



VALIDATION REPORT

CORONEL ARAÚJO ENERGÉTICA S/A AND
PASSO FERRAZ ENERGIA S/A

SHPs CORONEL ARAÚJO AND PASSO
FERRAZ CDM PROJECT (JUN1059), BRAZIL

Report No: 9375 – 12/617

Date: 2014-05-12

TÜV NORD CERT GmbH
JI/CDM Certification Program
Langemarckstraße, 20
45141 Essen, Germany
Phone: +49-201-825-3335
Fax: +49-201-825-2139
www.tuev-nord.de
www.global-warming.de



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|--|---|-----------------------------|--|--------------------------|
| Validation Report: | Report No. | Rev. No. | Date of 1st issue: | Date of this rev. |
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| Project: | Title: | Initial PDD Version: | Final PDD Version | |
| | SHPs Coronel Araújo and Passo Ferraz CDM Project (JUN1059), Brazil | 2012-07-13 | 2014-01-20 (Version 03.1) | |
| Project Participant(s): | Client: | | | |
| | Coronel Araújo Energética S/A and Passo Ferraz Energia S/A | | | |
| | Non-Annex 1 country: | | Annex 1 country: | |
| | Brazil | | N/A- | |
| | PP from Non-Annex 1 country: | | PP from Annex 1 country: | |
| | Coronel Araújo Energética S/A Passo Ferraz Energia S/A Carbotrader Assessoria e Consultoria em Energia Eireli (private entities) | | N/A- | |
| Applied methodology/ies: | Title: | No.: | Scope / TA: | |
| | Grid connected renewable electricity generation | AMS I.D ver. 17 | 01 / 1.2 | |
| Validation team / Technical Review and Final Approval | Validation Team: | Technical review: | Final approval: | |
| | Sergio Cruz (TL), Ricardo Lopes (TM), Marcelo Sebben (TM) | Emilio Martin | Emilio Martin | |
| Expected Emission reductions: [t CO₂e] | Expected emission reductions over the first crediting period: | | (Expected) starting date of the crediting period: | |
| | 73,017 | | 2014-01-01 | |
| Confidential content: | <input checked="" type="checkbox"/> Yes | | <input type="checkbox"/> No | |
| Key dates of validation: | Publication of PDD: | Draft Report issued: | On-site (from): | On-site (to): |
| | 2012-12-04 | 2013-02-14 | 2013-01-29 | 2013-02-01 |
| Summary of Validation Opinion: | <p>In detail the conclusions can be summarised as follows:</p> <p><input checked="" type="checkbox"/> The project is in line with all relevant host country criteria (Brazil) and all relevant UNFCCC requirements for CDM. At the time of the completion of the validation, the LoA was pending. For the Brazilian DNA, a positive validation opinion is a prerequisite for the host government approval and thus the LoA could not be considered at the rev.2 of the validation report. The LoA has been issued on 2013-10-14. Changes of this revision to revision 2.1 are only due to applicable UNFCCC requirements, minor editorial corrections and LoA assessment and not to the project activity content.</p> <p><input checked="" type="checkbox"/> The project additionality is sufficiently justified in the PDD.</p> <p><input checked="" type="checkbox"/> The monitoring plan is transparent and adequate.</p> <p><input checked="" type="checkbox"/> The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 73,017 t CO₂e are most likely to be achieved within the (1st renewable) crediting period.</p> <p><input checked="" type="checkbox"/> The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.</p> | | | |
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Abbreviations

| | |
|------------------------|---|
| ANEEL | National Agency of Electric Energy |
| BAU | Business as usual |
| CA | Corrective Action / Clarification Action |
| CAR | Corrective Action Request |
| CDM | Clean Development Mechanism |
| CER | Certified Emission Reduction |
| CERNE | Centre of Studies in Natural Resources and Energy |
| CL | Clarification Request |
| CO₂ | Carbon dioxide |
| CO_{2e} | Carbon dioxide equivalent |
| CP | Certification Program |
| DNA | Designated National Authority |
| DvalR | Draft Validation Report |
| EB | CDM Executive Board |
| EIA | Environmental Impact Assessment |
| FAR | Forward Action Request |
| GHG | Greenhouse gas(es) |
| IPCC | Intergovernmental Panel on Climate Change |
| PDD | Project Design Document |
| QC/QA | Quality control/Quality assurance |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VVS | Validation and Verification Standard |

| Table of Contents | Page |
|--|-------------|
| 1 OBJECTIVE / SCOPE | 6 |
| 2 GHG PROJECT DESCRIPTION..... | 7 |
| 2.1 Project Characteristics | 7 |
| 2.2 Involved Parties and Project Participants | 7 |
| 2.3 Project Location | 8 |
| 2.4 Technical Project Description | 8 |
| 3 METHODOLOGY AND VALIDATION SEQUENCE..... | 10 |
| 3.1 Validation Steps | 10 |
| 3.2 Contract review | 10 |
| 3.3 Appointment of team members and technical reviewers | 10 |
| 3.4 Consideration of Public Stakeholder Comments | 12 |
| 3.5 Validation Protocol | 12 |
| 3.6 Review of Documents | 13 |
| 3.7 Site Visit and Follow-up Interviews | 13 |
| 3.8 Project comparison | 14 |
| 3.9 Resolution of Clarification and Corrective Action Requests | 14 |
| 3.9.1 Definition | 14 |
| 3.9.2 Draft Validation | 14 |
| 3.9.3 Final Validation | 14 |
| 3.10 Technical review | 15 |
| 3.11 Final approval | 15 |
| 4 VALIDATION FINDINGS | 16 |
| 5 VALIDATION ASSESSMENT SUMMARY | 36 |
| 5.1 General Description of the Project Activity | 36 |
| 5.1.1 Technology to be employed | 36 |
| 5.1.2 Small Scale Projects | 36 |
| 5.2 Project Baseline | 37 |
| 5.2.1 Application of the Methodology | 37 |
| 5.2.2 Project Boundary | 38 |
| 5.2.3 Baseline Identification | 38 |
| 5.2.4 Algorithms and formulae used to determine emission reductions | 38 |
| 5.3 Additionality Determination | 39 |
| 5.3.1 Consideration of CDM in decision making (if project start before validation) | 39 |
| 5.3.2 Alternatives | 42 |
| 5.3.3 Investment analysis | 42 |
| 5.3.4 Barrier analysis | 42 |



| | | |
|---|--------------------------------|-----|
| 5.3.5 | Common practice analysis | 43 |
| 5.4 | Monitoring Plan | 43 |
| 5.5 | Crediting Period | 44 |
| 5.6 | Environmental Impacts | 44 |
| 5.7 | Comments by Local Stakeholders | 44 |
| 5.8 | Participation | 45 |
| 5.8.1 | Project Participants | 45 |
| 5.8.2 | LOA | 45 |
| 5.8.3 | MoC | 45 |
| 5.9 | PDD editorial Aspects | 46 |
| 6 | VALIDATION OPINION | 47 |
| 7 | REFERENCES | 48 |
| ANNEX 1: VALIDATION PROTOCOL..... | | 60 |
| ANNEX 2: ASSESSMENT OF APPLICABILITY CRITERIA | | 119 |
| ANNEX 3: ASSESSMENT OF BASELINE IDENTIFICATION | | 122 |
| ANNEX 4: ASSESSMENT OF FINANCIAL PARAMETERS..... | | 123 |
| ANNEX 5: ASSESSMENT OF BARRIER ANALYSIS | | 142 |
| ANNEX 6: OUTCOME OF THE GSCP | | 143 |
| ANNEX 7: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL | | 144 |

1 OBJECTIVE / SCOPE

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

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

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

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

The information included in the PDD and the supporting documents were reviewed against the requirements as set out by the UNFCCC. The validation team has, based on the requirements in the Validation and Verification Standard^{VVS}, carried out a full assessment of all evidences to assess the compliance of the project with the key areas as outlined in section 7. of the VVS (version 03.0, EB 70).

The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions.

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

2 GHG PROJECT DESCRIPTION

2.1 Project Characteristics

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

Table 2-1: Project Characteristics

| Item | Data |
|---|--|
| Project title | SHPs Coronel Araújo and Passo Ferraz CDM Project (JUN1059), Brazil |
| Project size | <input type="checkbox"/> Large Scale <input checked="" type="checkbox"/> Small Scale |
| Project Scope (according to UNFCCC sectoral scope numbers for CDM) | <input checked="" type="checkbox"/> 1 Energy Industries (renewable- /non-renewable sources) |
| | <input type="checkbox"/> 2 Energy distribution |
| | <input type="checkbox"/> 3 Energy demand |
| | <input type="checkbox"/> 4 Manufacturing industries |
| | <input type="checkbox"/> 5 Chemical industry |
| | <input type="checkbox"/> 6 Construction |
| | <input type="checkbox"/> 7 Transport |
| | <input type="checkbox"/> 8 Mining/Mineral production |
| | <input type="checkbox"/> 9 Metal production |
| | <input type="checkbox"/> 10 Fugitive emissions from fuels (solid, oil and gas) |
| | <input type="checkbox"/> 11 Fugitive emissions from production and consumption of halocarbons and hexafluoride |
| | <input type="checkbox"/> 12 Solvents use |
| | <input type="checkbox"/> 13 Waste handling and disposal |
| | <input type="checkbox"/> 14 Afforestation and Reforestation |
| | <input type="checkbox"/> 15 Agriculture |
| Applied Methodology | AMS I.D ver. 17 |
| Technical Area(s) | 1.2 Renewable Energies |
| Crediting period | <input checked="" type="checkbox"/> Renewable Crediting Period (7 y) <input type="checkbox"/> Fixed Crediting Period (10 y) |
| Start of crediting period | 2014-01-01 |

2.2 Involved Parties and Project Participants

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

Table 2-2: Project Parties and project participants

| Characteristic | Party | Project Participant |
|---------------------|--------|---|
| Non-Annex 1 Country | Brazil | Coronel Araújo Energética S/A Passo Ferraz Energia S/A Carbotrader Assessoria e Consultoria em Energia Eireli |
| Annex 1 Country | N/A | N/A- |

2.3 Project Location

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

Table 2-3: Project Location

| No. | Project Location |
|---------------------------|--|
| Host Country | Brazil |
| Region: | South Region – State of Santa Catarina |
| Project location address: | City of Água Doce (Coronel Araújo SHP) and City of Bom Jesus (Passo Ferraz SHP) |
| Coronel Araújo SHP | |
| - Latitude: | 26° 40' 21" S |
| - Longitude: | 51° 45' 09" W |
| Passo Ferraz SHP | |
| - Latitude: | 26° 45' 32.10" S |
| - Longitude: | 52° 23' 07.59" W |

2.4 Technical Project Description

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

Table 2-4: Technical data of the project activity

Coronel Araújo SHP

| Parameter | Unit | Value |
|---------------------------|-------------------|--------------------------|
| Generator | | |
| - Type | - | Synchronous |
| - Quantity (serial #s) | Un | 2 (161610 and 161612) |
| - Power | kW | 2 x 2,898.5 |
| - Nominal Power | kVA | 2 x 3,100 |
| - Voltage | kV | 6.9 |
| - Frequency | Hz | 60 |
| - Assured Energy | MWaverage | 3.70/3.89 ¹ |
| - Cos φ | | 0.935 |
| Turbine | | |
| - Type | - | Francis |
| - Quantity (serial #s) | Un | 2 (1244-1 and 1244-2) |
| - Power | kW | 2 x 3,008 |
| - Nominal Flow | m ³ /s | 2 x 11.09 |
| - Head | m | 30.4 |
| - Rotation | Rpm | 514.28 |

¹ A value of 3.70 was considered for the investment analysis, following guidance 6 of the "Guidelines on the Assessment of Investment Analysis, whereas a value of 3.89 was used for the calculation of emission reductions.

Passo Ferraz SHP

| Parameter | Unit | Value |
|---------------------------|-------------------|----------------------------------|
| Generator | | |
| - Type | - | Synchronous |
| - Quantity (Serial #s) | Un | 3 (090006, 090005 and 090007) |
| - Power | kW | 3 x 1,333.8 |
| - Nominal Power | kVA | 3 x 1,482 |
| - Voltage | kV | 2.1 |
| - Frequency | Hz | 60 |
| - Assured Energy | MWaverage | 2.21/2.10 ² |
| - Cos φ | | 0.9 |
| Turbine | | |
| - Type | - | Kaplan |
| - Quantity (serial #s) | Un | 3 (1296, 1298 and 1297) |
| - Power | kW | 3 x 1,382 |
| - Nominal Flow | m ³ /s | 3 x 19.52 |
| - Head | m | 8.0 |
| - Rotation | Rpm | 360 |

² A value of 2.21 was considered for the investment analysis, following guidance 6 of the "Guidelines on the Assessment of Investment Analysis, whereas a value of 2.10 was used for the calculation of emission reductions.

3 METHODOLOGY AND VALIDATION SEQUENCE

3.1 Validation Steps

The validation of the project consisted of the following steps:

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

3.2 Contract review

To assure that

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

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

3.3 Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities, a validation team, consisting of one team leader and 1 additional team member, as well as the Technical Review personnel were appointed.

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

Table 3-2: Involved Personnel

| | Name | Company | Function ¹⁾ | Qualification Status ²⁾ | Scheme competence ³⁾ | Technical competence ⁴⁾ | Host country Competence | On-site visit |
|---|----------------|----------------------|------------------------|------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Sergio Cruz | BRTÜV | TL ^{A)} | LA | <input checked="" type="checkbox"/> | 1.2 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Ricardo Lopes | BRTÜV | TM ^{A)} | LA | <input checked="" type="checkbox"/> | 1.2 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Marcelo Sebben | BRTÜV | TM ^{A)} | A | <input checked="" type="checkbox"/> | 1.2 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms. | Martin Emilio | TÜV NORD, Germany | FA/TR ^{B)} | SA | <input checked="" type="checkbox"/> | 1.2 | <input type="checkbox"/> | <input type="checkbox"/> |

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

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

³⁾ GHG auditor status (at least Assessor)

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

⁵⁾ In case of verification projects

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

^{B)} No team member

All team members contributed to the review of documents, the assessment of the project activity and to the preparation of this report under the leadership of the team leader.

Only the team members indicated in the table above attended in the complete site-visit.

In order to qualify further personnel the project team was accompanied by observers and/or trainees as indicated in the table above. They are usually not considered as team members.

Statements of competence for the above mentioned team members are enclosed in annex 7 of this report.

3.4 Consideration of Public Stakeholder Comments

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

In case comments are received, they are taken into account during the validation process. The comments and the discussion of the same are documented in annex 6 of this report.

3.5 Validation Protocol

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

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

The validation protocol is described in Figure 1.

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

Figure 1: Validation protocol table

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

3.6 Review of Documents

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

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

3.7 Site Visit and Follow-up Interviews

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

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

Table 3-3: Interviewed persons and interview topics

| Interviewed Persons / Entities | Interview topics |
|---|--|
| Project proponent representatives Project consultant | <ul style="list-style-type: none">- Chronological description of the project activity with documents of key steps of the implementation.- Current status of plant design- Technical details of the project realization, project feasibility, designing, operational life time, monitoring of the project- Host Government Approval- Approval procedures and status- Monitoring and measurement equipment and system.- Financial aspects- Crediting period- Project activity starting date- CER allocation / ownership- Baseline study assumptions- Additionality- Sustainable development issues- Monitoring- Analysis of local stakeholder consultation- Roles & responsibilities of the project participants w.r.t. project management, monitoring and reporting- National Legislation- Editorial issues of the PDD |

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

3.8 Project comparison

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

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

3.9 Resolution of Clarification and Corrective Action Requests

3.9.1 Definition

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

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

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

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

3.9.2 Draft Validation

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

3.9.3 Final Validation

The final validation starts after issuance of the proposed corrective action (CA) of the CARs, CLs and FARs by the project proponent. The project proponent has to reply on those and the requests are “closed out” by the validation team in case the response is assessed as sufficient. In case of raised FARs the project proponent has to respond on this, identifying the necessary actions to ensure that the topics raised

in this finding are likely to be resolved at the latest during the first verification. The validation team has to assess whether the proposed action is adequate or not.

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

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

3.10 Technical review

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

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

3.11 Final approval

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

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

4 VALIDATION FINDINGS

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

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

| Validation topic ¹⁾ | No. of CAR | No. of CL | No. of FAR |
|--|---------------|--------------|---------------|
| Description of project activity (A): <ul style="list-style-type: none"> - Project specification - Technical project description - Project Participants Technologies and/or measures | 0 | 2 | 0 |
| Application of selected approved baseline and monitoring methodology (B) <ul style="list-style-type: none"> - Application of the Methodology - Project Boundary - Baseline identification - Calculation of GHG emission reductions <ul style="list-style-type: none"> Project emissions Baseline emissions Leakage - Additionality determination - Monitoring Methodology - Monitoring Plan - Project management planning | 7 | 6 | 0 |
| Duration and Crediting Period (C) | 0 | 1 | 0 |
| Environmental impacts (D) | 0 | 0 | 0 |
| Local Stakeholder Consultation (E) | 0 | 2 | 0 |
| Approval, Authorization and other aspects (F): <ul style="list-style-type: none"> - Letter of Approval - Contribution to sustainable development - MoC - PDD editorial aspects | 0 | 0 | 0 |
| SUM | 7 | 11 | 0 |

¹⁾ The letters in brackets refer to the validation protocol

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

The findings of validation process are summarized in the tables below.

| Finding | CL A1 |
|--|--|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>Section A.1 of the PDD:</p> <ul style="list-style-type: none"> - Beside the estimation of the annual average emission reductions the total GHG emission reductions for the chosen crediting period should be provided. <p>Section A.3, the PDD</p> <ul style="list-style-type: none"> - It does not provide information about age and average lifetime of the equipment based on manufacturer's specification and industry standards as required by the guidelines for completing the SSC-PDD. Moreover, according to the guidelines to complete a PDD, the load factors and efficiencies and information about the monitoring equipment and their location in the system should be provided. The expression "assured energy" needs further explanation how it is defined and what is the difference between PLF and assured energy. Furthermore some technical details as rated (or net) head for both SHPs, how the SHPs are connected to the grid (substations, transmission lines...) is missing. <p>Associated checklist question(s): A.1.1, F.3.2</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The total GHG emission reduction for the first 7 years was included (73,017 tCO₂)</p> <p>The information was provided accordingly in the PDD version 2 (30 year based on the manufacture's statements).</p> <p>ANEEL allows generators to sell all of their "assured energy" via freely negotiated contracts with consumers above 3MW (this value is equivalent to the Plant Load Factor). Since is also the ratio of the actual output of a power plant over a period of time and its output if it had operated a full capacity of that time period.</p> <p>Also the monitoring equipment, SHPs grid connections, etc were included in the section A.3.</p> |



| Finding | CL A1 |
|---|---|
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The total GHG emission reduction for the first crediting period was included in section A.1 of the PDD and it is equal to 73,017 tCO₂e.</p> <p>The information was included in PDD. The PP provided letters from the turbines' and generators' manufacturers^{/LIFE/} stating that these equipments have life time of 30 years if maintained adequately.</p> <p>The current equipment installed in the facilities was described in the PDD and are in accordance with the ones observed during the validation visit as well as their location.</p> <p>SHP Coronel Ferraz is connected to the grid through the substation Palmas (location of the electricity meters)</p> <p>SHP Passo Ferraz is connected to the grid straight after the power plant. That is the reason why the measuring meters are located at the SHP's powerhouse.</p> <p>Assured energy is the maximum annual electricity production that a plant has to produce by contract in a determined cycle (yearly average for example). It is determined by ANEEL which is the National Association of Electric Energy. Its value is given in MW_{average} or MWh/year. It can be related to PLF once PLF is the maximum electricity that a plant can produce, based on its efficiency. The assured energy is used in power plants in Brazil as it is part of the national electric strategy and it has been used in this case to determine the maximum energy that the plants can produce.</p> <p>The head of the SHPs were included in the PDD and their evidences^{/PLF/} were sent to the validation team.</p> <p><u>CL is closed.</u></p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding | CL A2 |
|--|---|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>In section A.3, the PDD does not describe correctly the provisions of small scale activity as per the project standards.</p> <p>Associated checklist question(s): A.2.2, F.3.2</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The provisions of small scale project activity were described accordingly in the PDD version 2.</p> |

| Finding | CL A2 |
|---|---|
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The information regarding the provisions of small scale was duly included in the PDD.</p> <p><u>CL is closed.</u></p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding | CL B1 |
|---|--|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>In section B.1, the exact reference of the methodology and tool applied by the project activity as well as the correct version of them are missing.</p> <p>Associated checklist question(s): B.1.1, F.3.2</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The Tool to calculate the emission factor for an electricity system was updated (version 03.0.0) and also the ACM0002 meth reference was included.</p> <p>The exact references of the meth and tools used were informed in the section B.1.</p> |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The information required by the guidelines for completing the PDD was included.</p> <p>Furthermore, the tool version was updated.</p> <p><u>CL is closed.</u></p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding | CL B2 |
|---|--|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>In section B.3 of the PDD it is missing the emission sources of the project activity and the baseline as per Guidelines for completing the SSC PDD.</p> <p>Associated checklist question(s): B.3.2, F.3.2</p> |



| Finding | CL B2 |
|---|---|
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | The table with the sources was included in the PDD version 2. |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | The main emissions of the baseline and project scenarios were included in section B.3 of the PDD. <u>CL is closed.</u> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding | CAR B3 |
|--|--|
| Classification | <input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | At Section B.5, benchmark calculation: <ol style="list-style-type: none"> 1. The benchmark applied for comparison with the chosen IRR is not clear in the PDD ; 2. debt/equity ratio is missing; 3. the reference about the choice of the vintage of the Average Return of Rate (1996 to 2005) used at the calculations is missing; 4. the references for inflation, tax free risk, and ERP are missing; 5. it is not stated if the benchmark is in real or nominal terms; 6. it is not stated if the benchmark is pre-tax or post-tax. Associated checklist question(s): B.5.1.1, B.5.4.1, B.5.4.19, B.5.4.20, B.5.4.21, B.5.4.22, B.5.4.23, B.5.4.24, B.5.4.25, B.5.4.26, B.5.4.27, B.5.5.1, B.5.5.4 |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <ol style="list-style-type: none"> 1. The CAPM Model was identified in the PDD version 2; 2. The Deb/Equity ratio was also included (0/100%); 3. 10 years before the SHP Coronel Araujo investment decision; 4. The references were included; 5. Included Real Terms; 6. Included Post-Tax. |



| Finding | CAR B3 |
|--|---|
| <p>DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p> | <ol style="list-style-type: none"> 1. The benchmark analysis was performed by comparing the Project IRR (obtained from the CAPM – Capital Asset Pricing Model) with the benchmark (WACC). The information was included in section B.5 of the PDD. The type of benchmark is appropriate for the project IRR and it is in accordance with the requirements of the applied methodology. It is possible to confirm the additionality of the project according to the applied methodology. Furthermore, the PDD now provided evidences that the project will not be the most financially attractive alternative as the IRRs calculated are smaller than the Benchmark chosen for both SHPs. All evidences were assessed by validation team and are considered plausible. 2. There is no financing included in the investment of this project activity. Thus, a 0/100% debt/equity ratio has been considered. 3. The reference of choice of vintage was included in the investment analysis. The vintage data considered was from 10 years before the investment decision of SHP Coronel Araújo. This reference was compiled in an excel spreadsheet and sent to the validation team^{/BENCH/}. 4. The inflation is described in the spreadsheet Ke_calculation_V2.xls, tab “Brazilian Risk”, being calculated using an adjustment between the US inflation and the Brazilian Inflation. The tax free risk was based on values of the T-Bond for the period comprehended between 1996 and 2005 (10 years before the investment decision). ERP was based on data from JP Morgan corresponding to years 1996 to 2005. 5. The benchmark was calculated in real terms. It was considered by the validation team that the Benchmark and the cash flow have been applied consistently. This information was included in the PDD, section B.5 / investment analysis. 6. The benchmark was calculated post tax. This information was included in the PDD, section B.5 / investment analysis. <p>It is important to point out that</p> <ul style="list-style-type: none"> - The benchmark value is suitable for the project activity as it was calculated based on publically available information (American T-Bond and Host Country’s risk) and related to energy generation investments. This way of calculation (estimating the risk premium country rate relatively to US market) was based on the document “Estimating Discount Rates”^{/BENCH/} by Aswath Damodaran which is an expert in this matter and is known worldwide. - No internal benchmark was chosen for this project |



| Finding | CAR B3 |
|---|---|
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding | CAR B4 |
|--|--|
| Classification | <input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>The calculation of the presented IRR is not consistent with Equity IRR described in the PDD, once loans, interests and amortizations were not considered in the calculations. Furthermore, justify the benchmark used in this case.</p> <p>Associated checklist question(s): B.5.1.1, B.5.4.1, B.5.4.10, B.5.4.19, B.5.4.20, B.5.5.1, B.5.5.4</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The IRR presented is consistent with Equity IRR described in the PDD in accordance with the "GUIDELINES ON THE ASSESSMENT OF INVESTMENT ANALYSIS"</p> <p>"10. Guidance: In the calculation of equity IRR only the portion of investment costs which is financed by equity should be considered as the net cash outflow, the portion of the investment costs which is financed by debt should not be considered a cash outflow." So loans and interests should not be considered in the cashflow. See the</p> <p>Amortization was considered only to calculate the fair value of the project activity at the end of the cashflow. Since the tax applicable to the projects is the "presumed profit" (in accordance with the Brazilian Accounting Rules).</p> <p>Due all this, the Benchmark used is the Equity IRR since the <u>Project IRR</u> calculation is to determine the viability of the project to service debt (which is not applicable in this case).</p> <p>"12. Guidance: In cases where a benchmark approach is used the applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for equity IRR...."</p> |



| Finding | CAR B4 |
|--|--|
| <p>DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p> | <p>As per concept, Equity IRR is the vision of the stakeholder (only equity portion) and Project IRR is the vision of the whole project, independently of how it is financed.</p> <p>The <u>project IRR</u> takes as its inflows the full amount(s) of money that are needed in the project. The outflows are the cash generated by the project. The calculation <u>assumes</u> that no debt is used for the project, even though it <u>may</u> occur.</p> <p><u>Equity IRR assumes</u> that you use debt for the project, so the inflows are the cash flows required minus any debt that was raised for the project. The outflows are cash flows from the project minus any interest and debt repayments. Hence, equity IRR is essentially the “leveraged” version of project IRR.</p> <p>So, as there was no financing associated to the project, the validation team conclude that the financial indicator used (equity IRR) is not indicated for this type of project.</p> <p><u>CAR remains open</u></p> |
| <p>Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p> | <p>The calculations of the IRRs were adjusted accordingly in the Financial Spreadsheet version 2 (Project IRR). And also the benchmark was changed to the WACC (Weighted Average Cost of Capital).</p> |

