PERRY JOHNSON REGISTRARS

Carbon Emissions Services, Inc.

VALIDATION REPORT

EXPANSÃO ENERGIA LTDA

RIACHÃO III AND V WIND POWER PLANTS CDM PROJECT ACTIVITY IN BRAZIL

REPORT NO. C-1-B-01-L-0214

REVISION NO. 1

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VALIDATION REPORT

Date of first issue:	Project No:
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Approved by and date:	Organisational unit:
Bilal Anwar on 16 April 2012	PJR CES
Client:	Client ref.:
EXPANSÃO ENERGIA LTDA	68456

Project Name: Riachão III and V Wind Power Plants CDM Project Activity
Country: Brazil
Methodology: ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources
Version: 12.3.0
Sectoral Scope: 01
Project Type and Technology: Renewable Energy - Wind Power
ER estimate: 55,501 tCO_2 per year
Size
☒ Large Scale
☐ Small Scale

Validation Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is DOE's opinion that the "Riachão III and V Wind Power Plants CDM Project Activity" in Brazil, as described in the PDD, version 3, of "5 April 2012", meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 12.3.0. PJR CES thus requests the registration of the project as a CDM project activity.

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Report title:
Riachão III and V Wind Power Plants CDM Project Activity

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Key words:
CDM Validation, Kyoto Protocol, CDM Executive Board, Renewable Energy, Wind Farm, Brazil

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ABBREVIATIONS

ANEEL	Brazilian Electricity Regulatory Agency
BAU	Business as usual
BM	Building Margin
BNDES	Brazilian Development Bank (in Portuguese Banco Nacional de Desenvolvimento Economico e Social)
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CCEE	Electric Energy Commercialization Chamber (in Portuguese Câmara de Comercialização de Energia Elétrica)
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CM	Combined Margin
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
EB	Executive Board
EIA	Environmental Impact Assessment
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MCT	Ministry of Science and Technology, Brazilian DNA
MME	Ministry of Mining and Energy
MP	Monitoring Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operational Margin
ONS	Electric System National Operator
PPA	Power Purchase Agreement
PDD	Project Design Document
SER	Simplified Environmental Report
SIN	Brazilian National Interconnected System
UNFCCC	United Nations Framework Convention on Climate Change

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1 INTRODUCTION

The Client 'EXPANSÃO ENERGIA LTDA' has commissioned PJRCES Inc. to perform a validation of the Riachão III and V Wind Power Plants CDM Project Activity project in Brazil (hereafter called "the project"). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

1.1 OBJECTIVE

Purpose of this validation is to have an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with:

- The requirements of Article 12 of the Kyoto Protocol;
- The CDM modalities and procedures as agreed in the Marrakesh Accord under decision 17/CP.7 and subsequent decisions made by CDM Executive Board; and
- Other relevant rules, including the Host Country legislation and sustainability criteria.

The above requirements 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 necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

1.2 SCOPE

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan which are included in the PDD and other relevant supporting documents.

The scope of the validation is defined as below:

- The Kyoto Protocol, in particular § 12 and modalities and procedures for the CDM
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Decisions and specific guidance by the EB published under http://cdm.unfccc.int
- Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed

- New Baseline and Monitoring Methodology (CDM-NM)
- Baselines and monitoring methodologies (including GHG inventories)
- Management systems and auditing methods
- Environmental issues relevant to the sectoral scope applied for
- Applicable environmental and social impacts and aspects of CDM project activity
- Sector specific technologies and their applications
- Current technical and operational knowledge of the specific sectoral scope and information on best practice

The information included in the PDD and the supporting documents have been reviewed against the requirements and criteria mentioned above and the quality management system (QMS) of PJRCES. The validation team has, based on the recommendations in the Validation and Verification Manual /35/ employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consultation to the organization(s). However, stated requests for clarifications and/or corrective actions may provide input for improvements of the project design.

2 VALIDATION TEAM AND QUALITY CONTROL

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

***Validation team*:**

Name	Country	Role	Type of work carried out
Ricardo Costa	*Brazil*	*Lead Validator*	*Desk review, site visit and management of the validation activity.*
Esteban Van Dam	*Argentina*	*Technical expert*	*Technical expert inputs*
Bilal Anwar	*USA*	*Technical reviewer*	*Independent technical review and final approval.*

3 METHODOLOGY OF VALIDATION

The validation of the project activity is carried out in the following phases:

- Desktop review of project design document (PDD) and other relevant documents
- Follow up interviews (site visits) with the relevant stakeholders
- Resolution of the identified corrective action requests (CARs), clarification requests (CL) and forward action requests (FARs) if any, followed by the issuance of the final validation opinion and final validation report.

3.1 DESK REVIEW

The desktop review includes:

- A review of the PDD (including annexes) and the relevant supporting documents. The detailed list of documents reviewed through out the validation process, are included in the section 6, under references.
- Preparation of project specific validation protocol in line with the requirements of the validation and verification Manual
- Background investigation and follow-up interviews with personnel of the project proponent, the consultant, legal authorities and other stakeholders.
- Reporting of validation findings taking into account the public comments received on UNFCCC website

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

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

The validation protocol consists of three tables: Table 1 (Mandatory Requirements);

Table 2 (Requirement checklist); and table 3 (Resolution of corrective Action and clarification request) as described in figure 1

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

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*

Validation Protocol Table 2: Requirement checklist			
Validation requirement	***Checklist Question / check point***	***Remarks / comments***	***Evidence***
The various requirements as per para 37 of the CDM modalities and procedures, in line with the validation and verification manual	*The various requirements in Table 2 are linked to checklist questions the project should meet.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable*

Validation Protocol Table 3: Resolution of issues identified in Table 2			
Draft report clarifications, corrective action requests and forward action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Validation conclusion***
If the conclusions from the draft Validation are either a CAR, FAR or a CL, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the CAR, FAR or CL is explained.*	*The responses given by the project participants during the communications with the validation team should be summarised in this section.*	*This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

3.2 FOLLOW-UP INTERVIEWS

PJRCES, during the site visit, 02-03 February 2012, performed interviews with project stakeholders to confirm the information presented in the PDD /1/ and to resolve issues identified in the document review.

Representatives of Atiaia Energia and EQAO were also interviewed as below.

	Date	Name	Organization	Topic
/01/	02 and 03 February 2012	Karen M. Nagai	EQAO	- Letters of Approval - Project boundaries - Technical description - Applicability of selected methodology - Baseline determination - Additionality/ investment Analysis - Emission reduction calculation - Monitoring plan - Environmental aspects and permits - Stakeholder process (local and global)
/02/	02 and 03 February 2012	Sergio Posternak	Atiaia Energia	- Project implementation - Investment Analysis - Environmental aspects and permits - Letters of Approval
/03/	02 and 03 February 2012	Armando Peixoto	Atiaia Energia	- Project implementation - Investment Analysis - Environmental aspects and permits - Letters of Approval
/04/	02 and 03	Daniela Grau	Atiaia Energia	- Project implementation

	February 2012	Makowski		- Investment Analysis - Environmental aspects and permits - Letters of Approval

Table 2: Main topic of interviews

The common way to do the local stakeholders consultation is inviting the list of stakeholders by sending them invitation registered letters /52/ for commenting projects. The federal Brazilian mail service is used and because the mails are registered, warning receipts are returned to who has sent the mail. PJR CES has reviewed the letters and warning receipts and considers the consultation has been done in accordance with local practices.

3.3 RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUESTS

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to PJRCES's positive conclusion on the project design and its compliance with the CDM requirements.

- In order to ensure transparency, a validation protocol is customised for the project. The protocol shows the criteria (requirements) in transparent manner, means of verification and the results from validating the identified criteria.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified.

Corrective action requests ***(CAR)*** are issued, where:

i) Mistakes have been made with a direct influence on project results;
ii) CDM and/or methodology specific requirements have not been met; or
iii) There is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification ***(CL)*** may be used where additional information is needed to fully clarify an issue.

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

The validation process resulted into a total of 20 CARs and 2 CLs. No FARs has been raised. All CARs and CLs have been satisfactorily addressed by the PP before the final validation opinion is established.

Main changes between the PDD published for global stakeholder consultation process, version 1.1, dated 06 December 2011 /1/ and the final version of 5 April 2012 PDD /63/ submitted for registration are as follows:

- The description of the project activity further elaborated and clarified;
- Additionality section improved by applying the guidelines on common practice approved by the Executive Board at EB 63;
- Calculation of baseline emissions and parameters for emission reductions revised;
- Overall generic consistency and completeness of the PDD improved.

4 VALIDATION FINDINGS

The details of the assessment and the main results have been described below in accordance with the VVM version 1.2 (approved at EB 55) reporting requirements. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

4.1 PARTICIPATION REQUIREMENTS

The project participants are Atiaia Energia S/A and Ecopart Assessoria em Negócios Empresariais Ltda (EQAO), of Brazil. No Annex 1 Party has been defined by the time of issuance of this report.

The host Party, Brazil, is party to the Kyoto Protocol and meets the requirements to participate in the CDM.

The designated national authority (DNA) of Brazil issues the LoA after having received the positive validation opinion from DOE, after submitting PDD and the validation report to the DNA.

According to the Brazilian DNA resolutions LoA will be issued after validation documents are analysed and approved as a project participant and confirming that the project assists in achieving its sustainable development. After that, the validation report will be modified accordingly. Annex I country will issue its LoA after Brazilian DNA.

The project does not involve public funding, and the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Brazil.

4.2 PROJECT DESIGN

The project consists of two wind farms called Riachão III and Riachão V with 28.8 MW installed capacity for each one with a total installed capacity of 57.6 MW. The generated renewable energy will be supplied to the National Interconnected System (SIN from Portuguese language) through 36 turbines of 1.6 MW each divided equally for Riachão III and Riachão V. The plant load factor has been calculated by GL Garrad Hassan Ibérica S.L.U, a third party certified company, based on the wind study in the region/18/. According to GL Garrad Hassan wind study the plant load factor was calculated 47.6% for Riachão III and 49.1% for Riachão V. Based on that, PP has estimated the annual electricity generation /65/ in 243,962 MWh per year, being 120,089 MWh from Riachão III and 123,873 MWh from Riachão V.

The wind study prepared by GL Garrad Hasan was validated and certified by DEWI do Brasil Engenharia de Energia Eólica Ltda /7/, another third party. PJRCES reviewed both documents and since the plant load factor has been calculated and certified by two independent entities, it complies with the requirements of 'Guidelines for the reporting and validation of plant load factors'/?/.

The project will be connected to the National Interconnected System- SIN (Brazilian power grid). The project is developed by Atiaia Energia S/A[1] (hereinafter "Project Developer") for the period of 20 years as per the design descriptions provided by Expansão Energia Ltda /16/ and /17/. This period is also indicated as the lifetime of the project activity.

The project design and its techno-economic features are based on the Descriptive Design Memorial Riachão III and Riachão V, developed by Expansão Energia Ltda/16//17/. Expansão Energia Ltda[2] is a third Party engineering company specialized in undertaking such technical consultancy work. Based on the analysis and the findings presented, GE 1.6-100 type wind turbines were recommended for project implementation.

The installed capacity of 57.6 MW could provide an annually gross generation of 504,576 MWh Based on the future installed capacity and on the calculated load factor for each of the plants 47,6% and 49.1%, the and the net electricity generation is estimated to be 243,962 MWh This estimated total power generation value is used to calculate emission reductions which results into estimated annual emission reductions of 55,501 tCO_2e and a total reduction of 388,505 tCO_2e

[1] Atiaia Energia (Atiaia Energy) - Cornélio Brennand Group http://www.atiaiaenergia.com.br/home/home.php
[2] Expansão Energia Ltda - Queiroz Galvão Group - http://portal.queirozgalvao.com/web/grupo/empresas-do-grupo;jsessionid=142DD17764FB397AE78BF791705E3B51

during the first crediting period, of 7 (seven) years. The estimated ER calculations are in accordance with the Design Descriptive Memorials/16//17/ and are found to be conservative.

The project will be located in the municipality of Ceará-Mirim, Rio Grande do Norte state, Northeast region of Brazil. During the site visit the geographic coordinates of the polygon where the project will be located were confirmed. The coordinates are as follows:

Geographic Coordinates	Riachão III	Riachão V
Longitude (West)	35º 25' 05''	35º 26' 15''
Latitude (South)	05º 33' 44''	05º 33' 35''

PJRCES is able to confirm that the final PDD (version 3), dated 5 April 2012, is in compliance with the guidance and has followed the structure and guidance in the latest Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodology (CDM-NM).

PJRCES considers the project description to be complete and accurate.

4.3 CREDITING PERIOD AND PROJECT DURATION

The project starting date is indicated to be 30 October 2013, which, is the estimated date for the signature of the Engineering, Procurement and Construction (EPC) contract. The decision to proceed with the development and implementation of the project as the CDM project was taken based on the financial analysis, dated 01 December 2011 /60/. Further details of project start date and prior consideration can be found in section 4.8.1 of this report. Operational lifetime is determined as 20 years which is based on the Expansão Energia Ltda project design descriptive memorial/16//17/.

The starting date of the crediting period is indicated to be from 01st November 2014, or the date of registration, whichever is later.

4.4 ELIGIBILITY AS SCALE OF PROJECT ACTIVITY

The project activity is a renewable energy project with an installed capacity of 57.6 MW, qualifying as a large scale project activity. The scale of the installed capacity has been verified by reviewing the following project documentation and equipment purchase contracts:

Document	Description	Date	Document Reference
GE Energy Proposal (OID 724124 - Cornelio Brennand - June 2011 Budgetary Proposal.pdf)	Technical proposal of turbine with the supplier which indicates the scale of the equipment	7 June 2011	/10/
GE Energy O&M Proposal (OL OSA Budgetary Brazil 2011.pdf			/11/
Descriptive Design Memorial Riachão III (MD Riachão III A3_2012 V1.doc)	Riachão III and V details of design, data sheet and project despcription	27 January 2012	/16/
Descriptive Design Memorial Riachão V (MD Riachão V A3_2012 V1.doc)			/17/
Preliminary License Riachão III of 14 May 2010 (LP Riachão III_verso.pdf - LP Riachão III_frente.pdf)	Preliminary Environmental Licenses for Riachão III and V	14 May 2010	/21/
Preliminary License Riachão V of 14 May 2010 (LP Riachão V_verso.pdf - LP Riachão V_frente.pdf)			/22/

4.5 APPLICABILITY OF METHODOLOGY TO PROJECT ACTIVITY

Applicability of the approved baseline methodology

The project activity correctly applies the approved consolidated baseline and monitoring methodology - ACM0002 “Consolidated baseline methodology for grid connected electricity generation from renewable sources” version 12.3.0 EB 66, Annex 35, valid from 2 March 2012 onwards.

