseline and Monitoring Methodologies ACM0002**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>1. Baseline Methodology</b>					
<b>1.1. Applicability</b>					
Is the project activity a grid-connected electricity generation from renewable sources?	1	DR	Yes	OK	OK
Does the project activity apply to electricity capacity additions from run-of-river hydro power plants; hydro power projects with existing reservoirs where the volume of the reservoir is not increased?	1	DR	No	OK	OK
Does the project activity apply to electricity capacity additions from new hydro electric power projects with reservoirs having power densities (installed power generation capacity divided by the surface area at full reservoir level) greater than 4 W/m2?	1	DR	Yes	OK	OK
Does the project activity apply to electricity capacity additions from Wind sources?	1	DR	No	OK	OK
Does the project activity apply to electricity capacity additions from Geothermal sources?	1	DR	No	OK	OK
Does the project activity apply to electricity capacity additions from Wave and tidal sources?	1	DR	No	OK	OK
Does the project activity apply to electricity capacity additions from Project activities that involve switching from fossil fuels to renewable energy at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site?	1	DR	No	OK	OK
Does the project activity apply to electricity capacity additions for which the geographic and system boundaries for the relevant electricity grid can be clearly	1	DR	Yes	OK	OK

\* MoV=Means of Verification, DR=Document Review, I=Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
identified and information on the characteristics of the grid available?					
Does the project activity apply to grid connected electricity generation from landfill gas capture to the extent that it is combined with the approved "Consolidated baseline methodology for landfill gas project activities" (ACM0001)?	1	DR	No	OK	OK
<b>1.2. Identification of the baseline scenario</b>					
Did the project participants identify the most plausible baseline scenario among all realistic and credible alternatives(s)?	1	DR	Yes	OK	OK
Do the project type and the baseline scenario conform to one of those described on applicability of Baseline Methodology ACM0002?	1	DR	Yes. It corresponds to New hydro electricity power projects with reservoirs having power densities greater than 4 W/m <sup>2</sup> .	OK	OK
<b>1.3. Project boundary</b>					
Did the project participants include the physical site of the plant as well as the reservoir area?	1	DR	Yes	OK	OK
Does the spatial extent of the project boundary include the project site and all the power plants connected physically to the electricity system that the CDM project power plant is connected to?	1	DR	Yes. For Fundão-Santa Clara Energetic Complex Project the South-Southeast and Midwest subsystem of the Brazilian grid is considered as a boundary, since it is the system to which it is connected.	OK	OK
<b>1.4. Emissions reductions</b>					
Is the emission reduction determined according to the following formula: $ER_y = BE_{y, Santa Clara} - PE_{y, Santa Clara} - Ly_{Santa Clara}$ ?	1	DR	Yes. In item D.2.4 of PDD, the emission reduction is calculated according to the following formula: $ER_{y, Elejor} = (BE_{thermal, y, Santa Clara} + BE_{electricity, y, Santa Clara} - PE_{y, Santa Clara} - Ly_{Santa Clara}) + (BE_{thermal, y, Fundao} +$	CR 08	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			BElectricity,y, Fundao – PEy, Fundao – Ly, Fundao). Please inform the reason for the inclusion of BEthermal,y,Fundão and BEthermal,y,Santa Clara in the formula above.		
Are all values chosen in a conservative manner and is the choice justified?	1	DR	Yes. See above.	OK	OK
<b>1.5. Project emissions</b>					
Does the project emissions include emissions from the reservoirs of Santa Clara and Fundao?	1	DR	Yes. Project emission from the reservoir of Fundão PEy, Fundão=0 and PEy, Santa Clara=0,09.EGy. Please, in item D.2.4 of PDD, inform the final formula for the calculation of ERy, Elejor.	CR 09	OK
<b>1.6. Emissions reductions due to displacement of electricity</b>					
Are the emission reductions calculated by multiplying the net quantity of electricity generated from renewable sources as a result of the project activity (EGy) with the CO2 baseline emission factor for the electricity displaced due to the project (EElectricity,y), minus the Project emissions PEy, Santa Clara?	1	DR	Yes.	OK	OK
Does the emission factor for the displacement of electricity (EElectricity,y) correspond to the grid emission factor (EFgrid,y)?	1	DR	Yes.	OK	OK
Is the grid emission factor (EFgrid,y) calculated as a combined margin (CM)?	1	DR	Yes. Please, inform the assumptions made and additional information regarding the calculations of the Simple Adjusted OM Emission Factor, Lambda Factors and Build Margin Emission Factor.	CR 10	OK
In determining the <i>net</i> quantities of electricity generation	1	DR	Please, inform if the project participants subtracted	CR 11	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
or the <i>net</i> efficiency of electricity generation, did the project participants subtract the quantity of electricity required for the operation of the power plant (in both the baseline and project cases)?			the quantity of energy required for the operation of the power plant in determining the net quantities of electricity supplied to the grid.		
1.7. Emissions reductions or increases due to displacement of heat					
Did the project participants determine the emission reductions or increases due to displacement of heat ( <i>ER<sub>heat,y</sub></i> )?	1	DR	Emission reductions from heat are not considered because <i>BE<sub>thermal,y</sub></i> , Santa Clara = <i>BE<sub>thermal,y</sub></i> , Fundão = 0	OK	OK
1.8. Baseline emissions due to natural decay or uncontrolled burning of anthropogenic sources of biomass					
Were the baseline emissions due to natural decay or uncontrolled burning of anthropogenic sources of biomass considered null?	1	DR	Biomass decay was non-existent.	OK	OK
1.9. Additionality					
Was the additionality of the project activity demonstrated and using the latest version of the “Tool for the demonstration and assessment of additionality”?	1 7	DR	Yes.	OK	OK
1.10. Leakage					
Were the leakage effects addressed?	1 6	DR	Yes. Please, see item E.2 of PDD.	OK	OK
2. Monitoring Methodology					
2.1. Applicability					
Is the project activity a grid-connected renewable power generation project?	1 6	DR	Yes	OK	OK