| Finding | CAR B4 |
|---|---|
| DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The chosen financial indicator (Project IRR) is considered to be indicated for this type of project. The chosen benchmark WACC considers the cost of both portions of the investment (cost of debt and cost of equity) what is in accordance with the guidelines for investment analysis.</p> <p>Now it is possible to confirm the additionality of the project according to the applied methodology.</p> <p>Furthermore The PDD now provided evidences that the project will not be the most financially attractive alternative as the IRRs calculated are smaller than the Benchmark chosen for both SHPs. All evidences were assessed by validation team and are considered plausible.</p> <p>The benchmark value is suitable for the project activity as it was calculated based on publically available information (American T-Bond and Host Country's risk) and related to energy generation investments. This way of calculation (estimating the risk premium country rate relatively to US market) was based on the document "Estimating Discount Rates" ^{/BENCH/} by Aswath Damodaran which is an expert in this matter and is known worldwide.</p> <p>No internal benchmark were chosen for this project</p> <p><u>CAR is closed.</u></p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding: | CL B5 |
|---|--|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>At Section B.5, according to the "Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM", for proposed project activities with a start date before 2 August 2008, a full demonstration that the CDM was seriously considered in the decision to implement the project activity has to be done.</p> <p>Associated checklist question(s): B.5.2.3, B.5.4.8 and F.3.2</p> |



| Finding: | CL B5 |
|---|--|
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>More details about CDM Prior Consideration were provided at the Section B.5 in the PDD version 2 as below “As observed all the Power Plants took in consideration the CDM benefits before and also during the project activity implementation. The SHP Coronel Araújo started their implementation in 19/05/2006 and become operational in 10/10/2007, before, during and after this, the CDM status was kept by the evidences listed in the respective table (CDM Prior Consideration and Keeping CDM Status evidences).</p> <p>Also the SHP Passo Ferraz started their implementation in 08/12/2007 and become operational in 01/10/2011, before, during and after this, the CDM status was kept by the evidences listed in the respective table (CDM Prior Consideration and Keeping CDM Status evidences).”</p> |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-2. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>In section B.5 of the PDD a consistent analysis of prior consideration was inserted.</p> <p>Evidences that the CDM was seriously considered prior the start of the project activity were provided to the verification team such as minutes from company’s board meetings and commercial proposals.</p> <p>In the table 6 of the PDD, a consistent time line can also be observed.</p> <p>Furthermore, a full assessment was made in section 5.3.1 of this report regarding the continuous and real action taken to secure the CDM status for the projects and it was observed that there were no gaps longer than two years in the documents as required by the Guidelines on the demonstration and assessment of prior consideration of CDM.</p> <p><u>CL is closed.</u></p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding | CAR B6 | | |
|-----------------------|---|--|------------------------------|
| Classification | <input checked="" type="checkbox"/> CAR | <input checked="" type="checkbox"/> CL | <input type="checkbox"/> FAR |



| Finding | CAR B6 |
|---|---|
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <ul style="list-style-type: none"> - The input values: energy price (for SHPs Coronel Araújo and Passo Ferraz) and assured energy (for Coronel Araújo) were obtained more recently than the management decision, which is not in line with the Guidelines on the Assessment of Investment Analysis, guidance 6. - In the investment analysis of Passo Ferraz Plant, it was observed that the value of TUSD was not in accordance with the one observed in the evidence provided. <p>Associated checklist question(s): B.5.4.7, B.5.4.12</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The input values <u>Energy Price</u>, for the SHPs Coronel Araújo and Passo Ferraz, and also <u>Assured Energy</u>, for the SHP Coronel Araújo, were obtained more recently in a conservative approach. They are conservative since they have the opportunity to study the project's IRR feasibility against the Benchmark in a properly scenario available to these proposed CDM projects (the values used are feasible to occur).</p> |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>As per guidelines on the assessment of investment analysis, the management decision shall be based on relevant information available at the time of the investment decision and not information available at an earlier or later point.</p> <p><u>CAR remains open</u></p> |
| Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The input values: energy price (for SHPs Coronel Araújo and Passo Ferraz) and assured energy (for Coronel Araújo) were adjusted accordingly in the Financial spreadsheets version 2.</p> |
| DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The data of energy price and assured energy for SHPs Coronel Araújo and Passo Ferraz were inserted as per information available at the moment of investment decision.</p> <p>Furthermore, the value of TUSD for Passo Ferraz was updated as per evidence given^{/FD-13/}. The value of 2.54 R\$/kW was applied.</p> <p><u>CAR is closed.</u></p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p> |

| Finding | CAR B7 | | |
|-----------------------|---|-----------------------------|------------------------------|
| Classification | <input checked="" type="checkbox"/> CAR | <input type="checkbox"/> CL | <input type="checkbox"/> FAR |

| Finding | CAR B7 |
|---|--|
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>At Section B.5, the sensitivity analysis with the variation of -/+10% is missing.</p> <p>Associated checklist question(s): B.5.4.13, B.5.4.16</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>Included the variation +/- 10% in the PDD version 2 (Table 5).</p> |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The sensitivity analysis with the variation of -/+10% can be observed in table 5 of the PDD and in the financial analysis spreadsheets. ^{/IRR 1-2/}</p> <p>CAR is closed.</p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p> |

| Finding | CL B8 |
|---|--|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>In section B.6.1 is missing the EF_{CM} formula.</p> <p>Associated checklist question(s): B.5.7.1 and B.5.8.8</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The formula was included in the PDD version 2.</p> |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The information was correctly inserted in section B.6.1 of the PDD</p> $EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$ <p>CL was closed.</p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p> |

| Finding | CL B9 |
|---|---|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>Section B.6.1: in this section the methodological choices should be provided. Choose of the option "dispatch data analysis" and its justification regarding the Grid emission factor calculation is missing here. Correction requested.</p> <p>Associated checklist question(s): B.5.7.2</p> |

| Finding | CL B9 |
|---|---|
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The information about selected method for the OM calculation was included in the B.6.1 item, being:</p> <p>“The method to determine the Operating Margin is the dispatch data analysis OM (option c in the Tool) so it is determined based on the grid power units that are actually dispatched at the margin during each hour h where the project is displacing grid electricity.”</p> |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The information regarding the methodological choice to calculate the operating margin is included in section B.6.1 of the PDD. The method is the dispatch data analysis. The justification of its use is that the data used for this method are available to the PPs. It uses the data from energy generation and data provided by the Brazilian DNA.</p> <p>The VT has validated that monthly OM values are publicly available from the Brazilian DNA website and that the values reported in the PDD correspond to those published. The validating DOE also confirms that the calculation method used by the PP to obtain the year wise OM value based on a simple average value is well spread in the Brazilian projects and so far accepted by the Board and the Brazilian DNA.</p> <p><u>CL is closed.</u></p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p> |

| Finding | CAR B10 |
|--|---|
| Classification | <input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>The fixed parameters stated at Section B.6.2 are not in accordance with the applied methodology.</p> <p>Furthermore the parameters Area of reservoirs $A_{x,y}$ and $CAP_{x,y}$ (x= the names of the 2 projects) should be verified during verification, so these 4 parameters are not fixed and ex-ante parameters but parameters to be monitored.</p> <p>Associated checklist question(s): B.5.7.4, B.5.8.1 and B.5.8.9</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The fixed parameters were revised accordingly in the PDD version 2.</p> |

| Finding | CAR B10 |
|---|--|
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The installed capacity and the area of reservoirs of both plants before the implementation of the PA were inserted in section B.6.2 as required by the applied methodology.</p> <p>However the parameters Area of reservoirs $A_{x,y}$ and $CAP_{x,y}$ (x= the names of the 2 projects) after the implementation of the PA should be verified during verification, so these 4 parameters are not fixed and ex-ante parameters but parameters to be monitored.</p> <p><u>CAR is still open.</u></p> |
| Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The parameters area of reservoirs and power plant capacity now shall be monitored.</p> |
| DOE Assessment #2 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>The parameters cited above were excluded from section B.6.2 and included in the section B.7.1. The $CAP_{x,y}$ will be monitored continuously by checking the equipment identification and the $A_{x,y}$ will be measured annually as required by the applied methodology.</p> <p>All provided information for the parameters such as Description, Source of data, measurement equipment, monitoring frequency, QA/QC procedures and purpose of data are in accordance with information required by applied methodology.</p> <p><u>CAR is closed</u></p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p> |

| Finding | CAR B11 |
|---|--|
| Classification | <input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>At Section B.7.1, the monitored parameter EG for both plants:</p> <ol style="list-style-type: none"> it is not clear if the quantity of electricity supplied by the project activity to the grid and the quantity of electricity delivered to the project activity from the grid are being monitored; the monitoring frequency is missing; there is no indication about quantity, function type, class and location of the used meters to monitor parameter EG; the cross-check procedures are missing. <p>Associated checklist question(s): B.5.8.2, B.5.8.3, B.5.8.4, B.5.8.9, B.5.8.10</p> |

| Finding | CAR B11 |
|---|--|
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>Included in B.7.1 parameter EG more details about the meters (location, quantity, bidirectional, monitoring frequency, cross checking, etc)</p> |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <ol style="list-style-type: none"> It was clarified that bidirectional meters are being used in the PA. So the source of data has been clarified. Continuous monitoring, hourly measurement and monthly recording will be applied to data from EG meters. Main and backup meters with 0.2 of accuracy class were applied to both SHPs. The datas from the energy meters will be cross checked with the CCEE data bank (Electric Power Commercialization Chamber in Brazil). In case of difference of readings will be considered the lowest for the calculation of CERs from the project. <p>Concluding:</p> <ul style="list-style-type: none"> The means of monitoring of all parameters are now feasible within the project design informed in the MP for both plants. Information was correctly inserted in section B.7.1 of the PDD. <p><u>CAR is closed.</u></p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <p> <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed </p> |

| Finding | CAR B12 |
|--|---|
| Classification | <input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>As verified during the site visit, the meters used to monitor parameter EG of each plant are located at different locations: at SHPP Coronel Araújo, the meters are located at Palmas Substation where the energy is delivered to the grid; at SHPP Passos Ferraz, the meters are located at the plant premises where the energy is delivered to the grid.</p> <p>Clarify the reasons for the different location where the energy is delivered to the grid.</p> <p>Associated checklist question(s): B.5.8.3, B.5.8.4, B.5.8.9</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>The meters from the SHP Coronel Araújo are located at Palmas substation and the meters from the SHP Passo Ferraz are located inside the Powerhouse in a locked Pannel.</p> |



| Finding | CAR B12 |
|---|--|
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>It was observed during the site visit that a different situation occurred for each SHPP of this PA as explained in the description of the finding above. So, it can be concluded that:</p> <ul style="list-style-type: none"> - To SHPP Coronel Araújo, the energy is measured at Palmas Substation as the transmission line belongs to the PP and this is the grid delivering point. - To SHPP Passo Ferraz, the energy is measured inside the powerhouse and at this point it is delivered to the grid. <p>CAR is closed</p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding | CL B13 |
|---|---|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | <p>The PPs have not listed in the PDD all relevant assumptions used in the investment analysis and the results of the analysis as per PS version 02.1 paragraph 48 (a).</p> <p>Associated checklist question(s): B.5.4.7</p> |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | <p>A list with all parameters used in the investment analysis was included in the section B.5 of the PDD.</p> |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | <p>All relevant assumptions for the investment parameters were included in the section B.5 of the PDD. The parameters were all assessed during the validation process of the Project Activity and were considered reliable. A full assessment of the parameters can be found in the Annex 4 (Assessment of Financial Parameters) of this report.</p> <p>CL is closed</p> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding | CL C1 |
|-----------------------|--|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |

| Finding | CL C1 |
|---|---|
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | Reference for the operational lifetime of the project activity is missing at Section C.1.2. Associated checklist question(s): C.1.2, F.3.2 |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | The references was included (based on the manufacture's statements) |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | Letters from manufacturers ^{/LIFE/} stated that the operational lifetime of the main equipments (turbines and generators) are at least 30 years for both projects. <u>CL is closed.</u> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |

| Finding | CL E1 |
|---|---|
| Classification | <input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | Section E.1. Please provide some more detailed information about the Local Stakeholder Consultation (LSC) process. How inhabitants were informed about the projects, does additional publication in newspaper or other media took place, at what time the 2 LSCs took place? |
| Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i> | The details about local stakeholders consultation was included in the section E.1. |
| DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i> | The local stakeholders were informed about both project through letters explaining the project characteristics and the intention to become CDM project activity. Letters were sent to the stakeholders between 13 and 20 of June 2011. The copy of the letters as well as the proofs of receipt was provided to the validation team. Project details were available to the stakeholders. Main channels of communication between the entrepreneurs and the community were informed in the PDD. <u>CL is closed</u> |
| Conclusion <i>Tick the appropriate checkbox</i> | <input type="checkbox"/> To be checked during the first periodic verification <input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed |



| Finding | CL E2 | | |
|---|--|--|------------------------------|
| Classification | <input type="checkbox"/> CAR | <input checked="" type="checkbox"/> CL | <input type="checkbox"/> FAR |
| Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i> | During the request of the LoA, the Brazilian DNA released the Resolution 10 on 2013-05-22. As per this Resolution an attendance meeting shall be organized with the stakeholders that did not participated in the initial Stake Holder Consultation Process. | | |

| Finding | CL E2 |
|---|--|
| <p>Corrective Action #1</p> <p><i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i></p> | <p>During the LoA requisition three additional meetings were done in order to satisfy the DNA requirement based on Resolution 10 of CIMGC. One meeting was done on 06.08.2013 between the following stakeholders (the person on the position or delegate) and the PP:</p> <ul style="list-style-type: none"> - Environmental Department of Água Doce - Trade, industry and urbanism Department of Água Doce - Rural Infrastructure Department of Água Doce, and - Tourism Department of Água Doce <p>The second meeting was done on 07.08.2013 between the following stakeholders (the person on the position or delegate):</p> <ul style="list-style-type: none"> - City Hall of Bom Jesus (Mayor and Vice); - Shopkeepers' Chamber of Bom Jesus; <p>And finally the third meeting was done on 30.08.2013 where was invited all the other stakeholders:</p> <p>Participation of the person on the position or delegate and the PP:</p> <ul style="list-style-type: none"> - Committee for Water Resource Management in Chapecó and Irani Basin (only this entity participated with three participants). <p>Was presented to them the proposed project activity, positive and negative impacts and their questions, opinions and suggestions was took in consideration by the project proponents(was done also minutes). The minutes content can be summarized with the following content:</p> <ul style="list-style-type: none"> - Proposed project activity presentation and their intention to obtain CDM registration and also the GGH proposed reduction due to the SHPs operation; - Explained the positive impacts as: employment opportunity, socio and environmental enhancement due the studies done on local area that host the SHPs, listed the environmental programs already described in the section D.1 of the PDD; - Negative impacts as: the deforestation on the area of SHP's power houses and reservoirs surrounding. <p>As local meetings outcomes, described in Section E.1, the opinions over the themes presented can be summarized as:</p> <ul style="list-style-type: none"> - There are older expectative about the SHPs to become available, - The evidenced environmental benefits shall to attract new projects; - The cities will have receipts increase due to projects operation; - The benefits shall become evident for the local population stimulating research over preservation options; - The project success shall to create an environmental conscience over the local population. |



| Finding | CL E2 |
|--|--|
| <p>DOE Assessment #1 <i>The assessment shall encompass all open issues in annex A-1. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i></p> | <p>Since no negative opinion about the projects were provided during the stakeholders consultation, the PP felt very satisfied about the positive commentaries and project acceptance. And shall to keep efforts in order to continue the good relationship with them.</p> <p>During the LoA requesting process three additional meetings were organized in order to satisfy the Resolution 10^{/SHCP/} released on 2013-05-22 which states that the PP shall organize an attendance meeting with all stakeholder that could not be reached during the consultation process (SHCP) in order to inform them about the Project Activity. The invitation letters of these three meeting were provided to the Validation Team^{/SHCP/}, as well as the meeting minutes^{/SHCP/} with the signatures of all invited stakeholders.</p> <p>The following stakeholders participated of the meetings:</p> <p>At the meeting held on 2013-08-06:</p> <ul style="list-style-type: none"> - Department of Environment of the Municipality of Agua Doce - Department of Trade, Industry and Urbanism of Agua Doce - Department of Rural Infrastructure of Agua Doce - Department of Tourism of Agua Doce <p>At the meeting held on 2013-08-07:</p> <ul style="list-style-type: none"> - City Hall of Bom Jesus - Chamber of Shopkeepers of Bom Jesus <p>At the meeting held on 2013-08-30:</p> <ul style="list-style-type: none"> - Committee for Water Resource Management in Chapecó and Irani Basin (only this entity participated with three participants). <p>The PA is now in accordance with all requirements of the Resolution 10 of the Host Country DNA.</p> <p><u>CL is closed</u></p> |
| <p>Conclusion <i>Tick the appropriate checkbox</i></p> | <p><input type="checkbox"/> To be checked during the first periodic verification</p> <p><input type="checkbox"/> Additional action should be taken (finding remains open)</p> <p><input checked="" type="checkbox"/> The finding is closed</p> |

5 VALIDATION ASSESSMENT SUMMARY

5.1 General Description of the Project Activity

5.1.1 Technology to be employed

The project activity consists in the use of water directly from the river to generate electricity. The project will comprehend two small hydro power plants with final installed capacity of 5,797 kW and 4,001.4 kW. They will use the gravitational force of the water to move the turbines. The turbines will trigger the generators which will produce electricity dispatched to the National Grid.

The two small hydro power plants will be called Coronel Araújo SHP and Passo Ferraz SHP. They will be considered run-of-river plants as they will have new small reservoirs with 0.40 and 0.056 km² resulting in a power density of 14.49 and 71.45 W/m² respectively.

The project is located in the State of Santa Catarina, southern region of Brazil in the municipalities of Água Doce (Coronel Araújo) and Bom Jesus (Passo Ferraz)

The project is correctly described in the PDD and it provides an understanding of the proposed CDM PA.

There is no previous activity in the place where the project activity is installed as it is considered a greenfield project.

5.1.2 Small Scale Projects

The proposed project activity is considered a bundle of two small scale projects as its installed capacity will remain under 15 MW every year during the crediting period. Hence, the project activity meets the eligibility criteria for bundling of SSC projects which is explained below:

- The intention of the PP in considering this PA as a bundle is being indicated by the filled Bundling Form (F-CDM-SSC-BUN v.3).
- The composition of the bundle will remain fixed during the crediting period.
- All project activities of the bundle have the same crediting period
- The bundling form provided by the PP^{/BUNDLE/} contains all relevant information such as title of the bundle, general description, project participants, locations, types and categories, estimated amount of emission reduction, crediting period and monitoring plans;
- The PAs of the bundle are of the same type, category and technology/measure.
- The PAs are using the same Methodology (AMS I.D. methodology, version 17.0).
- The bundle uses the same monitoring plan for both project activities.

- Each small-scale PA complies with the simplified modalities and procedures for small-scale CDM project activities.

The methodology and tools informed are correctly applied as the activity – install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity and it results in new reservoirs with the power density of the power plant being greater than 4 W/m².

The project activities are not considered a debundled part of a large scale project activity as the project participants are not registered or operating in any other small-scale CDM PA, the PPs are not operating other projects with the same category or technology/measures and there is no other project whose boundary is within 1km of the PA.

5.2 Project Baseline

5.2.1 Application of the Methodology

The project applies the AMS-I.D – Grid connected renewable electricity generation, Version 17 which an approved methodology by the board and it is valid at the moment of the validation process.

The applied methodological tool is the “Tool to calculate the emission factor for an electricity system” version 03.0 which the last one available.

Both methodology and tool are derived from UNFCCC CDM website.

All applicability conditions of the methodology are met:

- The project activity will supply electricity to the National Grid;
- The PA consists in installing new power plants at a site where there were no renewable energy power plants operating prior to the implementation of the project activity (Greenfield plant);
- The bundling project total installed capacity will be smaller than 15 MW;
- The PA results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m².

Hence, the PA is in line with all requirements and stipulations mentioned in all sections of the applied methodology.

There are no project and leakage emissions expected to be generated by the PA. As both reservoirs have its power density bigger than 10 W/m², no emissions were related to it. There is no energy generating equipment being transferred from another activity. Hence, no leakage is to be considered.

No deviation or revision of the methodology was requested during the validation period. The “Finalized requests for clarification and revision of approved SSC methodologies” were checked in the UNFCCC website where no revision related to the same concept of this PA was requested.

5.2.2 Project Boundary

According to the applied methodology the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM PA is connected to. The project boundary in this case is the area where the project is located, containing the reservoirs area, the dams, the power plants, the substations, the measurements systems and the National Interconnected Grid. The boundary descriptions are correctly given in the PDD and reproduce the boundaries observed during the site visit.

5.2.3 Baseline Identification

The baseline scenario is the electricity delivered to the grid by the SSC PA that otherwise would be dispatched by the operation of grid-connected power plants or by the addition of new generation sources what is in accordance with the applied methodology.

As it is a small scale project a barrier analysis was done to demonstrate additionality. The chosen one was the investment barrier which was demonstrated using a benchmark analysis. The financial indicator was the equity IRR which was compared with the benchmark parameter Cost of Equity (K_e), extracted from the WACC calculation.

The identification of the baseline scenario is plausible and conservative. All used data and all assumptions were evidenced by the project participants. Official documents and websites were assessed to verify their veracity. The documents were correctly quoted and interpreted in the PDD. Their analyses were duly conducted by checking their original versions and obtaining digital copies incorporated in the evidences list.

Through documents, site visit and personnel interview it could be observed that this is a greenfield project. It means that no other facility was prior installed in the PA location. It proves that no artificial baseline scenario was created as there was no facility in place prior the adoption of the Kyoto Protocol (1997-12-11) (E+).

5.2.4 Algorithms and formulae used to determine emission reductions

According to the applied methodology, the ER calculation is done in the following way:

$$ER_y = BE_y - PE_y - LE_y, \text{ where}$$

ER_y : Emission reductions in year y (tCO₂/y)

BE_y : Baseline emissions in year y (tCO₂/y)

PE_y : Project emissions in year y (tCO₂/y)

LE_y : Leakage emissions in year y (tCO₂/y)

As per PDD, the project applies values equal to **zero** to the PE_y and LE_y due to the fact that the power density of the hydro power plants are higher than 10 W/m² and that there are no transfers of energy generating equipments from another activity, respectively. Hence, the baseline considered in the project is equal to:

$$ER = BE_y$$

which is in accordance with the applied methodology.

The parameters fixed ex-ante are the capacities both hydro power plants and the area of both reservoirs. These chosen parameters were determined before the validation and are reflect the necessity of the project activity according to the validation team.

The data sources and assumptions were checked and the corresponding calculations for these parameters were found correct. The values are reasonable and the estimated emission reduction is plausible and conservative.

5.3 Additionality Determination

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

The starting date of the project corresponds to the signature of the civil contract with COMAX^{/PSD/} which was considered as the first major commitment.

The CDM decision was seriously considered at the time of the decision making as the company's board considered as one of the important points of the project implementation as can be observed in the minute of the board meeting^{/PSD/}. Furthermore a contract was provided to the validation team^{/PSD/} which informs the commitment of the PP in deliver the CERs obtained in the Coronel Araújo Project.

The CDM decision was made by the project owners at the time of the investment decision (Mr. Ivo Rishbitter and Mr. Valter Luis Torresani).

During the whole period of project development evidences that real action was taken to secure the CDM status of the project with no gaps bigger than 2 years were provided to validation team.

These evidences are all cited in Table 6 of the PDD and evidenced during the site visit^{/PSD/}.

According to evidences provided to the verification team, continuing and real actions were taken to secure CDM status for the project. The gap between documented evidences did not exceed the period of two years. This measure is in accordance with Guidelines on the demonstration and assessment of prior consideration of the CDM.

The evidences were all provided and its validity was assessed. The main evidences are assessed in table below:

A full list can be found in the section 7^{/PSD/} of this report

SHP Coronel Araújo^{/PSD/}

| Date | Evidence and explanation | Reference Section 7 ^{/PSD/} # |
|------------|---|--|
| 2006-01-05 | Minute of board meeting which reinforces the CDM consideration | 2 |
| 2006-01-06 | Contract of electricity supply guarantee between Electra and Bunge which considers the commercialization of carbon credits | 1 |
| 2007-03-02 | E-mail - Commercial proposal between Carbotrader and Rischbitter regarding the consulting services in CDM. | 10 |
| 2008-01-22 | Validation proposal of SHP Coronel Araújo between Carbotrader and Bureau Veritas # BRASIL/0260/2008. | 7 |
| 2009-03-06 | PDD Publication for stakeholders comments in the UNFCCC website (Date of First Attempt). The PDD is dated on 2008-07-02. This publication can be evidenced in the link: http://cdm.unfccc.int/Projects/Validation/DB/RHTLYN2B32G63YV4SMQAJA2QFGVRRG/view.html . | 8 |
| 2010-06-21 | Minute of the Board meeting where consideration of the bundle project between SHP Coronel Araújo and SHP Passo Ferraz was made. | 17 |
| 2011-09-27 | "E-mail "RES Orçamento de Validação MDL - PCHs CAR ePFZ" where it is evidenced that a new DOE contract process is started. | 20 |
| 2012-12-04 | PDD publication for stakeholders consultation available on the website http://cdm.unfccc.int/Projects/Validation/DB/9NPLGW23M6ER9RZS9T4FLTA7YIC4LR/view.html . | 21 |

- SHP Passo ferraz^{/PSD/}

| Date | Evidence and explanation | Reference Section 7 ^{/PSD/} # |
|------------|--|---|
| 2006-12-20 | E-mail - Commercial proposal between mr. Walter Camargo (Passo Ferraz Energia S.A.) and Carbotrader regarding the CDM project | 9 |
| 2007-06-19 | E-mail - Validation proposal between Ms. Mayra Caradec (SGS) and Carbotrader | 11 |
| 2007-11-09 | Minute from the board meeting where the participants discussed about the benefits and revenues of the CERs; The authenticity was proven by the verification of the real signatures of the participants. | 13 |
| 2008-10-16 | Minute from the board extraordinary meeting where the participants discussed about CERs selling. The authenticity was proven by the verification of the real signatures of the participants. | 15 |
| 2009-11-23 | Minute of board meeting regarding transformation of Passo Ferraz from Limited Company to Joint-stock company. In this minute was discussed the commercialization of the CERs. This minute was registered in the Board of Trade of the State of Santa Catarina on 2010-02-02 under the number 42300034983 represented by Monique Olinger Philippi (general secretary), signed by the following shareholders: Norimar Roberto Fracasso, Sérgio Vicente Novak, Alberto de Andrade Pinto, José Pedro Bertoluzzi, Sergio Antônio Bertoluzzi and Valter L. Torresani and the Lawyer Gabriel Strazas Henkin (OAB/SC 24.583). The document was presented during the site visit and an official stamp of the Board of Trade was observed. It proves its authenticity. | 16 |
| 2010-06-21 | Minute of the Board meeting where a consideration of the bundle project between SHP Coronel Araújo and SHP Passo Ferraz was made. The authenticity was proven by the verification of the real signatures of the participants. | 17 |
| 2011-06-09 | Local Stakeholders Consultation with theirs confirmation's receipts. It was considered reliable evidence of continuous CDM status. | ^{/SHCP/} Confirmations of Receipt - Brazilian Post dated as per reception |
| 2011-09-27 | "E-mail "RES Orçamento de Validação MDL - PCHs CAR ePFZ" where it is evidenced that a new DOE contract process is started. | 20 |
| 2012-12-04 | PDD publication for stakeholders consultation available on the website http://cdm.unfccc.int/Projects/Validation/DB/9NPLGW23M6ER9RZS9T4FLTA7YIC4LR/view.html . | 21 |

The original versions of these documents were all provided to the verification team during the validation process. The signatures and the registration in the Board of Trade were all considered authentic. By checking them it is possible to evidence that

continuous and real actions were taken to secure CDM status for the project. As required by the Guidelines on the demonstration and assessment of prior consideration of the CDM, contract with consultants for CDM services, draft versions of PDD, evidences of negotiations with DOE for validation services, emails and minutes of board meeting were provided and were considered reliable. No gaps in documents longer than 2 years have been observed for any of the two projects that constitute the bundle (SHPs Coronel Araújo and Passo Ferraz).

