VALIDATION REPORT

REB CASSINO WIND ENERGY COMPLEX CDM PROJECT ACTIVITY IN BRAZIL

REPORT NO. 2011-1339

REVISION NO. 02

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Report No: 2011-1339, rev. 02

VALIDATION REPORT

Date of first issue: 31 October 2011	ConCert Project No.: PRJC-334503-2011-CCS-BRA
Approved by Michael Lehmann	Organisational unit: DNV KEMA Energy & Sustainability Accredited Climate Change Services
Client: REB Empreendimentos e Administradora de Bens S.A.	Client ref.: Gabriel Lino Martins

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Summary:

Project Name: REB Cassino Wind Energy Complex CDM Project Activity

Country: Brazil

Methodology: ACM0002 **Version:** 12.3.0

GHG reducing Measure/Technology: Grid-connected electricity generation from wind power (Sectoral Scope 1)

ER estimate: 54 978 tCO_2e per year (average)

Size

☒ Large Scale ☐ Small Scale

Validation Phases:

☒ Desk Review ☒ Follow up interviews ☒ Resolution of outstanding issues

Validation Status

☐ Corrective Actions Requested ☐ Clarifications Requested

☒ Full Approval and submission for registration ☐ Rejected

In summary, it is DNV's opinion that the project activity "REB Cassino Wind Energy Complex CDM Project Activity" in Brazil, as described in the PDD, version 3 of 13 April 2012, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.3.0. Hence, DNV requests the registration of the project as a CDM project activity.

Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

Report No.: 2011-1339	Subject Group: Environment
Report title: REB Cassino Wind Energy Complex CDM Project Activity in Brazil	
Work carried out by: Juliana Scalon, Luis Filipe Tavares, Fernando Sasdelli, Frederico Rosas	
Work verified by: Felipe Lacerda Antunes	

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Abbreviations

ABNT	Brazilian Association of Technical Standards
ANEEL	National Electric Energy Agency
BNDES	Brazilian Development Bank
BRL	Brazilian Real; Brazilian currency
CAPEX	Capital Expenses
CAPM	Capital Asset Pricing Model
CAR	Corrective Action Request
CCEE	Electric Energy Commercialization Chamber
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CONAMA	Environmental National Council
CSLL	Social Tax on Assumed Profit
DNA	Designated National Authority
DNV	DNV Climate Change Services AS
EUR	Euro, European currency
FAR	Forward Action Request
FEPAM	State Foundation on Environmental Protection of Rio Grande do Sul State
FGV	Getúlio Vargas Foundation
GHG	Greenhouse gas(es)
INMET	Instituto Nacional de Meteorologia
IPCC	Intergovernmental Panel on Climate Change
IPEA	Advanced Economic Research Institute
LI	Installation License
LoA	Letter of approval
Ltda	Brazilian limited company
NGO	Non-governmental Organisation
ODA	Official Development Assistance
O&M	Operation and Maintenance
ONS	National Operator of the System
PASEP	Tax for Heritage Program for Public Employees
PDD	Project Design Document
PIS	Tax for Social Integration Program
PPA	Power Purchase Agreement
PROINFA	Program of Incentive to Alternative Sources of Electric Energy
S&P500	Standard and Poor's
SIN	National Integrated System – Electricity Grid of Brazil
tCO_2e	Metric tonnes of CO_2 equivalents
TFSEE	Fiscalization Tariff for Electricity Services
TUSD	Electrict Distribution System Tariff
UNFCCC	United Nations Framework Convention on Climate Change
WACC	Weighted Average Cost of Capital
WEC	Wind Energy Converter

1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the project activity "REB Cassino Wind Energy Complex CDM Project Activity" in Brazil. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism 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 DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is Brazil, which fulfils the participation criteria. There is no Annex I Party identified yet.

The project correctly applies the baseline and monitoring methodology ACM0002, version 12.3.0 "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources".*

The project activity is a wind power project consisting of three wind farms with a total of 64 MW of installed capacity. By generating electricity from wind power and displacing electricity from the grid that is partly generated from fossil fuels, the project results in reductions of CO_2 emissions are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 54 978 tCO_2e per year over the selected 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.

The monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is DNV's opinion that the project participants are able to implement the monitoring plan.

In summary, it is DNV's opinion that the project activity "REB Cassino Wind Energy Complex CDM Project Activity*" in Brazil, as described in the PDD, version 3 dated 13 April 2012, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.3.0. Hence, DNV requests the registration of the project as a CDM project activity.*

Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

Rio de Janeiro and Oslo, 17 April 2012

Juliana Scalon
Validator
DNV Rio de Janeiro, Brazil

Michael Lehmann
Director of Services and Technologies
DNV Climate Change Services AS

2 INTRODUCTION

REB Empreendimentos e Administradora de Bens S.A. has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the project activity "REB Cassino Wind Energy Complex CDM Project Activity" 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.