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
Is the electricity capacity addition from a run-of-river power plant; hydro power projects with existing reservoirs where the volume of the reservoir is not increased?	6	DR	No	OK	OK
Is the electricity capacity addition from a new hydro electric power project with reservoirs having power densities (installed power generation capacity divided by the surface area at full reservoir level) greater than 4 W/m <sup>2</sup> ?	6	DR	Yes.	OK	OK
Is the electricity capacity addition from Wind sources?	6	DR	No.	OK	OK
Is the electricity capacity addition from Geothermal sources?	6	DR	No.	OK	OK
Is the electricity capacity addition from Solar sources?	6	DR	No.	OK	OK
Does the project activity involve switching from fossil fuels to renewable energy at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site?	6	DR	No.	OK	OK
Can the geographic and system boundaries for the relevant electricity grid be clearly identified and information on the characteristics of the grid is available?	6	DR	Yes.	OK	OK
Is it applied to grid connected electricity generation from landfill gas capture to the extent that it is combined with the approved "Consolidated baseline methodology for landfill gas project activities?"	6	DR	No.	OK	OK
<b>2.2. Monitoring Methodology</b>					
Will the electricity generation from the proposed project activity be monitored?	1	DR	Yes. The Electricity supplied to the grid by the project will be monitored	OK	OK
Will the data needed to recalculate the operating margin emission factor, if needed, based on the choice of the	1 6	DR	Yes.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
method to determine the operating margin (OM), consistent with “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (ACM0002) be monitored?					
Will the data needed to recalculate the build margin emission factor, if needed, consistent with “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (ACM0002) be monitored?	1 6	DR	Yes	OK	OK
Will the data needed to calculate fugitive carbon dioxide and methane emissions and carbon dioxide emissions from combustion of fossil fuels required to operate the geothermal plant be monitored?	1 6	DR	No. This is not a geothermal power project.	OK	OK
Will the surface area of reservoir at the full reservoir level be monitored?	1 6	DR	Yes. This is a new hydro electric power project.	OK	OK
<b>2.3. Project emissions parameters</b>					
Does the project emissions include emissions from the reservoirs of Santa Clara and Fundao?	1	DR	Yes. Please, see question 1.5 of this table.	OK	OK
Do the reservoirs have power densities (installed power generation capacity divided by the surface area at full reservoir level) greater than 4 W/m <sup>2</sup> and less or equal to 10 W/m <sup>2</sup> ?	1 6	DR	The reservoir of UHE Santa Clara has a power density of 6.13 W/m <sup>2</sup> .	OK	OK
Are the project emissions of the UHE Santa Clara being considered, according to the formulae $PE_{y,Santa Clara} = EF_{res} \cdot EG_y / 1000$ , where $PE_{y,Santa Clara}$ is the emission from reservoir expressed as tCO <sub>2</sub> e/year, $ER_{res}$ is the default emission factor for emissions from reservoirs, and the default value as per EB23 is 90 Kg CO <sub>2</sub> e/MWh, and $EG_y$ is the electricity produced by the	1 6	DR	Yes.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
hydro electric power project in year y, in MWh?					
Do the reservoirs have power densities (installed power generation capacity divided by the surface area at full reservoir level) greater than 10 W/m <sup>2</sup> ?	1 6	DR	The reservoir of UHE Fundão has a power density of 56.97 W/m <sup>2</sup> .	OK	OK
Are the project emissions of UHE Fundão PEy,Fundão being considered as null?	1 6	DR	Yes. PEy,Fundão=0	OK	OK
Are there: a) Fugitive carbon dioxide and methane emissions due to the release of non-condensable gases from the produced steam? or b) Carbon dioxide emissions from fossil fuel combustion?	1 6	DR	No. This is not a Geothermal project activity.	OK	OK
<b>2.4. Baseline emission parameters</b>					
Will the net quantity of electricity generated in the project plant during the year y be monitored?	1	DR	Yes. The electricity supplied to the grid by the project will be monitored by measurement with calibrated equipment	OK	OK
Will the EFy CO <sub>2</sub> emission factor be calculated in tCO <sub>2</sub> e/MWh, at the validation?	1	DR	Yes. It will be calculated at the validation and in the baseline renewal.	OK	OK
Will the EFom,y CO <sub>2</sub> operating margin emission factor be calculated, in tCO <sub>2</sub> e/MWh, at the validation?	1	DR	Yes. It will be calculated at the validation and in the baseline renewal, utilizing information from ONS, the Brazilian electricity system manager	OK	OK
Will the EFbm,y CO <sub>2</sub> build margin emission factor be calculated, in tCO <sub>2</sub> e/MWh, at the validation?	1	DR	Yes. It will be calculated at the validation and in the baseline renewal, utilizing information from ONS, the Brazilian electricity system manager	OK	OK
Will the surface area at full reservoir level be measured?	1	DR	Yes. It will be measured at the start of the project.	OK	OK
Will the fraction of time λy, during which low-cost/ must-run sources are on the margin be calculated?	1	DR	Yes. It will be calculated at the validation and in the baseline renewal, utilizing information from ONS, the Brazilian electricity system manager.	OK	OK
<b>2.5. Leakage</b>					
Were the leakage effects addressed?	1	DR	Yes. Please, see item E.2 of PDD.	OK	OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	6				
2.6. Quality Control (QC) and Quality Assurance (QA) procedures					
Will all measurements use calibrated measurement equipment that is maintained regularly and checked for its functioning?	1	I	Please, see item D.4.4. of table 2. There are no evidences that the Electrical Energy Measurement Equipment utilized to measure the Energy Dispatched to the grid are calibrated.	CAR 06	OK