5.3.2 Alternatives

Not applicable as it is a small scale project activity

5.3.3 Investment analysis

According to the investment analysis, the project scenario is not the most attractive alternative without the benefits of CER sales. Actually, even with the benefits of the CERs sales, the benchmark chosen as a comparative parameter is higher than the project financial indicator, which proves that the project activity is not financially attractive as per the latest version of the Guidance on the Assessment of Investment Analysis.

The financial indicator Project IRR is considered a correct choice for this type of project and the financial parameters were all assessed as plausible.

The chosen benchmark was the (Weighted Average Cost of Capital calculated considering the percentage of debt/equity financing and the average cost of debt/equity financing using the Capital Asset Pricing Model) which was compared with the Project IRR (Internal Rate of Return). All input data are official and public. By the time of the investment decision the debt structure was defined, so debt / equity ratio was assumed as 0 / 100%. The benchmark was calculated in real terms post tax.

The comparison between the benchmark and the Project IRRs can be observed above:

| Benchmark (WACC) | Project IRR Coronel Araújo | Project IRR Passo Ferraz |
|------------------|----------------------------|--------------------------|
| 14.98% | 12.53% | 12.74% |

In addition, the sensitivity analysis with a variation from -10% to +10% was performed with the following items: Total Investment, Energy Price, Assured energy and Operational Costs was done and continues to give a lower IRR than the benchmark rate.

For a detailed assessment of the financial parameters, please see check list section B.5.4 (Annex 1 of this report) and Table A-4, Annex 4.

5.3.4 Barrier analysis

Barrier analysis was not applicable as it was not chosen by the project participants

5.3.5 Common practice analysis

Common practice analysis was not applicable as the project activity is small scale

5.4 Monitoring Plan

The monitoring plan is applied as per requirements of the applied methodology. The parameters to be measured, described in the PDD, reflect the necessity of the project activity in providing enough information about the PA to calculate the ERs, with respect to the whole project boundary.

The monitoring plan can be implemented as described in the PDD. All monitoring arrangements are considered feasible within the project design. The parameters to be monitored are:

- Electricity generated by both hydro power plants ($EG_{\text{coronel araujo,y}}$ and $EG_{\text{Passo Ferraz,y}}$)
- Grid Emission factor of the Brazilian National Interconnected System: The emission factor operating margin (EF_{OM}) and built margin (EF_{BM}) will be taken directly from the Brazilian DNA website. These are official data. The Combined margin emission factor (EF_{CM}) will be calculated based on this information, on the electricity generated by each power plant and on the formulae provided by the applied version of the “tool to calculate the emission factor of an electric system”.
- Installed Capacity (CAP_y) for both power plants
- Area of reservoir (A_y) for both power plants

The measuring of data will be done according to the requirements of the methodology, which is described in the PDD and was assessed by the validation team. The responsibilities were determined and also described. The quality control will follow the procedures from ONS (National System Operator) which is the official regulator of the Brazilian electric system. The calibration will be done according to national requirements (According to ABNT – National Association of Technical Standards).

The means of implementation of the monitoring plan is considered sufficient to ensure that the ERs will be achieved properly by the PP, based on the information provided above.

5.5 Crediting Period

The crediting period chosen is 7 years renewable twice. The starting date of the crediting period of the project is 2014-01-01 which can be considered appropriate given the information regarding the timeline of the project activity.

5.6 Environmental Impacts

The environmental licenses (previous, installation and operation) as well as the basic environmental plan for both hydro power plants were provided to the validation team. The operational license is on its effective date during the validation period. Further details can be observed in section 7 of this report^{/OL/}. These documents were emitted by FATMA which is the Environmental Foundation of the State of Santa Catarina. No EIA is required by the government due to the project scale. The basic environmental plan was provided instead.

5.7 Comments by Local Stakeholders

The stakeholder consultation was conducted following the Brazilian DNA rules (Resolution 7)^{/dna/} prior to the publication of PDD. As required by the Brazilian DNA relevant stakeholders were invited by letters and the PDD in Portuguese was published in the website.

A complete list of all relevant stakeholders to whom invitation letters were sent during the SHCP is included in section E.1. of the PDD and no comments were received.

During the LoA request three additional meetings were organized in order to satisfy the Resolution 10^{/SHCP/} released on 2013-05-22 which states that the PP shall organize an attendance meeting with all stakeholder that could not be reached during the consultation process (SHCP) in order to inform them about the Project Activity. The invitation letters of these three meetings were provided to the Validation Team^{/SHCP/}, as well as the meeting minutes^{/SHCP/} with the signatures of all invited stakeholders. For the meetings participants, please refer to CL E2.

As a result from the stakeholder involvement process it can be concluded that no relevant concerns of the local stakeholders are existing.

All letters sent to these parties and proofs of receipt were provided to the validation team^{/SHCP/}.

5.8 Participation

5.8.1 Project Participants

- The involved party involved in the CDM project activity are:
- Host Party: Brazil
- Project Participants: Coronel Araújo Energética S.A., Passo Ferraz Energia S/A and Carbotrader Assessoria e Consultoria em Energia Eireli (all private entities)

5.8.2 LOA

At the time of the completion of revision 0 of this report, the LoA of the Brazilian DNA (host country) was pending. For the Brazilian DNA, a positive validation opinion is a prerequisite for the host government approval and thus the LoA cannot be considered at that validation stage.

According to CDM requirements, at the validation stage, a party may or may not have provided its approval by the time of making the PDD public. The approval of the involved parties is required at the time of registration request.

The LoA was issued by the Brazilian DNA on 2013-10-14.

The Letter of Approval is in line with all CDM requirements:

- The only Party involved in the project activity is the Federative Republic of Brazil.
- The Brazilian DNA issued the Letter of Approval^{/LoA/} confirming that the party is a party of the Kyoto Protocol (Brazil has ratified the Kyoto Protocol on 2002-08-23),
- The participation of the party in the CDM is voluntary,
- The Project Activity contributes for the sustainable development of the party
- The LoA refers to the precise project activity title in the PDD intended for submission for registration.

The LOA was made available to the DOE by the PP.

The Validation Team confirms that the presented LoA is authentic. It can be confirmed through an Official Letter^{/LoA/} issued by the Executive Secretary of the Brazilian DNA.

5.8.3 MoC

All project participants and focal points were included in the Modalities of Communication (MoC) statement, as well as the personal identities, including specimen signatures and employment status, of their authorized signatories.



Furthermore, the MoC was received from the PP with whom TÜV NORD has the contractual relationship (Coronel Araújo Energética S/A and Passo Ferraz Energia S/A). The representatives who submitted the MoC statement to the DOE are duly authorized to do so, on behalf of the respective project participant.

The PPs indicated by the MoC are Corone! Araújo Energética S/A, Passo Ferraz Energia S/A and Carbotrader Assessoria e Consultoria em Energia Eireli. Only the last entity is considered as sole focal point.

5.9 PDD editorial Aspects

The PDD is in compliance with latest PDD Template, i.e., F-CDM-SSC-PDD, version 04.1 and latest version of the guideline for completing CDM-SSC-PDD version 01.0, EB 66 Annex 9. When a deviation has been identified, a corresponding CAR or CL was raised

6 VALIDATION OPINION

Coronel Araújo Energética S/A and Passo Ferraz Energia S/A have commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: “SHPs Coronel Araújo and Passo Ferraz CDM Project (JUN1059), Brazil” with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board

In the course of the validation 7 Corrective Action Requests (CARs) and 11 Clarification Requests (CLs) were raised and successfully closed.

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

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (Brazil) and all relevant UNFCCC requirements for CDM. Further the project activity is in compliance with the requirements set up by the applied approved CDM methodology AMS I.D ver. 17. At the time of the completion of the validation, the LoA is pending. For the Brazilian DNA, a positive validation opinion is a prerequisite for the host government approval and thus the LoA could not be considered at the present validation stage.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 73,017 t CO₂e are most likely to be achieved within the 1st renewable crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation

São Paulo, 2014-05-12



Sergio Cruz
TÜV NORD JI/CDM CP
Validation Team Leader

Essen, 2014-05-12



Emilio Martin
TÜV NORD JI/CDM CP
Final Approval

7 REFERENCES

Table 7-1: Documents provided by the project participant

| Reference | Document |
|------------------|--|
| /AUCTION/ | Result of the 1 st public auction for Alternative Energy Sources performed by the Brazilian Government on 2007-06-18 evidencing the average price of Energy from SHPs, issued by EPE on the same date. |
| /BENCH/ | <p><u>Benchmark Coronel Araújo:</u></p> <ul style="list-style-type: none"> - Document “<i>Estimating Discount Rates</i>” written by Aswath Damodaran – 2005 - Aswath Damodaran http://pages.stern.nyu.edu/~adamodar/pc/archives/emergcompfirm05.xls - EMBI + Brazil Spread - http://www.ipeadata.gov.br/Default.aspx - Brazil Inflation: http://anhanguera.edu.br/home/index2.php?option=com_docman&task=doc_view&gid=62&Itemid=1 http://pt.wikipedia.org/wiki/Infla%C3%A7%C3%A3o#Hist.C3.B3rico_do_Quadro_Inflacion.C3.A1rio_no_Brasil - US inflation: ftp://ftp.bls.gov/pub/special.requests/cpi/cpiat.txt - Benchmark calculation – Excel file Ke_calculation_V2.xls |
| /BUNDLE/ | Bundling form - SHPs Coronel Araújo and Passo Ferraz CDM Project (JUN1059), Brazil, dated on 2014-01-20, version 1. |
| /EIA/ | <p><u>PBA (Basic Environmental Report):</u></p> <ul style="list-style-type: none"> - PCH Coronel Araújo – Elaborated by RTK Consultoria and DW Engenheiros Associados – February/2004; - PCH Passo Ferraz – Elaborated by Impacto Assessoria Ambiental – July/2010; |
| /FD/ | <p><u>Financial Data – General:</u></p> <p><u>Coronel Araújo</u></p> <ol style="list-style-type: none"> 1. Minute of the Board – Coronel Araújo S.A from 2006-01-05 2. Chapter 10 of Basic Environmental Plan SHP Coronel Araújo – rev. 02 |

| Reference | Document |
|--------------|---|
| | <p>from May/2007 written by Karl Rischbitter.</p> <ol style="list-style-type: none"> 3. Contract of transference of rights of Coronel Araújo S.A. from RTK and DW group to Eletrisa Group from 2006-03-10 - "Particular Instrument of transfer of rights" (<i>Instrumento particular de cessão de direitos</i>) 4. Dispatches # 2,268 from 2005-12-29 and # 141 from 2007-01-24 regarding the TFSEE tax. <ol style="list-style-type: none"> a) Resolution #130 dated on 2005-06-20 regarding the TUSD (Use of distribution system tariff) and TFSEE (Inspection of Electric Energy services tariff) for the distribution company COPEL issued by ANEEL. 5. O&M Costs spreadsheet for SHP Coronel Araújo dated on January/2006 6. Basic Financial Project (budget) for SHP Coronel Araújo dated on 2006-01-04 7. Ordinance # 1 from Planning and Energetic Development Secretariat – Ministry of Mines and Energy (Brazil) - approving the second assured energy value) dated on 2010-01-14. 8. Contract # 032/2007 between Electra and Coronel Araújo S. A. regarding the energy sale price. <p><u>Passo Ferraz</u></p> <ol style="list-style-type: none"> 9. Minute of the Board meeting – Passo Ferraz S.A from 2007-11-09 10. Contract # 005/2010 between Electra and Passo Ferraz S. A. regarding the energy sale price. 11. O&M Costs spreadsheet for SHP Passo Ferraz dated on October/2007; 12. Basic Financial Project (budget) for SHP Passo Ferraz dated on 2006-12-18 13. Resolution #529 dated on 2007-08-06 regarding the TUSD (Use of distribution system tariff) and TFSEE (Inspection of Electric Energy services tariff) for the distribution company CELESC issued by ANEEL. |
| /IRR/ | <ol style="list-style-type: none"> 1- IRR calculation sheet for Coronel Araújo 2- IRR calculation sheet for Passo Ferraz |
| /LOA/ | <ul style="list-style-type: none"> - Letter of Approval from Brazil – issued by Interministerial Commission of Global Climate Change (Brazilian DNA) dated on 2013-10-14 and signed by Marco Antonio Raupp (President of the Brazilian DNA) - Official Dispatch # 819 MDL/2013/CIMGC stating the approval of the PA by the Brazilian DNA issued by Gustavo Luedemann (Executive |

| Reference | Document |
|------------------|---|
| | Secretary of Brazilian DNA) on 2013-10-14. |
| /MOC/ | Modalities of Communication (F-CDM-MOC) – signed by Coronel Araújo S.A, Passo Ferraz S.A and Carbotrader Assessoria e Consultoria em Energia Eireli dated on 2013-02-04. |
| /OL/ | <p><u>Licenses:</u></p> <ul style="list-style-type: none"> • <u>PCH Coronel Araújo:</u> <ul style="list-style-type: none"> - Environmental Operation License # 552/2011 – issued by FATMA on 2011-11-11 – Valid for 47 months (until 2015-10-10) • <u>PCH Passo Ferraz:</u> <ul style="list-style-type: none"> - Environmental Operation License # 953/2010 – issued by FATMA on 2010-12-13 – Valid for 48 months (until 2014-12-12) |
| /O&M/ | Guidelines for Studies and Projects of Small Hydro Powerplants (Diretrizes para estudo e projetos de Pequenas Centrais Hidroelétricas) issued on January 2000 by Eletrobrás and Ministry of Mines and Energy of Brazil, regarding O&M cross-check. |
| /PDD/ | <p>Project Design Document named “SHPs Coronel Araújo and Passo Ferraz CDM Project (JUN1059), Brazil”</p> <ul style="list-style-type: none"> - version 01 (2012-07-13) – hosted from 2012-12-04 to 2013-01-02 - version 02 (2013-02-14) - version 03 (2013-08-30) - version 03.1 (2014-01-20) |
| /PLF/ | <p><u>Assured energy (Plant Load Factor):</u></p> <ul style="list-style-type: none"> • <u>Coronel Araújo:</u> <ul style="list-style-type: none"> - “Particular Instrument of transfer of rights” (<i>Instrumento particular de cessão de direitos</i>), signed between Rischbieter Engenharia, Torresani Empreendimentos and Electra Power Geração, on 2006-03-10 – (evidence of the first assured energy value) - Basic Project Coronel Araujo, rev. 02, produced by the Electrician Engineer Karl Rischbitter, on May/2007 – (calculation of second |

| Reference | Document |
|--------------|---|
| | <p>assured energy value)</p> <ul style="list-style-type: none"> - Ordinance # 1 from Planning and Energetic Development Secretariat – Ministry of Mines and Energy (Brazil) - approving the second assured energy value) dated on 2010-01-14. - Ordinance # 58 from Planning and Energetic Development Secretariat – Ministry of Mines and Energy (Brazil) - approving the second assured energy value) dated on 2012-07-30. • <u>Passo Ferraz:</u> <ul style="list-style-type: none"> - Basic Project Passo Ferraz, from 2006-12-18 – (calculation of first assured energy value) - “Minute from the board from on 2007-11-09 – (evidence of the first assured energy value) - Ordinance # 24 from Planning and Energetic Development Secretariat – Ministry of Mines and Energy (Brazil) - approving the second assured energy value) dated on 2012-04-27. |
| /PRO/ | <ul style="list-style-type: none"> - Internal procedure regarding data Management - Procedure 12.2 from ONS (National Electric System Operator) regulating the frequency of calibration - Procedure 12.3 from ONS (National Electric System Operator) regulating the accuracy class of the electricity meters |
| /PSD/ | <p>Evidences of <u>prior consideration</u> and <u>project starting date</u>:</p> <ol style="list-style-type: none"> 1. Contract of electricity supply guarantee between Electra and Bunge which considers the commercialization of carbon credits, dated on 2006-01-06 2. Minute of the Board meeting – Coronel Araújo S.A from 2006-01-05 reinforcing the CDM consideration; 3. Contract of Civil Services Provision between COMAX and CORONEL ARAÚJO S.A. – from 2006-05-19 which is the first major commitment and the starting date of the project. <p><u>Evidences of continuous CDM consideration</u></p> <ol style="list-style-type: none"> 4. Contract between Coronel Araújo S.A. and WEG for generators supply, revision 4 from August/2006. 5. Contract between Coronel Araújo S.A. and Hacker Industrial for turbines supply, revision 3 from August/2006. 6. Dispatch # 3,122 from 2007-10-10 issued by ANEEL authorizing the operation of the SHP Coronel Ferraz. |

| Reference | Document |
|-----------|---|
| | <p>7. Validation proposal of SHP Coronel Araújo between Carbotrader and Bureau Veritas # BRASIL/0260/2008 dated on 2008-01-22</p> <p>8. PDD first attempt publication considering the SHPs Coronel Araújo and Salto do Timbó. The PDD is dated on 2008-07-02. http://cdm.unfccc.int/Projects/Validation/DB/RHTLYN2B32G63YV4SMQAJA2QFGVRRG/view.html</p> <p>9. E-mail - Commercial proposal of Passo Ferraz between mr. Walter Camargo (Passo Ferraz Energia S.A.) and Carbotrader sent on 2006-12-20</p> <p>10. E-mail - Commercial proposal between Carbotrader and Rischbitter 2007-03-02</p> <p>11. E-mail – Validation proposal of Passo Ferraz between Carbotrader and SGS 2007-06-19</p> <p>12. E-mail - Commercial proposal between Electra Energy and Carbotrader – 2007-09-19</p> <p>13. Minute of Extraordinary meeting with Passo Ferraz Partners dated on 2007-11-09</p> <p>14. E-mail - Commercial Proposal between Carbotrader and RINA – 2011-09-29</p> <p>15. Minute of Extraordinary Meeting with Passo Ferraz Partners dated on 2008-10-16.</p> <p>16. Minute of transformation of Passo Ferraz from Limited Company to Joint-stock company dated from 2009-11-23 and registered in the Board of Trade of the State of Santa Catarina on 2010-02-02 under the number 42300034983 represented by Monique Olinger Philippi (general secretary), signed by the following shareholders: Norimar Roberto Fracasso, Sérgio Vicente Novak, Alberto de Andrade Pinto, José Pedro Bertoluzzi, Sergio Antônio Bertoluzzi and Valter L. Torresani and the Lawyer Gabriel Strazas Henkin (OAB/SC 24.583)</p> <p>17. Minute of Board Meeting between shareholders of Passo Ferraz dated from 2010-06-21 and signed by the following shareholders: Norimar Roberto Fracasso, Sérgio Vicente Novak, Alberto de Andrade Pinto, José Pedro Bertoluzzi, Sergio Antônio Bertoluzzi and Valter L. Torresani and the secretary Elisa Fracasso.</p> <p>18. Minute of the Board meeting considering the bundle project between SHP Coronel Araújo and SHP Passo Ferraz from 2010-06-21</p> <p>19. Annex II – Chronogram of activities of SHP Passo Ferraz until 2011-05-31.</p> <p>20. "E-mail "RES Orçamento de Validação MDL - PCHs CAR ePFZ" it is evidenced that a new DOE contract process is started dated on 2011-09-</p> |

| Reference | Document |
|---------------|---|
| | <p>27.</p> <p>21. PDD publication for stakeholders consultation on 2012-12-04 available on the website http://cdm.unfccc.int/Projects/Validation/DB/9NPLGW23M6ER9RZS9T4FLTA7YIC4LR/view.html.</p> |
| /SHCP/ | <p>Stakeholder consultation process evidences:</p> <ul style="list-style-type: none"> - Invitation letters dated on 2011-06-07 - Confirmations of Receipt - Brazilian Post dated as per reception. - Resolution 10 from Brazilian DNA requiring the invitation of other stakeholders issued on 2013-05-22 - Invitation letters dated on 2013-07-29 as per requirement of Brazilian DNA - Minute of Public Meeting in the Environmental Department and Agriculture Secretariat of the Municipality of Agua Doce issued on 2013-08-06; - Minute of Public Meeting in the City Hall of the Municipality of Bom Jesus issued on 2013-08-07; - Minute of Public Meeting in the Morgano Hotel issued on 2013-08-30; |
| /TD/ | <p><u>Project technical description:</u></p> <p>22. Contract between Coronel Araújo S.A. and WEG for generators supply, revision 4 from August/2006.</p> <p>23. Contract between Coronel Araújo S.A. and Hacker Industrial for turbines supply, revision 3 from August/2006.</p> <p>24. Dispatch # 949 issued by ANEEL on 2007-04-04 regarding the new installed power Coronel Araújo</p> <p>25. Invoice of purchase (SanJorge) of 3 Generators for SHP Passo Ferraz totalizing the installed power of 4 MW dated on 2007-12-11.</p> <p>26. Contract between Passo Ferraz S.A. and Hacker Industrial for turbines supply, from 2009-02-27.</p> <p>27. Operation and Maintenance Manual SHP Coronel Araújo 2012 issued by MacroEnergy Engenharia;</p> <p>28. Operation and Maintenance Manual SHP Passo Ferraz 2013 issued by MacroEnergy Engenharia;</p> <p>29. Dispatch # 347 issued by ANEEL on 2007-02-13 regarding the approval</p> |

| Reference | Document |
|--------------|--|
| | of the basic project Passo Ferraz |
| /XLS/ | Emission reduction calculation spreadsheet |

Table 7-2: Background investigation and assessment documents

| Reference | Document |
|----------------|---|
| /AMSID/ | - AMS I.D ver. 17: Grid Connected renewable electricity generation. |
| /CON/ | Signed Proposal for Carrying out the validation of the CDM project “SHPs Coronel Araújo and Passo Ferraz (JUN1059), Brazil” between TÜV-Nord and Coronel Araújo S/A and Passo Ferraz S/A dated on 2012-10-02. |
| /CPM/ | TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms) |
| /EL/ | <u>Environmental Legislation:</u> <ul style="list-style-type: none"> - CONAMA’s Resolution nº 279/2001 - Federal Law 380/2008 |
| /GCP/ | UNFCCC: Guidelines for completing the Project Design Document Form for Small-Scale CDM Project Activities (v. 01.0) |
| /IPCC/ | <ul style="list-style-type: none"> • IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000 • Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual |
| /KP/ | Kyoto Protocol (1997) |

| Reference | Document |
|----------------|--|
| /LEGIS/ | <p><u>Legislation:</u></p> <ul style="list-style-type: none"> • Decree # 2410 – Rules of Tariff of Electric Energy Services Inspection –1997-11-28; • Dispatch # # 2,268 from 2005-12-29 – Rules of Tariff of Electric Energy Services Inspection – ANEEL – 2005-12-29 • Dispatch # 141 – Rules of Tariff of Electric Energy Services Inspection – ANEEL – 2007-01-24 • Law # 7689 – Rules of CSLL – 1988-12-15; • Law # 9249 – Rules of CSLL and Additional Income Tax – 1995-12-26; • Law # 9430 – Rules of CSLL – 1996-12-27; • Decree # 2410 – Rules of Tariff of Electric Energy Services Inspection –1997-11-28; • Law # 10637 – Rules of PIS and PASEP – 2002-12-30; • Law # 10833 – Rules of COFINS – 2003-12-29. • Normative Instruction SRF # 247 Article 52 – from 2002-11-21 – from Brazilian Government. • Technical Note # 68/2007-SRE/ANEEL – ANEEL Directive. • Normative Resolution n° 77, 18 August 2004 - ANEEL (2004). |
| /LIFE/ | <p><u>Project Lifetime:</u></p> <ul style="list-style-type: none"> • Economic Lifetime Study and Depreciation Rate “<i>Estudo de vida útil econômica e taxa de depreciação</i>” vols 1 and 2 from Nov/2000 issued by ANEEL, CERNE and Federal School of Engineering of Itajubá <p><u>Coronel Araújo</u></p> <ul style="list-style-type: none"> • Document # 1160 from Hacker (turbines manufacturer) stating the technical lifetime of the turbines of SHP Passo Ferraz dated on 2012-08-28. • Letter from WEG (generators manufacturer) stating the technical lifetime of the generators of SHP Coronel Araújo dated on 2012-09-04. <p><u>Passo Ferraz</u></p> <ul style="list-style-type: none"> • Document # 1162 from Hacker (turbines manufacturer) stating the technical lifetime of the turbines of SHP Passo Ferraz dated on 2012-08- |

| Reference | Document |
|---------------|---|
| | <p>31.</p> <ul style="list-style-type: none"> Declaration from Automatic (generators representative) stating the technical lifetime of the generators of SHP Passo Ferraz dated on 2011-06-08. |
| /MA/ | Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7)) |
| /PS/ | Clean Development Mechanism Project Standard (Version 02.1, EB 70, Annex 4) |
| /TOOL/ | <ol style="list-style-type: none"> Guidelines on Demonstration of Additionality of Small-Scale Project Activities (version 09.0) Tool to calculate the emission factor for an electricity system – version 03.0 |
| /VVS/ | Validation and Verification Standard (Version 03.0, EB 70, Annex 3) |

Table 7-3: Websites used

| Reference | Link | Organization |
|-----------------|--|--|
| /aneel/ | <ul style="list-style-type: none"> - http://www.aneel.gov.br/ - http://www.aneel.gov.br/aplicacoes/capacidadebrasil/energiaassegurada.asp - | <ul style="list-style-type: none"> - National Electric Energy Agency - list of assured energy of all electricity generators in Brazil assessed on 2014-01-22 |
| /bcb/ | http://www.bcb.gov.br | Central Bank of Brazil |
| /bndes/ | <p><u>Interest Rate</u> http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/energias_alternativas.html</p> <p><u>Cost of debt</u> http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/proesco.html</p> <p><u>Inflation Rate</u> http://www.bcb.gov.br/Pec/metase/TabelaMetaseResultados.pdf</p> | BNDES – National Bank for Social Economic Development |
| /ccee/ | http://www.ccee.org.br/ | Chamber of Electric Energy Commerce |
| /conama/ | http://www.mma.gov.br/port/conama/ | National Environmental Council |
| /dna/ | <p>http://www.mct.gov.br</p> <p>http://www.mct.gov.br/index.php/content/view/74689.html</p> | <p>DNA of Brazil</p> <p>Published Emission Factor of the SIN</p> |

| Reference | Link | Organization |
|--------------|--|--|
| /eletrobras/ | www.eletrobras.com | Brazilian Generation, Transmission and Distribution Company |
| /ipcc/ | www.ipcc-nggip.iges.or.jp | IPCC publications |
| /ipea/ | www.ipeadata.gov.br/ | Ipeadata |
| /ons/ | http://www.ons.org.br/home/ http://www.ons.org.br/historico/geracao_energia.aspx | National Operator of the Electric System Historic Generation Data |
| /unfccc/ | http://cdm.unfccc.int | UNFCCC |