2.1 Objective

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

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002 (version 12.3.0). The validation was based on the recommendations in the Validation and Verification Manual /34/.

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

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk review of the project design documentation

The following tables list the documentation that was reviewed during the validation.

3.1.1 Documentation provided by the project participants

/1/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *CDM-PDD for project activity "REB Cassino Wind Energy Complex CDM Project* Activity*" in Brazil*, version 1 dated 25 August 2011, version 2 dated 7 February 2012 and version 3 dated 13 April 2012.

/2/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *CER calculation spreadsheet "Cassino I, II e III_CERs_ex ante_2012.03.20_v2_rev.xls"*, Version 2, dated 20 March 2012.

/3/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *WACC Analysis "WACC ElectricGen_2012.03.20_v3.xlsx"*, Version 3, dated 20 March 2012.

/4/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *Financial Analysis "FCF_CASSINOSI_II_III_v3_rev.xls"*, Version 3, dated 30 March 2012.

/5/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Calculation of Operating Margin, Build Margin and Combined Margin grid emission factors* for years *2008, 2009 and 2010.*

/6/ National Operator System (ONS): *Daily report of the interconnected system operation. Energy generation by source and other system information* for years *2008, 2009 and 2010.*

/7/ REB Empreendimentos e Administradora de Bens S.A.: *Notification form*, submitted to UNFCCC Secretariat for Prior Consideration of CDM, dated 25 August 2010.

/8/ REB Empreendimentos e Administradora de Bens S.A.: *Notification form*, submitted to DNA of Brazil for demonstration and assessment of prior consideration of the CDM, dated 25 August 2010.

/9/ REB Empreendimentos e Administradora de Bens S.A.: Documents for Simplified Environmental Report, dated July 2011.

/10/ FEPAM: *Environmental licenses:*

- Preliminary License for the project wind farms #395/2010-DL dated 13 April 2010;
- Preliminary License for the transmission line #218/2011-DL dated 28 February 2011.

- Construction License for the project wind farms #1231/2011-DL dated 20 October 2011.

/11/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *Stakeholder consultation - Receipts filled by postal service when delivering mail (invitation to stakeholder's consultation) to recipients*, 12 August 2011.

/12/ ANEEL: *REB Cassino I, II and III – authorization for energy generation*.

- REB Cassino I: http://www.aneel.gov.br/cedoc/prt2011153mme.pdf
- REB Cassino II: http://www.aneel.gov.br/cedoc/prt2011162mme.pdf
- REB Cassino III: http://www.aneel.gov.br/cedoc/prt2011152mme.pdf

/13/ Electric Energy Commercialization Chamber: *Bid resulted electricity prices for REB Cassino I, II and III*. http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Leiloes/2_F_A/Resulta_Completo_2_LFA_Resumo_vendedor.pdf

/14/ Gamesa: Aerogenerator *Characteristics - GAMESA G97 - 2 MW. Available at*: http://www.gamesa.es/es/productos-servicios/aerogeneradores/gamesa-g97-20-mw-iiia.html

/15/ Garrad Hassen Ibérica S.L.U.: *Cassino Wind Analysis and Energy Production Assessement*, version A, dated 13 July 2011.

/16/ Garrad Hassen Ibérica S.L.U.: *Cassino Wind Analysis and Energy Production Assessement*, version D, dated 26 January 2012.

/17/ Det Norske Veritas, Danmark A/S: *Certification of Gamesa's product: Design evaluation conformity statement according to norms IEC 61400-1 ed.2: 1999 and IEC 61400-22 attesting 20 years of equipment lifetime*. 31 August 2011.

/18/ REB Empreendimentos e Administradora de Bens S.A.: *documentation presented for requesting the installation licence – designs, descriptions, environmental monitoring plan*, 25 July 2011.

/19/ REB Empreendimentos e Administradora de Bens S.A. and Multi Empreendimentos: *Basic project "Memorial Projeto Básico.pdf*", 21 July 2011.

/20/ Gamesa Eólica Brasil Ltda.: *Proposal for equipment supply, project construction and maintenance*, dated 30 August 2010.

/21/ Gamesa Eólica Brasil Ltda.: *Engineering, Procurement and Construction Contract*, signed between REB Empreendimentos e Administradora de Bens S.A. and Gamesa Eólica Brasil Ltda., dated 15 February 2012.

/22/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *Contracts of land rental between Edy Costa Quaresma and Fortuny Energia Brasil Ltda.*, dated 16 January 2009.

/23/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *Cession Lands Contract between Fortuny Energia Brasil Ltda. and* REB Empreendimentos e Administradora de Bens S.A., dated 22 October 2009.