**Table 4 Legal requirements**

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>1. Legal requirements</b>					
1.1. Is the project in line with relevant legislation and plans in the host country?	-	DR I	There are evidences that the project is in line with all the relevant legislation and plans of the Host Country.	OK	OK
1.2. Is the project activity environmentally licensed by the competent authority?	16 17 18 19 20 21 22 23 24	DR I	Operation Licenses for UHE Santa Clara, for PCH Santa Clara, for UHE Fundão and for PCH Fundão have already been granted. Excluding for PCH Fundão, which construction is still being finalized and it is not operational yet, all the ANEEL's authorizations have already been granted.	OK	OK
1.3. Are the conditions of the environmental licenses being met?	-	DR I	Yes.	OK	OK
1.4 Are the conditions of the Designated National Authority being met?	1	DR	The final decision from the DNA will be available only after its first meeting after the receiving of all documents necessary for evaluation, including this validation report, according to Article 6 <sup>th</sup> of Resolução Interministerial 01/03.	-	-

\* MoV=Means of Verification, DR=Document Review, I=Interview

**Table 5 Resolution of Corrective Action and Clarification Requests**

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Tables 2/3/4	Summary of project owner response	Validation team conclusion
<b>CAR 01</b> - There are no evidences of which were the basic assumptions of the baseline methodology in the context of the project activity and of the key methodological steps that were followed in determining the baseline scenario.	Table 2 B.2.1	<p>The ACM0002 – version 6 applies to the project activity for the following reasons:</p> <ul style="list-style-type: none"> <li>• The FSCECP comprises the construction of the new Santa Clara Hydroelectric power plant and the new Fundão Hydroelectric power plant.</li> <li>• Both reservoirs (Santa Clara's reservoir and Fundão's reservoir) have power densities (installed power generation capacity divided by the surface area at full reservoir level) greater than 4 W/m<sup>2</sup>.</li> </ul> <p>The PDD was updated in section B.2.</p>	The information given is considered sufficient, and the corrective action request is closed.
<b>CAR 02</b> - There are no evidences of a description of authority and responsibility for the project management.	Table 2 D.4.1	Elejor has the responsibility for the project management and its strategic decisions as well as the authority concerning it. The authority and responsibility for the project management is Nilson Paula Xavier Marchioro.	The information given is considered sufficient, and the corrective action request is closed.
<b>CAR 03</b> - There are no evidences of a	Table 2	The energy dispatched to the grid will	The information given is considered

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Tables 2/3/4	Summary of project owner response	Validation team conclusion
description of authority and responsibility for registration, monitoring, measurement and reporting the amount of energy sold to the grid.	D.4.2	<p>be measured remotely by COPEL in its headquarters and registered in a generation report. This report will be sent to Elejor which will emit an invoice for COPEL.</p> <p>Elejor shall register the energy sold to the utility in an electronic spreadsheet for further verification, according to the generation report.</p> <p>The calibration of the equipment is in the responsibility of COPEL and will be made every two years. Elejor shall request the calibration certificates from COPEL.</p> <p>The procedures for calibration are determined by ONS, the National Operator of the System (Operador Nacional do Sistema), which controls the dispatch of the energy to the S-SE-MW electric grid.</p> <p>The persons involved in the FSCECP monitoring are: João Miyaoka (engineer of COPEL) responsible for reading remotely the energy despatched to the grid, Sergio Luiz Lamy (the President of</p>	sufficient, and the corrective action request is closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Tables 2/3/4	Summary of project owner response	Validation team conclusion
		<p>Elejor) responsible for checking the quantity of energy sold to COPEL and Renato Luiz Dallagranna (accountant of Elejor) responsible for issuing the invoice.</p> <p>The energy generated will be cross-checked with the sales invoices and receipts from CCEE (Câmara de Comercialização de Energia Elétrica).</p> <p>The PDD was updated in the Annex 4 – Monitoring Plan.</p>	