Table 7-4: List of interviewed persons

| Reference | Mol ¹ | | Name | Organization / Function |
|-----------|------------------|--|-------------------|--|
| /IM01/ | V | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms | Adenilson Rocha | Coronel Araújo S.A. / Plant Operator |
| /IM01/ | V | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms | Antônio Fochesato | Passo Ferraz S.A. / Plant Operator |
| /IM01/ | V | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms | João Paulo Polo | Chico Elétrica / Technician Electricity |
| /IM01/ | V | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms | Olinto Silveira | Coronel Araújo S.A. - Passo Ferraz S.A. / Adm. Manager |
| /IM02/ | V | <input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms | Arthur Moraes | Carbotrader / Consultor |

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)

ANNEX

- A1:** Validation Protocol
- A2:** Assessment of Applicability
Criteria
- A3:** Assessment of Baseline
Identification
- A4:** Assessment of Financial
Parameters
- A5:** Assessment of Barrier analysis
- A6:** Outcome of the GSCP
- A7:** Statement of competence of
involved Personnel

ANNEX 1: VALIDATION PROTOCOL

Table A-1: Requirements Checklist

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|-------------------------|---|-----------------|-----------------|
| A. General Description of Project Activity | | | | |
| A.1. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/maintenance needs. The DOE should ensure that environmentally safe and sound technology and know-how is used.</i> | | | | |
| <p>A.1.1. Does the PDD contain a clear, accurate and complete project description?</p> <p>(VVS, v. 03.0, §§ 64, 69)</p> <p><i>The PDD shall contain a clear description of the project activity which provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation.</i></p> <p><i>Pl. consider esp. chapters A.1, A.3 (in case of LSC PDD) for assessment.</i></p> <p><i>§69 (a) Describe the process undertaken to validate the accuracy</i></p> | <p>/PDD/ /IM01/</p> | <p><i>Description:</i> The project activity was described in a comprehensive way in PDD, sections A.1 and A.3. The PA consists in the operation of two hydropower plants with a total installed capacity of 9,798.4 kW. The plants have reservoirs with 0.4 and 0.056 km² of superficial area.</p> <p>Both plants are operating during the validation visit. All main equipments observed during the site visit.</p> <p>However in section A.1 the estimation of total emission reductions for the crediting period was not included. In section A.3 the measuring equipments were not described as required by the guidelines for completing the PDD and information of age and average lifetime were also not included in the PDD.</p> | GLA4 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|--|--|--|-----------------|-----------------|
| <p><i>and completeness of the project description.</i></p> <p>§69 (b) Contain the DOE's opinion on the accuracy and completeness of the project description.</p> | | <p>Thus, a CL has been raised.</p> <p><i>Validator's action:</i> Interviews were performed and during the site visit, the equipments and the project itself was compared with the descriptions in sections A.1, A.3 and B.3.</p> <p><i>Conclusion:</i> (CL A1) Section A.1 of the PDD, beside the estimation of the annual average emission reductions the total GHG emission reductions for the chosen crediting period should be provided. Section A.3, the PDD does not provide information on age and average lifetime of the equipment based on manufacturer's specification and industry standards as required by the guidelines for completing the SSC-PDD. Moreover, according to the guidelines to complete a PDD, the load factors and efficiencies and information about the monitoring equipment and their location in the system should be provided. The expression "assured energy" needs further explanation how it is defined and what is the difference between PLF and assured energy. Furthermore some technical details as rated (or net) head for both SHPs, how the SHPs are connected to the grid (substations, transmission lines...) is missing.</p> | | |
| <p>A.1.2. Is this description in accordance with the real situation or (in case of greenfield projects) is it most likely that the project will be implemented acc to the project description?</p> | <p>/PDD/ /IM01/ /IM02/ /PSD/</p> | <p><i>Description:</i> This is a greenfield project. No other facility was in place prior the construction of the hydro power plants. Both projects are in operation during the validation period and it could be observed in the PDD that it is correctly described. PCH Coronel Araújo started its operation on 2007-10-10 and PCH Passo Ferraz on 2011-10-01^{/PSD/}.</p> <p><i>Validator's action:</i> For the assessment the validation team has: a) reviewed the PDD in detail; b) carried out interviews with technical and operational personnel of Coronel Araújo and Passo Ferraz companies</p> | <p>OK</p> | <p>OK</p> |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|--|------------------|--|-----------------|-----------------|
| | | and the project consultants. <i>Conclusion:</i> The description observed in the PDD is in accordance with real situation. | | |
| A.1.3. In case the project involves alteration of the existing installation or process, is a clear description available regarding the differences between the project and the pre-project situation? (VVS, v. 03.0, § 68) <i>Describe the steps taken to validate this issue.</i> | /PDD/ | <i>Not applicable, since the project does not involve alteration of the existing installation or process. It is a greenfield project.</i> | N/A | N/A |
| A.2. Small scale project activity <i>It is assessed whether the project qualifies as small-scale CDM project activity</i> | | | | |
| A.2.1. Does the project fall within the small scale project activity threshold and applies a large-scale approved methodology? In this case, are the modalities and procedures for large-scale project activities followed? (VVS, v. 03.0, § 151) | /PDD/ | <i>This project fall within the small scale project activity threshold but applies an small scale methodology AMS I.D "Grid connected renewable electricity generation"</i> | N/A | N/A |
| In case of project activities applying a LSC-Methodology, go to B.1 | | | | |
| A.2.2. Does the project qualify as a small scale CDM project activity as defined in decision 4 / | /PDD/ /AMSID/ | <i>Description:</i> Yes, the project activity is classified as type I (Renewable Energy Projects) and the installed capacity is under 15 MW and its capacity will remain within the limits of small scale project activity | CLA2 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|---|---|-----------------|-----------------|
| <p>CMP.1 annex II? (VVS, v. 03.0, §§ 150–152) <i>Please indicate whether the project activity meets the eligibility criteria for small scale-projects. Specially consider whether the project qualifies within the thresholds of the three possible types of small-scale project activities</i></p> | /VVS/ | <p>types during every year of the crediting period. However, it is not well described in section A.3 of the PDD. So a CL has been raised.</p> <p>Validator's action: The PDD was verified against the VVS and applied methodology.</p> <p>Conclusion: The project qualifies as a small scale CDM project. However a CL has been raised. (CL A2) In section A.3, the PDD does not describe correctly the provisions of small scale activity as per the project standards.</p> | | |
| <p>A.2.3. Does the project apply one of the approved small scale categories and any methodology and tool referred therein? (VVS, v. 03.0, § 152 (b)) <i>Check, if applicable the expiry dates of the applied methodology. Further, take into consideration the general guidance to the methodologies¹, which provide guidance on equipment capacity, equipment performance, sampling and other monitoring related issues.</i></p> | <p>/PDD/ /AMSID/ /VVS/ /unfccc/</p> | <p>Description: The project is a type I (Renewable Energy Projects) and applies AMS-I.D – Grid connected renewable electricity generation - v. 17 and tools.</p> <p>Validator's action: The PDD was verified against the VVS and applied methodology and tools.</p> <p>Conclusion: The project is within small scale category and applies an approved small scale methodology and tools.</p> | OK | OK |
| <p>A.2.4. Is the small scale project activity not a debundled component of a larger project activity?</p> | <p>/PDD/ /unfccc/</p> | <p>Description: The project is not a debundled component of a larger project activity as there is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity.</p> | OK | OK |

¹ See EB 54 report, paragraph 37 and the latest “General guidelines to SSC methodologies” for further clarification.

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| (VVS, v. 03.0, §§ 154-157) <i>Describe the steps taken to assess whether the project activity is not a debundled component of a large scale activity, in accordance to the "Guidelines on assessment of debundling for SSC project activities"...</i> | | <ul style="list-style-type: none"> with the same project participants; in the same project category and technology/measure; registered within the previous two years. Whose project boundary is within 1 km of the project boundary of the proposed small scale activity at the closest point <p><i>Validator's action:</i> The PDD was verified against the UNFCCC rules. Furthermore the validation team had checked all registered renewable energy CDM projects in Brazil and confirms that the proposed project activity is not a fragmentation of a large project activity into smaller parts.</p> <p><i>Conclusion:</i> The project is not a debundled component of a larger project activity.</p> | | |
| B. Project Baseline, Additionality and Monitoring Plan | | | | |
| B.1. Reference of the Methodology | | | | |
| B.1.1. Does the PDD correctly quote an applicable version of the methodology? (VVS, v. 03.0, § 74) | /PDD/ /unfccc/ /AMSID/ | <input type="checkbox"/> The applied methodology is correctly quoted and is identical to the version available on the UNFCCC website. <input checked="" type="checkbox"/> The applied version of the baseline and monitoring methodology is applicable and valid at the time of submission for stakeholder consultation. The correct methodology is correctly quoted, however its exact reference is missing. So CL B1 has been raised. | CL B1 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | (CL B1) In section B.1, the exact reference of the methodology and tool applied by the project activity as well as the correct version of them are missing. | | |
| B.2. Applicability of the Methodology | | | | |
| <p>B.2.1. Does the project apply an approved and applicable CDM methodology and a valid version thereof?</p> <p>(VVS, v. 03.0, §§ 70, 74, 76, 77)</p> <p><i>Describe the steps taken to validate this issue.</i></p> <p><i>Describe for each applicability criterion listed in the selected approved methodology the steps taken to assess its fulfilment</i></p> | <p>/PDD/ /unfccc/ /AMSID/ /OL/ /TD/ /XLS/</p> | <p><input checked="" type="checkbox"/> The applied methodology is correctly quoted and is identical to the version available on the UNFCCC Website.</p> <p><input checked="" type="checkbox"/> The applied version of the baseline and monitoring methodology is valid at the time of submission for stakeholder consultation.</p> <p><input checked="" type="checkbox"/> All applicability criteria in the methodology, the applied tools or any other methodology component referred to therein are fulfilled (please make detailed assessment in Annex 2 of this protocol).</p> <p>The project applies the AMS-I.D – Grid connected renewable electricity generation, Version 17 which an approved methodology by the board and it is valid at the moment of the validation process.</p> <p>All applicability conditions of the methodology are met:</p> <ul style="list-style-type: none"> - The project activity will supply electricity to the National Grid (project description) - The PA consists in installing a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); - The project installed capacity will be smaller than 15 MW (technical information of the project); | OK | OK |

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| | | <p>- The PA results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m² (Basic Environmental Plan and excel calculations)</p> <p>Hence, the PA is in line with all requirements and stipulations mentioned in all sections of the applied methodology.</p> | | |
| <p>B.2.2. In case one or more applicability criteria have not been met, has the validation team requested clarification to, revision of or deviation from the methodology in accordance with the latest guidelines?</p> <p>(VVS, v. 03.0, §§ 78-81)</p> | | <p><i>Description:</i> Not applicable as project meets all applicability conditions of AMS-I.D.</p> <p><i>Validator's action:</i> The information contained in the PDD was checked on site and it was cross-checked with information provided in the applied methodology.</p> <p><i>Conclusion:</i> The project meets all applicability conditions of the applied methodology.</p> | N/A | N/A |
| <p>B.3. Project Boundaries</p> <p><i>Project Boundaries are the limits and borders defining the GHG emission reduction project</i></p> | | | | |
| <p>B.3.1. Are the project's spatial boundaries (geographical) clearly defined?</p> <p>(VVS, v. 03.0, §§ 72 (a), 82)</p> <p><i>Provide information on how the validation of the geographical boundary has been performed either based on reviewed documented evidence or by describing what was observed/viewed</i></p> | <p>/IM01/ /IM02/ /PDD/ /TD/</p> | <p><i>Description:</i> The spatial boundaries are clearly described in the PDD, section B.3 and correspond to the physic location observed during the site visit. The project's boundary corresponds to the reservoirs area, the dams, the powerhouses (turbines and generators), the substations, the measurement equipments and the National Interconnected Grid; all valid for both power plants.</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| during a site visit. | | <p><i>Validator's action:</i> The boundaries were checked during site visit and compared with the PDD. Interviews were also performed to project consultants. Furthermore, technical diagrams were observed.</p> <p><i>Conclusion:</i> The physical boundaries are clearly defined in the PDD</p> | | |
| <p>B.3.2. Are all sources and GHGs included in the project boundary as required in the applied methodology?</p> <p>(VVS, v. 03.0, §§ 82, 84)</p> <p><i>Provide information on how the validation of the GHGs and sources has been performed either based on reviewed documented evidence or by describing what was observed/viewed during a site visit.</i></p> | /AMSID/ /PDD/ | <p><i>Description:</i> The sources of GHG are not well described in section B.3 of the PDD.</p> <p><i>Validator's action:</i> the PDD was cross-checked with information from the applied methodology.</p> <p><i>Conclusion:</i> Not all sources of GHG from PA were described in the PDD. Thus a CL has been raised</p> <p>(CL B2) In section B.3 of the PDD it is missing the emission sources of the project activity and baseline as per Guidelines for completing the SSC PDD.</p> | CL B2 | OK |
| <p>B.3.3. In case the methodology allows to choose whether a source and/or gas is to be included, is the choice sufficiently explained and justified?</p> <p>(VVS, v. 03.0, §§ 84, 87)</p> <p><i>Confirm if the Adequacy provided by the PPs is reasonable, based on assessment of supporting documented evidence provided by the PPs or by onsite observations.</i></p> | /AMSID/ | N/A as the methodology does not allow such choice | N/A | N/A |
| <p>B.3.4. Have emission sources been identified, which are expected to contribute more than 1% of the overall expected average annual emissions reductions and which are not</p> | /AMSID/ | Not applied as all emission sources identified are addressed by the selected approved methodology. | N/A | N/A |

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| addressed by the selected approved methodology? (VVS, v. 03.0, § 87) <i>Describe the steps taken to validate this issue. If any emission sources that are expected to contribute more than 1% have been identified, the DOE shall request clarification of, revision to, or deviation from the methodology, as appropriate.</i> | | | | |
| B.4. Baseline Identification <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.</i> | | | | |
| B.4.1. Has the baseline scenario been determined according to the methodology? (VVS, v. 03.0, §§ 72 (b), 89, 87(e)) <i>Describe how it is validated that the identification of the most plausible baseline scenario is carried out in accordance with the applied methodology and applied methodological tools. Please refer to table A-2.</i> | /AMSID/ | <input checked="" type="checkbox"/> The baseline is defined by the applying methodology and the PDD refers to it. If the answer is Yes, continue to B.4.5 <input type="checkbox"/> The baseline is not directly defined by the applying methodology. For details of the assessment regarding the evaluation of the baseline scenario pl. refer to table A-2. <input type="checkbox"/> The determination has been carried out as per the procedure contained in the applied methodology. <input type="checkbox"/> The following CARs / CLs have been identified with respect | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | to the selection of the baseline scenario: | | |
| <p>B.4.2. Is the list of alternatives complete?</p> <p>(VVS, v. 03.0, § 90)</p> <p><i>Describe how it was validated that all alternatives are plausible and that any scenarios that are supplementary to those required by the methodology are realistic and credible in the context of the project activity and that no alternative scenarios have been excluded.</i></p> <p><i>Fill in all alternatives in table A-2.</i></p> | /AMSID/ | <p><input type="checkbox"/> All plausible alternative scenarios listed in the approved methodology have been considered. In the course of document review and site visit, it has been validated that no other alternatives which supply comparable outputs and / or services are to be taken into consideration. Thus no plausible scenario has been excluded.</p> <p><input type="checkbox"/> The following alternative scenarios/options have been omitted. Corresponding CAR(s)/CL(s) has /have been issued</p> <p><i>Not applicable as the baseline is defined by the applying methodology</i></p> | N/A | N/A |
| <p>B.4.3. Is the identified baseline scenario reasonable and has the baseline scenario been determined using conservative assumptions where possible, including relevant references and sources?</p> <p>(VVS, v. 03.0, § 91)</p> <p><i>Describe whether the choice of the identified baseline scenario is reasonable by validating the <u>key assumptions, calculations and rationales</u> used in the PDD. Describe whether these are listed, relevant and <u>conservatively interpreted</u> in the PDD.</i></p> | /AMSID/ | <p><input type="checkbox"/> The baseline scenario is reasonable and has been determined using conservative assumptions where possible. Please refer to comments in table A-2.</p> <p><input type="checkbox"/> The following CARs / CLs have been issued because assumptions used in the baseline determination have been assessed to be not conservative</p> <p><i>Not applicable as the baseline is defined by the applying methodology</i></p> | N/A | N/A |
| <p>B.4.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the</p> | /AMSID/ | <i>Not applied as the baseline scenario is determined as per methodology</i> | N/A | N/A |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| <p>project sector.?</p> <p>(VVS, v. 03.0, § 93)</p> <p><i>Describe whether the PP has shown that all relevant policies and circumstances have been identified and correctly considered in the PDD. Two (2) types of national and/or sectoral policies have to be taken into account:</i></p> <p>(a) <i>National and/or sectoral policies or regulations that give comparative advantages to more emissions-intensive technologies or fuels over less emissions-intensive technologies or fuels, known as E+ policies. For this type of national and/or sectoral policies or regulations, only those that have been implemented before adoption of the Kyoto Protocol by the COP (decision 1/CP.3, 11 December 1997) shall be taken into account</i></p> <p>(b) <i>National and/or sectoral policies or regulations that give comparative advantages to less emissions-intensive technologies over more emissions-intensive technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programmes), known as E- policies. For this type of national and/or sectoral policies or regulations, those that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001) need not be taken into account in identifying a baseline scenario.</i></p> | | | | |
| <p>B.4.5. What has been identified as the baseline scenario? Does the PDD contain a <i>verifiable</i> description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity?.</p> | <p>/AMSID/ /PDD/ /IM01/ /IM02/</p> | <p><i>Description:</i> The identification of the baseline scenario contained in the PDD is the following: “The baseline scenario is the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants or by the addition of new generation sources.” The technology to be employed is a renewable generating unit (hydro power plant) and in case of the project’s absence, the electricity will be generated by thermal power plants connected to the National Grid and fed by fossil</p> | OK | OK |

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| (VVS, v. 03.0, § 88) | | <p>fuels. All this information is clearly described in the PDD.</p> <p><i>Validator's action:</i> The PDD was reviewed and cross-checked with information obtained during the site visit. The applied methodology was also checked.</p> <p><i>Conclusion:</i> The identification of the baseline scenario is in accordance with information provided in the applied methodology</p> | | |
| B.5. Additionality Determination <i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i> | | | | |
| B.5.1. Methodology | | | | |
| <p>B.5.1.1. Does the PDD describe how the project is additional and does the additionality justification follow the requirements of the applied methodology and/or methodological tools?</p> <p>(VVS, v. 03.0, §§ 72 (d), 101-102)</p> <p><i>Describe how it is validated that additionality justification is carried out in accordance with the applied methodology and/or applied methodological tools. Further focus your assessment on the reliability and credibility of data, rationales and assumptions, justifications and documentations provided by the PP.</i></p> | /AMSID/ /FD/ /TOOL/ /XLS/ /PDD/ | <p><i>Description:</i> As per the "Guidelines on the Demonstration of Additionality of Small-scale Project Activities" v. 09.0 the PPs shall chose one among a list of barriers to demonstrate the additionality. The chosen barrier is the Investment Barrier. A benchmark analysis was used to demonstrate it. The calculation of the equity IRR was performed to compare with a benchmark parameter, which was the Cost of equity (K_e), extracted from the WACC calculation. In this way, the PPs demonstrated the additionality. However, the financial indicator (Equity IRR) and the benchmark (K_e) used were not chosen accordingly with the requirements of the applied methodology and methodological tools for this specific project. Thus, CARs have been raised.</p> | CAR B3 CAR B4 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | <p><i>Validator's action:</i> The conference of calculation was performed during the validation process. Information contained in the PDD was cross-checked with contracts and financial data. The excel spreadsheet containing the whole calculation was assessed by the validation team</p> <p><i>Conclusion:</i></p> <p>(CAR B3)</p> <ol style="list-style-type: none"> 1. clarify the model of benchmark chosen for a comparison with the chosen IRR; 2. debt/equity ratio is missing; 3. the reference about the choice of the vintage of the Average Return of Rate (1996 to 2005) used at the calculations is missing; 4. the references for data input; 5. it is not stated if the benchmark is in real or nominal terms; 6. it is not stated if the benchmark is pre-tax or post-tax. <p>(CAR B4) The financial indicator (equity IRR) is not consistently applied in this specific project, once loans, interests and amortizations were not considered in the calculations.</p> | | |
| B.5.2. Consideration of CDM before project start | | | | |
| <p>B.5.2.1. In case the project start date is on or after 2nd August 2008 has the PP informed the DNA and UNFCCC about the intention to seek CDM status?</p> <p>(VVS, v. 03.0, § 107)</p> | <p>/PDD/ /PSD/</p> | <p><i>Not applied as the project starting date is before 2nd August 2008.</i></p> | N/A | N/A |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| <p><i>Describe whether such a notification has been provided by the project participants within 180 days to the UNFCCC and host Party DNA and that further notifications, if necessary (two years from CDM Prior Notification letter without having published the PDD), have been sent to the UNFCCC. If NOT it shall be determined that the CDM was not seriously considered.</i></p> <p><i>Assess the project starting date in section C.1</i></p> | | | | |
| In case the project starting date has been correctly defined on or after 2 nd August 2008, go to B.5.2.4 | | | | |
| <p>B.5.2.2. In case the project start date is before commencing of validation and 2nd August 2008, was the incentive from the CDM seriously considered by the project participants and the benefits of CDM were considered a decisive factor in the decision to proceed with the project?</p> <p>(VVS, v. 03.0, § 108 (a))</p> <p><i>Describe whether the evidences to support such considerations are adequately and transparently described in the PDD.</i></p> <p><i>Include an assessment on how was the CDM involved in the decision making process, as well as how and when the decision to proceed with the project activity was taken and whether the decision to proceed with the project was taken by a person which has the authority to do so.</i></p> <p><i>Include an assessment of the authenticity of the evidences.</i></p> | /PSD/ | <p><i>Description:</i> As stated in the PDD, the Project activity starting date is on 2006-05-19, thus, before 2008-08-02. According to a contract signed on 2006-01-06 between the project stakeholders, it compromises the carbon credit sales to other part. This evidence demonstrates that the CDM was seriously considered by the PPs and the benefits of the CDM were considered decisive factor in the decision to proceed with the project. Furthermore, a meeting minute of the Coronel Araújo management board dated on 2006-01-05 states also the commitment in proceed with the project taking into consideration the CDM. The decision was taken by the president of Electra (Company that owns Coronel Araujo and Passo Ferraz) who has the authority to do so.</p> <p><i>Validator's action:</i> Documents which reinforce the CDM decision taken were assessed^{/PSD/}. Among them, contracts of Carbon Credits pre-sales, meeting minutes, and civil contracts.</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | <i>Conclusion:</i> The validation team had access to authentic documents that evidence the decision taken of the project CDM status. The CDM was seriously considered for the project's implementation. | | |
| <p>B.5.2.3. Does the documented evidence provided doubtlessly prove that continuous and real actions were taken in order to secure the CDM status?</p> <p>(VVS, v. 03.0, §§ 108;(b), 109, 110)</p> <p><i>Include an assessment on the gap between the documented evidences to secure the CDM status.</i></p> <p><i>When the gap is greater than two years and less than three, it has to be assessed whether continuing and real actions were taken to secure CDM status for the project activity.</i></p> <p><i>If the gap is greater than three years, it must be concluded that continuing and real actions were not taken to secure CDM status for the project activity).</i></p> <p><i>Describe the steps taken to validate that the real documented evidences are reliable and authentic.</i></p> | <p>/VVS/ /PSD/ /PDD/</p> | <p><i>Description:</i> A timeline table has been provided in the PDD section B.5 which describes all steps taken since the CDM prior consideration until the current status – validation process for both SHPs. All evidences described were assessed by the validation team and they are considered reliable and authentic. Taking into account that efforts were done to keep the CDM status since its prior consideration and no gaps greater than one year were found, the VT considers that the PPs took continuous and real action in order to secure the CDM status. It was assessed and can be confirmed for both plants.</p> <p><i>Validator's action:</i> The following evidences were assessed, which are all described in the PDD section B.5. Contracts of commitment of CERs purchasing, meeting memorandum, contracts of equipments acquisition, generation authorization from ANEEL (National Electric Energy Agency), DOE contracts, PDD development contract, changes of project bundle (regarding the SHPs participants).</p> <p><i>Conclusion:</i> the justification given by the PP regarding the maintenance of CDM status during the period between the prior consideration and the start of the validation process was enough evidence to prove that real actions were taken to ensure this status. However, a clear and description shall be included in the PDD. Thus, a CL has been raised.</p> <p>(CL B5) At Section B.5, according to the "Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM", for proposed project activities with a start date before 2 August 2008, a full demonstration that the CDM was seriously considered in the decision to implement the project activity has to be done.</p> | CL-B5 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| <p>B.5.2.4. Does the proposed project activity comply with all applicable requirements related to the prior consideration of the CDM?</p> <p>(VVS, v. 03.0, § 112(c)) <i>Describe whether or not the project would have been undertaken without the incentive of the CDM.</i></p> | <p>/PSD/ /PDD/ /VVS/</p> | <p><i>Description:</i> According to evidences described in the projects timeline and presented to the validation team ^{/PSD/} the CDM possibility has been considered since before 2006-05-19 which is the project starting date, which could be accessed through the minute from board meeting (2006-01-05) and the commitment of CERs purchase ^{/PSD/}.</p> <p>Thus, it can be considered that the project activity comply with all applicable requirements related to prior consideration of the CDM as per VVS.</p> <p><i>Validator's action:</i> The timelines described in the PDD have been assessed as well as all evidences regarding maintenance of CDM status for both projects.</p> <p><i>Conclusion:</i> Since the prior consideration, the CDM status has been considered for this project activity.</p> | OK | OK |
| <p>B.5.3. Identification of alternatives Step 1 (in case of SSC projects pl. skip steps 1 and 2 if appropriate; in cases where the baseline scenario is prescribed in the approved methodology, skip step 1, (VVS, v. 03.0, § 115))</p> | | | | |
| <p>B.5.3.1. Does the list of alternatives contain the status-quo situation, the project not undertaken as a CDM project as well as all other viable alternatives for supplying the outputs or services that are to be supplied by the proposed CDM project activity? Do all identified alternatives comply with enforced</p> | <p>/AMSID/</p> | <p><i>Not Applicable as it is a SSC project and an alternative analysis was not necessary</i></p> | N/A | N/A |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| <p>legislations?</p> <p>(VVS, v. 03.0, §§ 114, 116)</p> <p><i>Describe whether the list of alternatives is credible and complete. Describe how it is validated that the list of alternatives is complete, realistic and that the alternatives are credible and that all alternatives comply with the existing and enforced legislation.</i></p> <p><i>Describe the steps taken to validate this issue on the basis of your local and sectoral knowledge.</i></p> | | | | |
| <p>B.5.4. Investment analysis Step 2</p> <p><i>In case the investment analysis as per step 2 is chosen to justify the additionality Annex 4 "Assessment of Financial Parameters" has to be used to provide additional details of the the calculation parameters..</i></p> | | | | |
| <p>B.5.4.1. Does the PDD provide evidence that the project would not be the most economically or financially attractive alternative or economically / financially feasible without the revenues from the sale of CERs?</p> <p>(VVS, v. 03.0, § 117)</p> <p><i>In cases where the project activity would produce no financial or economic benefits other than CDM-related income, describe how it has been validated that at least one of the alternatives identified is less costly than the proposed project activity.</i></p> | <p>/PDD/</p> <p>/IRR/</p> | <p><i>Description:</i> A benchmark analysis is the basis of additionality determination and Equity IRR is the financial indicator chosen. It was verified in the financial analysis that the benchmark for this comparison is the Cost of Equity (K_e) which is in line with the Guidelines on the assessment of investment analysis. According to the Draft PDD, the IRR is below the benchmark, and hence not financially attractive. However the choice of the financial indicator was not consistent with the project, and consequently the choice of the benchmark. Thus, findings have been raised regarding these issues</p> <p><i>Validator's action:</i> PDD and investment analysis spreadsheet were checked.</p> | <p>CAR B3</p> <p>CAR B4</p> | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | <p><i>Conclusion:</i></p> <p>Please refer to CAR B3 and B4 above.</p> | | |
| <p>B.5.4.2. Is a clear, viewable and unprotected Excel spreadsheet available for the investment calculation?</p> <p>(EB 62 Annex 5, §8)</p> <p><i>Describe the steps taken to validate this issue.</i></p> | <p>/PDD/ /IRR/</p> | <p><input checked="" type="checkbox"/> Yes, a clear, viewable and unprotected Excel spreadsheet is available.</p> <p><input type="checkbox"/> No, a respective Excel spreadsheet needs to be made available for investment calculation.</p> <p>In this context the following additional findings have been identified:</p> <p>N/A</p> | OK | OK |
| <p>B.5.4.3. Does the period chosen for the investment analysis reflect the technical lifetime of the project activity or in case a shorter period is chosen, is the fair value of the project activity's assets at the end of the investment analysis period (as a cash inflow) included?</p> <p>(EB 62 Annex 5, § 3)</p> <p><i>Describe how the technical lifetime / period chosen for calculating financial parameter(s) is reviewed and which documents were utilised in the course of review. Describe furthermore the approach used to check the inclusion of a potential fair value.</i></p> | <p>/LIFE/ /PDD/</p> | <p><i>Description:</i> The period of investment analysis considers 30 years, which was the technical lifetime of the main equipments evidenced by letter from the manufactures of Hacker (turbines) and WEG and Automatic (generators for Coronel Araujo and Passo Ferraz respect.). This letters^{/LIFE/} were provided to the validation team.</p> <p><i>Validator's action:</i> Letters from manufacturers were provided to the validation team</p> <p><i>Conclusion:</i> The period of assessment is 30 years and it reflects the technical lifetime of turbines and generators.</p> | OK | OK |
| <p>B.5.4.4. Is the fair value calculated in accordance with local accounting regulations (where available) or international best practice?</p> <p>(EB 62 Annex 5, § 4)</p> | <p>/LIFE/ /TOOL/ /PDD/</p> | <p><i>Description:</i> A fair value was considered for this project activity and it is in accordance with international best practices. It was determined conservatively according to the document Economic Lifetime Study and Depreciation Rate "Estudo de vida útil econômica e taxa de depreciação" vols 1 and 2 issued by ANEEL. The economic lifetime</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| <i>State the accounting regulations applied for calculating the fair value and describe why these are applicable under the project specific circumstances. Describe potential mismatches between regulations and the approach applied for calculating the fair value.</i> | /IRR/ /fazenda / | <p>estimated for a hydro power project is 50 years as per this document. Hence a depreciation of 2% per year is applied (100% / 50 years = 2% per year). Considering that the lifetime for this specific project is 30 years, the depreciation along this project will be 60%. Thus its fair value considered will be the activity assets at the end of the assessment period, i.e. 40%.</p> <p><i>Validator's action:</i> Evidences of hydropower plants lifetimes from ANEEL were assessed as well as accounting international best practices^{/LIFE/}.</p> <p><i>Conclusion:</i> The fair value is duly determined as per guidelines on the assessment of investment analysis.</p> | | |
| <p>B.5.4.5. Is the book value as well as the expectation of the potential profit or loss included in the fair value calculation?</p> <p>(EB 62 Annex 5, § 4)</p> | /LIFE/ /IRR/ | <p><i>Description:</i> The book value as well as the expectation of potential profit were included in the fair value calculation and can be observed in the investment calculation. The lifetime indicated in the ANEEL Report^{/LIFE/} is the economic lifetime, which takes into account the accountancy requirements.</p> <p><i>Validator's action:</i> The ANEEL report was used to assess the method of calculation of the fair value.</p> <p><i>Conclusion:</i> The book value as well as the expectation of potential profit or loss were included in the fair value calculation</p> | OK | OK |
| B.5.4.6. Is an appropriate analysis method chosen for the project (simple cost analysis, | /TOOL/ /PDD/ | <i>Description:</i> According to the Guidelines on Demonstration of Additionality of Small-Scale Project Activities (version 09.0) a barrier | OK | OK |