/24/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Power Purchase Agreements*, between REB Empreendimentos e Administradora de Bens S.A. and the power utilities (starting date of the project), dated and signed on 9 August 2011.

/25/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *Common Practice Analysis "REB Cassino_Prática Comum_2011.10.14_v2.xlsx*" version 2 dated 3 February 2012.

/26/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *Stakeholder consultation - Receipts filled by postal service when delivering mail (invitation to stakeholder's consultation) to recipients*, dated 12 August 2011.

/27/ REB Empreendimentos e Administradora de Bens S.A.: *Insurance calculation*, E-mail sent to Ecopart Assessoria em Negócios Empresariais Ltda. indicating the insurance calculation, "Seguro das Eólicas REB Cassino.msg", dated 23 March 2012.

/28/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: Auxliary calculation spreadsheet "Premissas.xls", dated 15 March 2012.

/29/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *Administrative expenses – job position and correspondent wages and charges sourced from public information.* Dated 11 October 2011.

/30/ REB Empreendimentos e Administradora de Bens S.A.: Letter from BNDES for acceptance of the Project for potential financing. 1 November 2011.

/31/ Ecopart Assessoria em Negócios Empresariais Ltda.: *BNDES weight of debt for long term loans in Brazil for wind projects, 2009.*

/32/ REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.: *Demonstration of diesel consumption, equipment characteristics and estimation of project emission due to fossil fuel combustion,* dated 2 March 2012.

3.1.2 Letters of approval

/33/ Interministerial Commission on Global Climate Change (DNA of Brazil): *Letter of approval:* Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

/34/ CDM Executive Board: *Validation and Verification Manual*, version 1.2, adopted at EB55 Annex 1.

/35/ CDM Executive Board: *Glossary of CDM terms*, version 5 adopted at EB47, paragraph 71.

/36/ CDM Executive Board: *Baseline and monitoring methodology ACM0002*, "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*, version 12.3.0.

/37/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*, version 6.0.0.

/38/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system*,

version 2.2.1.

/39/ CDM Executive Board: *Guidelines on the demonstration and assessment of prior consideration of the CDM*, version 4.0.

/40/ CDM Executive Board: *Guidelines on the Assessment of Investment Analysis*, version 5.0.

/41/ CDM Executive Board: *Guidelines on the Reporting and Validation of Plant Load Factors*, version 1.

3.1.4 Documentation used by DNV to validate / cross-check the information provided by the project participants

/42/ Ministry of Environment, *Resolution CONAMA nº 001*, of 23 January 1986 about Environmental Impact Assessment. Available at: http://www.mma.gov.br/port/conama/res/res86/res0186.html

/43/ BNDES: *Long Term Interest Rate*, 2011 rates, available at: http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Custos_Financeiros/Taxa_de_Juros_de_Longo_Prazo_TJLP/index.html

/44/ National Operator of the System - *Grid Procedures*, available at: www.ons.org.br/procedimentos/index.aspx

/45/ ANEEL, *Bank of Information of Generation*, the capacity of electricity generation in Brazil. Available at: http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.asp

/46/ ANEEL *Decrees, Dispatches and Notes on Tariffs:*

- Normative Resolution *nº* 77 about discount in tariff for alternative sources, dated 18 August 2004;
- Decree *nº* 2410, dated 28 November 1997, creating the TFSEE tariff;
- Dispatch *nº* 360, dated 4 February 2011 about the values of the TFSEE tariff.

/47/ CCEE: *2nd Alternative Sources Auction* – Auction nº 007/2010, Results dated 20 August 2011 – Available at: http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=ef4f39fd29b39210VgnVCM1000005e01010aRCRD

/48/ IPCC: *Guidelines 2006, Volume 2, Chapter 1, Table 1.4* – "Default CO_2 emission factors for combustion". Available at: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf

/49/ US Department of Defense: *American Military Standard and tables for Inspection by Attributes (MIL-STD-105E)* dated 10 May 1989.

/50/ Treasury Department: Brazilian *Assumed Profit regulations*. Available at: http://www.receita.fazenda.gov.br/Publico/perguntao/dipj2011/CapituloXIII-IRPJ-LucroPresumido2011.pdf

/51/ Damodaran website: *30-year US Treasury Yields*, dated June 2011. Available at: http://pages.stern.nyu.edu/~adamodar/

/52/ Federal Reserve: *Financial and Economics Research Data*, dated August 2011. Available at: http://www.federalreserve.gov/econresdata/researchdata.htm

/53/ IPEA: *Brazilian Macroeconomics Data*, from August 2006 to August 2011. Available at: http://www.ipeadata.gov.br/

/54/ BNDES: *Brazilian Funding Conditions*, dated 2011. Available at: http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/meio_ambiente.html

/55/ Brazilian Central Bank: *Inflation Targets*, for year 2011. Available at: http://www.bcb.gov.br/pec/metas/InflationTargetingTable.pdf

/56/ Ministry of Environment: *Renewable Sources of Energy in Brazil*, dated 2003.