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

Applicability Conditions	Validation	Reference Document
This methodology is applicable to grid connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of an existing plant(s).	The project activity is a Greenfield wind power plant with an installed capacity of 57.6 MW. The electricity generated will be dispatched to the Sistema Interligado Nacional - SIN (national grid). The compliance with the applicability condition has been confirmed through the review of Design Descriptive Memorials, PDD and technical proposal for equipment supply.	/10/ /11/ /14/ /15/ /16/ /17/ /33/
The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydropower plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.	The project activity is a Greenfield wind power plant with an installed capacity of 57.6 MW. The electricity generated will be dispatched to the Sistema Interligado Nacional - SIN (national grid). The compliance with the applicability condition has been confirmed through the review of Design Descriptive Memorials, PDD and technical proposal for equipment supply.	/10/ /11/ /14/ /15/ /16/ /17/ /33/
The project activity does not involve switching from fossil fuels to renewable energy sources at the site of the project activity.	The project activity does not involve fuel switching from fossil fuels to renewable energy sources. The project activity is a Greenfield wind farm project. The compliance with the applicability condition has been confirmed through the review of Design Descriptive Memorials, PDD and technical proposal for equipment supply.	/10/ /11/ /14/ /15/ /16/ /17/ /33/
The methodology is not applicable to Biomass fired power plants.	The project is not a biomass fired power plant.	/16/ /17/ /33/
The methodology is not applicable to Hydro power plants that result in new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m^2	The project is not a hydro power plant.	/16/ /17/ /33/

Table 4: Methodology conditions

In addition, the applicability conditions included in the tools applied and referred to above apply as follows:

Tool	Applicability conditions	Applicability
Tool for demonstration and assessment of additionality (v06)	Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	The chosen methodology prescribes the use of this tool. There is no further applicability condition for using the tool.
Tool to calculate the emission factor for an electricity system (v02.2.1)	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The proposed project activity is the installation of a wind power plant supplying electricity to the grid. Estimation of operating margin, build margin and combined margin has been calculated applying the steps of the tool.
	The tool is not applicable if the project electricity system is located partially or totally in an Annex-I country.	The project electricity system is located in a non-Annex I country.

Table 5: Applicability of the methodology

Based on the above analysis, PJRCES is able to confirm that the approved baseline methodology ACM0002 "Consolidated baseline methodology for grid connected electricity generation from renewable sources" version 12.3.0 is applicable to the project activity. It is further confirmed that the referred tools are also applicable and appropriately applied in the context of the project activity.

Appropriateness of the baseline scenario selection methodology

The project activity consists of the installation of a new grid-connected renewable electricity generation plant (wind farm) that will be installed at a site where no renewable power plant was operated previously and the electricity generated will be dispatched to the Sistema Interligado Nacional - SIN (national interconnected grid) in Brazil.

The baseline scenario has thus been correctly identified in accordance with applied baseline and monitoring methodology 'ACM0002 version 12.3.0' as follows:

Electricity delivered to the grid by the project activity would otherwise have been generated by the operation of grid-connected power plants in Sistema Interligado Nacional - SIN (national grid) of Brazil and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system" version 2.2.1.

It is confirmed that the approved baseline methodology has been correctly applied and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

4.6 PROJECT BOUNDARY

As per the requirements of the applied baseline and monitoring methodology ACM0002 /27/, the spatial extent of the project boundary includes all the power plants physically connected to the Sistema Interligado Nacional - SIN (national grid) and the project power plant. The spatial extent of the project boundary is clearly defined as the site of project activity and the grid system comprising all power plants connected physically to the grid.

The details of project boundary have been determined by means of reviewing the project documentation, such as, Design Descriptive Memorials and also by the physical inspection during the site visit. The selected sources and gases are justified for the project activity. Emission sources and gases included in the project boundary are:

	GHGs involved	***Description***
Baseline emissions	CO_2	According to 'ACM0002 version 12.3.0' only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity are accounted for.
Project emissions	N/A	As the project is a wind power plant no GHG emissions from the project have to be considered according to 'ACM0002 version 12.3.0'.
Leakage	N/A	N/A

Table 6: Emission sources

PJRCES is able to confirm that the application of the baseline methodology is transparent and conservative. The identified project boundary and selected sources and gases are justified for the project activity.

The validation of the project activity did not reveal other GHG emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by the applied baseline methodology ACM0002 (version 12.3.0).

4.7 BASELINE ASSESSMENT

The applied baseline and monitoring methodology 'ACM0002 version 12.3.0' prescribes the baseline as the *electricity delivered to the grid by the project that would have otherwise been*

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

The connected power grid for the proposed project is the Brazilian grid (SIN). Therefore, the baseline scenario is the continuation of the current situation, i.e. the electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin calculations according to "*Tool to calculate the emission factor for an electric system*".

As per the paragraph 105 of the CDM-VVM version 01.2, if the applied approved baseline methodology prescribes the baseline scenario, no further analysis of baseline alternatives is required. It is confirmed by PJRCES that the baseline identified in the final version of the PDD is correctly identified following the conditions and requirements of the applied baseline methodology. It is further confirmed that:

(a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;

(b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;

(c) Assumptions and data used in the identification of the baseline scenario are appropriately justified, supported by evidence and can be deemed reasonable;

(d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;

The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario that reasonably represents what would occur in the absence of the proposed CDM project activity.

PJRCES considers the list of realistic and credible alternatives to be complete. The application of the baseline methodology is transparent and conservative.

4.8 ADDITIONALITY ASSESSMENT

The additionality of the proposed project is demonstrated by applying the "Tool for the demonstration and assessment of additionality", version 06.0.0.

4.8.1 START DATE OF THE PROJECT ACTIVITY

The project starting date is indicated to be 30 October 2013 which is the estimated date for the signature of the Engineering, Procurement and Construction (EPC) contract. The decision to proceed with the development and implementation of the project as the CDM project was taken based on the financial analysis /60/, dated 01 December 2011 which demonstrated that the project on its own was not financially viable hence necessitated CDM for its implementation.

The validation team reviewed the financial analysis and could verify that the decision to proceed with the implementation of the project as a CDM project activity is based on financial reasons as the project on its own is not a viable investment. PJRCES extensively reviewed the project timelines and its implementation status and could verify that the indicated start date is an important milestone towards the project implementation, in particular, considering the fact that the project is at the early stage of its development and implementation and no contractual arrangements for the equipment purchase and/or construction have been made. It has been further reviewed and ascertained that with the completion of design and planning phase (references: /7//18//8//9//10//11//12//14//15//16//17//19//20//21//22//23//24/) of the project activity and also committing significant financial resources on the validation process /44/, the PP has demonstrated their strong commitment to proceed with the implementation of the project as a CDM project activity.

The table below lists the documents PJRCES reviewed to validate the background of the project activity and also its eligibility as the CDM project.

Document	Description & Validation	Date	Document Reference
Wind study and Report.	GL Garrard Hassan a third party has undertaken the Wind Study. PJRCES has reviewed the report and is able to confirm that the report carried out the assessment of the wind farms.	14 November 2011	/18/
Validation of Wind Study and Report form Garrard Hassan	Dewi do Brasil a third party has evaluated the Wind Study from Garrard Hassan and validated and certified it. PJRCES has reviewed the report and is able to confirm that the report carried out the assessment of the wind farms.	17 January 2012	/7/
Financial analysis	Financial analysis regarding the implementation availability of the project activity. PJRCES has reviewed the financial analysis.	01 December 2011	/2/ /3/ /4/ /5/ /60/
Expansão and EQAO Contract for CDM services	Expansão and EQAO Contract for CDM services for developing of the project activity. PJRCES reviewed the document.	21 October 2011	/13/

Land lease Contracts Riachão III and Riachão V	Land lease Contracts for the areas where projects will be installed and the intention to construct wind farms. PJRCES reviewed the document.	14 and 19 April 2010	/19/ /20/

The review of above evidences showed that the project was considered as a CDM project activity from its early stage given the fact that its financial viability would not have allowed its implementation otherwise. It also shows that only consideration of CDM benefits enabled the PP to decide and proceed with its implementation as a CDM project activity.

4.8.2 PRIOR CDM CONSIDERATION AND CONTINUED ACTION TO SECURE CDM STATUS

The project activity is a new project with the starting date after 02 August 2008, as per the "Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM"/37/. In accordance with the requirements of the guidelines the PPs informed Brazilian DNA and the UNFCCC on 16 August 2011 of the project commencement and their intention to seek CDM status/31//32/. Both notifications have been submitted prior to the indicated start date which is 30 October 2013.

PJRCES reviewed notifications and their confirmations and also cross-checked on the UNFCCC website[3] and found them to be in line with the "Guidelines on the demonstration and assessment of prior consideration of the CDM"/37/.

PJRCES has undertaken a review of the status of activities related to the project's implementation in order to verify the prior consideration. The table below presents details of some key events, timelines and also how PJRCES validated these events.

Date	Event	Validation Document	Reference
14 May 2010	Preliminary License Riachão III	Preliminary License is provided by the State Environmental Agency to the project developer when an environmental impact assessment is prepared and approved the State by the Environmental Agency. PJRCES reviewed the document and its	21

[3] The UNFCCC website show submission of two notifications for Riachao III and Riachao IV and date of received is 17 August 2011.

		contents.	
14 May 2010	Preliminary License Riachão V	Preliminary License is provided by the State Environmental Agency to the project developer when an environmental impact assessment is prepared and approved the State by the Environmental Agency. PJRCES reviewed the document and its contents.	22
16 August 2011	Prior Consideration Riachão III sent to DNA and UNFCCC	Prior consideration form sent by email to UNFCCC. PJRCES reviewed the document and its contents.	31
16 August 2011	Prior Consideration Riachão V sent to DNA and UNFCCC	Prior consideration form sent by email to UNFCCC. PJRCES reviewed the document and its contents.	32
28 September 2011	Local stakeholder consultation - Invitation letters to comments	According to the Brazilian DNA resolutions PDD shall be available for consultation 15 days before the global stakeholder consultation.	52
21 October 2011	Expansão and EQAO Contract for CDM services	Expansão has signed the contract with PJRCES to validate Riachão III and V. PJRCES reviewed the document and its contents.	13
From 04 October to 01 December 2011	Warning Receipts - Invitation letters to comments for Local Stakeholders Consultation	PJRCES reviewed the document and its contents.	53
14 November 2011	Contract agreement between Expansão Energia and PJR CES	PJRCES has the contract signed	44

14 November 2011	Wind Study and Report	GL Garrard Hassan a third party has undertaken the Wind Study and calculated the Plant load factor for Riachão III and Riachão V sites. PJRCES reviewed the document and its contents.	7
01 December 2011	Financial Analysis	PP undertook the financial analysis applying benchmarking on IRR. PJRCES reviewed the documents, inputs source .included in the financial analysis	2
09 December 2011	Global stakeholder consultation commenced.	PJRCES confirmed date in the UNFCCC site.	42
17 January 2012	Wind report and certificate Riachão III and V	Dewi do Brasil a third party has evaluated the Wind Study from Garrard Hassan and validated and certified it. PJRCES reviewed the document and its contents.	18

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

Furthermore, the PP has demonstrated to follow the 'Guidelines on the demonstration and assessment of prior consideration of the CDM, (EB 62 Annex 13)/?/.

PJRCES has determined that the CDM was seriously considered before the decision to go ahead with the proposed project. From the project financial analysis/?/ and further confirmed through interviews with PPs it is confirmed that the project will not be implemented if not registered as a CDM project activity. It has been confirmed that the project is conditional with the CDM benefits. Hence, PP had taken continued action to secure CDM status in accordance with the "Guidelines on the demonstration and assessment of prior consideration of the CDM" version 4.

4.8.3 STEP 01: DISCUSSION OF ALTERNATIVES AND LEGAL COMPLIANCE

According to the applied baseline methodology ACM0002 version 12.2.0 /27/, if the project activity is the installation of a new grid connected renewable power plant/unit, the baseline scenario is the following:

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

The proposed project is a new wind park project activity that would annually deliver a total of 243,962 MWh of electricity to the Sistema Interligado Nacional - SIN (national grid) in Brazil. As per paragraph 105 of the VVM, no analysis of baseline alternatives is required if the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario. However, PPs have identified alternative scenarios in the PDD which have been validated by PJRCES.

Alternative scenarios for the project activity have been identified as per the applied baseline methodology ACM0002 v12.3.0 and the applicable tool for demonstration and assessment of additionality (v.6). PP has analyzed the identified alternatives and summary of the analysis is presented below:

***Alternative 1**: Continuation of the current situation. Electricity will continue to be provided by the existing grid (SIN).*

***Alternative 2**: The proposed project activity without CDM: construction of wind farms connected to the grid, implemented without considering CDM revenues.*

The identification of alternatives and their substantiation have been found consistent and in accordance with the requirements of the applied baseline methodology as well its applicable tool. The alternatives listed in the PDD are found to be credible and complete as per the requirements of the approved applied methodology, VVM and tool for demonstration and assessment of additionality (v.6).

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

Alternatives mentioned above are in compliance with Brazil legislation. PJRCES, based on its local and sectoral expertise, and review of related legislations and regulations is able to confirm that above two alternative scenarios are in compliance with the local laws and regulations. No local regulation have been noted which prohibits the implementation of wind farms and similarly for continuation of electricity to be provided by the grid which is also baseline for the project activity and will be discussed at the next steps.

4.8.4 STEP 02: INVESTMENT ANALYSIS: CHOICE OF APPROACH

The project activity applied the "Tool for the demonstration and assessment of additionality". In accordance with the sub-step 2a. of the tool an appropriate method for the investment analysis shall have to be determined. The tool provides three options:

Option I: simple cost analysis

Option II: investment comparison analysis

Option III: benchmark analysis

Since the project activity involves investment and revenues from the sale of electricity to the grid other than the proposed carbon revenue. Thus simple cost analysis (Option I) cannot be applied for investment analysis.

Furthermore, the alternative (generation of equivalent amount of electricity in the grid) to the project does not involve investments. Thus, an investment comparison analysis (Option II) is also not the appropriate approach for the project activity. Thus the project proponent has applied "Benchmark Analysis" (Option III) for proving investment barrier.

Benchmark analysis is in compliance with the "Guidelines on the assessment of investment analysis", paragraph 19: if the alternative to the project activity is the supply of electricity from a grid this is not to be considered an investment and a benchmark approach is considered appropriate. The proposed project activity will supply renewable energy to the national grid (SIN).