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| <p>investment comparison analysis or benchmark analysis)?</p> <p>(EB 70 Annex 8, EB 62, Annex 5, §19)</p> <p><i>Describe why the selected analysis method is appropriate under consideration of potential revenues and costs, potential project alternatives and potential available benchmark values.</i></p> <p><i>Assess whether the alternative to the project activity is to supply the same or substitute products or services. In this case, an investment comparison analysis shall be used.</i></p> | | <p>analysis must be done in order to demonstrate the project additionality. The guideline let the PP chose one of the given barriers. For this project, the chosen one is the Investment Barrier. The benchmark analysis was chosen as simple costs could not be used since the PA has other revenues than the CDM benefits and there are no other investment alternatives for the project sponsors; thus investment comparison was also discarded.</p> <p><i>Validator's action:</i> The information contained in the PDD were cross-checked with the ones provided by the guideline of small-scale PA additionality.</p> <p><i>Conclusion:</i> The analysis method chosen for the project is the benchmark analysis which is in accordance with the applied guideline.</p> | | |
| <p>B.5.4.7. Were the input values used in the investment analysis valid and applicable at the time of the investment decision?</p> <p>(EB 62 Annex 5, § 6)</p> <p><i>Describe the steps taken to validate this issue</i></p> | <p>/VVS/ /FD-7/ /FD-8/ /FD-10/ /IRR/</p> | <p><i>Description:</i> All input values used in the investment analysis were evidenced and assessed one by one. Most of them were valid and applicable at the time of investment decision. However there are some parameters that were used which are more recent than the investment decision.</p> <p><i>Validator's action:</i> All financial evidences provided were assessed and are included in the list of evidences, section 7 of this verification report.</p> <p><i>Conclusion:</i> All input values were checked and their evidences assessed. However, there were some parameters that were obtained more recently than the investment decision and one parameter was not informed as per evidence. Furthermore, all relevant assumptions used in the investment analysis have not being inserted in the PDD as</p> | <p>CAR B6 GL B13</p> | <p>OK</p> |

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| | | <p>required by Guidance on investment analysis. Thus, a CAR B6 and CL B13 have been raised.</p> <p>(CAR B6)</p> <ul style="list-style-type: none"> - The input values: energy price (for SHPs Coronel Araújo and Passo Ferraz) and assured energy (for Coronel Araújo) were obtained more recently than the management decision, which is not in line with the Guidelines on the Assessment of Investment Analysis, guidance 6. - In the investment analysis of Passo Ferraz Plant, it was observed that the value of TUSD was not in accordance with the one observed in the evidence provided. <p>(CL B13) The PP have not listed in the PDD all relevant assumptions used in the investment analysis and the results of the analysis as per PS version 02.1 paragraph 48 (a).</p> | | |
| <p>B.5.4.8. Did implementation of the project ceased after its commencement and did implementation recommence after consideration of the CDM?</p> <p>(EB 62 Annex 5, § 7) Describe the reasons for ceasing the project and explain why the incentive from CDM was necessary to recommence the implementation.</p> <p>Assess whether the investment analysis reflects the economic decision-making context at point of the decision to recommence the project, i.e. capital costs incurred prior to the recommencement of the project are to be limited to the potential reuse/resale of tangible assets, demonstrating the value through assessment done by chartered specialists.</p> | <p>/PSD/ /PDD/ /IM01/ /IM02/</p> | <p><i>Description:</i> No. The implementation of the project did not cease. Change of bundles can be observed but the intentions of CDM were always considered. The evidences can be followed in the timeline presented in the PDD. After the CDM prior consideration, constant efforts were taken in order to keep with the CDM intentions for the project and no gap superior than two years were observed until the start of the validation process.</p> <p><i>Validator's action:</i> Evidences of prior consideration and project timelines were assessed. The timeline presented in the PDD was cross-checked with evidences. Interviews were performed to project participants.</p> | CL-B5 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | <i>Conclusion:</i> Further explanation was required in the PDD regarding the project timeline. Please refer to CL B5 above. | | |
| <p>B.5.4.9. Are the input parameters based on values from Feasibility Study Reports that are approved by national authorities for proposed project activities?</p> <p>(VVS, v. 03.0, § 122)</p> <p><i>In case the basis for input values is a Feasibility Study Report (FSR) describe how it has been ensured that the period in time between the finalisation of the FSR and the investment decision is sufficiently short so that it is unlikely that input values would have materially changed. Further confirm the consistency of values in FSR and PDD.</i></p> | <p>/PDD/ /FD-6/ /FD-12/ /IRR/ /IM01/ /IM02/</p> | <p><i>Description:</i> Some values were obtained from Feasibility Study Reports but all of them were then confirmed with supplier's proposals, auction results, PP's experience in other projects and public information. The FSR were dated before the starting date of each project.</p> <p><i>Validator's action:</i> The PDD and excel spreadsheet were checked and interviews were performed to assess this issue. The documents cited above were also checked.</p> <p><i>Conclusion:</i> The input parameters are not based on values from Feasibility Study Reports.</p> | OK | OK |
| In case a simple cost analysis has been done, go to B.5.5; | | | | |
| <p>B.5.4.10. Has been a suitable financial indicator chosen by the project participants?</p> <p>(VVS, v. 03.0, § 120 (a))</p> <p><i>Describe the steps taken to validate this issue.</i></p> | <p>/PDD/ /IRR/ /FD-1/ /FD-9/</p> | <p><i>Description:</i> Equity IRR is the financial indicator chosen for the project activity. However, this parameter was not considered appropriate for this specific parameter as no financing was used for this project.</p> <p><i>Validator's action:</i> The PDD and excel spreadsheet financial analysis were checked. This information was also evidenced during the interviews performed with the PPs and it is described in the minute of the board meeting ^{/FD-1-9/} that the total investment for the project will be invested by the company.</p> | CAR B4 | OK |

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| | | <p><i>Conclusion:</i> As the financial indicator was not considered correct for this project a CAR has been raised;</p> <p>Please refer to CAR B4 above</p> | | |
| <p>B.5.4.11.Are depreciation and other non-cash related items only considered in the tax calculation and not as cash outflow?</p> <p>(EB 62 Annex 5, § 5)</p> | <p>/PDD/ /IRR/ /IM01/ /IM02/</p> | <p><i>Description:</i> Not applicable as the project uses vain (assumed) profit calculation of income tax, additional income tax and social contribution. Thus, the income tax is completely independent from any other parameter.</p> <p><i>Validator's action:</i> In line with tax legislation, the above mentioned taxes are calculated based on an assumed profit of total revenues; therefore depreciation does not impact the cash flow, as the taxes are calculated based on gross sales. Interviews were performed regarding this issue.</p> <p><i>Conclusion:</i> Not applicable as the depreciation does not have any impact on the cash flow and IRR calculation</p> | OK | OK |
| <p>B.5.4.12.Is the plant load factor (PLF) chosen in a conservative manner, taking into account that the PLF may be different in the framework of demonstrating additionality and calculating the ex-ante ER?</p> <p>(EB 48, Annex 11)</p> | <p>/aneel/ /PLF/ /mme/ /IRR/ /IM01/ /IM02/</p> | <p><i>Description:</i> The common practice in Brazil is to use the assured energy instead the PLF. According to ANEEL (National Electrical Agency – Brazil) the assured energy is the maximum energy that a power plant can dispatch during its worst hydrological cycle with a maximum demand. The assured energy calculated by a third party company and then homologated by ANEEL.</p> <p>For Coronel Araújo the assured energy was first evidenced in a document "Particular Instrument of transfer of rights" (<i>Instrumento particular de cessão de direitos</i>)^{/PLF/} on which the assured energy for the plant is 3.54 MWh average. This document, however, indicated</p> | CAR B6 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | <p>that, in case the installed power of Coronel Araújo turn to 5.8 MW (aprox.) the assured energy will turn to 3.70 MWh average . Another study, the Basic Project of Coronel Araújo, rev. 02 dated on May 2007, changes the value of assured energy to 4.09 MWh. This study was then sent to the Ministry of Mines and Energy (MME - Brazil) which, through the Ordinance # 1^{/PLF/} approved the new value. This value was used because results in a more conservative investment analysis calculation.</p> <p>For Passo Ferraz the assured energy was first evidenced in a document Basic Project Passo Ferraz, from 2006-12-18^{/PLF/} on which the assured energy for the plant is 2.21 MWh. Another study sent to the Ministry of Mines and Energy (Brazil) which, through the Ordinance # 24^{/PLF/} approved the new value of 2.1 MWh. Unlike in the Coronel Araújo, the new value homologated by the MME was bigger than the first one. Thus, as a conservative action, resulting in a higher IRR the first value was used for the investment analysis.</p> <p>However, as these values were not available at the time of management decision, this measure was not in line with the used Guidance for Investment Analysis. Thus a CAR has been raised.</p> <p><i>Validator's action:</i> Documents evidencing the changes of assured energy for both plants were assessed and interviews with the PP were performed.</p> <p><i>Conclusion:</i> Even though the measures taken were more conservatives, the presented values were not available at the time of the management decision.</p> <p>Hence a CAR has been raised. Please refer to CAR B6 above</p> | | |
| B.5.4.13.Does the PDD and related spreadsheets | /PDD/ | <i>Description:</i> Yes, a sensitivity analysis is included in the PDD and | CAR | OK |

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| <p>contain a sensitivity analysis and does the same contain variation of parameters which may vary throughout the project lifetime,</p> <p>(EB 62 Annex 5, § 20-21)</p> <p><i>Describe relevance of parameters used in the sensitivity analysis as well as their likeliness to vary during the project's lifetime. Parameters which are fixed on the basis of contracts, PPAs etc. may not be subject to variation and not adequate.</i></p> | <p>/FD-1/ /FD-2/ /FD-3/ /FD-8/ /FD-9/ /FD-10/ /FD-12/ /IRR/</p> | <p>financial spreadsheet. Key parameters which may vary throughout the project lifetime were included: <u>Investment</u>, <u>Energy Price</u>, <u>Assured energy</u> and <u>O & M Costs</u> which are representative for this project.</p> <p>However, as required by the guidelines on the assessment of the investment analysis, the range of + /- 10% was not included. Thus a CAR has been raised.</p> <p><i>Validator's action:</i> PDD and spreadsheet were reviewed in detail. For more details of assessment of each financial parameter, please refer to Table A-3 Annex 3.</p> <p><i>Conclusion:</i></p> <p>(CAR B7) At Section B.5, the sensitivity analysis with the variation of - /+10% is missing.</p> | B7 | |
| <p>B.5.4.14. Were only variables that constitute more than 20% of either total project costs or total project revenues subjected to reasonable variation?</p> <p>(EB 62 Annex 5, § 20)</p> | <p>/PDD/ /FD-6/ /FD-12/ /IRR/ /TOOL/</p> | <p><i>Description:</i> All parameters above represent more than 20% of the total project costs and/or revenues and are subject to a reasonable variation. Furthermore, the O&M costs were also included as they are representative in the project even though represent less than 20% of the total project costs.</p> <p><i>Validator's action:</i> PDD and financial documents were reviewed in detail.</p> <p><i>Conclusion:</i> The parameters included and the variations applied are reasonable and in line with the guidelines of investment analysis. For more details of assessment of each financial parameter, please refer</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | to Table A-3 Annex 3. | | |
| <p>B.5.4.15. Have parameters, constituting less than 20% of total project costs or revenues, been identified with potential material impact on the financial parameter?</p> <p>(EB 62 Annex 5, § 20)</p> <p><i>Describe whether those parameters are considered in the sensitivity analysis?</i></p> | <p>/PDD/ /FD-6/ /FD-12/ /IRR/ /TOOL/</p> | <p><i>Description:</i> the O&M costs were also included as they are representative in the project even though represent less than 20% of the total project costs.</p> <p><i>Validator's action:</i> PDD and spreadsheet were reviewed in detail.</p> <p><i>Conclusion:</i> The parameters included and the variations applied are reasonable and in line with the guidelines of investment analysis. For more details of assessment of each financial parameter, please refer to Table A-3 Annex 3.</p> | OK | OK |
| <p>B.5.4.16. Is the range of variation reasonable in the specific context of the project activity, taking into consideration historic trends in the business sector?</p> <p>(EB 62 Annex 5, § 21)</p> <p><i>Describe whether the range of variation is appropriate with focus on historic developments, e.g. price of oil / labour etc., energy potential in the region in question.</i></p> | <p>/PDD/ /FD/ /IRR/ /TOOL/</p> | <p><i>Description:</i> The breakeven range was duly demonstrated in the PDD and it was proved to be higher than the 10% considered by the guidelines for the investment analysis. The deviation was presented in the PDD and calculation spreadsheet. The PP performed a breakeven analysis which represent a variation much greater than the +/-10% required by the Guidelines.</p> <p><i>Validator's action:</i> PDD and spreadsheet were reviewed in detail. Each financial parameter was reviewed and validated carefully considering submitted evidences, public available sources of information and the local expertise of the validation team. The variation is in line with latest EB guidance. Registered CDM projects were checked and the variation is in line with other similar registered CDM projects.</p> <p><i>Conclusion:</i> The variation applied is considered appropriate in the context of the project activity, taking in consideration historic trends in the business sector. However, a CAR was opened as the 10% variation was not done. Please refer to CAR B7 above.</p> | CAR B7 | OK |

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| B.5.4.17. In case of project IRR: Are the costs of financing expenditures (loan repayments and interests) excluded from the calculation of project IRR? (EB 62 Annex 5, § 9) | /PDD/ /FD/ /IRR/ | <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes, the costs of financing expenditures have been excluded. <input type="checkbox"/> No, this requirement is not met. In this context the following additional findings have been identified: N/A | N/A | N/A |
| B.5.4.18. In case of equity IRR: Is the part of the investment costs, which is financed by equity, considered as net cash outflow and is the part financed by debt excluded in net cash outflow? (EB 62 Annex 5, § 10) | /PDD/ /FD/ /IRR/ | <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes, in- and outflows have been considered correctly. <input type="checkbox"/> No, this requirement is not met. In this context the following additional findings have been identified: N/A | OK | OK |
| In case a comparison analysis has been done, go to B.5.5 | | | | |
| B.5.4.19. Is the type of benchmark chosen appropriate for the type of IRR calculated (e.g. local commercial lending rates or weighted average costs of capital for project IRR; required/expected returns on equity for equity IRR)? | /PDD/ /IRR/ /BENCH / | <i>Description:</i> The chosen benchmark used is the cost of equity (Ke), which is appropriate for the equity IRR. However as the financial indicator chosen (equity IRR) was not in accordance with the type of the project, and benchmark model for its calculation was not clear in the PDD. CARs have been raised. <i>Validator's action:</i> The specific excel spreadsheet benchmark calculations and the PDD were checked. | CAR B3 CAR B4 | OK |

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| (EB 62 Annex 5, § 12) <i>Describe the steps taken to validate this issue.</i> | | <i>Conclusion:</i> The financial indicator was not appropriate for this type of project and consequently the chosen benchmark (Cost of equity – Ke) is not correct. Thus, CAR B3 and CAR B4 have been raised. Please refer to them above. | | |
| B.5.4.20. Is a pre-tax benchmark applied in case of project IRR is calculated? In cases where a post-tax benchmark is applied, assess whether actual interest payable is taken into account in the calculation of income tax. (EB 62 Annex 5, § 11) <i>If this is not the case, ensure that taxation is excluded from the investment analysis. As per the guidance it is recommended to select a pre tax benchmark in order to describe the steps taken in assessing this requirement.</i> | /PDD/ /IRR/ /BENCH / | <input type="checkbox"/> N/A <input type="checkbox"/> A pre-tax benchmark is applied <input type="checkbox"/> The benchmark is post-tax and the interest has been taken into account for the calculation <input type="checkbox"/> No, this requirement is not met. <i>In this context the following additional findings have been identified: As the financial indicator (equity IRR) is not considered correctly chosen, it is necessary the answer of CAR B3 and CAR B4 for assess this question. Please refer to them above.</i> | CAR B3 CAR B4 | OK |
| B.5.4.21. Have both benchmark and cash flows expressed consistently, i.e. real terms (excluding the effect of inflation) or nominal terms? <i>Describe the steps taken to validate this issue.</i> | /PDD/ /IRR/ /BENCH / | <i>Description:</i> The validation team has to wait for the benchmark calculation to assess this question as the CAR B3 has been raised. <i>Validator's action:</i> The specific excel spreadsheet benchmark calculations and the PDD were checked. <i>Conclusion:</i> Please refer to CAR B3 above | CAR B3 | OK |
| B.5.4.22. Is the benchmark value suitable for the | /PDD/ | <i>Description:</i> The benchmark chosen was suitable for the Equity IRR chosen by the PP. However, as the IRR was not considered correct by | CAR | OK |

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| <p>project activity and is it reasonable to assume that no investment would be made at a rate of a lower return than the benchmark?</p> <p>(VVS, v. 03.0, § 121 (c))</p> <p><i>Describe whether it is reasonable to assume that a lower rate of return would consequently result in the baseline scenario.</i></p> | /BENCH / | <p>the validation team, a new benchmark may be chosen. Thus, a CAR has been raised.</p> <p><i>Validator's action:</i> The specific excel spreadsheet benchmark calculations and the PDD were checked.</p> <p><i>Conclusion:</i> CAR B3 has to be closed to allow a complete assessment of this point. Please, refer to it.</p> | B3 | |
| <p>B.5.4.23. Is the benchmark applied based on parameters that are available and standard in the market?</p> <p>(VVS, v. 03.0, 121 (b), EB 62 Annex 5, §§13, 15, 16, 18)</p> <p><i>Assess whether company-specific benchmarks or benchmarks based on parameters that are available in the market are suitable to the project activity. A benchmark that includes the subjective profitability expectations or risk profile of the project developer (size risk premiums, company own risk premium, etc) is not suitable for project activities open to be developed by other entities.</i></p> <p><i>If cost of equity is applied, assure that best financial practices are used and are based on data sources which can be cross-checked against third-party or publicly available sources.</i></p> <p><i>If cost of debt is used for the calculation of the benchmark, ensure that it is calculated as the cost of financing in the capital markets (e.g: commercial lending rates)</i></p> <p><i>If the cost/equity financing structure of the project is not yet available, 50% equity, 50% debt financing may be assumed as default.</i></p> | /BENCH / /PDD/ | <p><i>Description:</i> As the financial indicator chosen is not suitable for the type of project, consequently the benchmark chosen cannot be considered. Thus a CAR has been raised.</p> <p><i>Validator's action:</i> The PDD was cross-checked with information provided by Agency Standards & Poor's and Damodaran Article and interviews were performed with the PPs.</p> <p><i>Conclusion:</i> Please refer to CAR B3 above</p> | CAR B3 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| Following checklist is intended for cases where intern company benchmarks are applied, otherwise go to B.5.5 | | | | |
| <p>B.5.4.24. Is it ensured that the project cannot be developed by other developers than the PP, so that internal company benchmarks or expected returns are suitable for the project activity?</p> <p>(EB 62 Annex 5, §§ 13 – 14) <i>Describe how it has been validated that there is only one possible project developer.</i></p> | /PDD/ | <i>It will be only assessed after the answer of the CAR B3</i> | CAR B3 | OK |
| <p>B.5.4.25. Was the benchmark consistently used in the past by the same company for similar projects with similar risks?</p> <p>(EB 62 Annex 5, § 14) <i>If applicable, assess the past financial behaviour of the entity during the last 3 years in relation to similar projects.</i></p> | /PDD/ | <i>It will be only assessed after the answer of the CAR B3.</i> | CAR B3 | OK |
| <p>B.5.4.26. Was the cost of debt calculated based on the weighted average cost of debt financing of the legal entity owning the CDM project activity?</p> <p>(EB 62 Annex 5, § 16) <i>If applicable, assess whether loans, bonds or debt financing from a parent company are calculated according to the latest "Guidance</i></p> | /PDD/ | <i>It will be only assessed after the answer of the CAR B3</i> | CAR B3 | OK |