<p><b>CAR 04</b> - According to the law, the metering equipment shall be periodically calibrated to comply with the regulations for independent power producers connected to the grid. There are no evidences of procedures for calibration of monitoring equipment.</p>	<p>Table 2 D.4.4</p>	<p>The calibration procedures are explained on CAR 3, above.</p> <p>At the time of the calibration, COPEL replaces the existing equipment for one that is already calibrated.</p>	<p>The information given is considered sufficient, and the corrective action request is closed.</p>
<p><b>CAR 05</b> - There are no evidences of procedures for maintenance of monitoring equipment and installations.</p>	<p>Table 2 D.4.5</p>	<p>The Calibration Certificates were sent to Bureau Veritas Certification.</p> <p>The maintenance of the monitoring equipments is according to the manufacturers procedures, and in the case of electric measurements equipments the calibration is done</p>	<p>The information given is considered sufficient, and the corrective action request is closed.</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Tables 2/3/4	Summary of project owner response	Validation team conclusion
		according to ONS procedures.	
<b>CAR 06</b> - There are no evidences that the Electrical Energy Measurement Equipments utilized to measure the Energy Dispatched to the grid are calibrated.	Table 3 2.6	The certificates of calibration of the electric energy measurement equipments are available to Bureau Veritas Certification.	The information given is considered sufficient, and the corrective action request is closed.
<b>CR 01</b> - Please, inform which provisions were made to meet training and maintenance activities necessary for the project.	Table 2 A.4.3.5	COPEL is responsible for training the persons involved in the operation of the power plants. The training certificates are available to Bureau Veritas Certification.	The information given is considered sufficient.
<b>CR 02</b> - Please, explain why additionality is for FSCCHP and not for FSCECP.	Table 2 B.3.1	The PDD was updated. The use of the additionality tool presented in the PDD, as well as the entire PDD, actually refer to FSCECP (Fundão-Santa Clara Energetic Complex Project) and not to FSCCHP.	The information given is considered sufficient.
<b>CR 03</b> - Please, explain what kind of new power generation units are being considered as alternatives to the project activity.	Table 2 B.3.1	Thermoelectric power plant is one alternative for COPEL, the major shareholder of Elejor, which has already invested in one thermoelectric generation unit.  The PDD was updated in section B.3, Sub-Step 1a.	The information given is considered sufficient.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Tables 2/3/4	Summary of project owner response	Validation team conclusion
<b>CR 04</b> - Please, explain on item IV. Investment Barrier, of Step 3. Barrier Analysis, the cost and the impact of the BNDES financing of USD 120 millions for the project.	Table 2 B.3.1	The financing from BNDES has strongly helped the construction of the power plants. The BNDES tax rate is equal to TJLP plus 4%. At the time of the start of the project activity, TJLP was about 8%. That sums a 12% rate for the project financing, which is lower than the SELIC (the Brazilian basic tax rate).  The PDD was updated in section B.3, Step 3 (Investment Analysis).	The information given is considered sufficient.
<b>CR 05</b> - Please, explain why financial application in safe investment funds was not considered as an alternative to the project activity in Step 1a.	Table 2 B.3.1	The core business of Elejor is to invest its money in energy generation and distribution activities. The project participants chose the step 3 (Barrier Analysis) of the Tool for the demonstration and assessment of additionality instead of step 2 (Investment analysis).	The information given is considered sufficient.
<b>CR 06</b> - Please, confirm the methodology utilized for the project.	Table 2 D.2.1	The Monitoring Methodology ACM0002 version 6 is the one used in the project activity.  The PDD was updated in section D.2.1.	The information given is considered sufficient.
<b>CR 07</b> - During the Visit to the Fundação-Santa Clara Energetic Complex an information has	Table 2	Two comments from stakeholders were	The information given is considered