4.8.3.1 INVESTMENT ANALYSIS: BENCHMARK SELECTION

The economic and financial indicator of equity internal rate of return (equity IRR) calculated in the financial model of the project activity has been used to compare with the benchmark in the power sector in the host Country. The benchmark is calculated as the weighted average of cost of capital (WACC) to compare the against the project internal rate of return (equity IRR). The WACC represents the minimum rate of return, which the project should earn to merit consideration, as failure to earn the minimum rate of return is indicative of the erosion in the value of shareholders' investment, hence, it deemed to be appropriate.

Since investment in wind energy could have been done by any entity other than the project participant, the PP has determined the benchmark using publicly available data. It has been further confirmed that the WACC calculation is based on parameters that are standard in the market, considers the specific characteristics of the project type, and is not linked to the

subjective profitability expectation or risk profile of the PP. The benchmark is calculated based on the December 2011 values which have been confirmed and it aligns with the time of the investment decision which is also December 2011.

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

As per paragraph 34 (b) of the additionality tool if benchmark analysis has been used, PP has to demonstrate that the CDM project activity results into less favourable financial indicator (in this project lower IRR) than the CDM project activity. The Financial Analysis established by PP is based on the following documents:

Document	Description	Date	Document Reference
GE Energy Proposal (OID 724124 - Cornelio Brennand - June 2011 Budgetary Proposal)	Technical proposal of turbine with the supplier which indicates the scale of the equipment	7 June 2011	/10/
GE Energy O&M Proposal (OL OSA Budgetary Brazil 2011			/11/
Riachão III drawing (Planta_de_Situacao_Riachao.III AV05a.dwg)	Riachão III and V details of design, data sheet and project despcription	30 January 2012	/14/
Riachão V drawing (Planta_de_Situacao_Riachao.III AV05a.dwg)		13 June 2011	/15/
Descriptive Design Memorial Riachão III (MD Riachão III A3_2012 V1.doc)		27 January 2012	/16/
Descriptive Design Memorial Riachão V (MD Riachão V A3_2012 V1.doc)			/17/
Wind Study Report and Certificate Riachão III and V (237522-BRPA-T-01-B-Nota técnica EPE e Relatorio Riachão III e V.pdf - 237522-BRPA-T-01-A-Capa ResultadosAssinados.pdf)	Wind Study Report and Certificate Riachão III and V prepared by Garrard Hassan	14 November 2011	/18/
Preliminary License Riachão III of 14 May 2010 (LP Riachão III_verso.pdf - LP Riachão III_frente.pdf)	Preliminary Environmental Licenses for Riachão III and V	14 May 2010	/21/
Preliminary License Riachão V of 14 May 2010 (LP Riachão V_verso.pdf - LP Riachão V_frente.pdf)			/22/
Turbine Location Riachão III (BRENNAND-RIII-C-001-REV.02A-IMPLANTAÇÃO DE AEROGERADORES RIACHÃO III.pdf	Turbine location for Riachão III	14 September 2011	/23/
Turbine Location Riachão V (BRENNAND-	Turbine location for	13	/24/

RV-C-001-REV.02-IMPLANTAÇÃO DE AEROGERADORES RIACHÃO V.pdf)	Riachão V	September 2011	
Inspection Fee Electricity Services (TFSEE) – ANEEL Dispatch No. 360, of 4 February 2011 (dsp2011360.pdf)	Establishes the annual value of Inspection Fee Services Electricity (TFSEE) for the year 2011, for compounders and independent producers of electricity, according to Annex available on the National Energy Agency (ANEEL[4]), on the Internet: http://duto.aneel .gov.br / dealers.	4 February 2011	/25/
Distribution Systems Use Rates – ANEEL Ratifying Resolution No. 1139 of 19 April 2011	Approves rates for electric power supply and Fees for Use of Distribution Systems - TUSD, establishes the annual revenue of the connection facilities and fixing the annual value of Inspection Fee Services Electricity - TFSEE, referring to the Energy Company Rio Grande do Norte – COSERN	19 April 2011	/26/
Brazilian Income Taxed at Source[5]	Tributes charged by Secretariat of the Federal Revenue of Brazil on profits	NA	NA
Equipments insurance – Wind turbines (Megler_Seguro equipamentos.pdf	Insurance for the wind farm equipments	3 August 2011	/54/
2011 Brazilian Energy Auction Results (Resultado_4LER_2011.08.18.xls)	2011 Brazilian Energy Auction Results	17 August 2011	/55/
2011 Brazilian Energy Auction Full Results (Resultado_Completo_12LEN_2011.08.17.xls)	2011 Brazilian Energy Auction Full Results	17 August 2011	/56/
Inflation targeting table up to 2011 (Inflation targeting table.pdf)	Historical data of inflation target	28 July 2009	/57/

[4] http://www.aneel.gov.br/
[5] o http://www.receita.fazenda.gov.br/pessoajuridica/dipj/2000/orientacoes/determinacaolucropresumido.htm

Inflation targeting table up to 2012 [6]	Fixed the target for inflation and its tolerance range for the year 2012. Income Taxed at Source	22 de June de 2010	/58/

Based on the above values, the WACC was calculated as **9.57%**. PJRCES confirms that based on the assessment of above submitted documents, the determination of benchmark has been done as per the investment guidance.

4.8.3.2 INVESTMENT ANALYSIS: INPUT PARAMETERS

Input values used for the equity IRR is presented below:

Parameter	Description	Value	Reference
Installed capacity	Project design of the wind farms	56.7 MW	/16/ /17/
Plant load factor	PLF= available output capacity/ installed capacity.	47.6% for Riachão III 49.1% for Riachão V	/7/ /18/
Net energy generation for sale	Electricity generation projected on the basis of the PLF for each wind farm	243,962 MWh annually	/7/ /16/ /17/ /18/
Total investment	Total investment based on the number of wind turbines and related infrastructure	Riachão III = R$91.865.700 Riachão V = R$91.865.700	/10/ /11/
TFSEE	ANEEL Dispatch nr. 360 dated February 4th, 2011	R$ 385.73/kW	/26/
O&M costs	Budgeted according to equipment manufactures recommendations	R$ 2,588,165	/2/
PIS	PIS - Social Integration Programs and Training of Public Heritage - PIS / PASEP. It treats the art. 239 of the 1988 Constitution and the Laws Complementary 7, September 7, 1970, and 8, 3 December 1970. Charged based on presumed profit	3.65%	Federal revenue site
COFINS[7]	Contribution for Social Security, established by the Complementary Law 70 of 30/12/1991. Charged based on presumed profit		
TUSD[8]	Approves rates for electric power supply	R$ 3.35/KWh	ANEEL site[9]

[6] (https://www3.bcb.gov.br/normativo/detalharNormativo.do?method=detalharNormativo&N=110054694)
[7] Social integration program/ contribution for financial of the social security - http://www.receita.fazenda.gov.br/pessoajuridica/pispasepcofins/default.htm

	and Fees for Use of Distribution Systems - TUSD, establishes the annual revenue of the connection facilities and fixing the annual value of Inspection Fee Services Electricity - TFSEE, referring to the Energy Company Rio Grande do Norte – COSERN ANEEL Resolution nr. 1,139 dated April 19th, 2011		
Income Tax	Based on the presumed profit	Up to 240,000 – 15% More than 240,000 – 25%	2
Social contribution	9% of the gross revenue basis	9%	Brazilian government website[10]
Land Use Lease	1.5% of revenues	1.5%	19 20
Environmental and managerial	1% of revenues	1%	PPs experience[11]
Insurance	0.47% of assets	0.47%	54
Energy selling price	Average of energy auctions price for wind power projects conducted by the Brazilian government in 2011, adjusted to inflation targeting until de operation start.	R$ 113.52/MWh	55 56 57 58

Table 9 - Investment analysis - input parameters and validation cross check

4.8.3.3 INVESTMENT ANALYSIS: CALCULATION AND CONCLUSION

As mentioned above that the PP has applied an investment benchmark analysis (WACC) in order to economic evaluate the additionality of Riachão III and Riachão V projects, which is in accordance with the guidelines/?/. The financial indicator identified for the project is the project Internal Rate of Return (IRR). The benchmark was applied to the cash flow of the comparing its value to the internal rate of return (IRR) of the project considering information from December 2011. In order to calculate the WACC, values for cost of equity and cost of debt have been calculated by the PP.

The cost of debt inputs applied is in the table below:

[8] Tariff of distribution system
[9] http://www.aneel.gov.br/cedoc/reh20111141.pdf
[10] http://www.planalto.gov.br/ccivil_03/leis/L7689.htm
[11] PP owns hydro power plants and has expenses of about 1% of the revenues with Environmental and Managerial

Cost of Debt (Kd)	
(a) Financial cost[12]	6.53%
(b) BNDES spread[13]	0.90%
(c) Credit risk rate[14]	2.00%
(a+b+c) Pre-Cost of Debt	9.43%
(t) Marginal tax rate[15]	0.00%
(d) Inflation forecast[16]	4.50%
After tax Cost of Debt	4.71% p.a.

The cost of Equity inputs applied is in the table below:

Cost of Equity	
(Rf) Risk-free rate[17]	4.25%
US expected inflation[18]	1.60%
(Rm) Equity Risk Premium[19]	6.03%
(β) Sectorial risk[20]	1.55%
(Rc) Estimated Country Risk Premium[21]	2.45%

[12] 5-year average of the Long term Interest Rate (from the Portuguese *Taxa de Juros de Longo Prazo – TJLP*). Available at BNDES' website: <http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Custos_Financeiros/Taxa_de_Juros_de_Longo_Prazo_TJLP/index.html>.

[13] BNDES' remuneration. BNDES' policies. Available at <http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/meio_ambiente.html>.

[14] Credit risk rate. BNDES' policies. Available at <http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/meio_ambiente.html>.

[15] Taxes calculated based on an assumed percentage over the gross revenue.

[16] Central Bank of Brazil. Brazilian inflation targeting. Available at: <http://www.bcb.gov.br/pec/metas/InflationTargetingTable.pdf>

[17] 30-year US Treasury Yield. Available at Damodaran's website: <http://pages.stern.nyu.edu/~adamodar/>.

[18] Change Average 2010. U.S. Bureau of Labor Statistics. Available at: < ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt>.

[19] Historical S&P500 premium over 10-year US-Treasury Bond. Available at Damodaran's website: <http://pages.stern.nyu.edu/~adamodar/>.

[20] Market weighted average Beta US power Co. re-levered to Brazilian leverage. Available at Damodaran's website: <http://pages.stern.nyu.edu/~adamodar/>.

Cost of Equity with Brazilian Country Risk	14.44% p.a.

And the calculated WACC considering the above values for cost of equity and cost of debt and applying the default values for debt/equity financing the WACC is calculated as 9.57%.

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

Plant load factor (PLF)

The plant load factor was calculated 47.6% for Riachão III and 49.1% for Riachão V. PLF is determined as per the 'Guidelines for the reporting and validation of plant load factors by a third party company and verified by another third party engineering company and considered acceptable by PJRCES/?/?/.

Electricity generation for sale

The total installed capacity of the project is 57.6 MW. The generated renewable energy will be supplied to the National Interconnected System (SIN from Portuguese language) through 36 turbines of 1.6 MW each.

PJRCES has verified that this value is in accordance with Design Descriptive Memorials and and Garrad Hassan wind study considered plausible as per the Brazilian regulation for electric energy and project activity installed capacity. Based on the PLF and on the EF calculation /3/ PP estimated the annual electricity generation /61/ in 243,962 MWh per year, being 120,089 MWh from Riachão III and 123,873 MWh from Riachão V

Plants investment

The value is based on the proposals /10//11/ for 36 wind turbines, i.e. Riachão III and V (Riachão III = R$91.865.700 + Riachão V = R$91.865.700 with a total of R$ 183.731.400) and it is applied in accordance to the Financial Analysis. The total plant investment is based on Technical proposal of turbine with the supplier /10//11/.

O&M costs

The value in the table above has been calculated considering zero for the 2 first years and one month for the third year and R$ 1,294,082 per year for each of the plants for the next 7 years in accordance to the O&M equipment proposals /10/ and /11/. The relation between O&M (annual cost) and total investment reaches 0.07%. O&M value has been cross-checked with the Financial Analysis and found appropriate.

[21] Emerging Markets Bond Index Plus Brazil. Index calculated by JPMorgan. Available at IPEA's website: < www.ipeadata.gov.br>.

Tax and depreciation

PJRCES can confirm that the special purpose societies formed for the project are eligible for the presumed (or assumed) profit regime, in accordance to the national fiscal legislation.

Income tax (15% - 25%), PIS/COFINS 3.65% and a 9% rate applied as social contribution on gross revenue basis were established accordingly to the Brazilian legal requirements. In the presumed profit regime, depreciation has no impact in the project's internal rate of return. In this case, tax rates are calculated over revenues and not over gross profits.

	Riachão III	Riachão V
Equity IRR	6.87%	7.32%
Benchmark	9.57%	9.57%

The IRR calculations were provided in spreadsheet, Financial Analysis, and verified by PJRCES. The assumptions and calculations were verified and found to be correct. The IRR is for the assessment period of 20 years is equivalent to the lifetime of the project. Based on above parameters and assumptions equity IRR for the project activity was calculated to be 6.87% for Riachão III and 7.32% for Riachão V. Those IRR are confirmed to be lower than the benchmark of 9.57%.

PJRCES, having compared input parameters for the financial analysis included in the Financial Analysis, verifying the overall financing of the project activity and cross-checking with the documents referenced in the table above is able to confirm that the project is not a economically attractive and viable investment option on its own. It is further confirmed that the project IRR is below the benchmark. Further evaluation of input values and sensitivity analysis is presented below.

4.8.3.4 INVESTMENT ANALYSIS: SENSITIVITY ANALYSIS

The sensitivity analysis has been carried out for parameters that most likely to fluctuate over time and contributing for more than 20% to project costs or total revenues as per the Guidelines on the assessment of investment analysis. Parameters considered: energy price, amount of energy to be generated, CAPEX and O&M cost.

Key indicators	Variation of the parameter indicator needed to reach benchmark project 9.57%
Energy price	-10% would be 8.25%; +10% would be 8.71%
Volume of energy generated	-10% would be 8.25%; +10% would be 8.71%
CAPEX	-10% would be 8.10%; +10% would be 8.57%

O&M cost	-10% would be 7.25 %; +10% would be 7.69%

Energy price

The revenue of the proposed project activity depends on two factors: the electricity generated and the electricity sales price. It is not certain that the sales price will change over the time according to the last auctions occurred in Brazil. With the 10% increase the energy price the increase in the IRR reaches to 8.71% which is still below the applied benchmark.