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| <p>on Investment Analysis”.</p> <p><i>In case that the debt structure of the project is not yet available, the cost of debt can be assumed as the commercial lending rate in the company or the yield of a 10-year bond issued by the government of the host county.</i></p> | | | | |
| <p>B.5.4.27. Does the equity/debt ratio of the project reflect the long-term debt/equity finance structure of the legal entity owning the assets of the project activity? (EB 62 Annex 5, § 17)</p> <p><i>Assess the latest balance sheets of the legal entity owning the assets of the project activity, in case these are available and audited by a third party within two years prior to the submission of the PDD for validation, and the accounting books reflect the total value of all assets needed for the project activity.</i></p> <p><i>If debt/equity financing structure is not available, 50% equity, 50% debt shall be considered as default.</i></p> | /PDD/ | <i>It will be only assessed after the answer of the CAR B3</i> | CAR B3 | OK |
| B.5.5. Barrier analysis Step 3 or SSC additionality assessment | | | | |
| <p>B.5.5.1. Are there any barriers given which have a clear and direct impact on the financial returns of the project? (VVS, v. 03.0, § 125)</p> <p><i>In case of LSC projects those issues <u>cannot be considered</u> as barriers and shall be assessed in the investment analysis. In case of SSC projects the same fundamentals as for LSC projects shall apply, i.e. the assessment of the investment barrier according to</i></p> | /AMSID/ /IRR/ /PDD/ | <p><i>Description:</i> This is a Small-Scale project which used the investment barrier to demonstrate the additionality as per methodology^{/AMSID/}. As the financial indicator chosen was not considered correct by the validation team, and consequently the benchmark used, this assessment shall be performed after the answer of CAR B3 and CAR B4.</p> | CAR B3 CAR B4 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| <i>EB 62 Annex 5. Only unavailability of sources of finance and/or risk related barriers, for example, the risk related to technical failure that could have negative impact on financial performance are acceptable as barriers.</i> | | <p><i>Validator's action:</i> The specific excel spreadsheet benchmark calculations and the PDD were checked.</p> <p><i>Conclusion:</i> The investment analysis will be assessed after the answers of CAR B3 and CAR B4</p> | | |
| <p>B.5.5.2. Has the unavailability of means of finance for the project been described and adequately substantiated? Do evidences doubtlessly prove that the financing of the project was assured only due to the benefit of the CDM?</p> <p>(EB 50 Annex 13, § 9)</p> | <p>/PSD/ /IM01/ /IM02/ /IRR/</p> | <p><i>Description:</i> Since the prior consideration, all contracts signed and minutes of meetings considered the income of CERs as a necessity for the project implementation.</p> <p><i>Validator's action:</i> The prior consideration documents were all assessed as well as interviews were performed to the project participants.</p> <p><i>Conclusion:</i> The evidences assessed prove that the financing of the project was assured due to the benefit of the CDM.</p> | OK | OK |
| <p>B.5.5.3. Would provision of additional financial means lead to the mitigation of the barrier(s) demonstrated?</p> <p>(EB 50 Annex 13, § 7)</p> <p><i>Describe why provision of additional financial means would not lead to mitigation of the barrier(s) demonstrated and hence analysing the project's additionality within the framework of an investment analysis is inappropriate. .</i></p> | <p>/PDD/</p> | <p><i>Not applied as the investment barrier was used</i></p> | N/A | N/A |
| <p>B.5.5.4. How is it justified and evidenced that the barriers given in the PDD are real?</p> <p>(VVS, v. 03.0, § 126(a))</p> | <p>/PDD/ /ACMID/</p> | <p><i>Description:</i> The chosen barrier was the investment barrier for this project. The barriers chosen are in accordance with the applied methodology. The assessment of the investment analysis will be only</p> | <p>CAR B3 CAR</p> | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | possible after the answer of CAR B3 and CAR B4. <i>Validator's action:</i> The sensitive analysis was checked for this assessment. <i>Conclusion:</i> Please refer to CAR B3 and CAR B4 above | B4 | |
| B.5.5.5. How is it justified that one or a set of real barriers prevent(s) the implementation of the project activity and do not prevent the implementation of at least one of the alternatives? (VVS, v. 03.0, § 126 (b)) | /AMSID/ | <i>Not applicable as it is a Small-scale project and no alternatives were created.</i> | N/A | N/A |
| B.5.5.6. Does the review of relevant background information on the nature of the company(ies) and entity(ies) involved in the financing and implementation of the project sufficiently justify that the barriers related to the lack of access to capital, technologies and skilled labour are real? (EB 50 Annex 13, § 4) | /PDD/ | <i>Not applicable in the Project Activity</i> | N/A | N/A |
| B.5.5.7. Has it been demonstrated in an objective way how the CDM alleviates each of the identified barriers to a level that the project is not prevented anymore from occurring by | /PSD/ /PDD/ | <i>Description:</i> As it is a small scale PA, only the investment barrier was considered. Since the prior consideration, the PPs took into account the benefit of the CERs and without them, the investment would assume a higher risk rate. <i>Validator's action:</i> The prior consideration documents were all | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| any of the barriers? (EB 50 Annex 13, § 5) | | assessed as well as interviews were performed to the project participants. <i>Conclusion: Only one barrier was considered in this case.</i> | | |
| B.5.6. Common practice analysis Step 4 (in case of SSC projects or first-of-its-kind LSC projects skip this step) | | | | |
| B.5.6.1. Is the defined region for the common practice analysis appropriate for the technology/industry type? (VVS, v. 03.0, § 129(a)) <i>Describe why the project activity is not common practice in a transparent and unambiguous manner. If a region other than the entire host country is chosen, describe why this region is more appropriate.</i> | /PDD/ | <i>Not Applied as it is a SSC project</i> | N/A | N/A |
| In case of projects activities applying ACM002, go to B.5.6.4 | | | | |
| B.5.6.2. To what extent similar projects have been undertaken in the relevant region? (VVS, v. 3.0, § 129(b)) <i>Similar projects are considered those that take place in a comparable environment w.r.t. regulatory framework, investment climate, access to technology and financing, etc. Registered CDM PA and PA that have been published on the UNFCCC website are not to be considered as similar.</i> | /AMSID/ | <i>The project uses the small scale version of the ACM0002 methodology which is the AMS.I-D.</i> | N/A | N/A |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|-----------|---|-----------------|-----------------|
| B.5.6.3. In case similar projects are identified, are there any key differences between the proposed project and existing or ongoing projects and what kind of differences are observed? (VVS, v. 03.0, § 129(c)) | /AMSID/ | <i>The project uses the small scale version of the ACM0002 methodology which is the AMS.I-D.</i> | N/A | N/A |
| B.5.6.4. In case of projects activities applying ACM002: Has an output range as +/- 50% of the design output of the project activity been calculated in order to define the capacity range for “similar” projects? (EB 69 Annex 8, § 5) | /AMSID/ | <i>Not applicable for the SSC methodology AMS.I-D</i> | N/A | N/A |
| B.5.6.5. In case of projects activities applying ACM002: Does N_{all} include only plants that have started commercial operation before the the start date of the project and are within the applicable output range? (EB 69 Annex 8, § 7) <i>Under N_{all}, registered CDM projects and projects undergoing validation are not to be included.</i> | /AMSID/ | <i>Not applicable for the SSC methodology AMS.I-D</i> | N/A | N/A |
| B.5.6.6. In case of projects activities applying ACM002: | /AMSID/ | <i>Not applicable for the SSC methodology AMS.I-D</i> | N/A | N/A |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| <p>Does N_{diff} include only plants that apply different “technology” than the project activity?</p> <p>(EB 69 Annex 8, §§ 4, 8)</p> <p><i>The term “technology” refers to energy fuel, investment climate (access to technology, subsidies, legal regulations, etc...) or unit cost of output.</i></p> <p><i>Assess how the essential distinctions to identify the different measures have been carried out.</i></p> | | | | |
| <p>B.5.7. Algorithms and/or formulae used to determine emissions reductions</p> <p><i>It is assessed whether the steps taken and the equations and parameters applied in the PDD to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected methodology including applicable tool(s).</i></p> | | | | |
| <p>B.5.7.1. Are the equations applied correctly according to the applied approved methodology?</p> <p>(VVS, v. 03.0, §§ 72(c), 96)</p> <p><i>Describe clearly the steps taken to assess whether the methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. Further take into consideration that all estimates of the baseline emissions can be replicated using the data and parameter values</i></p> | <p>/PDD/ /TOOL/ /AMSID/</p> | <p><input checked="" type="checkbox"/> The equations applied for calculation are correctly applied according to the approved methodology.</p> <p><input type="checkbox"/> The following mistakes have been identified in this context:</p> <p><i>Description:</i> The equations were correct applied. However an used equation was not described in the PDD. So a CL has been raised</p> <p><i>Validator’s action:</i> PDD, applied tools and methodology were checked</p> | CL-B8 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| <i>provided in the PDD.</i> | | <p><i>Conclusion:</i></p> <p>(CL B8) In section B.6.1 is missing the EF_{CM} formula.</p> | | |
| <p>B.5.7.2. In case the methodology allows for different methodological choices, are the equations applied properly justified and have they been used reflecting the other methodological choices (i.e. baseline identification)?</p> <p>(VVS, v. 03.0, §§ 97, 98)</p> <p><i>Assess the correct selection and application of methodological choices. Describe whether proper justification has been provided (based on the choice of the baseline scenario, context of the project activity and other evidence provided) and whether the correct equations have been used reflecting the relevant methodological choices.</i></p> | /PDD/ /AMSID/ | <p><i>Description:</i> The applied methodology comprises renewable energy generation units, which supply electricity to the national grid. This methodology is applied, among others, to activities that install new power plant at a site where there was no renewable energy power plant operating (greenfield). The applied baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.</p> <p>The total capacity cannot be higher than 15 MW.</p> <p>The methodological choices were applied as per methodology AMS.I-D.</p> <p>However the justification of methodological choices to calculate the Operating Margin was not given in section B.6.1 of the PDD. Thus a CL has been raised.</p> <p><i>Validator's action:</i> The methodology was consulted and its information was cross-checked with information provided in the PDD.</p> <p><i>Conclusion:</i></p> <p>(CL B9) Section B.6.1: in this section the methodological choices should be provided. Choose of the option "dispatch data analysis" and its justification regarding the Grid emission factor calculation is</p> | CL-B9 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | missing here. | | |
| <p>B.5.7.3. Have conservative assumptions been used when calculating the emission reductions? (VVS, v. 03.0, §§ 98, 99(a))</p> <p><i>Describe clearly the steps taken to assess whether all the assumptions and data used by the PP are listed in the PDD including references and sources and are conservatively interpreted in the PDD.</i></p> | <p>/PLF/ /aneel/ /dna/</p> | <p><i>Description:</i> The baseline emissions are calculated based on net energy generated multiplied by the combined margin emission factor (EF) calculated according to the Tool to Calculate the emission factor for an electric system and published by Brazilian DNA. The net energy generated is estimated based on the assured energy, which was also obtained in a conservative manner.</p> <p><i>Validator's action:</i> Data used is adequate as the EF value is publicly available and calculated by the Ministry of Science and Technology and published by the Brazilian DNA and the energy generation is calculated using the Assured Energy certified by a specialized third party and approved by ANEEL.</p> <p><i>Conclusion:</i> Conservative assumptions have been used when calculating the project emissions.</p> | OK | OK |
| <p>B.5.7.4. Are all data sources and assumptions appropriate and parameters which remain fixed throughout the crediting period correct, applicable to the project and will lead to a conservative estimation of emission reductions? (VVS, v. 03.0, § 98)</p> <p><i>Describe clearly the steps taken to assess whether the values used for the fixed parameters are considered reasonable, correct and applicable in the context of the project activity. Check esp. chapter</i></p> | <p>/PDD/ /ACM02/</p> | <p><i>Description:</i> Yes, the fixed parameters will lead to a conservative estimation of emission reductions. However some fixed parameters were not included in the PDD and others should be monitored as per applied methodology. Thus a CAR has been raised.</p> <p><i>Validator's action:</i> The fixed and monitored parameters are given by the applied methodology and tools.</p> <p><i>Conclusion:</i> The fixed parameters are from the emission factor tool and they will lead to a conservative estimation of emission reductions.</p> | CAR B10 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| 6.2 of the PDD. | | <p>However a CAR has been raised.</p> <p>(CAR B10) The fixed parameters stated at Section B.6.2 are not in accordance with the applied methodology.</p> <p>Furthermore the parameters Area of reservoirs $A_{x,y}$ and installed capacity $CAP_{x,y}$ (x= the names of the 2 projects) should be verified during verification, so these 4 parameters are not fixed and ex-ante parameters but parameters to be monitored.</p> | | |
| <p>B.5.7.5. Are all ex-ante calculation values for monitoring parameters (as defined as per chapter B.7.1 of PDD) reasonable?</p> <p>(VVS, v. 03.0, § 98)</p> <p><i>Describe clearly the steps taken to assess whether the values used for the monitoring parameters are considered reasonable, applicable and conservative in the context of the project activity</i></p> | <p>/IRR/ /BENCH / /AMSID/ /XLS/</p> | <p><input checked="" type="checkbox"/> All “Values of data to be applied for the purpose of calculating expected emissions reductions” are considered to be reasonable, applicable and conservative.</p> <p><input type="checkbox"/> The following mistakes have been identified in this context:</p> | OK | OK |
| <p>B.5.7.6. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.</p> <p><i>Describe the steps taken to validate this issue.</i></p> | <p>/XLS/ /PDD/ /IM01/ /IM02/ /PLF/</p> | <p><i>Description:</i> The emission reductions are real, measurable and it gives a long term benefit related to the mitigation of climate change. The emission reductions are calculated based on the assured energy approved by the National Agency which takes into consideration technical studies, equipment capacity, losses, and hydrologic regimes. The long term benefits are based on production of clean energy, contribution to better working conditions and increasing employment opportunities, increases the local economy.</p> <p><i>Validator’s action:</i> These mitigation measures were observed during the site visit, through interviews to the company workers and having access to the official documents which have the assured energy</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| | | confirmed. <i>Conclusion:</i> The emission reduction are real, measurable and bring long-term benefits to the mitigation of climate change | | |
| B.5.8. Monitoring of Emission Reductions <i>It is assessed whether the monitoring plan is appropriate for the project activity and in line with the applied methodology.</i> | | | | |
| <p>B.5.8.1. Are all monitoring parameters required by the applied methodology contained in the monitoring plan?</p> <p>(VVS, v. 03.0, §§ 72 (e), 131, 132 (a) (i))</p> <p><i>Assess whether all applicable parameters listed in the methodology are included in the monitoring plan.</i></p> <p><i>Pl. check further whether the selection of parameters not to be monitored (section B.6.2) is appropriate and in line with the applied methodology.</i></p> <p><i>In case of different approaches can be chosen acc. to the methodology assess whether the selection of parameters is justified and correct.</i></p> | <p>/PDD/ /AMSID/</p> | <p><i>Description:</i> Not all fixed and monitoring parameters required by the AMS.I-D were correctly described in the presented monitoring plan of the PDD.</p> <p>Thus a CAR has been raised.</p> <p><i>Validator's action:</i> The information inserted in the PDD was cross-checked with information from the applied methodology</p> <p><i>Conclusion:</i> Please refer to CAR B10 above</p> | CAR B10 | OK |
| <p>B.5.8.2. Are the means of monitoring of all parameters contained in the monitoring plan feasible within the project design?</p> <p>(VVS, v. 03.0, §§ 132 (b) (i), 133(b))</p> | <p>/MP/ /AMSID/ /IM01/ /IM02/</p> | <p><i>Description:</i> The parameters "area of reservoir" (A_v) and installed capacity (CAP_v) for both plants were not considered as monitored parameters.</p> <p>Furthermore, it was observed that the information presented in the</p> | CAR B11 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. | | | | | | | | | | | | |
|---|-------------------------------------|---|--------------------------|-----------------|--------|-----|-------|-------------------------------------|--------------------------|--------------------------|-----------|-------------------------------------|--------------------------|--------------------------|------------------------------|----|
| Describe the steps undertaken to assess whether the monitoring arrangements described in the monitoring plan are feasible within the project design. | | <p>monitoring plan does not reproduce what was viewed during the site visit and the monitoring method of the parameter EG for both plants is not described as per requirements of the applied methodology. Thus, CAR B10 and CAR B11 have been raised.</p> <p><i>Validator's action:</i> Information from the monitoring plan was cross-checked with information from monitoring plan and interviews were performed during the site visit.</p> <p><i>Conclusion:</i> Please refer to CAR B10 above.</p> <p>(CAR B11) At Section B.7.1, the monitored parameter EG for both plants:</p> <ol style="list-style-type: none">1. it is not clear if the quantity of electricity supplied by the project activity to the grid and the quantity of electricity delivered to the project activity from the grid are being monitored;2. the monitoring frequency is missing;3. there is no indication about quantity, function type, class and location of the used meters to monitor parameter EG;4. the cross-check procedures are missing. | | | | | | | | | | | | | | |
| B.5.8.3. Electricity of the SHP Coronel Araújo delivered to the grid in year y - [EG _{CoronelAraujo,y}] (VVS, v. 3.0, § 132(a)– (ii)) | /PDD/ /AMSID/ | <table><tr><td>Requirement</td><td>OK</td><td>Not OK</td><td>N/A</td></tr><tr><td>Label</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr><tr><td>Data Unit</td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr></table> | Requirement | OK | Not OK | N/A | Label | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Data Unit | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | CAR B11 CAR B12 | OK |
| Requirement | OK | Not OK | N/A | | | | | | | | | | | | | |
| Label | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | | | | | | |
| Data Unit | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | | | | | | |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
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| <p>Indicate whether the provided information for the monitoring parameter complies with the approved methodology including applicable tool(s) in the aspects listed.</p> <p>For checking the use of international standards in the nomenclature, consider:</p> <p>a) Standard format (e.g. 1,000 representing one thousand and 1.0 representing one).</p> <p>b) Values shall be directly given in SI units – or additionally to original units transferred to SI.</p> <p>c) Short scale naming system: (Only) million = 10^6 and billion 10^9 shall be used.</p> | | <p>Description <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Source of data <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p>Measurement equipment / measure method <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p>Monitoring frequency <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p>QA/QC procedures <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p>Purpose of data <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Standard format <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>SI units <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Short scale naming <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Please refer to CAR B11 above and CAR B12 below.</p> <p>(CAR B12) As verified during the site visit, the meters used to monitor parameter EG of each plant are located at different locations: at SHPP Coronel Araújo, the meters are located at Palmas Substation where the energy is delivered to the grid; at SHPP Passos Ferraz, the meters are located at the plant premises where the energy is delivered to the grid.</p> <p>Clarify the reasons for the different location where the energy is delivered to the grid.</p> | | |
| B.5.8.4. Electricity of the SHP Passo Ferraz delivered to the grid in year y - [EG _{PassoFerraz,y}] | /PDD/ /AMSID/ | <p>Requirement OK Not OK N/A</p> <hr/> <p>Label <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Data Unit <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> | CAR B14 CAR | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | | | Draft Concl. | Final Concl. | |
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| (VVS, v. 3.0, § 132(a)– (ii)) <i>Indicate whether the provided information for the monitoring parameter complies with the approved methodology including applicable tool(s) in the aspects listed.</i> <i>For checking the use of international standards in the nomenclature, consider:</i> d) <i>Standard format (e.g. 1,000 representing one thousand and 1.0 representing one).</i> e) <i>Values shall be directly given in SI units – or additionally to original units transferred to SI.</i> f) <i>Short scale naming system: (Only) million = 10⁶ and billion 10⁹ shall be used.</i> | | Description | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | B12 | |
| | Source of data | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | | | |
| | Measurement equipment / measure method | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | | | |
| | Monitoring frequency | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | | | |
| | QA/QC procedures | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | | | |
| | Purpose of data | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| | Standard format | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| | SI units | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| | Short scale naming | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| | Please refer to CAR B11 and CAR B12 above. | | | | | | |
| B.5.8.5. CO2 Emission Factor of the grid electricity in year y, [EF _{CO2,grid,y}] (VVS, v. 2.0, § 132(a)– (ii)) <i>Indicate whether the provided information for the monitoring parameter complies with the approved methodology including applicable tool(s) in the aspects listed.</i> <i>For checking the use of international standards in the nomenclature, consider:</i> g) <i>Standard format (e.g. 1,000 representing one thousand and 1.0 representing one).</i> | /PDD/ /AMSID/ /TOOL/ | Requirement | OK | Not OK | N/A | OK | OK |
| | Label | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| | Data Unit | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| | Description | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| | Source of data | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| | Measurement equipment / measure method | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | | | | Draft Concl. | Final Concl. |
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| <i>h) Values shall be directly given in SI units – or additionally to original units transferred to SI.</i> <i>i) Short scale naming system: (Only) million = 10⁶ and billion 10⁹ shall be used.</i> | | Monitoring frequency | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | QA/QC procedures | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Purpose of data | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Standard format | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | SI units | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Short scale naming | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| B.5.8.6. CO2 Operating Margin emission factor of the grid in year y, [EF_{grid,OM-DD,y}] (VVS, v. 3.0, § 132(a)– (ii)) <i>Indicate whether the provided information for the monitoring parameter complies with the approved methodology including applicable tool(s) in the aspects listed.</i> <i>For checking the use of international standards in the nomenclature, consider:</i> <i>j) Standard format (e.g. 1,000 representing one thousand and 1.0 representing one).</i> <i>k) Values shall be directly given in SI units – or additionally to original units transferred to SI.</i> <i>l) Short scale naming system: (Only) million = 10⁶ and billion 10⁹ shall be used.</i> | /PDD/ /AMSID/ /TOOL/ | Requirement | OK | Not OK | N/A | OK | OK |
| | | Label | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Data Unit | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Description | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Source of data | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Measurement equipment / measure method | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Monitoring frequency | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | QA/QC procedures | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Purpose of data | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Standard format | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | SI units | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Short scale naming | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | | | | Draft Concl. | Final Concl. |
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| B.5.8.7. CO2 Build Margin Emission Factor of the grid in year a y, [EF_{grid,BM,y}] (VVS, v. 3.0, § 132(a)– (ii)) <i>Indicate whether the provided information for the monitoring parameter complies with the approved methodology including applicable tool(s) in the aspects listed.</i> <i>For checking the use of international standards in the nomenclature, consider:</i> m) <i>Standard format (e.g. 1,000 representing one thousand and 1.0 representing one).</i> n) <i>Values shall be directly given in SI units – or additionally to original units transferred to SI.</i> o) <i>Short scale naming system: (Only) million = 10⁶ and billion 10⁹ shall be used.</i> | /PDD/ /AMSID/ /TOOL/ | Requirement | OK | Not OK | N/A | OK | OK |
| | | Label | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Data Unit | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Description | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Source of data | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Measurement equipment / measure method | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Monitoring frequency | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | QA/QC procedures | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Purpose of data | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Standard format | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | SI units | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | Short scale naming | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| B.5.8.8. Have all means of implementing the monitoring plan, e.g. equations necessary for ex-post emission reduction calculation, been described clearly and in line with the methodology? (VVS, v. 03.0, § 131) <i>Check whether all necessary equations have been provided in the PDD. Pl. consider that ex-post and ex-ante calculations might be</i> | /PDD/ /AMSID/ /TOOL/ | <i>Description:</i> Not all equations for calculation of ex-post emission reductions were described in the monitoring plan. Hence a CL has been raised. <i>Validator's action:</i> Information in PDD were cross checked with data from applied tool and methodology were | | | | CL-B8 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|---|--|--|-----------------|
| different. Please consider that additional equations might be necessary to calculate auxiliary parameters. | | Conclusion: Please refer to CL B8 above. | | |
| <p>B.5.8.9. Is it likely that the monitoring arrangements described in the PDD can properly be implemented in the context of the project activity?</p> <p>(VVS, v. 03.0, § 132 (b) (i))</p> <p>Assess whether the described monitoring arrangements are sufficient and realistic to enable a thorough monitoring. Pl. consider also special monitoring conditions, e.g. downtimes of monitoring equipment etc.</p> | <p>/IM01/ /IM02/ /PDD/ /MP/</p> | <p>Description: The monitoring arrangements described in the PDD needed some further clarification as it can be assessed in CAR B10, CAR B11 and CAR B12 raised above.</p> <p>Validator's action: Interviews were performed and the PDD was revised</p> <p>Conclusion: During the interviews performed to the PPs, the Monitoring plan was clarified; however it was not clear in the PDD. Thus, the CAR B11 and CAR B12 have been raised. Please refer to them above.</p> | <p>CAR B10 CAR B11 CAR B12</p> | OK |
| <p>B.5.8.10. Are the QA/QC procedures appropriate sufficient to ensure the emission reductions achieved from the project activity can be reported ex-post and verified?</p> <p>(VVS, v. 03.0, § 132 (b) (ii))</p> <p>Please consider the description given in section B.7.2. Describe which QA/QC provisions are considered. Address Quality Management System provisions, calibration and maintenance of equipment. Address further any review procedures.</p> | <p>/IM01/ /IM02/ /PDD/ /MP/</p> | <p>Description: Information regarding quantity of electricity to be supplied, monitoring frequency, types of meters need to be clarified. Hence a CAR has been raised.</p> <p>Validator's action: Interviews were performed and the PDD was revised</p> <p>Conclusion: the CAR B11 has been raised. Please refer to it above</p> | CAR B11 | OK |
| <p>B.5.8.11. Are procedures identified for data management?</p> | <p>/VVS/ /IM01/</p> | <p>Description: Yes. The data management includes the responsibilities on data analysis, data aggregation periods and data storage. The data will be stored for the whole crediting period + 2 years as required by</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|-----------------------------------|--|-----------------|-----------------|
| <p>(VVS, v. 03.0, § 132 (b) (ii))</p> <p><i>Check whether appropriate provisions are considered for data management including responsibilities, what records to keep, storage area of records and how to process performance documentation</i></p> <p><i>Check further the data archiving provisions for the project activity and ensure that provisions are made to archive data for the whole crediting period + 2 years.</i></p> | <p>/IM02/ /PDD/ /PRO/</p> | <p>the VVS</p> <p><i>Validator's action:</i> The PDD information was cross-checked with the company's internal procedures regarding data management.</p> <p>Interviews were performed with the company personnel.</p> <p><i>Conclusion:</i> The procedures identified for data management are in accordance with requirements from VVS</p> | | |
| <p>C. Duration and Crediting Period</p> <p><i>It is assessed whether the temporary boundaries of the project are clearly defined.</i></p> | | | | |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|-----------|--|------------------|-----------------|
| <p>C.1.1. Is the project start date consistent with the available evidences?</p> <p>(VVS, v. 03.0, § 106)</p> <p><i>Describe the evidence assessed regarding the prior consideration of the CDM (if necessary). Describe whether the evidence to support such consideration is adequately and transparently described in the PDD.</i></p> | /PSD/ | <p><i>Description:</i> The project starting date for the PA is the signature of the civil works with COMAX for the SHP Coronel Araújo. It was considered the first major commitment performed by the Company</p> <p><i>Validator's action:</i> The COMAX contract regarding start of Coronel Araújo civil works was presented to the validation team</p> <p><i>Conclusion:</i> The board minutes were checked regarding prior consideration of the PA and the start date of the PA (2006-05-19) is considered adequate and transparent as per evidences provided.</p> | OK | OK |
| <p>C.1.2. Is the project's operational lifetime clearly defined and evidenced?</p> <p><i>Check whether the project lifetime is correctly defined. Consider the latest "Guidance on the assessment of investment analysis".</i></p> <p><i>Check in case of phased implementation this has been reflected throughout the whole PDD incl. the financial assessment, if applicable.</i></p> | /LIFE/ | <p><i>Description:</i> The operational lifetime of the PA was described in the PDD section C.1.2. However no reference to this date was provided. So a CL has been raised.</p> <p><i>Validator's action:</i> Letters from turbines and generators were provided as evidences of the project lifetime. Furthermore, a report called Economic Lifetime Study and Depreciation Rate was assessed for the economic lifetime of the PA.</p> <p><i>Conclusion:</i></p> <p>(CL C1) Reference for the operational lifetime of the project activity is missing at Section C.1.2.</p> | CL C1 | OK |
| <p>C.1.3. Is the start of the crediting period clearly defined and reasonable?</p> | /PDD/ | <p><i>Description:</i> The start date of the crediting period was defined as 2013-07-01. It is considered reasonable, taking into account the periods of validation and registration.</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|--------------------------------|--|-----------------|-----------------|
| <i>Check whether the envisaged starting date of the crediting period is realistic, taking into consideration the times needed for validation and registration.</i> | | <p><i>Validator's action:</i> PDD was checked and validation team experience was taking into account.</p> <p><i>Conclusion:</i> The start date of the crediting period is clearly defined and reasonable.</p> | | |
| D. Environmental Impacts <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the DOE.</i> | | | | |
| <p>D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA)?</p> <p>(VVS, v. 3.0, § 134-135)</p> <p><i>Check the host party regulations regarding EIA. If no requirements for an EIA exist, discuss whether the project participants conducted an analysis of the environmental impacts of the project activity.</i></p> | <p>/EIA/ /OL/ /EL/</p> | <p><i>Description:</i> According to the CONAMA Resolution 279/2001 and EIA is not required for small hydro power plants. A RAS (Simplified Environmental Report), followed by a PBA (Basic Environmental Report) is required. The PPs provided to the State Environmental Agency (FATMA) the PBAs. Operational licenses were issued by FATMA for both Hydro Power Plants and are currently valid.</p> <p><i>Validator's action:</i> The national and regional legislation were checked as well as the PBAs and operational licences</p> <p><i>Conclusion:</i> There are no requirements for an EIA for this project. A Basic Environmental Plan is required by the Environmental Agency to issue the operational License. These documents were presented to the validation team.</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|---------------------------------|--|-----------------|-----------------|
| <p>D.1.2. In case an Environmental Impact Assessment (EIA) is requested by the host party, has it been carried out in accordance with the host Party procedures?</p> <p>(VVS, v. 03.0, § 135) <i>Check the EIA and its approval, if applicable.</i></p> | <p>/EIA/ /OL/ /EL/</p> | <p><i>Description:</i> As explained above a Basic Environmental Report has been carried out as it is required by the State environmental agency (FATMA). The PBAs have been dully approved as part of the Environmental License process for both hydro power plants.</p> <p><i>Validator's action:</i> The national and regional legislation were checked as well as the PBAs and operational licences</p> <p><i>Conclusion:</i> The PBAs have been carried out in accordance with the host Party legislation.</p> | OK | OK |
| <p>D.1.3. Are transboundary environmental impacts considered in the analysis?</p> <p>(VVS, v. 03.0, § 134) <i>Check the documents and local official sources / expertise regarding transboundary environmental impacts.</i></p> | <p>/PDD/ /EIA/ /OL/</p> | <p><i>Not Applicable since no transboundary environmental impacts are envisaged for this project activity.</i></p> | OK | OK |
| <p>E. Stakeholder Comments</p> <p><i>The DOE should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i></p> | | | | |
| <p>E.1.1. Have relevant local stakeholders been invited to consultation prior to the publication of the PDD?</p> | <p>/PDD/ /SHCP/</p> | <p><i>Description:</i> Yes. The following stakeholders have been publically consulted prior to the publication of the PDD: City Hall of Agua Doce City Council of Agua Doce</p> | CL-E2 | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|--|-----------|--|-----------------|-----------------|
| <p>(VVS, v. 03.0, § 138-140)</p> <p><i>Check by means of document review and interviews with local stakeholders if and when a local stakeholder consultation process has been carried out.</i></p> | | <p>City Hall of Bom Jesus City Council of Bom Jesus Shop Owners Council of Agua Doce Rural Workers Union of Agua Doce State Environmental Foundation – FATMA Brazilian Forum of NGOs and Environmental and Development Social Movements – FBOMS State Prosecutors Office of Santa Catarina National Prosecutors Office -</p> <p><i>Validator's action:</i> The invitation letters and confirmation of receipts of the Brazilian Post were provided to the verification team.</p> <p><i>Conclusion:</i> The relevant stakeholders have been consulted prior to the publication of PDD. During the request for LoA, the Brazilian DNA informed to the PP that further requirements were necessary through the Resolution 10 issued on 2013-05-22. Thus a CL was raised.</p> <p>(CL E2) During the request of the LoA, the Brazilian DNA released the Resolution 10 on 2013-05-22. As per this Resolution an attendance meeting shall be organized with the stakeholders that did not participated from the initial Stake Holder Consultation Process.</p> | | |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|--------------------------------------|--|-------------------------|-----------------|
| <p>E.1.2. Can the local stakeholder consultation process be assessed as adequate? (VVS, v. 03.0, § 138-140)</p> <p><i>Describe what assessment steps have been undertaken to assess the adequacy of the stakeholder consultation process. Give a final opinion on the adequacy.</i></p> <p><i>Please consider the following requirements in this context:</i></p> <p><i>(a) Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity, have been invited;</i></p> <p><i>(b) The summary of the comments received as provided in the PDD is complete;</i></p> <p><i>(c) The project participants have taken due account of any comments received and have described this process in the PDD.</i></p> | <p>/PDD/ /SHCP/ /unfccc/</p> | <p><i>Description:</i> All relevant stakeholders have been invited to consultation following host country DNA rules (Resolution 1 and 7) prior to the publication of PDD for GSC and according to PP they receive no comment from local stakeholders to date.</p> <p><i>Validator's action:</i> Invitations letters and confirmations of receipt were evidenced. The website indicated in the PDD was checked and the Portuguese version of the PDD as well as the Annex describing the contribution of the project to the sustainable development were both available, confirming compliance with host country DNA rules for CDM local SHC.</p> <p><i>Conclusion:</i> The Local Stakeholder consultation is not clearly described in the PDD. Thus a CL has been raised.</p> <p>(CL E1) Section E.1. Please provide some more detailed information about the Local Stakeholder Consultation (LSC) process. How inhabitants were informed about the projects, does additional publication in newspaper or other media took place, at what time the 2 LSCs took place?</p> | <p>CL E1</p> | <p>OK</p> |
| <p>F. Others</p> | | | | |
| <p>F.1. Approval – Contribution to Sustainable Development</p> <p><i>The written approval of the parties involved is a mandatory requirement.</i></p> | <p>/dna/ /LoA/</p> | <p><i>Description:</i> Brazil is the host party. In accordance with the CDM M&P at the stage of validation a party involved may or may not have provided its approval at the time of making the PDD public. The approval of the parties involved is required at the time of requesting registration. The Letter of Approval from the Brazilian DNA was requested and issued on 2013-10-14. It confirms that the project activity contributes to the sustainable development of Brazil.</p> | <p>OK</p> | <p>OK</p> |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|---------------------------|--|-----------------|-----------------|
| | | <p><i>Validator's action:</i> The Letter of approval has been checked to validate this item.</p> <p><i>Conclusion:</i> The LoA confirms that the project activity contributes to the sustainable development of Brazil.</p> | | |
| <p>F.1.1. Have written approvals of all parties involved been provided to the validation team?</p> <p>(VVS, v. 03.0, § 38)</p> <p><i>Indicate whether a letter of approval has been received, with a clear reference to the supporting documentation.</i></p> <p><i>Indicate whether this letter was provided to the DOE by the project participants or directly by the DNA</i></p> | <p>/dna/ /LoA/</p> | <p><i>Description:</i> The letter of approval has been issued by the Brazilian DNA. Brazil is the host party and the only party involved in the Project Activity.</p> <p><i>Validator's action:</i> The Letter of approval has been checked to validate this item.</p> <p><i>Conclusion:</i> The project participants provided to the Validation Team the letter of approval of the project activity issued by the Brazilian DNA and signed by the DNA President.</p> | OK | OK |
| <p>F.1.2. Are the approvals issued from organisations listed as DNAs on the UNFCCC CDM website?</p> <p>(VVS, v. 03.0, §§ 41)</p> <p><i>Indicate the means of validation employed to assess the authenticity, i.e. in case of doubt whether LoA has been verified with the DNA. Further describe which entity submitted the LoA for validation.</i></p> | <p>/unfccc/ /LoA/</p> | <p><i>Description:</i> Brazil, the host country, has ratified the Kyoto Protocol on 23rd August 2002. The Brazilian DNA assigned for CDM is the "Interministerial Commission on Global Climate Change".</p> <p>The LoA was provided by the above cited organization which is the Brazilian DNA.</p> <p><i>Validator's action:</i> The letter of approval has been checked by the validation team. The information about the Kyoto protocol ratification by Brazil is evidenced at UNFCCC website. The official dispatch has</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|----------------|--|-----------------|-----------------|
| | | been assessed which confirms the authenticity of the LoA. <i>Conclusion:</i> The project complies with the requirement. | | |
| F.1.3. Do the written approvals confirm that the corresponding party is a Party to the Kyoto Protocol? (VVS, v. 03.0, § 39(a)) | /dna/ /LoA/ | <i>Description:</i> The letter of approval confirms that the Brazilian DNA is a Party of the Kyoto Protocol <i>Validator's action:</i> The Letter of approval has been checked to validate this item. <i>Conclusion:</i> The LoA complies with this requirement. | OK | OK |
| F.1.4. Do the written approvals confirm that the participation is voluntary? (VVS, v. 03.0, § 39(b)) | /dna/ /LoA/ | <i>Description:</i> The letter of approval confirms that the participation of the Brazilian DNA is voluntary. <i>Validator's action:</i> The Letter of approval has been checked to validate this item. <i>Conclusion:</i> The LoA complies with this requirement. | OK | OK |
| F.1.5. Does the written approval from the host country confirm that the project contributes to the sustainable development in the country? (VVS, v. 03.0, § 39(c)) | /dna/ /LoA/ | <i>Description:</i> The letter of approval confirms that the PA contributes to the sustainable development in Brazil <i>Validator's action:</i> The Letter of approval has been checked to validate this item. | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|----------------|--|-----------------|-----------------|
| | | <i>Conclusion:</i> The LoA complies with this requirement. | | |
| F.1.6. Do the written approvals refer to the precise project title in the PDD submitted for registration or an additional specification of the project activity, e.g. PDD version number? (VVS, v. 03.0, §§ 39(d)) | /dna/ /LoA/ | <p><i>Description:</i> The letter of approval refers to the precise project activity title, version number and date of the PDD submitted for registration.</p> <p><i>Validator's action:</i> The Letter of approval has been checked to validate this item.</p> <p><i>Conclusion:</i> The LoA complies with this requirement.</p> | OK | OK |
| F.1.7. Are the written approvals unconditional with regard to F.1.3 to F.1.6? (VVS, v. 03.0, § 40) | /PDD/ /LoA/ | <p><i>Description:</i> The letter of approval and the PDD confirms that Brazil is a Party of the Kyoto Protocol. Furthermore the LoA has been checked and confirm that the project participants and the project title (date and version number of the PDD) are precise.</p> <p><i>Validator's action:</i> The LoA and the PDD have been checked to confirm this information.</p> <p><i>Conclusion:</i> The information regarding project participants is consistent.</p> | OK | OK |
| F.1.8. Is the information regarding the project participants listed in tabular form in PDD and is internally consistent with the information | /PDD/ /LoA/ | <p><i>Description:</i> Yes, as stated at section A.4 and in Appendix 1, the project participants are:</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|--|--|-----------------|-----------------|
| <p>provided in the section that contains the contact information of the project participants?</p> <p>(VVS, v. 03.0, § 46)</p> | | <ul style="list-style-type: none"> • Coronel Araújo S/ A; • Passo Ferraz S/ A; • Carbotrader Assessoria e Consultoria em Energia Eireli. <p>This information is consistent with the LoA presented to the Validation Team.</p> <p><i>Validator's action:</i> The PDD and the LoA have been compared.</p> | | |
| <p>F.1.9. Are all project participants listed in the PDD approved at least by one Party involved?</p> <p>(VVS, v. 03.0, § 45)</p> <p><i>Indicate whether the participation of the project participant(s) has been approved by a Party to the Kyoto Protocol.</i></p> <p><i>Describe the means of validation employed to draw this conclusion.</i></p> | <p>/PDD/ /LoA/</p> | <p><i>Description:</i> Yes. All project participants have been approved by the Brazilian DNA as can be observed in the LoA. The project participants are the ones stated in PDD, LoA and described in item F.1.8 above.</p> <p><i>Validator's action:</i> It could be confirmed with the LoA provided.</p> <p><i>Conclusion:</i> All PPs listed in PDD are approved the the Brazilian DNA as per LoA provided.</p> | OK | OK |
| <p>F.1.10. Are any other project participants than those authorized as project participants listed in the PDD?</p> <p>(VVS, v. 03.0, § 47)</p> | <p>/dna/ /PDD/ /LoA/ /IM01/ /IM02/</p> | <p><i>Description:</i> No. The project participants are only the ones stated in PDD, LoA and described in item F.1.8 above.</p> <p><i>Validator's action:</i> Interviews were performed during site visit by validation team and there are no other PPs than stated in PDD. It could be confirmed with the LoA provided.</p> <p><i>Conclusion:</i> All PPs are dully listed in PDD</p> | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|---|---------------------------|--|-----------------|-----------------|
| F.2. Modalities of Communication Statement <i>A due diligence on the Modalities of Communication statement in accordance with the requirements established in the VVS is mandatory.</i> | | | | |
| F.2.1. Has a valid Modalities of Communication (MoC) been provided to the validation team from a project participant with whom the DOE has a contractual relationship? (VVS, v. 03.0, § 55) <i>Indicate whether a MoC has been received, with a clear reference to the contractual relationship of the project participant with the DOE.</i> | /PDD/ /CON/ /MOC/ | <i>Description:</i> Yes. The modalities of communication has been provided to the validation team from a PP which the DOE has a contractual relationship. <i>Validator's action:</i> The PPs listed in the MoC were cross-checked with the information listed in the PDD and in the Contract between the PP and the DOE <i>Conclusion:</i> The MoC has been received with a clear reference to the contractual relationship of the project participant with the DOE. | OK | OK |
| F.2.2. Has the MoC been signed by a duly authorized person on behalf of the respective project participant? (VVS, v. 03.0, §§ 54, 56) <i>Please Indicate how the personal and corporate identities of all project participants and focal points included in the MoC statement have been validated.</i> | /MOC/ /IM01/ /IM02/ | The personal and corporate identities of all project participants and focal points included in the MoC were validated by: <input checked="" type="checkbox"/> Directly checking evidence for corporate and personal entity <input type="checkbox"/> Notarized documentation <input type="checkbox"/> Written confirmation from the project participant that all corporate and personal details are accurate and valid. , including specimen signatures and employment status of | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|--|----------------------------|--|-----------------|-----------------|
| | | their signaries whether a letter of approval has been received, with a clear reference to the supporting documentation | | |
| F.2.3. Has the MoC statement correctly been completed? (VVS, v. 03.0, §§ 59, 60) | /MOC/ | <input checked="" type="checkbox"/> The latest version of the form (F-CDM-MOC) has been used <input checked="" type="checkbox"/> Annex 1 of the MoC is correctly completed <input checked="" type="checkbox"/> The project participants' authorized signatories signing the MoC are also listed in Annex 1 of the MoC. | OK | OK |
| F.3. PDD editorial aspects <i>The PDD used as a basis for validation shall be prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website.</i> | | | | |
| F.3.1. Has the latest version of the PDD form been applied? (VVS, v. 03.0, § 62) | /PDD/ /unfccc/ /GCP/ | <i>Description:</i> Yes. The latest version (04.1) of the PDD has been used for this project. <i>Validator's action:</i> the UNFCCC website has been checked. <i>Conclusion:</i> The latest PDD template has been used. | OK | OK |