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Tables 2/3/4	Summary of project owner response	Validation team conclusion
been given that two stakeholder comments have been received. Please, send information about those comments and which where the actions taken related to those comments.	G.1.4	received. One from “Forum Brasileiro de ONGs” (the Brazilian NGOs fórum) and the other from the Municipal Administration of Pinhão. The comments were answered. The content of the comments as well as the answers were updated in the PDD (Sections G.2 and G.3).	sufficient.
<b>CR 08</b> – In item D.2.4 of PDD, the emission reduction is calculated according to the following formula: $ER_{y, Elejor} = (BE_{thermal, y, Santa Clara} + BE_{electricity, y, Santa Clara} - PE_{y, Santa Clara} - Ly, Santa Clara) + (BE_{thermal, y, Fundao} + BE_{electricity, y, Fundao} - PE_{y, Fundao} - Ly, Fundao)$ . Please inform the reason for the inclusion of $BE_{thermal, y, Fundao}$ and $BE_{thermal, y, Santa Clara}$ in the formula above.	Table 3 1.4	The PDD was updated in section D.2.4.	The information given is considered sufficient.
<b>CR 09</b> - Project emission from the reservoir of Fundão $PE_{y, Fundao}=0$ and $PE_{y, Santa Clara}=0,09.EG_y$ . Please, in item D.2.4 of PDD, inform the final formula for the calculation of $ER_{y, Elejor}$ .	Table 3 1.5	The PDD was updated in section D.2.4.	The information given is considered sufficient.
<b>CR 10</b> - Please, inform the assumptions made and additional information regarding the calculations of the Simple Adjusted OM	Table 3 1.6	The assumptions made and the summary information of the calculation of the emission factor is demonstrated	The information given is considered sufficient.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in Tables 2/3/4	Summary of project owner response	Validation team conclusion
Emission Factor, Lambda Factors and Build Margin Emission Factor.		in the PDD section E.4 and Annex 3. The spreadsheet of the emission factor calculation is available for Bureau Veritas Certification.	
<b>CR 11</b> - Please, inform if the project participants subtracted the quantity of energy required for the operation of the power plant in determining the net quantities of electricity supplied to the grid.	Table 3 1.6	The electricity exported to the grid is measured directly in the power house by the measurer of COPEL, which also controls the operation of the power plants. The electricity measuring comes directly from the measurers installed in the power plant electric sub-station. Therefore the amount of energy that is fed to the grid does not take into account the amount of energy that is used for the operation of the power plants.	The information given is considered sufficient.

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## **Appendix B – Explanation of taking due account of comments by parties, Stakeholders and NGOs during commenting period**

According to the modalities for the Validation of CDM projects, the DOE shall make publicly available the project design document and receive, within 30 days, comments from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available.