It has been noted that the average price of the last auction prior to the time of the investment decision has been used for the cash flow projection. The price considered is the average of 2011 auctions and which was crosschecked in the Energy Research Company[22] and conservatively was increased based on the Brazilian inflation target of 4.5% until 2014 when the project shall start-up. If an unexpected reason takes place to achieve the benchmark the price has to reach 20%, which is 15.5% above to the projected (during the 20 years of the lifetime of the project) which is unlikely to happen.

Volume of energy generated

It is unlikely that the scenario of revenue generation in result to quantity of total power generated will be consistently 10% above the volume projected and considered in the investment analysis. Effective revenue of 20%, which is 15.5% above to the projected is required to achieve the benchmark which means that the volume of electricity sold should reach the average of 15.5% above projected for the lifetime of the project activity.

CAPEX

A 10% reduction in capital expenditure is a conservative as per investments in infrastructure usually overrun higher than budgeted. A 10% increases pushes the IRR to the level of 8.57% which is still below the benchmark. In a scenario like this the equity IRR would increase, but would not reach the benchmark. This would occur if the CAPEX were 20 % below the original projections, considered not a realistic scenario as per the construction and equipment supplying proposals were received.

O&M cost

O&M costs are operational costs including sectoral taxes, transmission costs, costs for O&M, regular overhaul and land lease expenses. The 10% reduction in all these costs would not affect the project's return, hence would not elevate the project IRR to the project benchmark.

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

[22] Energy Research Company - http://www.epe.gov.br/leiloes/Paginas/default.aspx?CategoriaID=6734

4.8.5 STEP 03: BARRIER ANALYSIS

According to the "Tool for the demonstration and assessment of additionality" /32/, no barrier analysis is required if additionality is demonstrated by investment analysis. Hence, barrier analysis is applicable to this project activity.

4.8.6 STEP 04: COMMON PRACTICE ANALYSIS

The PP has undertaken the common practice analysis of the project following the 'Guidelines on common practice'/?/. As per the guidance, a proposed project activity is considered common practice in a sector in the applicable geographical area if the factor F ($F = 1 - N_{diff}/N_{all}$) is greater than 0.2 and N_{all}-N_{diff} is greater than 3.

PP has applied the approach recommended in the common practice guideline. Four steps of the guidance are applied as follows:

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

Based on the installed capacity of the project activity, which encompasses two wind power plants, each one with 28.8 MW installed capacity, a range between 14.4 MW (the lowest capacity between ranges) and 86.4 MW installed capacity (the highest capacity between ranges) was analysed.

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

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

A total of 22 wind farm projects under the characteristics above (output range) have been identified:

S. NO	Project Titel	Capacity	S. NO	Project Titel	Capacity
1	Alegria I	51 MW	12	Parque Eólico Elebrás Cidreira I	70 MW
2	Bons Ventos	50 MW	13	Parque Eólico de	50 MW

				Osório	
3	Canoa Quebrada	57 MW	14	Parque Eólico Enacel	31.5 MW
4	Cerro Chato III	30 MW	15	Parque Eólico Sangradouro	50 MW
5	Eólica Icaraizinho	54.6 MW	16	Pedra do Sal	18 MW
6	Eólica Paracuru	25.2 MW	17	Praia do Morgado	28.8 MW
7	Eólica Praias de Parajuru	28.8 MW	18	Púlpito	30 MW
8	Foz do Rio Choró	25.2 MW	19	RN 15 - Rio do Fogo	49.3 MW
9	Gargaú	28.05 MW	20	Rio do Ouro	30 MW
10	Parque Eólico de Beberibe	25.6 MW	21	Taíba Albatroz	16.5 MW
11	Parque Eólico dos Índios	50 MW	22	Volta do Rio	42 MW

The analysis resulted in 22 operational wind power plants considering the range identified in Step 1 (between 14.4 and 86.4 MW). When excluding registered CDM project activities and CDM project activities undergoing validation, 17 wind power plants were left.

Hence $N_{all} = 17$

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

All 17 projects identified as N_{all} have received subsides and incentives from Government program PROINFA[23]. These projects have been implemented as per the use of resources of this Brazilian program which involves special contractual arrangements and favourable financing conditions for the development of the wind projects applying new technology. Considering that the proposed project had not received any special contractual considerations or finances from the Government, hence it can be concluded that all mentioned projects are different from Riachão III and V.

Therefore $N_{diff} = 17$

[23] Federal program from the Minister of Mining and Energy for supporting of alternative sources of electricity

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

$F = 1 - N_{diff}/N_{all} = 1 - 2/2$

$F = 0$

Based on the common practice guidelines, the proposed project activity is not a common practice.

PJRCES, confirms that based on the above information and various barriers associated with the project activity, it is sufficiently demonstrated that the project is not a likely baseline scenario and thus project is additional.

4.9 MONITORING PLAN

The monitoring plan is in line with the approved monitoring methodology ACM0002, version 12.3.0 and monitoring arrangements are sufficient for the real measurement of emission reductions resulting from the project activity. As a newly developed wind power project and in accordance with the applied monitoring methodology, the required monitoring parameter is 'net electricity supplied by the project plant/unit (the two wind farms) to the grid' ($EG_{facility\ III\ and\ V,y}$) which is calculated from the continuous measurement of electricity import and export.

In accordance with the "Tool to calculate the emission factor for an electricity system", the dispatch data analysis OM method was considered for the determination of the operating margin (OM). The combined margin CO_2 emission factor ($EF_{grid,CM,y}$) will be monitored ex post. The Brazilian grid emission factor is published by the DNA of Brazil. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid.

The power exported to and imported from the SIN will be monitored continuously and recorded on monthly basis. In addition, the electricity sales receipts will be provided for data quality control and cross check. In addition, this data will be verified against data provided in the Electric Energy Commercialization Chamber (CCEE).

There will be two energy meters (main and backup) located at the substation, as specified by CCEE. Energy information will be controlled in real time by CCEE. Once the measurement points are physically defined and the invoice measurement system and the communication infrastructure are installed, the measurement points will be registered in the SCDE (System of Energy Data collection) managed by CCEE.

The PDD defines the accuracy of the meter to be based on the manufacturer's specifications. PJRCES confirms that monitoring arrangements and equipment are adequate for the monitoring of a wind power plant.

4.9.1 PARAMETERS DETERMINED EX-ANTE

PJRCES has assessed the data sources and assumptions of the data and parameters that will not be monitored and will remain fixed throughout the crediting period. The parameters are found to be correct and in accordance with the applied baseline methodology ACM0002 version 12.3.0 and the 'Tool to calculate the emission factor for an electricity system, version 2.2.1'.

PJRCES is able to confirm that all parameters are appropriate, applicable to the project activity and will result in a conservative estimate of the emission reductions. Following parameters are determined *ex-ante*:

Parameter determined *ex-ante* is the electricity generated and delivered to the grid by each wind farm used for OM/BM calculations in year *y* and is presented below:

Parameter	Description	Source Verified	Value Verified
EG_y	Net electricity generated and delivered to the grid by each power plant used for OM/BM calculations in year *y*	Yes, The source of data is official statistical data.	Yes. The values are based on the official statistical data.
$EF_{grid,OM-adj,y}$	Simple adjusted operating margin CO_2 emission factor in year *y*	Yes, The source of data is official statistical data.	Yes. The values are based on the official statistical data.
$EF_{BM,\ 2010}$	Build Margin CO_2 emission factor in year *y*	Yes, The source of data is official statistical data.	Yes. The values are based on the official statistical data.

Table 10: Parameters determined *ex-ante*

4.9.2 PARAMETERS MONITORED EX-POST

There is only one parameter to be monitored: the net electricity generation supplied by the project plant to the grid.

The net electricity generated from the project will be measured through two bidirectional electricity meters (as described in the beginning of the section 4.9. This data will be cross verified against the sales receipts from the Sistema Interligado Nacional - SIN (national grid).

4.9.3 MANAGEMENT SYSTEM AND QUALITY ASSURANCE

Details of the data to be collected, the frequency of data recording and its format, responsibilities and authorities for project management, procedures for monitoring and reporting, QA/QC procedures, procedures for calibration of metering equipment and procedures for training and maintenance have been elaborated in the monitoring plan described in the PDD version 3. All data will be archived electronically and be kept for at least 2 years after the end of the last crediting period. All these elements will also be further verified during verification.

The application of the monitoring methodology is transparent and PJRCES considers that the project participants are able to implement the monitoring plan.

Following the requirements of the paragraph 123 of the CDM-VVM, PJRCES is able to confirm that:

(a) The monitoring plan is fully in compliance with the requirements of the applied monitoring methodology ACM0002, version 12.3.0;

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

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

4.10 CALCULATIONS OF GHG EMISSION REDUCTIONS

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

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

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

Where:

BE_y = Baseline emissions in year y (tCO_2/yr)

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

$EF_{grid,CM,y}$ Combined margin CO_2 emissions factor in year *y* (tCO_2/MWh)

As the project activity is the installation of a new grid-connected wind farm at a site where no wind farm was operated prior to the implementation of the project activity.

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

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

b) Project emissions: there are no emissions from the project, which is a wind energy project with no fossil-fired backup power source (ACM0002 v12.3.0).

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

As mentioned above, the grid emission factor is determined ex post as a combined margin, consisting of a weighted average of the operating margin (OM) and build margin (BM). Brazilian DNA provides updated information about emission factor operating margin and build margin. Information webhosted on the Brazilian Ministry of Science and Technology (MCT) website, the Brazilian DNA, was used to calculate the CM. According to methodology and tools w_{OM} = 0.75 and w_{BM} = 0.25 is used to obtain the CM. DNA website provides OM = 0.2644 and BM = 0.1166 resulting in a CM of 0.2275. Based on the above mentioned emission factor and net power generation of approximately 243,962 MWh (considering an installed capacity of 57.6 MW) annual estimated emission reductions are calculated as follows:

RiachãoIII:

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

$ERy = BE_y$ = 120,089 MWh * 0.2275 tCO_2/MWh

ER_y= 27,320 tCO_2e/year

RiachãoV:

ERy = BEy = EGPJ,y * EFGrid,CM,y

ERy = BEy = 123,873 MWh * 0.2275 tCO_2/MWh

ERy = 28,181 tCO_2e/year

The estimated emission reduction data and parameter values provided in the PDD and supporting files submitted to the DOE have been verified by PJRCES.

In summary,

(a) The GHG calculations presented in the Riachão III and V GHG reductions & grid emission factor calculation spreadsheet is complete and transparent, and their accuracy has been verified.

(b) No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been identified.

(c) All assumptions and data used by the project participants are listed in the PDD, including their references and sources;

(d) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;

(e) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;

(f) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;

(g) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

4.11 ENVIRONMENTAL IMPACTS

According to the Brazilian Environmental Regulation, wind power projects shall develop an environmental study. The approval of this study is the environmental licenses issuance.

The sate agency of Rio Grande do Norte required the environmental studies for the 2 wind farms which have been approved to the publication of the following environmental licenses (LP for preliminary licenses):

- Riachão III – 2010-036863/TEC/LP-0077, dated 14 May 2010, valid until 14/05/2012;
- Riachão V – 2010-036866/TEC/LP-0079, dated 14 May 2010, valid until 14/05/2012;

PJRCES has assessed during the onsite visit the environmental studies and the licenses and can confirm that the project activity fully complies with the Brazilian environmental. It is further confirmed that appropriate measures were undertaken to address the identified environmental impacts.

4.12 COMMENTS BY LOCAL STAKEHOLDERS

As per Brazilian DNA resolution (Resolution # 7 of 5 March 2008) local stakeholders shall be informed about the project activity by letters and also PDD in Portuguese language shall be available in the internet for consultation and. In both cases stakeholders are invited to send comments regarding the project activity.

The same resolution defined the following as required local stakeholders:

- *Prefeitura de Ceará-Mirim* (Ceará-Mirim City Hall)
- *Câmara Municipal de Ceará-Mirim*
  (Municipal Assembly of Ceará-Mirim)
- *Secretaria do Meio Ambiente de Ceará-Mirim*
  (Environmental Agency of Ceará-Mirim)
- *Associação comunitária de Desenvolvimento do Vale de Ceará-Mirim*
  (Local communitatian association)
- *Instituto de Desenvolvimento Sustentável e Meio Ambiente do Rio Grande do Norte - IDEMA*
  (Environmental Agency of Rio Grande do Norte State)
- *Ministério Público de Rio Grande do Norte*
  (State Attorney for the Public Interest of the State of Rio Grande do Norte)
- *Fórum Brasileiro de ONGs e Movimentos Sociais para o Desenvolvimento e Meio Ambiente*
  (Brazilian Forum of NGOs and Social Movements for the Development and Environment)

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

http://sites.google.com/site/consultadcp/parques-eolicos-riachao-iii-e-v

Both (letters and site with Portuguese version of the PDD) have met the required deadline of 15 days previous to the starting of the global stakeholder process. Portuguese version of PDD was available in the site above mentioned on 28 September 2011.

Regarding local stakeholder process, only one letter was received. The Project Participants received the official letter nr. 893/2011 – 4ª CCR dated October 26th, 2011 and signed by Mario José Gisi from the State Attorney for the Public Interest (Federal). In this letter, Mr. Gisi acknowledged the reception of the letter sent by the Project Participants and informed that, due to legal provisions, the State of Attorney cannot provide consultancy to public or private companies and, therefore, they cannot provide any comments related to the above mentioned projects.

PJRCES has reviewed letters of the invitations and the State Attorney for the Public Interest response and considers the local stakeholder consultation was carried out adequately and followed local practices.

4.13 COMMENTS BY PARTIES, GLOBAL STAKEHOLDERS AND NGOS

The PDD, version 1.1, 06 December 2011, was made publicly available through the CDM website for a global stakeholder process for period of 30 days period from 09 December 2011 to 07 January 12.

The Project Participants received only one official letter nr. 893/2011 – 4ª CCR dated October 26th, 2011 and signed by Mario José Gisi from the State Attorney for the Public Interest (Federal) in response to the invitation comments. In this letter, Mr. Gisi acknowledged receipt of the letter sent by the Project Participants and informed that, due to legal provisions, the State of Attorney cannot provide consultancy to public or private companies and, therefore, they cannot provide any comments related to the above mentioned projects.

5 VALIDATION OPINION

"Perry Johnson Carbon Emission Services, Inc (PJRCES) has performed a validation of the "Riachão III and V Wind Power Plants CDM Project Activity" in Brazil. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

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

The Host Country is Brazil and the Annex I Party is Italy. Both countries fulfil the participation criteria and have approved the project and authorized the project participants. The DNA from Brazil confirmed that the project assists in achieving its sustainable development objectives. The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Brazil.

The project correctly applies ACM0002 version 12.3.0: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

By generating renewable energy the project will displace fossil fuel based grid electricity in Brazil.