| Checklist Item (incl. guidance for the validation team) | Reference | Validation Team Comments (justification and substantiation of information, data and evidences) | Draft Concl. | Final Concl. |
|--|----------------------------|--|--|-----------------|
| F.3.2. Has the PDD been duly filled in accordance with the latest guidance(s)? (VVS, v. 03.0, § 63) | /PDD/ /unfccc/ /GCP/ | <p><i>Description:</i> The PDD has in general been filled in accordance with the PDD guidelines. Some revisions are necessary, so CL A1, A2, B1, B2, B5 and C1 were raised.</p> <p><i>Validator's action:</i> The PDD has been dully checked by the validation team.</p> <p><i>Conclusion:</i> Please refer to the findings above in this Validation Report.</p> | CL A1 CL A2 CL B1 CL B2 CL B5 CL C1 | OK |

ANNEX 2: ASSESSMENT OF APPLICABILITY CRITERIA

Table A-2: Assessment of Applicability Criteria (VVS, v. 03.0 §§ 70 – 76)

| Applicability Criteria | Evidence used | met | not met | N/A | Assessment of validation team (results and means of assessment) |
|--|--------------------------|-------------------------------------|--------------------------|--------------------------|---|
| <i>"This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass supplying electricity to a national or regional grid"</i> | /PDD/ /AMSID/ /TD/ | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Applicability condition is fulfilled, considering that the project activity is the installation of a "hydro power plant/unit" which its generation will be dispatched to the national grid. |
| <i>"This methodology is applicable to project activities that: a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield Plant); b) Involve a capacity addition; c) Involve a retrofit of an existing plant; or d) Involve a replacement of an existing plant."</i> | /PDD/ /AMSID/ /TD/ | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The project activity comprehends the installation of two new power plants in a site where there was no activity previously (Greenfield Plant). |

| | | | | | |
|---|-----------------------------------|-------------------------------------|--------------------------|-------------------------------------|---|
| <p><i>“Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</i></p> <ul style="list-style-type: none"> <i>- The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or</i> <i>- The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m²; or</i> <i>- The project activity involves new reservoirs and power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m²”.</i> | <p>/PDD/ /AMSID/ /TD/</p> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>The project activity involves new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is equal to 14.49 W/m² for SHP Coronel Araújo and 71.45 W/m² for SHP Passo Ferras, hence greater than 4 W/m² for both plants and for the total Project Activity, being eligible for this methodology.</p> |
| <p>To be eligible for the Small-Scale CDM methodology, the installed capacity of the project activity shall be smaller than 15 MW.</p> | <p>/PDD/ /AMSID/ /TD/</p> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <p>The installed capacity of the two SHPs is 9,798.4 kW. So the capacity of this project activity is below the limit established by the methodology - 15,000 kW (15 MW).</p> |
| <p>If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.</p> | <p>/PDD/ /AMSID/ /TD/</p> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <p>Not applied as this project does not involve non-renewable components.</p> |

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|--|
| Combined heat and power (co-generation) systems are not eligible under this category. | /PDD/ /AMSID/ /TD/ | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | This project does not fall under this category. It is a hydro power plant. |
| In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units. | /PDD/ /AMSID/ /TD/ | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | This project does not involve the addition of renewable energy generation units at an existing renewable power facility. |
| In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW. | /PDD/ /AMSID/ /TD/ | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | This project does not involve retrofit. |

ANNEX 3: ASSESSMENT OF BASELINE IDENTIFICATION

Table A-3: Assessment of Baseline Identification (VVS, v. 03.0 §§ 88 – 95)

| | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Baseline is pre-defined by the methodology |
| <input type="checkbox"/> | Assessment of baseline alternatives see below |

| Baseline Alternatives identified | In line with the Methodology? | Eliminated | Reasons for elimination / non-elimination from list of alternatives | Evidence used | DOE Assessment | |
|----------------------------------|-------------------------------------|-------------------------------------|---|---------------|-------------------------------------|---|
| | | | | | Appropriateness of elimination | Assessment of validation team (results and means of assessment) |
| N/A | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | <input checked="" type="checkbox"/> | |

ANNEX 4: ASSESSMENT OF FINANCIAL PARAMETERS

Table A-4: Assessment of Financial Parameters (VVS, v. 03.0, §§ 120, 121 / in case financial parameters stem from FSR §122,)

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|------|--|--------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| Total Investment Coronel Araújo | 20,750,500 | Real | Minute from the board meeting (page 1) and feasibility study - budget (page 3) | /FD-1/ /FD-6/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> total investment cost for each SHPP was obtained from the minutes of board meeting and from the budget reports obtained prior the starting date of the project activities.</p> <p><i>Validator's action:</i> this value can be evidenced at the financial feasibility study (budget) and minute of board meeting.</p> <p>The SHPP Coronel Araújo has an investment cost around US\$ 1,549 per installed kW (conversion rate on 04-01-2006: US\$ 1.00 = R\$ 2.31).</p> <p>The SHPP Passo Ferraz has an investment cost around US\$ 1,878 per installed kW (conversion rate on 01-11-2007: US\$ 1.00 = R\$ 1.75).</p> <p>When comparing this value with other SHPP investments per installed kW, official sources of information and specialized articles, it is possible to conclude that the project activity has a lower investment cost compatible with the market, representing a more conservative analysis, but maintaining the project additional., as can be verified below:</p> |
| Total Investment Passo Ferraz | 13,148,300 | Real | Minute from the board meeting (page 1) and feasibility study - budget (page 4) | /FD-9/ /FD-12 / | <input checked="" type="checkbox"/> | |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|--|------|---|--------------|---|---------|-------|----|-------|---------|------|--------------|-----|----|--------------|------|----------------------|----|-----|--------------|------|---------------------|----|----|--------------|------|-------------------|----|----|--------------|------|------------------|----|----|--------------|------|--------------|----|----|--------------|------|---|----|----|--------------|------|----|--------------|------|----|--------------|----|----|--------------|------|---------|----|-----|--------------|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Correctness of value applied | Comment | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | <ul style="list-style-type: none"> Examples of CDM Registered projects in Brazil^{/unfccc/} (conversion from R\$ to US\$ by the time of registration): <table border="1"> <thead> <tr> <th>Ref.</th> <th>Title</th> <th>MW</th> <th>MUS\$</th> <th>US\$/kW</th> </tr> </thead> <tbody> <tr> <td>1526</td> <td>Saldanha SHP</td> <td>4.8</td> <td>15</td> <td>3,028</td> </tr> <tr> <td>3316</td> <td>Queluz and Lavrinhas</td> <td>60</td> <td>160</td> <td>2,663</td> </tr> <tr> <td>2500</td> <td>Moinho and Barracão</td> <td>26</td> <td>67</td> <td>2,619</td> </tr> <tr> <td>2165</td> <td>Santa Edwiges III</td> <td>12</td> <td>30</td> <td>2,559</td> </tr> <tr> <td>0831</td> <td>Santa Edwiges II</td> <td>12</td> <td>22</td> <td>1,823</td> </tr> <tr> <td>4676</td> <td>Malagone SHP</td> <td>19</td> <td>58</td> <td>3,038</td> </tr> <tr> <td rowspan="4">3486</td> <td rowspan="4">Goiandira, Pedra do Garrafão, Pirapetinga and Sítio Grande SHPs</td> <td>27</td> <td>61</td> <td>2,264</td> </tr> <tr> <td>16.5</td> <td>47</td> <td>2,822</td> </tr> <tr> <td>15.7</td> <td>44</td> <td>2,833</td> </tr> <tr> <td>25</td> <td>93</td> <td>3,720</td> </tr> <tr> <td>3898</td> <td>Ganhães</td> <td>44</td> <td>152</td> <td>3,448</td> </tr> </tbody> </table> | Ref. | Title | MW | MUS\$ | US\$/kW | 1526 | Saldanha SHP | 4.8 | 15 | 3,028 | 3316 | Queluz and Lavrinhas | 60 | 160 | 2,663 | 2500 | Moinho and Barracão | 26 | 67 | 2,619 | 2165 | Santa Edwiges III | 12 | 30 | 2,559 | 0831 | Santa Edwiges II | 12 | 22 | 1,823 | 4676 | Malagone SHP | 19 | 58 | 3,038 | 3486 | Goiandira, Pedra do Garrafão, Pirapetinga and Sítio Grande SHPs | 27 | 61 | 2,264 | 16.5 | 47 | 2,822 | 15.7 | 44 | 2,833 | 25 | 93 | 3,720 | 3898 | Ganhães | 44 | 152 | 3,448 |
| Ref. | Title | MW | MUS\$ | US\$/kW | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1526 | Saldanha SHP | 4.8 | 15 | 3,028 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3316 | Queluz and Lavrinhas | 60 | 160 | 2,663 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2500 | Moinho and Barracão | 26 | 67 | 2,619 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2165 | Santa Edwiges III | 12 | 30 | 2,559 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0831 | Santa Edwiges II | 12 | 22 | 1,823 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4676 | Malagone SHP | 19 | 58 | 3,038 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3486 | Goiandira, Pedra do Garrafão, Pirapetinga and Sítio Grande SHPs | 27 | 61 | 2,264 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 16.5 | 47 | 2,822 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 15.7 | 44 | 2,833 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 25 | 93 | 3,720 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3898 | Ganhães | 44 | 152 | 3,448 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|------|---|-----------|------------------------------|---|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | | | | <ul style="list-style-type: none"> Investment in Projects for Generation of Electric Energy – PAC (Brazilian Government Plan for Development Acceleration) – Sept/2010 – publication of Eletrobrás^{eletrobras/} (state owned company of energy): <ul style="list-style-type: none"> i. SHPP João Borges (Eletrosul): US\$ 3,547,987/MW (conversion rate on Sept/2010 US\$ 1.00 = R\$ 1.70); ii. SHPP Barra do Rio Chapéu (Eletrosul): US\$ 3,235,294/MW (conversion rate on Sept/2010: US\$ 1.00 = R\$ 1.70). Stakeholders Public Consultation of PROINFA (Brazilian government program which was launched in 2002 with the objective of increasing the participation of electricity produced from wind, biomass and small hydroelectric plants in the National Interconnected System) – Ministry of Mines and Energy: US\$ 2,290/kW – July /2003 (corrected by Brazilian rate IGPM and conversion rate on Set/2011: US\$ 1.00 = R\$ 1.84); Articles: <ul style="list-style-type: none"> i. “Producers and Funds make their bets on SHPs” – Newspaper “Valor Econômico” – Maurício Capela – 18-07-2008 – available at http://www.investe.sp.gov.br/noticias/lenoticia.php?id=3679&c=6&lang=1 – US\$ 2,515/kW (conversion rate on 18-07- |