BVQI published the project documents on the UNFCCC CDM website (<http://cdm.unfccc.int>) on 02/08/2006 and latter on 26/10/2006 invited comments within 30/08/2006 and 24/11/2006, respectively, by Parties, stakeholders and non-governmental organizations. The comments received are compiled below in tabular format.

Details of the commenter: Mrs Ana Luiza Santos, email: [analuizacdm@gmail.com](mailto:analuizacdm@gmail.com)

Data of the comment: 22 November 2006

Comment	Response by the project participants	Explanation on how account is taken by the DOE
<p>1. - Considering that it is not a prompt start project but the decision to build the Hydro plant was made in 2002 according to internal report available at <a href="http://www.ceddtvm.com.br/relatorios/RelatorioEjeor2005.pdf">http://www.ceddtvm.com.br/relatorios/RelatorioEjeor2005.pdf</a> and copied above the Step 0 of the additionality tool is not obligatory but an evidence that the CDM was considered during the decision making may be necessary in order to keep transparency</p>	<p>The studies to take advantage of the energetic potential of the Jordão River began in the 1960s by ENERSUL, in order to map the regional hydroelectric potential and the long term planning of the Brazilian Electric Sector. This planning is part of a national energetic matrix study, including the fossil fuel sources. In 1997, COPEL developed a detailed report of the hydroelectric potential and environmental viability of the Jordão River. Considering the necessity to amplify the electric grid generation for the national development, COPEL studied deeply the Fundão-Santa Clara Complex, motivated by the possibility to contribute to the reduction of the greenhouse gases emission. On 01/11/2000, COPEL approved the participation of Mr. Frederico Reichmann Neto, engineer of COPEL, to participate in the Sixth Session of the UNFCCC Conference of the Parties, COP 6 in Hague, Netherlands, 13-24 November, 2000. The information that Frederico got from this event about the contribution of renewable energy to the sustainable development of the country was an evidence that the CDM was considered during the decision making.</p>	<p>Project proponent has adequately explained that the CDM was considered during the decision making.</p>

Comment	Response by the project participants	Explanation on how account is taken by the DOE
2 - The S-SE-CO grid emission factor was calculated using lambda values from 2002-2004. Why the 2005 data was not considered?	The data from 2003, 2004 and 2005 were considered in the new version of the PDD (version 3) for the S-SE-CO grid emission factor calculation.	The information given by the project participant is considered adequate.
3 - The mission of COPEL is generate energy as stated at their website. So, it is their core business generate and distribute energy. Why in Section B.3 is written that One alternative to the project activity was that "COPEL (...) would invest their capital on transmission and distribution lines or in new power generation units"? The company's profit comes from these type of activities and a financial analysis should be carried out in order to show that the CDM was really important for this project.	The Step 2. Investment Analysis was developed in order to demonstrate the financial benefits of the CERs on the decision context.	The project proponent response is considered adequate according to the conclusion presented in the step 2 analysis at the validation report
4 - The climate barrier is not clear because it is common to have insurance policy for low energy production. Does the supply contract consider non-delivery penalties?	In case that the FSCEC power plant is not able to comply with its PPA (Power Purchase Agreement), Elejor has to buy the contractual energy from CCEE (Câmara de Comercialização de Energia Elétrica), the Electric Energy Sales Chamber in Brazil, in the short term market. The prices from electric energy change according to market rules. Therefore, Elejor has to deal with an unexpected cost related to the variation of the prices of the electric energy.	Project proponent has adequately shown the climate barriers in PDD. The response is considered adequate too.

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Comment	Response by the project participants	Explanation on how account is taken by the DOE
5 - The investment barrier was not justified in this PDD. If it was true, all projects in Brazil are automatically additional.	A detailed investment analysis was described in Step 2 of the PDD (version 3).	The investment analysis is described in PDD and the validation team considered it satisfactory as stated in the validation report
6 - Considering the common practice barrier, the energy produced will be delivered to the grid or there is a specific consumer for that energy (such as Sadia SA.). Besides this Elejor is not the first of a kind and a common practice is not convenient.	The energy produced by Elejor will be sold to COPEL (Companhia Paranaense de Energia), the Energy Utility of Paraná State and also to specific consumer such as Sadia SA. FSCECP is not a common practice considering the scale of the power plant as explained in the section 4 of the PDD (version 3).	The common practice analysis presented in PDD was verified and considered adequate according to the validation report.