The project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The monitoring plan complies with the applied methodology ACM0002 version 12.3.0. Adequate training and monitoring procedures have been developed and will be implemented before the starting date of the crediting period (01 November 2014).

The total emission reductions from the project are estimated to be on the average 55,501 tCO_2e per year over the 7 year renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

In summary, it is PJRCES's opinion that the "Riachão III and V Wind Power Plants CDM Project Activity" in Brazil, as described in the PDD version 3 of "5 April 2012", meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 version 12.3.0. This DOE thus requests the registration of the project as a CDM project activity."

6 REFERENCES

/1/	PDD - Riachão III and V Wind Power Plants CDM Project Activity (Riachao_PDD_v.1.1_2011.12.06)
/2/	Financial Analysis (FCF_Riachao_2011.xls)
/3/	Emission Factor Calculation (BR EF ex ante 2008 to 2010-def EF tool 2.2-2011.10.06.xls)
/4/	CER estimate (Riachao_Estimated CERs_2011.09.26.xlsx)
/5/	WACC Electric Generation (WACC ElectricGen_2011 01 v1.xlsx)
/6/	Common Practice Analysis (Riachão_Common practice.xlsx)
/7/	Validation of Wind Measurements Study and Report (DEWI-BRA-WM11-00032-01.01.pdf)
/8/	Simplified Environmental Report for Riachão III (RAS Riachão III.zip)
/9/	Simplified Environmental Report for Riachão V (RAS Riachão V.zip)
/10/	GE Energy Proposal (OID 724124 - Cornelio Brennand - June 2011 Budgetary Proposal.pdf)
/11/	GE Energy O&M Proposal (OL OSA Budgetary Brazil 2011.pdf)
/12/	Use of the Land Riachão III and V (Matriculas RIII e V.pdf)
/13/	Expansão and EQAO Contract for CDM services (Contrato Expansao Eqao.pdf)
/14/	Riachão III drawing (Planta_de_Situacao_Riachao.III AV05a.dwg)
/15/	Riachão V drawing (Planta_de_Situacao_Riachao.III AV05a.dwg)
/16/	Descriptive Design Memorial Riachão III (MD Riachão III A3_2012 V1.doc)
/17/	Descriptive Design Memorial Riachão V (MD Riachão V A3_2012 V1.doc)
/18/	Wind Study Report and Certificate Riachão III and V (237522-BRPA-T-01-B-Nota técnica EPE e Relatorio Riachão III e V.pdf - 237522-BRPA-T-01-A-Capa e ResultadosAssinados.pdf)
/19/	Land lease Contract Riachão III (CO_2010_684_Expansão_Riachão_Magnus Barretto_Arrendamento.pdf)
/20/	Land lease Contract Riachão V (CO_2010_681_Expansão_Riachão_Ariosvaldo Araújo_Contrato de Arrendamento.pdf)
/21/	Preliminary License Riachão III (LP Riachão III_verso.pdf - LP Riachão III_frente.pdf)
/22/	Preliminary License Riachão V (LP Riachão V_verso.pdf - LP Riachão V_frente.pdf)
/23/	Turbine Location Riachão III (BRENNAND-RIII-C-001-REV.02A-IMPLANTAÇÃO DE AEROGERADORES RIACHÃO III.pdf)
/24/	Turbine Location Riachão V (BRENNAND-RV-C-001-REV.02-IMPLANTAÇÃO DE AEROGERADORES RIACHÃO V.pdf)
/25/	Inspection Fee Electricity Services – ANEEL Dispatch No. 360, of 4 February 2011 (dsp2011360.pdf)
/26/	Distribution Systems Use Rates – ANEEL Ratifying Resolution No. 1139 of 19 April

	2011
/27/	Brazilian Information Generation Database (ANEEL-BIG_Matriz eletrica brasileira_Ago 2011.htm)
/28/	Brazilian Wind Farm Information Generation Database (ANEEL-BIG_Eolicas operacionais_Ago 2011.htm)
/29/	ANEEL Central Monitoring of Wind Generators (Cronograma_Eventos_EOL_agosto_2011.pdf)
/30/	Brazilian Incentive Program for Alternative Sources of Electric Energy (PROINFA) – Contracts List (proinfa_contratos1.PDF)
/31/	Prior Consideration Riachão III (Formulario da Consideracao Previa do MDL_Riachao III_2011 08 16.pdf - Riachao III Prior Consideration_2011 08 16.pdf)
/32/	Prior Consideration Riachão V (Formulario da Consideracao Previa do MDL_Riachao V_2011 08 16.pdf - Riachao V Prior Consideration_2011 08 16.pdf)
/33/	ACM 0002 Consolidated baseline methodology for grid-connected electricity generation from renewable sources (version 12.3.0)
/34/	Guidelines for completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM) (version 07)
/35/	Clean Development Mechanism Validation and Verification Manual version 1.2
/36/	Glossary of CDM terms (version 05)
/37/	Guidelines on the demonstration and assessment of prior consideration of the CDM version 4, (EB 62 Annex 13)
/38/	Tool for the demonstration and assessment of additionality (version 6.0.0)
/39/	Tool to calculate the emission factor for an electricity system (version 2.2.1)
/40/	Modalities of Communication – dated 16 March 2012
/41/	Guidelines for the reporting and validation of plant load factors version 1 (EB 48 Annex 11)
/42/	Global stakeholder comments http://cdm.unfccc.int/Projects/Validation/DB/9BH27MYF0EJKGNQK68TX9K9AK8PZ21/view.html
/44/	Contract agreement between Expansão Energia and PJR CES dated 14 November 2011
/45/	Letter of Approval - LoA from Brazil dated dd Month yyyy
/46/	Letter of Approval - LoA from Annex I country dated dd Month yyyy
/47/	Modalities and procedures for a clean development mechanism
/48/	PDD template version 3 of 28 July 2006
/49/	Brazilian DNA website (www.mct.gov.br/index.php)
/50/	Guidelines on the assessment of investment analysis version 5.0 (EB 62 Annex 5)
/51/	Guidelines on common practice version 1.0 (EB 63 Annex 12)
/52/	Local stakeholders Consultation - Invitation letters to comments (Riachão_Cartas Convite Comentários pdf.rar)
/53/	Warning Receipts - Invitation letters to comments for Local Stakeholders Consultation (ARs_Riachão III e V.pdf)

/54/	Equipments insurance – Wind turbines (Megler_Seguro equipamentos.pdf)
/55/	2011 Brazilian Energy Auction Results (Resultado_4LER_2011.08.18.xls)
/56/	2011 Brazilian Energy Auction Full Results (Resultado_Completo_12LEN_2011.08.17.xls)
/57/	Inflation targeting table up to 2011 (Inflation targeting table.pdf)
/58/	Inflation targeting table up to 2012 (https://www3.bcb.gov.br/normativo/detalharNormativo.do?method=detalharNormativo&N=110054694)
/59/	PDD - Riachão III and V Wind Power Plants CDM Project Activity (Riachao_PDD_v.2_2012.03.14 track.doc)
/60/	Financial Analysis version 2 (FCF_Riachao_2011 v2.xls)
/61/	CER estimate (Riachao_Estimated CERs_2012.02.14_v2.xlsx)
/62/	Common Practice Analysis (Riachão_Common practice v.2.xlsx)
/63/	PDD - Riachão III and V Wind Power Plants CDM Project Activity version 3 of 05 April 2012(Riachao_PDD_v.3_2012.04.05 track.doc)
/64/	Financial Analysis version 3 (FCF_Riachao_2011 v3.xlsx)
/65/	CER estimate version 3 of 05 April 2012 (Riachao_Estimated CERs_2012.04.05_v3.xlsx)
/66/	WACC Electric Generation version 2 of 05 April 2012 (WACC ElectricGen_2011 01 v2.xlsx)

APPENDIX A
VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	CAR1
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	CAR1
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	~~CAR6~~ OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for	CDM Modalities and Procedures §31b	OK

Requirement	Reference	Conclusion
estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.		
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
About small-scale project activities (if applicable)		
13. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK

Requirement	Reference	Conclusion
monitoring methodology for that project category.		
15. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK
About stakeholder involvement		
16. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
17. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
18. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
19. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies & circumstances.	CDM Modalities and Procedures §45c,d	OK
20. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
21. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
22. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Table 2: Requirements Checklist

CDM Validation Requirement	*Remarks*	*Evidence*	*Conclusion*
A. General requirements			
A.1 Project description and PDD			
A.1.1 Does the PDD sufficiently cover all the relevant elements of the project activity, is accurate as per the planned and/or implemented scheme, and provides a clear understanding of the nature of the project activity?	The proposed project "Riachão III and V Wind Power Plants CDM Project Activity" will be a wind farm interconnected to the National Interconnected System (SIN) in Brazil. According to the PDD the project consists of two wind farms called Riachão III and Riachão V with 28.8 MW installed capacity each one. However, the description of the project activity in the PDD states the project is about a hydro power plant. (CL1) PP is requested to clarify the statement. The electricity generated will be sold to the Electric Energy Commercialization Chamber (in Portuguese Câmara de Comercialização de Energia Elétrica – CCEE) through a 20 years/100MW Power Purchase Agreement (PPA). The validation team has reviewed the project implementation schedule and lay outs and has carried out an on-site visit to assess the project. The project has not acquired its equipment or started the construction up to this moment, though it is not possible to state the commissioning date. The commissioning date will be defined after the equipments and services acquisition that will be done	***1*** ***2*** ***3*** ***4*** ***5*** ***6*** ***7*** ***8*** ***9*** ***10*** ***11*** ***12*** ***14*** ***15*** ***16*** ***17*** ***18*** ***19*** ***20*** ***21***	~~CL1~~ ~~CAR2~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
	after the Riachão Project CDM Validation process. The technology to be implemented according to the PDD is based on a machine with two or three-blade rotor, horizontal axis upwind design. The specifications for the wind turbines are not stated on the PDD. Figure 2 of the PDD presents main features of a typical turbine. The geographical coordinates of the project presented in the PDD has been cross checked with the concession land use agreement (see ref. /07/, /08/, /09/, /12/, /14/, /15/, /19/, /20/, /21/, /22/, /23/ and /24/), this layout included the geographical coordinates of each of two sites. The project will be located in the municipality of Ceará-Mirim, Rio Grande do Norte state, Northeast region of Brazil.	***22*** ***23*** ***24***	
A.1.1 Is the project a new installation and already commissioned, or does the project involve alteration of existing installation or process?	The project will be a new installation hence it is not installed or commissioned. It consists of the installation of two new grid-connected renewable plants. The validation team has carried out an onsite visit to the Company's office in São Paulo but not to Ceará-Mirim municipality where the wind farms Ricahão III and V are located given to the distance from the their office in São Paulo and the site. Validation Team did not go to the sites because no equipment or construction is in place. Photographs from December 2011 from the sites were	***1*** ***35*** ***Site visit assessment plan*** ***Opening closing meeting form*** ***Attendance meeting sheet***	~~CAR3~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
	presented during the onsite visit.		
A.1.2 What category does the project activity fall under: ▪ Large scale CDM project ▪ Non-bundled small scale CDM project with annual emission reductions more than 15,000 tonnes ▪ Bundled small scale with annual emission reductions more than 15,000 tonnes ▪ Small scale CDM project activity with annual emission reductions less than 15,000 tonnes Has a site visit been carried out for the project activity? If not, please justify	The project activity falls under large scale CDM project since the project will supply 28,8MW each of the two plants according to the Design Descriptive Memorial. Validation team was able to confirm project activity is large scale during the site visit as project activity consists on the installation of 36 GE turbines of 1.6 MW each for both sites. However, this information is not stated in the PDD. (CAR3) PP shall present specific features of the technology to be employed. According to reference /4/ the estimate of emission reductions is 55,501 tCO_2/year. The validation team has reviewed the Emission Factor/CERs spreadsheet in order to confirm that the description in the PDD reflects the proposed CDM project activity. This information was assessed during the onsite visit. The validation team has carried out an onsite visit to the Company's office in São Paulo but not to Ceará-Mirim municipality where the wind farms Richão III and V are located given to the distance from the their office in São Paulo and the site. Validation Team did not go to the sites because no equipment or construction is in place. Evidences 7, 8, 9, 12, 14, 15, 18, 19, 20, 21, 22, 23 and 24 were crosschecked to PDD. Validation Team can conclude that the area stated in the PDD refers to exactly place were plants	***1*** ***3*** ***4*** ***5*** ***6*** ***7*** ***8*** ***9*** ***10*** ***11*** ***12*** ***14*** ***15*** ***16*** ***17*** ***18*** ***19*** ***20*** ***21*** ***22*** ***23*** ***24***	~~CAR2~~ ~~CAR3~~ ~~CAR6~~ ~~CAR7~~ ~~CAR8~~ ~~CAR9~~ ~~CAR10~~ ~~CAR11~~ ~~CAR12~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
	will be installed.		
A.1.3 Is the PDD prepared in accordance with the latest guidance from the CDM EB available on the UNFCCC website	Yes, PDD has been prepared in accordance with the latest template and guidance from CDM EB available on the UNFCCC CDM website.	***1*** ***46***	***OK***
A.2 Participation and Approval			
A.2.1 Please include and confirm the details of the participating project participants and the Parties involved.	Project participants are stated on the PDD section A.3, as below: 1) Ecopart Assessoria em Negócios Empresariais Ltda. (EQAO) (Private entity) 2) Atiaia Energia S/A (Private entity) The Parties involved do not wishes to be considered as project participant.	***1***	***OK***
A.2.2 Has the participation of each project participant been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation?	There will be two approvals, one from the Brazilian DNA and another from the Annex I Party. During the onsite visit LoAs were not available. PP is requested to present LoAs		***CAR1***
A.2.3 Has the letter of approval (LoA) been submitted and reviewed by the DOE? Please confirm if the same was provided by the PP or directly by the DNA of the Party involved?	No, it was not submitted and reviewed as Brazilian DNA requires final Validation Report to issue the LoA.		***CAR1***
A.2.4 Does the LoA confirm the following: - Ratification of the Kyoto Protocol - Voluntary participation - The CDM project activity contributes to	Please, refer to A.2.2 and A.2.3		***CAR1***