| <input type="checkbox"/> No financial parameters are used for additionality justification | | | | | | |
|---|---------------|------|---|-----------|------------------------------|---|
| <input checked="" type="checkbox"/> Assessment of all financial parameters see below | | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | | | | <p>2008: US\$ 1.00 = R\$ 1.59);</p> <p>ii. "SHPs shall multiply by three the production of energy in Brazil" – Ricardo Pigatto (President of the Brazilian Association of Small and Medium Producers of Electric Energy) – 20-07-2009 – available at http://www.riosvivos.org.br/Noticia/PCHs+devem+triplicar+geracao+de+energia+no+Brasil/14029 – US\$ 2,631/kW (conversion rate on 20-07-2009: US\$ 1.00 = R\$ 1.90);</p> <p>iii. "Wind Energy" – Charles Lenzi (President of the Brazilian Association of Clean Energy) – 20-10-2010 – available at http://www.fatorambiental.com.br/portal/index.php/2010/10/25/energia-eolica-21/ – US\$ 3,592/kW (conversion rate on 20/10/2010: US\$ 1.00 = R\$ 1.67).</p> <p><i>Conclusion:</i> the total investment has been evidenced and this has been considered reasonable and consistent by the validation team.</p> <p>All calculations have been demonstrated in the Financial Analysis and the evidences have been presented to validation team.</p> <p>In addition, the comparison of the investment value with other SHPP investments, official sources of information and specialized articles reveals that the used investment values of the project activity are compatible with the market and official sources, in line</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|-------|--|-------------------|------------------------------|--|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | | | | with VVS. As per the DOE's understanding the value used for the investment analysis is adequate and conservative and can be assessed as valid at the time of the management decision and compatible with the SHPPs market in Brazil. |
| Assured Energy Coronel Araújo | 3.70 | MWavg | Minute from the board meeting (page 1) Contract of transference of rights (page 3) | /FD-1/ /FD-3/ | <input type="checkbox"/> | <i>Description:</i> the <u>assured energy</u> at full load is the long term average generation. This value is equivalent to the approved annual generation (MWh/year) divided by the total operational hours of the year. The values used were the assured energy values that were available at the time of the investment decision and even though other values were provided and approved later (and used in the ER estimations), the VT used them to be in compliance with the guidance 6 of the Guidelines on the Assessment of Investment Analysis. |
| Assured Energy Passo Ferraz | 2.21 | Mwavg | <ul style="list-style-type: none"> - Minute from the board meeting (page 1) - Ordinance # 58 (page 1 - Annex) - Aneel website Ordinance # 24 (page 1 – Annex) | /FD-9/ /aneel/ | <input type="checkbox"/> | <i>Validator's action:</i> Minutes of contract for both projects were considering these values as the correct ones for the investment decision. In order to confirm the suitability of these values, the VT used the following evidences: Coronel Araújo: <ul style="list-style-type: none"> - The value used for the investment analysis (3.7 MWaverage) is very similar to the value approved by the official government authority (Ordinance # 58 by Ministry |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|------|---|-----------|------------------------------|---|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | | | | <p>of Mines and Energy)^{/PLF/} which is 3.89 MWaverage, and used in the ER estimations. The difference is only 5% which is acceptable. The official value is based on on-site studies and is deemed accepted by VT.</p> <ul style="list-style-type: none"> - Furthermore, in order to consolidate the used value and the official value informed above the VT took into consideration all SHPs installed in the same region of Brazil (Southeast)^{/aneel/} and with +/- 20% of the Coronel Araújo's total installed capacity. By dividing their approved assured energy by their installed capacity it is possible to obtain the plant availability during the year (%). The average availability of these plants was 56% varying from 80% to 40%. As the result of Coronel Araújo is 64% (3.7 MWaver / 5.797MW), the SHP is within the variability of the SHPs installed in the same region of Brazil. The VT included in this sampling all SHPs installed to date. - Thus, bearing in mind these two arguments above, the VT concludes that the assured energy applied to the investment analysis is acceptable and it is in compliance with the applied guidance. <p>Passo Ferraz</p> <ul style="list-style-type: none"> - The value used for the investment analysis (2.21 MWaverage) is very similar to the value approved by the official government authority (Ordinance # 24 by Ministry |

| <input type="checkbox"/> No financial parameters are used for additionality justification | | | | | | |
|---|---------------|------|---|-----------|------------------------------|---|
| <input checked="" type="checkbox"/> Assessment of all financial parameters see below | | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | | | | <p>of Mines and Energy)^{/PLF/} which is 2.10 MWaverage, and used in the ER estimations. The difference is only 5% which is acceptable. The official value is based on on-site studies and is deemed accepted by VT.</p> <ul style="list-style-type: none"> - Furthermore, in order to consolidate the used value and the official value informed above the VT took into consideration all SHPs installed in the same region of Brazil (Southeast)^{/aneel/} and with +/- 20% of the Passo Ferraz's total installed capacity. By dividing their approved assured energy by their installed capacity it is possible to obtain the plant availability during the year (%). The average availability of these plants was 56%. As the result of Passo Ferraz's availability is 55% (2.21 MWaver / 4.00MW) the SHP's availability is very close to the average of the SHPs installed in the same region of Brazil. The VT included in this sampling all SHPs installed to date. - Thus, bearing in mind these two arguments above the VT concludes that the assured energy applied to the investment analysis is acceptable and it is in compliance with the applied guidance. <p><i>Conclusion:</i> These data were the considered the correct ones by the time of the investment decision and are in compliance with the applied guideline on investment analysis.</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|------|--|----------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| Installed Power Coronel Araújo | 5.797 | MW | Minute from the board meeting (page 1) and Dispatch # 949 (page 1) | /FD-1/ /TD/ | <input type="checkbox"/> | <p><i>Description:</i> In the evidence Minute of board meeting, the budget approval was making already reference to the installed power 5.8 MW. That is the reason why the financial analysis was done with this value. The confirmation of the installed power was made in the document Dispatch # 949^{/TD/}.</p> <p><i>Validator's action:</i> the minute of board meeting was considered as official for the investment decision. The ANEEL's confirmation came just after by the Dispatch #949.</p> <p><i>Conclusion:</i> all data were assumed initially by the internal board by the time of investment decision and then it became official and approved by ANEEL just after this date. So, the new value was considered for the investment analysis since the beginning.</p> |
| Installed Power Passo Ferraz | 4.0014 | MW | Minute of Board Meeting (page 1) Aneel approval Dispatch 347 (page 1) | /EIA/ /TD/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> In the evidence Minute of board meeting, the budget approval was making already reference to the installed power 4 MW. That is the reason why the financial analysis was done with this value. The confirmation of the installed power was made in the document Dispatch # 347^{/TD/}.</p> <p><i>Validator's action:</i> the minute of board meeting was considered a reliable document by the time of investment decision. The ANEEL's confirmation came just after by the Dispatch #347.</p> <p><i>Conclusion:</i> all data were assumed initially by the internal board by the time of investment decision and then it became official and</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|---------|---|---------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | | | | approved by ANEEL just after this date. So, this value was considered for the investment analysis since the beginning. |
| Energy Price Coronel Araújo | 130 | R\$/MWh | Minute of Board Meeting (page 1) Result of the Public auction (page 1) | /FD-1/ /AUCTION/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> In the evidence Minute of board meeting, the budget approval was making already reference to the energy price 130 R\$/MWh. That is the reason why the financial analysis was done with this value.</p> <p><i>Validator's action:</i> the minute of board meeting was considered a reliable document by the time of investment decision. In order to validate this data the VT cross-checked the energy price with the average price obtained in a public auction for Alternative Energy Sources performed by the Brazilian government in 2007 which is a date close to the investment decision of both SHPs of this project. Thus, in the auction performed on 2007-06-18, the average price of 6 SHPs built in Brazil was R\$ 134.99/MWh^{/AUCTION/}. By considering the evidences of the board meeting from SHP Coronel Araújo, which determined the energy prices, and crosschecking with public information from the Alternative Energy Sources Auction (price difference of 3.8%), the VT agrees that the prices considered are reliable.</p> <p><i>Conclusion:</i> the data assumed initially by the internal board, by the time of investment decision, and which was used to perform the investment analysis was cross-checked with public information described above and is considered reliable by the VT.</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|---------|---|---------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| Energy Price Passo Ferraz | 140 | R\$/MWh | Minute of Board Meeting (page 1) Result of the Public auction (page 1) | /FD-9/ /AUCTION/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> In the evidence Minute of board meeting, the budget approval was making already reference to the energy price 140 R\$/MWh. That is the reason why the financial analysis was done with this value. This figure, according to the document this value was based on research done by Design Head Consultancy as a current market value by the document's date.</p> <p><i>Validator's action:</i> the minute of board meeting was considered a reliable document by the time of investment decision. In order to validate this data the VT cross-checked the energy price with the average price obtained in a public auction for Alternative Energy Sources performed by the Brazilian government in 2007, which is a date closed to the investment decision of both SHPs of this project. Thus, in the auction performed on 2007-06-18, the average price of 6 SHPs built in Brazil was R\$ 134.99/MWh^{/AUCTION/}. By considering the evidences of the board meeting from SHPs Passo Ferraz, which determined the energy prices and by crosschecking with public information from the Alternative Energy Sources Auction, the VT agrees that the prices considered are reliable.</p> <p><i>Conclusion:</i> the data assumed initially by the internal board by the time of investment decision and which was used to perform the investment analysis, was cross-checked with public information described above and considered reliable by the VT.</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|-------|---|-------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| Energy Generation Coronel Araújo | 32,412 | MWh | Minute of Board Meeting (page 1) Contract of transference of rights (page 3) | /FD-1/ /FD-3/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> This value is obtained from the multiplication of the assured energy by the yearly total amount of hours.</p> <p><i>Validator's action:</i> The assured energy could be assessed above.</p> <p><i>Conclusion:</i> The way of data obtainment was considered correct by the validation team.</p> |
| Energy Generation Passo Ferraz | 19,397 | MWh | Minute of Board Meeting (page 1) Basic financial Project (page 4) | /FD-9/ /FD-12/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> This value is obtained from the multiplication of the assured energy by the yearly total amount of hours. Furthermore it was confirmed in the basic financial project.</p> <p><i>Validator's action:</i> the minute of board meeting was considered a reliable document by the time of investment decision as well as the basic financial project.</p> <p><i>Conclusion:</i> all data were assumed initially by the internal board by the time of investment decision and hence was considered to perform the investment analysis.</p> |
| Technical lifetime Coronel Araújo | 30 | Years | Economic Lifetime Study and Depreciation Rate (turbines, v.2, page 249 / generators, v.1, page 294). Document #1160 from | /LIFE/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> The Technical lifetime was based on suppliers statements regarding the lifetime of the main equipments (turbines and generators). Furthermore the PP considered the operational lifetime of the main equipment given by a third party (Escola Federal de Engenharia de Itajubá) study for ANEEL.</p> <p><i>Validator's action:</i> Letters from suppliers and third party study were considered. As ANEEL is a national association, the VT</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|-------|--|-----------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | Hacker (page 1) Letter from WEG (page 1) | | | considered its information reliable. This consideration is in compliance with guidance of VVS. |
| Technical lifetime Passo Ferraz | 30 | Years | Economic Lifetime Study and Depreciation Rate (turbines, v.2, page 249 / generators, v.1, page 294). Document #1162 from Hacker (page 1) Declaration from Automatic (page 1) | /LIFE/ | <input checked="" type="checkbox"/> | <i>Conclusion:</i> Letters from suppliers and third party study from ANEEL |
| PIS | 0.65 | % | Law # 10,637 (article 11) Normative Instruction # 247 (article 52) | /LEGIS/ | <input checked="" type="checkbox"/> | <i>Description:</i> Brazilian tributes are charged over the company's assumed profit (companies with gross revenue below R\$ 48 million can apply the modality of tax call "Presumed (vain) tax profit regime"). <i>Validator's action:</i> The assumed profit and the taxes are calculated as follows: <ul style="list-style-type: none"> - PIS (Social Integration Program): 0.65% of the gross profit; - COFINS (Contribution for Financing Social Security): 3% |
| COFINS | 3 | % | Normative Instruction # 247 (article 52) | /LEGIS/ | <input checked="" type="checkbox"/> | |
| Income Tax | 15 | % | Law # 9249 – Article 3 Law # 9430 – Article 2 Law # 10637 – Article 46 | /LEGIS/ | <input checked="" type="checkbox"/> | |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|--|--|----------|--|---------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| Additional Income Tax | 10 | % | Law # 9430 – Article 2 | /LEGIS/ | <input checked="" type="checkbox"/> | of the gross profit; |
| CSLL | 9 | % | Law # 9430 | /LEGIS/ | <input checked="" type="checkbox"/> | <ul style="list-style-type: none"> - CSSL (Social Contribution): 9% of 12% of the gross profit; (presumed profit) - Income tax: 15% of 8% of the gross profit; (presumed profit) - Additional Income tax: 10% of the presumed profit (8%) which exceeds R\$ 240 thousand/year for SHP Coronel Araújo. This tax however is not applied to SHP Passo Ferraz. <p><i>Conclusion:</i> government taxes established by law. Each Specific Purpose Society created for each wind farm, can apply the assumed profit tax modality which is calculated over an assumed percentage over gross revenues.</p> |
| Operation and Maintenance Coronel Araújo | 1,075,789.36 | R\$/year | Minute of Board Meeting (Page 1) O&M Costs Spreadsheet (page 1) Directives for SHPP Projects (page 31) | /FD-1/ /FD-5/ /O&M/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> other O&M costs are maintenance and repair of the installations, equipment and machinery, third party operation services, security and surveillance, cleaning services, environmental services related to the commitment to social and environmental programs, equipment rental, consumption and use of materials, civil liability insurance and operational risk insurance. They are estimates based on the PP's experience in other plants.</p> <p><i>Validator's action:</i> the estimates are based in PP's experience which was approved by the company's board in the board</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|--|--|----------|--|----------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | | | | <p>meeting. In order to cross-check the results, the VT calculated the representative amount of O&M costs based on the total investment. It was calculated to be equal to 5.18%. A guideline issued by Eletrobras and Ministry of Mines and Energy ^{/O&M/}, estimates that the O&M costs are around 5% of the total investment per year. Thus, bearing in mind that the guideline is a public information from Brazilian government, the VT considered that the assumption done by the PP is acceptable</p> <p><i>Conclusion:</i> when calculated the total O&M, the amount represents 5.18% per year of the total investment which is in accordance with the Directives for SHPP Projects, from Eletrobrás which considers an annual O&M costs around 5% of the total investment for projects in Brazil.</p> <p>Thus the VT considers this figure reasonable.</p> |
| Operation and Maintenance Passo Ferraz | 669,189 | R\$/year | Minute of Board Meeting (Page 1) O&M Costs Spreadsheet (page 1) Directives for SHPP Projects (page 31) | /FD-9/ /FD-11/ /O&M/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> other O&M costs are maintenance and repair of the installations, equipment and machinery, third party operation services, security and surveillance, cleaning services, environmental services related to the commitment to social and environmental programs, equipment rental, consumption and use of materials, civil liability insurance and operational risk insurance. They are estimates based on the PP's experience in other plants.</p> <p><i>Validator's action:</i> the estimates are based in PP's experience which was approved by the company's board in the board</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|--|--|----------|---|-------------------|------------------------------|--|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | | | | <p>meeting. In order to cross-check the results, the VT calculated the representative amount of O&M costs based on the total investment. It was calculated to be equal to 5.09%. A guideline issued by Eletrobras and Ministry of Mines and Energy ^{/O&M/}, estimates that the O&M costs are around 5% of the total investment per year. Thus, bearing in mind that the guideline is a public information from Brazilian government, the VT considered that the assumption done by the PP is acceptable.</p> <p><i>Conclusion:</i> when calculated the total O&M, the amount represents 5.09% per year of the total investment which is in accordance with the Directives for SHPP Projects, from Eletrobrás which considers an annual O&M costs around 5% of the total investment for projects in Brazil.</p> <p>Thus the VT considers this figure reasonable.</p> |
| Aneel Fiscalization Fee Coronel Araújo (TFSEE) | 9,609.00 | R\$/year | Aneel Dispatch 2268/2005 (page 10) Decree # 2410 | /FD-4/ /LEGIS/ | <input type="checkbox"/> | <p><i>Description:</i> TFSEE is a fee paid over the annual income resulted from the generation service. It is charged in Brazil by the ANEEL. It is 0.5% over the total income of the plant taking into consideration the installed power. In this case the tax value was based on similar SHP observed at the time of the investment. The SHP considered was Salto Claudelino, which has similar installed power and is installed in the same region as Coronel Araújo.</p> <p><i>Validator's action:</i> ANEEL regulation was checked.</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|---|--|----------|--|----------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | | | | <i>Conclusion:</i> the value is calculated multiplying the TFSEE by the installed power |
| Aneel Fiscalization Fee Passo Ferraz (TFSEE) | 4,596.20 | R\$/year | Aneel Dispatch 141/2007 (page 30) Decree # 2410 | /FD-4/ /LEGIS/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> TFSEE is a fee paid over the annual income resulted from the generation service. It is charged in Brazil by the ANEEL. It is 0.5% over the total income of the plant taking into consideration the installed power. In this case the tax value was based on similar SHP observed at the time of the investment. The SHP considered was Salto Donner I, which has similar installed power and is installed in the same region as Coronel Araújo.</p> <p><i>Validator's action:</i> ANEEL regulation was checked.</p> <p><i>Conclusion:</i> the value is calculated multiplying the TFSEE by the installed power</p> |
| Distribution Use of System Charge (TUSD) Coronel Araújo | 2.29*50% =1.15 | R\$/kW | Resolution # 130 (Frame P page 9) Normative Resolution # 77 – (page 2) | /FD-4.a)/ /LEGIS/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> it is a fee charged by ANEEL over the use of transmission line. The value is charged by kW per month.</p> <p><i>Validator's action:</i> it is an official fee charged regulated ANEEL's Resolution # 130 and the reduction is established in NR #77.</p> <p><i>Conclusion:</i> the value estimated is correctly applied according to Resolution # 130. According to ANEEL, a reduction is applied on transmission fee given to plants with less or equal installed capacity of 30 MW. This reduction is 50 %.</p> |
| Distribution Use of System Charge | 2.54*50% =1.27 | R\$/kW | Resolution # 529 (Frame P page 10) | /FD-13/ /LEGIS/ | <input checked="" type="checkbox"/> | <p><i>Description:</i> it is a fee charged by ANEEL over the use of</p> |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|------------------|--|-----------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| (TUSD) Passo Ferraz | | | Normative Resolution # 77 – (page 2) | | | transmission line. The value is charged by kW per month. <i>Validator's action:</i> it is an official fee charged regulated ANEEL's Resolution # 529 and the reduction is established in NR #77. <i>Conclusion:</i> the value estimated is correctly applied according to Resolution # 529. According to ANEEL, a reduction is applied on transmission fee given to plants with less or equal installed capacity of 30 MW. This reduction is 50 %. |
| Residual Coronel Araújo | 40 | % of total asset | "Lifetime Study and Depreciation Rate" - 50 years for the Turbines and Generators equipment. For turbines, see v.2, page 249. For generators, see v.1, page 294. | /LIFE/ | <input checked="" type="checkbox"/> | <i>Description:</i> A residual (fair value) was considered for this project activity and it is in accordance with international best practices. It was determined conservatively according to the document Economic Lifetime Study and Depreciation Rate "Estudo de vida útil econômica e taxa de depreciação" vols 1 and 2 issued by ANEEL. The economic lifetime estimated for a hydro power project is 50 years as per this document. Hence a depreciation of 2% per year is applied (100% / 50 years = 2% per year). Considering that the lifetime for this specific project is 30 years, the depreciation along this project will be 60%. Thus its fair value considered will be the activity assets at the end of the assessment period, i.e. 40%. |
| Residual Passo Ferraz | 40 | % of total asset | "Lifetime Study and Depreciation Rate" - 50 years for the Turbines and Generators equipment. For turbines, see v.2, page 249. For generators, see v.1, | /LIFE/ | <input checked="" type="checkbox"/> | <i>Validator's action:</i> Evidences of hydropower plants lifetimes from ANEEL were assessed as well as accounting international best practices ^{/LIFE/} . |

| <input type="checkbox"/> | No financial parameters are used for additionality justification | | | | | |
|-------------------------------------|--|------|--|-----------|------------------------------|---|
| <input checked="" type="checkbox"/> | Assessment of all financial parameters see below | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | page 294. | | | <i>Conclusion:</i> The fair value is duly determined as per guidelines on the assessment of investment analysis. |
| Benchmark | 14.98 | % | <ul style="list-style-type: none"> - “<i>Estimating Discount Rates</i>” written by Aswath Damodaran – 2005 (page 14) - http://pages.stern.nyu.edu/~adamodar/pc/archives/emergcompfirm05.xls - Industry sector and country specific (electric generation and Brazil) - EMBI + Brazil Spread - http://www.ipeadata.gov.br/Default.aspx | /BENCH/ | <input type="checkbox"/> | <p><i>Description:</i> the chosen benchmark is the WACC (Weighted Average Capital Cost) which is appropriate for the chosen financial indicator (project IRR) as per the <i>Guidelines on the Assessment of Investment Analysis</i>. As the investment was done 100% equity, to the WACC is equal to cost of equity (Ke). The benchmark was calculated using the Capital Asset Pricing Model (CAPM) applying the methodology presented on the study of FGV, a renowned business school in Brazil.</p> <p><u>Risk free Asset</u> (nominal = 6.31%) (real terms = 1.55%):</p> <ul style="list-style-type: none"> - the average return on investment rates of quotes from United States Treasury bonds (from 1996 to 2005) results in the nominal Risk Free Rate. To obtain the Risk Free Rate in real terms, an inflation adjustment between US inflation and Host country inflation for the period was been deducted (inflation adjustment = 4.76%). Those values are official and public; - Brazilian Country Risk: EMBI+ ten years average will be used which is 7.09% per year. This value is official and public at http://www.ipeadata.gov.br/Default.aspx. <p><u>Brazilian Risk Premium:</u> (7.89%) The average of Country Equity</p> |

| <input type="checkbox"/> No financial parameters are used for additionality justification | | | | | | |
|---|---------------|------|--|-----------|------------------------------|--|
| <input checked="" type="checkbox"/> Assessment of all financial parameters see below | | | | | | |
| Parameter | Value applied | Unit | Source of Information (please indicate document and page) | Reference | DOE ASSESSMENT | |
| | | | | | Correctness of value applied | Comment |
| | | | <p>px</p> <p>- Brazilian Inflation - http://pt.wikipedia.org/wiki/Infla%C3%A7%C3%A3o#Hist.C3.B3rico_do_Quadro_Inflacion.C3.A1rio_no_Brasil, http://anhanguera.edu.br/home/index2.php?option=com_docman&task=doc_view&gid=62&Itemid=1 (pg 6)</p> | | | <p>Risk Premium (Brazil), based on data from JP Morgan corresponding to the period between 1996 and 2005. The value was directly obtained from the document "Estimating Discount Rates"^{BENCH/}. Those values are official and public;</p> <p><u>Investment Risk Compared to Market (0.804)</u>: (Brazilian Beta – only the unlevered Beta was considered as the cost of debt is equal to 0%). The value of Beta was obtained from an average of all industry and country specific Betas (electric generation / Brazil) – last available - available at Stern University website (http://pages.stern.nyu.edu/~adamodar/pc/archives/emergcocompfirm05.xls)</p> <p><u>Benchmark</u> (calculated applying the methodology presented on the FGV's study): 14.98%.</p> <p><i>Validator's action</i>: all indicated websites and study were checked.</p> <p><i>Conclusion</i>: the chosen benchmark Weighted Average Capital Costs calculated by the Capital Asset Pricing Model using FGV's methodology (with publicly available input data) is adequate for the type of project activity, it uses public and consolidated available information and it is calculated in line with EB62 Annex 5. The use of the sectoral benchmark (Electricity Sector) provides a basis for any investor, without individual profitability expectations.</p> |

ANNEX 5: ASSESSMENT OF BARRIER ANALYSIS

Table A-5: Assessment of Barrier Analysis (VVS, v. 03.0, §§ 124-127)

| <input checked="" type="checkbox"/> | | No barrier parameters are used for additionality justification | | |
|--|------------------------|--|---------------------------------------|-----------------------------|
| <input type="checkbox"/> | | Assessment of barriers see below | | |
| Kind of Barrier (invest, tech, other) | Description of Barrier | Evidence used | Assessment of validation team | |
| | | | Appropriateness of information source | Explanation of final result |
| N/A | | | <input checked="" type="checkbox"/> | |

ANNEX 6: OUTCOME OF THE GSCP

Table A-6: Outcome of the Global Stakeholder Consultation Process

(VVS Version 03.0, §§ 34- 37)

| <input checked="" type="checkbox"/> | No comments were received during the global stakeholder consultation period | | | | | |
|-------------------------------------|--|--------------|---------|-----------------------|--|-------------------------------------|
| <input type="checkbox"/> | Comments were received during the global stakeholder consultation period. The comments (in unedited form) and the consideration/response of the validation team are presented below: | | | | | |
| Comment No.: | Comment by: | Inserted on: | Subject | Comment ^{*)} | Action taken by the validation team to take due account on the comment ^{*)} | Conclusion (incl. CARs CLs or FARs) |
| | | | | | | |

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

ANNEX 7: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL

| TÜV NORD Certification | | |
|---|---|-------------|
| Statement of Competence Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program | | |
| Mr. Sergio Cruz | | |
| SCHEME | STATUS | VALID UNTIL |
| CDM | Lead Assessor (Validation, Verification) | 2015-08-02 |
| VCS / ISO 14064-2 | Lead Assessor | 2015-08-02 |
| Authorization status for technical areas within sectoral scopes: | | |
| CODE | TECHNICAL AREA | |
| 1.2 | Renewable Energies | |
| 13.1 | Waste handling and disposal | |
| 185 – Rev. 2, Date: 2012-08-03 | | |
| 185_S01-F003_2012-08-03_rev3.doc | | |
| S01-F003 rev2 / 2012-04-05 | | |

| TÜV NORD Certification | | |
|---|---|---|
| Statement of Competence Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program | | |
| Mr. Emilio Martin | | |
| SCHEME | STATUS | VALID UNTIL |
| CDM | Senior Assessor (Validation, Verification) Technical Reviewer | 2016-02-04 |
| VCS / ISO 14064-2 | Senior Assessor | 2016-02-04 |
| Authorization status for technical areas within sectoral scopes: | | |
| CODE | TECHNICAL AREA | TR SUBCATEGORIES |
| 1.2 | Renewable Energies | 1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Total |
| 13.1 | Waste Handling and Disposal | 13.1.1 Waste Management 13.1.2 Waste Water Management |
| 157 – Rev. 3, Date: 2013-02-05 | | |
| 157_S01-VA000-F20_2013-02-05_rev3.doc | | |
| S01-VA000-F20 rev3 / 2013-10-25 | | |

| TÜV NORD Certification | | |
|---|---|-------------|
| Statement of Competence Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program | | |
| Mr. Ricardo Lopes | | |
| SCHEME | STATUS | VALID UNTIL |
| CDM | Lead Assessor (Validation, Verification) | 2013-11-04 |
| VCS | Lead Assessor | 2013-11-04 |
| Authorization status for technical areas within sectoral scopes: | | |
| CODE | TECHNICAL AREA | |
| 1.2 | Renewable Energy | |
| 077 – Rev. 2, Date: 2011-11-01 | | |
| 077_S01-F003_2011-11-01_rev2 | | |
| S01-F003 rev6 / 2010-04-19 | | |



Statement of Competence

Appointment and authorization according to the procedures
of the TÜV NORD JI/CDM Certification Program

Mr. Marcelo Sebben

| SCHEME | STATUS | VALID UNTIL |
|-------------------|--|-------------|
| CDM | Assessor (Validation, Verification) | 2016-04-07 |
| VCS / ISO 14064-2 | Assessor | 2016-04-07 |

Authorization status for technical areas within sectoral scopes:

| CODE | TECHNICAL AREA |
|------|--------------------|
| 1.2 | Renewable Energies |

297 - Rev. 2, Date: 2013-04-08