CDM Validation Requirement		Remarks	Evidence	Conclusion
	Host country's sustainable development - Title of the project activity is same as the PDD sent for registration			
A.2.5	Is the LoA conditional to a specific version of PDD or the validation report?	Please, refer to A.2.2 and A.2.3		***CAR1***
B. Baseline and monitoring methodology				
B.1 Methodology applicability				
B.1.1	Has the project proponent applied the relevant baseline and monitoring methodology that has been previously approved by the CDM Executive Board?	The project proponent has applied the approved baseline and monitoring methodology ACM0002: "Consolidated baseline methodology for grid connected electricity generation from renewable sources" Version 12.3.0, valid from 17 September 2010 onwards, this methodology has been correctly applied since the project activity consists of the installation of a renewable electricity generation plant (wind farm) that will be installed at a site where no renewable power plant was operated previously. However, on PDD stated version is 12.1.0. PP is requested to clarify methodology version.	***1*** ***4*** ***27***	~~CAR2~~ ***OK***
B.1.2	Does the project activity meet all of the applicability criteria defined in the approved methodology? Please clarify	The applicability conditions for ACM0002 are met as follow: Applicability: this methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity.	***1*** ***4*** ***27***	~~CAR 2~~ ~~CAR4~~ ~~CAR5~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
	Validation opinion: the methodology has not been correctly applied. Although, the project activity consists of the installation of a renewable electricity generation plant (wind farm) that will be installed at a site where no renewable power plant was operated previously, (CAR4) not all criteria was applied. The electricity generated will be dispatched to the National Interconnected System. (CAR5) Also, there is a lack of conclusion for what is the project activity.		
B.1.3 Does the project activity involve any emissions within the project boundary that contribute to more than 1% of the total expected annual average emission reductions which are not addressed/considered in the methodology? Please explain, if any.	***NA***	***1*** ***4*** ***27*** ***35***	***OK***
B.1.4 Does the project boundary defined include all emission sources and the clear demarcation on the physical and geographical boundary of the proposed CDM project activity? Is the selection of all emission sources (baseline, project and leakage) been justified?	The project boundary defined in the PDD section B3 includes all emission sources, in accordance with the applied methodology ACM0002. For baseline, CO2 emissions from the grid electricity generation (including existing grid-connected power plants and the addition of new grid-connected power plants) have to be accounted. For project activity (wind electricity production) no greenhouse gas emissions have to be considered. The validation team has reviewed the Design	***1*** ***3*** ***4*** ***16*** ***17*** ***33***	~~CAR2~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
	Descriptive Memorial		
B.2 Baseline Selection			
B.2.1 Does the methodology define a specific baseline directly for the project type, or does it refer to a tool for arriving at the baseline for the project activity?	The approved methodology ACM0002 version 12.3.0 defines a specific baseline directly for the wind farm projects. It states that If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin calculations (PDD section B.6.1) and emission reduction calculation in PDD section B.6.3 as per the "Tool to calculate the emission factor for an electricity system". The validation team has confirmed during the desk review and onsite visit that the baseline described in the PDD has been correctly applied with the methodology ACM0002 version 12.3.0.	***1*** ***3*** ***4*** ***16*** ***17*** ***33***	~~CAR2~~ ***OK***
B.2.2 Has the CDM project activity considered all alternatives available to the project proponent?	The approved methodology ACM0002 version 12.3.0 defines a specific baseline directly for the wind farm projects. The baseline described in the PDD is in accordance with the methodology ACM0002 version 12.3.0.	***1*** ***3*** ***4*** ***33***	~~CAR2~~ ***OK***
B.2.3 Is the documentation of the baseline determination clear regarding the following: - All assumptions and data used by the project	Information webhosted on the Brazilian Ministry of Science and Technology (MCT) website, the Brazilian DNA, confirms that in the absence of the project	***1*** ***3***	~~CAR2~~ ***OK***

CDM Validation Requirement		Remarks	Evidence	Conclusion
	participants are listed in the PDD and related document to be submitted for registration. - All Documentation is relevant as well as correctly quoted and interpreted - Assumptions and data can be deemed reasonable. - Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD and the same has been confirmed. - The methodology is correctly applied to identify what would have happened in the absence of the CDM project activity proposed.	activity, the electricity delivered to the grid would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the information/historical data provided by MCT used to calculate the CM. The methodology ACM0002 has been correctly applied, according to the baseline methodology procedure, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is "Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system"	***4*** ***33*** ***39*** ***48***	
B.2.4	Have all the assumptions, calculations, rationale and other sources described in the PDD been verified to determine if the baseline scenario identified is reasonable.	The data provided by Brazilian Ministry of Science and Technology (MCT) confirms that baseline scenario identified in the PDD is in accordance with the approved methodology ACM0002 version 12.3.0. The validation team can conclude that the assumptions, calculations, rationale and other sources described in the PDD used to determine the baseline scenario are reasonable and have correctly applied.	***1*** ***3*** ***4*** ***33*** ***48***	~~CAR2~~ ***OK***
B.2.5	Cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion, if	The information provided in the PDD regarding to the baseline determination and combined margin calculation have been cross checked with the	***1*** ***3***	~~CAR2~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
available	information available from MCT, this data confirms that in the absence of the project activity, the electricity delivered to the grid would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the information/historical data. The information used is available at: http://www.mct.gov.br/index.php/content/view/327118.html#ancora	***4*** ***33*** ***48***	
B.3 Additionality			
B.3.1 Is the tools applied to discuss additionality in line with the CDM tools and documents provided CDM EB and the specific methodology applied for the project activity?	The Tool for the demonstration and assessment of additionality version 6.0.0, has been applied to demonstrate the additionality of the project as follow: Step 1 Identification of the alternatives to the project activity consistent with the mandatory laws and regulations Based on the above mentioned tool, the alternative scenarios for the project activity consistent with current laws and regulations have been identified in section B.5 of PDD: Two alternatives to the project have been identified and discussed: Alternative 1: The proposed project activity without CDM i.e. construction of a wind farm with an	***1*** ***5*** ***6*** ***25*** ***26*** ***27*** ***28*** ***29*** ***30*** ***31*** ***32*** ***49*** ***50***	~~CAR2~~ ~~CL2~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
	installed capacity of 57.6 MW connected to the Grid, implemented without considering CDM revenues. Alternative 2: Continuation of the current situation. Electricity will continue to be provided by the existing Grid. If the current situation is continued, electricity would continue to be provided by the existing mix of power plants in the Grid according to the historical data provided by ANEEL. Step 2. Investment analysis A benchmark analysis is presented to demonstrate that without CER revenues from Riachão III and V would not have made the investments to the construction of a new 57.6 MW wind energy facility. The argumentation considers that the project IRR to be 5.88%% is smaller than the calculated WACC (9.57%) chosen as an indicator for the benchmark analysis. The results of the IRR analyses were presented on the PDD and in the spreadsheet. Validation team concluded the benchmark analysis was correctly applied. Step 3. Barrier Analysis		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	The barrier presented in the PDD is the Benchmark Analysis. Step 4. Common practice analysis. According to the additionality tool version 6.0.0, "projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc". Validation team crosschecked the research presented in the PDD and can conclude wind power plants in Brazil are not common as it does not receive any kind of incentive and no similar project is under operation. The audit team confirms that all steps of the Tool for the demonstration and assessment of additionality version 6.0.0 have correctly applied. (CL2) PP is requested to explain the meaning of BNDES.		
B.3.2 If the start date of the project activity prior to the date of publication of the PDD for	According to evidence documentation the starting date of the project activity is post to the date of the	***1*** ***2***	~~CAR7~~

CDM Validation Requirement		Remarks	Evidence	Conclusion
	stakeholder comments it shall be demonstrated that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity in line with the "*Guidance on the Demonstration and Assessment of prior consideration of the CDM*"?	publication of the PDD for global stakeholder consultation. Section C.1.1. states starting date of the project is 1st January 2012. However, starting date is not stated in section B.5. (CAR7) PP is requested to clarify the starting date of the project. According to the CDM glossary the starting date of a CDM project activity means the starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins, based on this, the audit team confirms that the starting date is in accordance with guidance. The validation team has confirmed that this is a new project activity, the PP has submitted a letter of prior consideration dated on 16 August 2011, is information is available on the UNFCCC website.	***3*** ***4*** ***5*** ***31*** ***32*** ***37*** ***52***	***OK***
B.3.3	Does the PDD identify all credible alternatives to the project activity in order to assess additionality, if applicable?	PP has applied the Tool for the demonstration and assessment of additionality.	***1*** ***33*** ***38***	***OK***
B.3.4	What are the barriers applicable to the project activity that have been discussed to prove the project additionality?	NA	***1*** ***33*** ***38***	***OK***
B.3.5	***Investment Analysis***:	a) Yes, team was able to confirm that the Internal Rate Return (IRR) is the indicator as per Guidelines on the assessment of investment analysis version 5.0	***1*** ***2***	~~CAR8~~ ~~CAR9~~

CDM Validation Requirement	Remarks	Evidence	Conclusion
a) In case of investment cost analysis, please confirm if a suitable indicator has been considered for the remaining alternatives available to the project activity. b) In case of Benchmark analysis, please confirm whether the benchmark applied is relevant to the type of the financial indicator c) Is the period of assessment considered for the financials in line with the guidance? d) Are the input values considered in the investment analysis are valid and applicable at the time of the investment decision taken by the project participant? e) In cases where the financials source any input value from Feasibility Study Reports (FSRs) approved by National authorities ensure that the same is in line with the guidance in the VVM. (*Paragraph 111 of VVM, ver 01.1)* f) Have any sunk costs, if any, been used for the financials? g) Has the fair value/salvage value been considered at the end of the assessment period? Is the value considered for fair value in line with the guidance? h) Has the depreciation and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, are added back to net	paragraph #3. b) Yes, according to the Guidelines on the assessment of investment analysis, paragraph 19, the benchmark analysis is the appropriate method to demonstrate the additionality of this project Activity as it is a wind power plant. c) Yes, the period considered is 20 years which is the life time of equipments, and it is in accordance to the Guidelines on the Assessment of Investment Analysis - Version 05, paragraph 3. d) Yes, the assumptions, calculations, rationale and other sources described in the PDD used on the investment analysis have correctly applied. However, (CAR8) No evidences were presented for the assumptions for the cash flow. (CAR9) PP shall explain the meaning and use of TUSD. (CAR10) The annual value of Inspection Fee Services Electricity is different from the ANEEL Order No. 360, of 4 February 2011. (CAR11) PPA price used in the spreadsheet is different from the 2007 auction. (CAR12) Timeline applied in the spreadsheet is 30 years.	***5*** ***6*** ***33*** ***35*** ***50*** ***51*** ***52*** ***53***	~~CAR10~~ ~~CAR11~~ ~~CAR12~~ ~~CAR13~~ ~~CAR14~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
profits for the purpose of calculating the financial indicators (e.g. IRR, NPV) i) Have any cost of financing expenditures (i.e. loan repayments and interest) included in the calculation of project IRR? Please ensure the same is not considered in IRR calculation. j) In case the project involves calculation of equity IRR, please ensure that only the portion of investment costs, which is financed by equity is considered as the net cash outflow. k) Has the financials been presented transparently in a separate spreadsheets with formulas readable for the DOE? l) *Sensitivity analysis*: ▪ Have all variables, that constitute more than 20% of either total project costs or total project revenues subjected to reasonable variation? ▪ Have the results of this variation presented in the PDD and the spreadsheets (reproducible manner)? ▪ Has a reasonable variation been considered in the sensitivity analysis in the project context?	(CAR13) In the spreadsheet the year 2013 is inconsistent. (CAR14) In the spreadsheet the Operating Expenses for ANEEL is inconsistent. e) Yes, the validation team conducted a thorough assessment of all parameters and assumptions used in financial calculations. http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=545d18816ded2110VgnVCM1000005e01010aRCRD f) No, there are no sunk costs involved on this project activity. g) No, fair value has not been considered and used in the calculation. h) Yes, they are properly considered to net profits for the purpose of calculating the financial indicators.		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	i) No, financial expenditures have not been considered in IRR calculation. j) The portion of investment costs which is financed by equity considered is as the net cash outflow. k) Yes, financials are presented transparently in separate spreadsheets with formulae readable accordingly. l) • Yes, variables have been properly subjected to reasonable variation. • Yes, the variation results presented in the PDD and the spreadsheets were reproducible by the team. • Yes, considered variation is considered proper and reasonable in the sensitivity analysis for this project activity.		

CDM Validation Requirement	Remarks	Evidence	Conclusion
B.3.6 Have the data, rationales, assumptions, justifications and documentation provided by Project Participants to demonstrate the additionality of the project been assessed and verified for the reliability and credibility? Assess the presented evidence using local knowledge and sectoral and financial expertise.	The data provided by the project participants to demonstrate the additionality were cross checked. Brazilian Ministry of Science and Technology (MCT), the Brazilian Ministry of Mining and Energy (MME), Brazilian Electricity Regulatory Agency (ANEEL), Electric System National Operator (ONS), Eletrobras, Rio Grande do Norte Environmental Agency, UNFCCC regulate and webhost information used to demonstrate additionality. Validation team visited all websites, checked and assessed all information used to demonstrate and assess the additionality presented by the various governmental and non-governmental entities. The investment analysis was conducted according to option III of the "Tool for the demonstration and assessment of additionality". According to it project activity is not the most economically or financially attractive; nor economically or financially feasible, without the revenues from the sale of certified emission reductions (CER). According to guidelines of investment analysis, paragraph 19, benchmark analysis is the most appropriate method to demonstrate the additionality of the project Activity once the alternative to the implementation of the wind power plant is the supply of electricity from the grid. According to PDD, PP has demonstrated and assessed the additionality by using the benchmark analysis.	***1*** ***2*** ***5*** ***6*** ***33*** ***35*** ***38*** ***50*** ***51*** ***52*** ***53***	~~CAR8~~ ~~CAR9~~ ~~CAR10~~ ~~CAR11~~ ~~CAR12~~ ~~CAR13~~ ~~CAR14~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
	The validation team can conclude that the data, rationales, assumptions, justifications and documentation and sources presented in the PDD and used to demonstrate and assess the additionality are reliable and have correctly applied.		
B.3.7 ***Barrier Analysis***: a) Has it clearly been demonstrated that the issues identified in project implementation prevent a potential investor from pursuing the implementation of the proposed project activity without the project being registered as a CDM project activity? b) Do any of the issues identified have a clear direct impact on the financial returns of the project activity, except in cases of issues related to risk (like technical risks), or barriers related to unavailability of sources of finance, been discussed? c) Please conclude if the barriers discussed are '*real and prevent the implementation of the project but not prevent at least one of the possible alternatives*'?	NA	***1*** ***2*** ***5*** ***6*** ***33*** ***35*** ***38*** ***50*** ***51*** ***52*** ***53***	***OK***
B.3.8 ***Common practice analysis***: Has a common practice analysis been carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality, in case of large-	No, (CAR15) PP has applied the "Tool for the demonstration and assessment of additionality". PP is requested to apply the guideline on common practice.	***1*** ***2*** ***5*** ***6***	~~CAR15~~ ***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
scale CDM project activities (unless the proposed project type is first-of-its kind). Please confirm this is in line with the VVM and the additionality tools.		***33*** ***35*** ***38*** ***50*** ***51*** ***52*** ***53***	
B.4 **Emission Reduction Calculations**			
B.4.1 Baseline Emissions			
B.4.1.1 Are correct equations and parameters used in accordance with the approved methodology selected in calculating the baseline emissions?	No, although the baseline emission calculation of the project has been calculated, through the multiplication between the net electricity to be supplied to the grid and the combined emission factor of the Brazilian grid, validation team has found: (CAR16) Emission Factor calculation on line 383 is not in accordance. (CAR17) Emission factor calculated in the spreadsheet and presented in the PDD are not in accordance. (CAR18) Low cost must run is different form the calculated	***1*** ***2*** ***5*** ***6*** ***33*** ***35*** ***38*** ***50*** ***51*** ***52*** ***53***	~~CAR16~~ ~~CAR17~~ ~~CAR18~~ ***OK***
B.4.1.2 In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will	The emission factor of Brazil is calculated based on all power plants connected to the SIN and centrally dispatched by the ONS. The Brazilian DNA calculates	***1*** ***2*** ***5***	***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions (*less baseline emissions*)	and provides in a monthly basis ex post emission factors of the SIN according to the "Tool to calculate the emission factor for an electricity system". Emission factor is available at: http://www.mct.gov.br/index.php/content/view/307492.html A spreadsheet has been provided by the PP with all calculations. The validation team confirms that ex ante values, assumptions and data were used by the project participant for 2010 estimate and for the operation margin. All parameters are listed in the PDD and their reference and sources were checked and considered appropriated.	***6*** ***33*** ***35*** ***38*** ***50*** ***51*** ***52*** ***53***	
B.4.2 Project Emission			
B.4.2.1 Are correct equations and parameters used in accordance with the approved methodology selected in calculating the project emissions?	According to the approved methodology ACM 0002 version 12.3.0 project emission PEy = 0.	***1*** ***2*** ***5*** ***6*** ***33*** ***35*** ***38*** ***50*** ***51***	***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
		52 ***53***	
B.4.2.2 In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions (*higher project emissions*)	Not applicable. Please, refer to B.4.2.1	***1*** ***2*** ***5*** ***6*** ***33*** ***35*** ***38*** ***50*** ***51*** ***52*** ***53***	***OK***
B.4.3 Leakage Emissions			
B.4.3.1 Are correct equations and parameters used in accordance with the approved methodology selected?	According to the approved methodology ACM 0002 version 12.3.0 no leakage emissions are considered.	***1*** ***2*** ***5*** ***6*** ***33*** ***35*** ***38*** ***50*** ***51***	***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
		52 ***53***	
B.4.3.2 In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions (*less baseline emissions*)	Please, refer to B.4.3.1.	***1*** ***2*** ***5*** ***6*** ***33*** ***35*** ***38*** ***50*** ***51*** ***52*** ***53***	***OK***
B.4.4 Please mention the expected emission reductions generated from implementation of the project activity.	Expected emission reductions during the crediting period 388,505 tCO_2e Expected annual emission reductions: 55,501 tCO_2e	***1*** ***2*** ***5*** ***6*** ***33*** ***35*** ***38*** ***50*** ***51*** ***52***	***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
		53	
B.5 **Monitoring Plan**			
B.5.1 Does the monitoring plan defined in the PDD, contain all necessary parameters required for calculating '*baseline emissions'* in line with the methodology?	The monitoring plan described in the PDD includes the quantity of net electricity generation supplied by the project plant/unit to the grid in year and it will be monitored in accordance with monitoring methodology of the approved methodology ACM 0002 version 12.3.0. The project consists of 2 zones where the wind turbines will be located. Each turbine includes a complete operational, meters and control system which measures the energy produced and sends it to a Class 0.2S power meter and controlling software. The plants will include one main and one backup meters located at the collector substation and other two metering devices installed at the grid connection point. These two meters located at the grid connection point will register the electricity dispatched to the grid by the Riachão III and V project. The net electricity "EGy" will be monitored using the meters and the amount of electricity generated will be cross checked with energy company invoice. Electric Energy Commercialization Chamber (CCEE) should carry out the electricity payment in a monthly basis.	***1*** ***16*** ***17***	***OK***
B.5.2 Does the monitoring plan defined in the PDD, contain all necessary parameters required for	Please refer to B.4.2.1	***1***	***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
calculating '*project emissions*' in line with the methodology?			
B.5.3 Does the monitoring plan defined in the PDD, contain all necessary parameters required for calculating '*leakage emissions*' in line with the methodology?	Please refer to B.4.2.1	***1***	***OK***
B.5.4 Has the feasibility of the monitoring arrangements within the project design been confirmed through interviews and physical visits to the site, where required?	Based on the Design Descriptive Memorial (Refs. /16/ and /17/), the validation team can confirm the feasibility of the monitoring. The project consists of 2 zones where the wind turbines will be located. Each turbine includes a complete operational, meters and control system which measures the energy produced and sends it to a Class 0.2S power meter and controlling software. The plants will include one main and one backup meters located at the collector substation and other two metering devices installed at the grid connection point. These two meters located at the grid connection point will register the electricity dispatched to the grid by the Riachão III and V Project. According to Design Description Memorial, the net electricity "EGy" will be monitored using the meters and the amount of electricity generated will be cross checked with CCEE invoice.	***1*** ***16*** ***17***	***OK***
B.5.5 The implementation of the monitoring plan, quality assurance and quality control procedures are verifiable	According to PDD and Design Descriptive Memorial, the implementation of the monitoring plan, quality assurance and quality control are according to ONS,	***1***	***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
	ANEEL and CCEE requirements.		
C. Crediting Period			
1.1 Has the start date of the project activity been defined in line with the latest EB guidance? What has been defined as the start date of the project activity?	According to the CDM glossary the starting date of a CDM project activity means the starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins. The date to the estimated date for the signature of the Engineering, Procurement and Construction (EPC) contract i.e. starting date of the project is 01/01/2012.	***1***	***OK***
1.2 Has a crediting period been clearly defined in the PDD?	A 7 year twice renewable crediting period has been chosen.	***1***	***OK***
2. Local stakeholder consultation			
D.1 Have all relevant stakeholders been identified for the project activity?	The stakeholders includes: • Municipal governments and City Councils; • State and Municipal Environmental Agencies; • Brazilian Forum of NGOs and Social Movements for Environment and Development; • Community associations; • State Attorney for the Public Interest (state and federal); • Prefeitura de Ceará-Mirim (Ceará-Mirim City	***1*** ***54*** ***55***	***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
	Hall) • Câmara Municipal de Ceará-Mirim • (Municipal Assembly of Ceará-Mirim) • Secretaria do Meio Ambiente de Ceará-Mirim • (Environmental Agency of Ceará-Mirim) • Associação comunitária de Desenvolvimento do Vale de Ceará-Mirim • (Local communitatian association) • Instituto de Desenvolvimento Sustentável e Meio Ambiente do Rio Grande do Norte - IDEMA • (Environmental Agency of Rio Grande do Norte State) • Ministério Público de Rio Grande do Norte • (State Attorney for the Public Interest of the State of Rio Grande do Norte) • Fórum Brasileiro de ONGs e Movimentos Sociais para o Desenvolvimento e Meio Ambiente (Brazilian Forum of NGOs and Social Movements for the Development and Environment) The PP has carried out local stakeholder consultation on 10 October 2011. Attendance list and invitation letter are available as		

CDM Validation Requirement	Remarks	Evidence	Conclusion
	evidence, stakeholder were invited by the PP by mail letter.		
D.2 What means have been used for the inviting comments from the stakeholders?	Stakeholders were invited by the PP by letters sent by mail. All sent letters have warning receipts proving the reception by the stakeholders. Letters were sent on 10th October 2011 and warning receipts were signed on the same day. (CAR19) PP is requested to present the stakeholders letters.	***1***	***OK***
D.3 Does the PDD include a summary of the comments received from the stakeholders?	(CAR20) Received comments are not included in the PDD. PP shall present the received comments	***1***	***OK***
D.4 Has a report on the due account taken of any comments received been described clearly in the PDD?	Please, refer to D.3	***1***	***OK***
E. Environmental impacts Assessment			
E.1 Have the project participants undertaken an analysis of environmental impacts and if the host country requires and environmental?	The PP has presented preliminary environmental license request and Simplified Environmental Report (SER) and the receipt from the State Environmental due to the deliver of the SER. No major issues are identified on the SER for Riachão III and V.	***1*** ***8*** ***9***	***OK***
E.2 Does the project create any adverse environmental effects? Have the same been recorded in the PDD?	No, refer to E.1.	***1*** ***8*** ***9***	***OK***

CDM Validation Requirement	Remarks	Evidence	Conclusion
E.3 Does the project comply with environmental legislation in the host country?	Yes, refer to E.1.	***1*** ***8*** ***9***	***OK***

Table 3: Resolution of issues identified in table 2 of the validation protocol

Draft report clarification requests, corrective action requests and forward action request	*Ref. to the section of the table 2 above*	*Summary of project owner response*	*Validation team conclusion*
CAR 1 LoAs have not been presented by the PP.	A.2.2.	The Project Participants (PPs) clarify that there is no Party from an Annex 1 country. Therefore, the only Party involved in the proposed project activity is the Host Country (the Brazilian DNA). In order to obtain the Letter of Approval (LoA), the PPs must submit the Final Validation Report to the Brazilian DNA ("CIMGC" from the Portuguese Comissão Interministerial de Mudança Global do Clima). The procedures established by the Brazilian DNA in order to obtain the LoA, are determined in Resolution nr. 1 dated September, 11th 2003. Further information related to the methods and procedures for the issuance of the Brazilian LoA can be obtained in the "Manual for submission of project activities under CDM" (from the Portuguese Manual para submissão de atividades de projeto no âmbito do MDL), available at: <http://www.mct.gov.br/upd_blob/0025/25268.pdf>.	It is regular procedure in Brazil. After having the positive validation opinion from DOE, Brazilian DNA issues LoA and having this host country LoA the Annex I country will issue its LoA. CAR 1 is closed (after submitting PDD and the validation report to the DNA and having its approval).
CAR 2 PP shall use in the PDD updated versions of methodology, tools and guidelines.	Sections: A. B. C.	The PDD was revised and the latest version of the methodology, tools and guidelines were applied. The main changes made in the second version of the PDD were made mainly to revise the applicability criteria of the methodology as presented in the	Final version of PDD (version 3) and spreadsheets have been reviewed by the validation team and the updated versions of the methodologies, tools and guidelines have been used.

	D. E.	updated version of ACM0002 and to include the stepwise approach in the common practice analysis as presented in the updated version of the "Tool for the demonstration and assessment of additionality". Please refer to the second version of the PDD.	Guidelines on Common Practice v.1.0 has been approved on EB 63 (Annex 12), 29 September 2011 which was applied in a consistent and transparent way. CAR 2 is closed.
CAR 3 Specific information about technology to be employed is not stated in the PDD.	A.1.1. A.1.2. A.1.3.	As discussed during the auditing visit, Riachão III and Riachão V wind projects are in a preliminary stage of implementation. Therefore, no equipment was purchased and technical specifications are based on the most recent information available. However, considering the DOE comments, the PPs included detailed information of the expected technology to be employed at the project activity based on specifications of Riachão III and Riachão V presented in since page 10 of "Memorial descritivo Riachão III" and "Memorial descritivo Riachão V" dated January 2012 (the most recent information available). These documents were presented during the auditing visit. Furthermore, the PPs included information related to baseline scenario and the scenario without the project activity. Please refer to Section A.4.3 of the second version of the PDD.	Specific information about the technology to be employed has been added to PDD accordingly. CAR3 is closed.
CAR 4 Applicability criteria of the methodology were not fully applied.	B.1.2	The PPs revised the PDD and applied the latest version of ACM0002 methodology. Please refer to the second version of the PDD.	PP has reviewed the PPD and fully applied the applicability criteria of the methodology accordingly. CAR4 is closed
CAR 5 PP shall present a conclusion for what the project activity is.	B.1.2	Considering the DOE comments, the PPs revised section B.2 of the PDD to include the purpose of the project activity and how it complies with the	PP has revised section B.2 of the PDD to include the purpose of the project activity and how it complies with the applicability

		applicability criteria established in ACM0002. Please refer to the second version of the document.	criteria established in ACM0002 accordingly. CAR5 is closed
CAR 6 Parties participating in the CDM shall designate a national authority for the CDM as per M&P paragraph 29	Validation protocol table 1 item 6	The Modalities of Communication (MoC) for the proposed project activity will be available to DOE at the time of the request for registration together with the Letter of Approval issued by the Brazilian DNA.	PP has defined the authority and presented FCDM- MOC (/40/) filled. CAR 6 is closed.
CAR 7 PP is required to define the starting date of the project activity as per the date in section C.1.1 of the PDD in section B.5.	A.1.3 B.3.2	The "project starting date" of the proposed project activity considered and presented in the first version of the PDD was based on the expected date of the signature of the Engineering, Procurement and Construction (EPC) contract for the project (01/01/2012). Considering the DOE comments, the PPs clarify the following: The concept of "project starting date" is not the same of the "starting date of the Global Stakeholder Process (GSP)" or the "date of the investment decision". In the case of Riachão III and Riachão V, the "date of the investment decision" is considered as the same date of the "project starting date", since none of these actions happened. According to the Glossary of CDM Terms, the starting date of a project activity is the "earliest date at which either the implementation or construction or real action of a project activity begins". Furthermore, it clarifies that: "...the start date shall be considered to be the date on	PP has clarified the choice of the starting date and the EPC signing intention was made available for DOE. This date and the evidences presented justify sufficiently the choice. CAR 7 is closed.

		which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. This, for example, can be the date on which contracts have been signed for equipment or construction/operation services required for the project activity". As presented in the first version of the PDD and as discussed during the auditing visit, the project is in a preliminary stage and no activities/measures were taken at the project site for the project construction (no equipment purchased, no financing arranged, no Power Purchase Agreement – PPA signed and no construction license issued). Therefore, no significant expenditures have been committed for the construction of the project activity which can be configured as a "real action", i.e. the "project starting date". Therefore, the "project starting date" considered in the first version of the PDD is the date when the Engineering, Procurement and Construction (EPC) contract was expected to be signed, i.e. 01/01/2012, since this date is the first expected expenditure commitment by the project owner for the implementation of the proposed project activity. However, the EPC contract was not signed until the preparation of this response. Therefore, the PPs revised the estimated project starting date in the second version of the PDD for 30/10/2013 based on information presented in specifications of Riachão III and Riachão V presented in page 21 of "Memorial descritivo Riachão III" and "Memorial descritivo Riachão V"	

		dated January 2012 (the most recent information available). Furthermore, according to the "Guidelines on the assessment of investment analysis": "Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant". As mentioned earlier, in the case of Riachão III and V, the "project starting date" and the "date of the investment decision" of the projects can be considered as the same. Since none of these actions happened, the financial analysis conducted in the PDD is based on the most recent data available at the time of the submission of the PDD for GSP (validation start), i.e. the data until the second semester of 2011.	
CAR 8 No evidences were presented for the assumptions for the cash flow	A.1.3 Section B.	The PPs revised the IRR calculation based on the following documented evidence attached to this response: • Plant export capacity, plant load factor and power output: GL Garrad Hassan certification dated 14/11/2011 (pages 119 and 120). File 237522-BRPA-T-01-B-Nota técnica EPE & Relatorio Riachão III e V.pdf • Energy price: Results of energy auctions conducted by the Brazilian government in 2011. Average of energy price for wind power projects. CCEEs website. Public available	Documents provided by the PP mention the technical characteristics and financial inputs as well their sources. Those documents have been crosschecked with PDD version 3 by validation team. Information considered satisfactory. CAR8 is closed.

		information. Files Resultado_Completo_12LEN_2011.08.17.xls/ Resultado_4LER_2011.08.18.xls • Plant investment: GE Energy quotation dated 07/06/2011 (corrosion protection included) - pages 2 and 4. File OID 724124 - June 2011 Budgetary proposal.pdf • O&M costs: GE Energy quotation dated June 2011 (page 4). File OL OSA Budgetary Brazil 2011.pdf • Land rental: Leasing contracts signed in April 2010 (pages 2 and 3). File OID 724124 - June 2011 Budgetary proposal.pdf • Environmental and managerial costs: Expected by the project sponsor • Insurance: Insurance quotations dated 03/08/2011. File Megler_Seguro equipamentos.pdf • Transmission cost (TUSD): ANEEL Resolution nr. 1,139 dated April 19th, 2011. File reh20111139.pdf • ANEEL fee: ANEEL Dispatch nr. 360 dated February 4th, 2011. File dsp2011360.pdf Documented evidence for the input values considered in the project cash flow is attached to this response. Furthermore, the PPs included in the PDD, input data and source of information for the main parameters considered in the project cash flow. The	

		sensitivity analysis considering variation in the parameters until the IRR reaches the benchmark was also included in the PDD. All information used in the sensitivity analysis is based on the documented evidence attached to this response. Please refer to the second version of the document.	
CAR 9 PP shall explain the meaning and use of TUSD	A.1.3 B.3.5 B.3.6	In each power project, the Tariff for the Use of the Distribution System ("TUSD" from the Portuguese Tarifa de Uso do Sistema de Distribuição) or Tariff for the Use of the Transmission System ("TUST" from the Portuguese Tarifa de Uso do Sistema de Transmissão) must be applied in Brazil. The choice of TUSD or TUST fee depends if the power plant is directly or indirectly connected to the electricity connection network (in a free translation from the Portuguese rede básica de conexão). However, independently if the project is directly or indirectly connected to the electricity connection network, the fee shall be paid. Therefore, the Internal Rate of Return (IRR) was calculated considering this transmission/distribution tax. It is important to mention that electricity producers using renewable sources receive a 50% discount in the TUST and TUSD fee. This discount aims at boosting investments in renewable energy projects and shall be considered as a Type E- policy as defined by Annex 3, EB 22. Additionally, according to this clarification, type E- policies do not need to be considered in the development of the baseline scenario if implemented after 11 November 2001. The reduction in the TUST/TUSD fee was	PP has clarified the meaning and its use in the project accordingly. TUSD is being applied in the financial calculations in accordance with Brazilian Regulations. CAR9 is closed.

		established by ANEEL Resolution nr. 77 dated 18/08/2004. Therefore, the discount was not taken into account in the proposed project activity.	
CAR10 The annual value of Inspection Fee Services Electricity is different from the ANEEL Order No. 360, of 4 February 2011	A.1.3 B.3.5 B.3.6	In fact, the ANEEL fee considered in the project cash flow is not same as the fee presented in ANEEL Dispatch nr. 360 dated February 4th, 2011 (the ANEEL fee was rounded/approximated in the first version of the PDD) and, therefore, the PDD and cash flow spreadsheet was revised. Please refer to the second version of the document.	PP has updated spreadsheet and PDD in accordance with Brazilian Regulations. CAR10 is closed.
CAR11 PPA price used in the spreadsheet is different from the 2007 auction.	A.1.3 B.3.5 B.3.6	As mentioned in the PPs response of CAR 8, the first version of the PDD considered the IRR of the project based on rounded/approximated values. Therefore, the energy price of BRL 100/MWh was considered in the first version of the PDD instead of BRL 99.48/MWh, the exact price. Furthermore, the energy price was adjusted to the inflation targeting until the operation starting of the project Therefore, the PPs revised the cash flow. Source of information was also corrected, since the energy price of BRL 99.48/MWh is based on the results of energy auctions conducted by the Brazilian government in 2011 for wind power projects (the most recent information available) and not in the energy auctions of 2007. Please refer to the second version of the PDD and cash flow spreadsheet.	PP has updated spreadsheet and PDD in accordance with presented evidences /55/ and /56/. CAR11 is closed.

CAR12 Timeline applied in the spreadsheet is 30 years.	A.1.3 B.3.5 B.3.6	The period of assessment considered in the project cash flow is 20 years based on the technical life of the project. According to the specifications from the manufacturer (GEA18178C_1.6-100 Wind Turbine_r1.pdf), the GE 1.6 – 100 turbines are designed for 20-year lifetime. This lifetime is according to the maximum assessment period as recommended by the §3, Annex 5, EB 62. Since the period of assessment of the project cash flow is based on the expected operation of the propose project activity (technical lifetime), the fair value was excluded in the IRR calculation following the §3, Annex 5, EB 62. Furthermore, depreciation calculation was revised to consider the 20 years technical lifetime. Please refer to the second version of the PDD and cash flow spreadsheet.	PP has updated spreadsheet and PDD in accordance with guidelines. CAR12 is closed.
CAR13 In the spreadsheet the year 2013 is inconsistent.	A.1.3 B.3.5 B.3.6	In fact, operational costs should not be considered in 2013 year since the project is expected to become operational only in 2014 year. Therefore, the IRR calculation was revised. Please refer to the second version of the PDD and cash flow spreadsheet.	PP has updated spreadsheet and PDD in accordance with guidelines. CAR13 is closed.
CAR14 In the spreadsheet the Operating Expenses for ANEEL is inconsistent.	A.1.3 B.3.5 B.3.6	As mentioned in the PPs response of CAR 10, the cash flow was revised according to ANEEL fee presented in ANEEL Dispatch nr. 360 dated February 4th, 2011. According to Law nr. 9,427 dated December 26th, 1996, the discount of 0.5% in the ANEEL fee is applied for energy generation projects independently of the source of generation (renewable or non-	PP has updated spreadsheet and PDD in accordance with Brazilian Regulations. CAR14 is closed.

		renewable), and therefore, this regulation cannot be considered as a Type E- policy as defined by Annex 3, EB 22. Therefore, the calculation of ANEEL fee presented in the cash flow was not revised.	
CAR15 PP has applied the "Tool for the demonstration and assessment of additionality".	B.3.8	As mentioned in the PPs response of CAR 2, the PDD was revised to consider the latest version of the methodological tool "*Demonstration and assessment of additionality*" approved by the board in its 65th Meeting. This version of the tool includes the new assessment of the common practice analysis. In lightening of the new version of the additionality tool, the common practice analysis was revised. Please, refer to the second version of the PDD and the common practice spreadsheet attached to this response.	Final version of PDD (version 3) and spreadsheets have been reviewed by the validation team and the updated versions of the methodologies, tools and guidelines have been used. The tool "Demonstration and assessment of additionality" approved by the board in its 65th Meeting was applied in a consistent and transparent way. CAR15 is closed.
CAR16 Emission Factor calculation on line 383 of the spreadsheet is not in accordance.	B.4.1.1	The CO_2 emission factor of the grid was revised based on the corrected values of Annex 1 (default efficiency factors for power plants) of the methodological tool "Tool to calculate the emission factor for an electricity system". Therefore, the CO_2 emission factor changed from 0.2248 tCO_2/MWh to 0.2275 tCO_2/MWh. The source of the information presented in "Sources" sheet was also revised. Please refer to the second version of the CO_2 emission factor of the grid spreadsheet. Regarding the baseline emissions calculation, the PPs also revised the Plant Load Factor (PLF) of Riachão III and V projects and, consequently, the estimated electricity delivered to the grid according	PP has updated spreadsheet and PDD in accordance with guidelines. CAR16 is closed.

		to information presented in the Wind Certification issued by GL Garrad Hassan Ibérica S. L. U. on 14/11/2011 (document presented during the auditing visit). Furthermore, the starting date of the crediting period was also revised considering the schedule presented in "Memorial descritivo Riachão III" and "Memorial descritivo Riachão V" dated January 2012 (the most recent information available). The leap years were also considered for the baseline emissions and emission reductions. Please refer to the second version of the PDD and CER spreadsheet.	
CAR17 Emission factor calculated in the spreadsheet and presented in the PDD are not in accordance.	B.4.1.1	Considering the DOE comments and the correction of the default efficiency factors for power plants (mentioned in the PPs response in CAR 16), PDD, the CER and the emission factor spreadsheets were revised. Please refer to the second version of the documents attached to this response.	PP has updated spreadsheet and PDD in accordance with guidelines. CAR17 is closed.
CAR18 Low cost must run is different form the calculated in the spreadsheet	B.4.1.1	Considering the DOE comments, the PPs attached to this response an additional spreadsheet which can confirm the lambda calculation considered in the calculation of the operating margin emission factor of the grid. Please refer to the file "Check lambda calculation-Example SIN-2008-2010.xls" attached to this response.	PP has updated spreadsheet and PDD accordingly. CAR18 is closed.
CAR19 PP is requested to present the stakeholders letters	D.2	The letters sent to local stakeholders in compliance with the Brazilian DNA requirements for the LoA issuance were presented to DOE during the auditing visit. However, the stakeholders' letters are attached to this response. Please, refer to the file "*Cartas*	Letters inviting stakeholders for commenting CDM project were presented and their Brazilian Mail Company warning receipts. Also, the local stakeholder consultation

		Convite Comentário.rar".	complies with the guidelines. CAR 19 is closed.
CAR20 Received comments are not included in the PDD	D.3 D.4	As presented during the auditing visit, the only letter received from local stakeholders was sent by the State Attorney for the Public Interest (Federal). However, no comments were in fact made. Anyway, sections E.2 and E.3 of the PDD were revised to include the receipt of this letter and detailed information on how the stakeholder process has been conducted. Please refer to the second version of the document.	PP has updated the PPD and included the received comment. CAR 20 is closed.
CAR21 ERs calculation in the PDD - Riachão III and V Wind Power Plants CDM Project Activity (Riachao_PDD_v.2_2012.03.14 track.doc) does not reflect the spreadsheet CER estimate (Riachao_Estimated CERs_2012.02.14_v2.xlsx). Spreadsheet considers 2 leap years which reflect in more MWh per year than it is described in the PDD. Consequently, spreadsheet estimates more ERs due to leap years. PDD presents the amount of ERs considering leap years,	B.1.4	The PPs clarify that the PDD is according to the CER spreadsheet. However, in making an in-depth analysis, the PPs realized that there was a slight difference when considering the average of the electricity dispatched to the grid/emission reductions because of the leap years and the decimal places. Therefore, the PDD and CER spreadsheet were revised. Please refer to the third version of the documents.	PP has corrected PPD Table 4, Table 21 and section B.6.3. - step 6. Also, spreadsheet which was considering leap years has been corrected. PDD and spreadsheets reflects same values and are in accordance with inputs. CAR21 is closed.

however, energy generation does not.			
CAR22 PP shall clarify the date of Financial Analysis was undertaken	B.3.5	As explained in the PPs response of CAR7, the investment decision and the project starting date of Riachão III and Riachão V did not happen. Therefore, the investment analysis of the projects was performed based on the most recent data available at the time of the submission of the PDD for GSP (validation start). The PPs also included the "complete" date (DD/MM/YYYY) of the financial spreadsheets attached to this response. Please refer to the revised versions attached to this response.	PP has clarified in the spreadsheet the financial analysis was undertaken on 01 December 2011. CAR22 is closed.
CAR23 PP shall clarify the date of "Memorial Descritivo" ((MD Riachão III A3_2012 V1.doc) and (MD Riachão V A3_2012 V1.doc)) were undertaken	B.3.5	As can be checked in the file, "Memorial Descritivo" is dated 27/01/2012.	CAR24 DOE could not identify the source of the date presented by the PP. Both files, Descriptive Design Memorial Riachão III (MD Riachão III A3_2012 V1.doc) and Descriptive Design Memorial Riachão V (MD Riachão V A3_2012 V1.doc) do not present such date. CAR23 is closed
CAR 24 DOE could not identify the source of the date presented by	B.3.5	As described in the files "Memorial Descritivo", they are dated January 2012. In the "properties" of the files "MD Riachão III A3_2012 V1.doc" and	PP has clarified the date of the document and according to the file properties of both files; the date is 27 January 2012.

the PP. Both files, Descriptive Design Memorial Riachão III (MD Riachão III A3_2012 V1.doc) and Descriptive Design Memorial Riachão V (MD Riachão V A3_2012 V1.doc) do not present such date.		"MD Riachão V A3_2012 V1.doc", the last change made in the files was on 27/01/2012.	CAR24 is closed
CL 1 The description of the project activity in the PDD states the project is about a hydro power plant. (CL1)	A.1.1	Section A.2 was revised. Please, refer to the second version of the PDD.	PP has updated the PPD and clarified the misstatement. CL1 is closed.
CL 2 PP shall clarify acronyms used in the PDD	Sections: A. B. C. D.	Acronyms were clarified in the second version of the PDD.	PP has updated the PPD and clarified the acronyms. CL2 is closed.

	E.		

APPENDIX B
VALDIATION TEAM DETAILS

Team Member Name	*Role*	*Experience*
Ricardo Costa	Lead validator	CDM lead validator and lead verifier mainly for renewable energy projects.
Esteban Van Dam	Technical expert	Expert renewable energy (wind)
Bilal Anwar	Technical Reviewer	CDM Expert, Technical expert on CDM and other GHG reduction Projects.