/57/ Brazilian National Treasury, *Normative Instruction nº 247*, dated 21 November 2002. About PIS/PASEP and Cofins taxes, available at: http://www.receita.fazenda.gov.br/legislacao/ins/2002/in2472002.htm

/58/ Brazilian National Treasury, *Note 517 for information on legislation about presumed profit companies*, available at: http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr517a555.htm

/59/ Brazilian National Treasury, *Article 22 of Law nº 10684 and Article 3 of Law nº 11727, for social contribution on net profit, available at:* http://www.receita.fazenda.gov.br/aliquotas/ContribCsll/Default.htm

/60/ *Global Stakeholder Consultation Process of REB Cassino Wind Energy Complex CDM Project Activity*: from 27 August 2011 to 25 September 2011. http://cdm.unfccc.int/Projects/Validation/DB/LNQSSH6MPWTTNP6XKEJ9YK8O5G7D00/view.html

/61/ International Electrotechnical Commission: Normative IEC 61 400-1 and 61 400-22 - *IEC system for conformity testing and certification of wind turbines*, ed. 2, 1999.

/62/ Frederico Rosas: *Financial Expert Assessments*, approving the choice of benchmark and the investment analysis. Dated 23 March 2012.

/63/ ANEEL: *Summary of the new energy plants and producers*. Dated November 2010.

/64/ Careers and salaries in Brazil: *Typical salary practiced according to the activity developed.* Available at: http://carreiras.empregos.com.br/carreira/administracao/pesquisa_salarial/diretores_gerentes.asp

/65/ ANEEL: *Decree #5 177 of 12 August 2004*: regulation about the CCEE operations and the contribution from associated energy producers (CCEE charge). Available at: http://www.aneel.gov.br/cedoc/bdec20045177.pdf

/66/ ANEEL: *Law #9 648 of 27 May 1998:* regulation about the ONS operations and the contribution from associated energy producers (ONS charge). Available at: http://www.aneel.gov.br/cedoc/blei19989648.pdf

/67/ CCEE: *The history of the energy sector in Brazil.* http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=96a0a5c1de88a010VgnVCM100000aa01a8c0RCRD

/68/ Ministry of Energy: *Definition and regulatory framework of the Alternative Electricity Sources Incentive Program (PROINFA):* http://www.mme.gov.br/programas/proinfa/

/69/ Interministerial Commission on Global Climate Change (DNA of Brazil): notes and

information on the calculation of the grid emission factor for Brazil: http://www.mct.gov.br/index.php/content/view/72764.html

3.2 Follow-up interviews with project stakeholders

The project is a newly built wind farm project. Through reviewing the documents, which the project participant provided, DNV could confirm the project design, construction, operation and monitoring plan and all baseline scenario information.

The representatives of the project owner REB Empreendimentos e Administradora de Bens S.A. and project participants from Ecopart Assessoria em Negócios Empresariais Ltda. were interviewed on 13 and 14 October 2011 at Santander Bank office in São Paulo by DNV auditors Juliana Scalon and Luis Filipe Tavares to resolve the issues identified during the desk review.

The physical implementation of the project had not started since the wind farms have not received the permit for construction until the site visit date (construction license was granted by the environmental agency on 20 October 2011 /10/). Hence, DNV can justify that a physical site visit for this project was not required during the validation stage.

	Date	Name	Organization	Topic
/70/	13 and 14 October 2011	Roberto Colindres	REB Empreendimentos e Administradora de Bens S.A. Ecopart Assessoria em Negócios Empresariais Ltda.	• Project Design and adopted technology • Determination of baseline scenario • Demonstration of additionality • Emission reduction calculations • Application of monitoring methodology as well as design and application of the monitoring plan • Assessment of environmental impacts, environmental licenses and legal compliance • Stakeholders consultation process • Financial analysis
/71/		Karollyne Matuchack Machado		
/72/		Marco Antonio Mazaferro		
/73/		Ana Paula Veiga		
/74/		Bruna Marigheto		
/75/		Renato Oliveira		

3.3 Resolution of outstanding issues

The objective of this phase of the validation was to resolve any outstanding issues which needed be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows

in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the project activity "REB Cassino Wind Energy Complex CDM Project Activity" in Brazil is enclosed in Appendix A to this report.

Table 2 of the validation protocol documents the findings of the desk review of the project design documentation and follow-up interviews with project stakeholders. Any findings raised in Table 2 are listed in Table 3 of the protocol, and changes to the description of the project design as a result of these findings will be addressed in Table 3. Table 2 thus may not reflect all aspects of the project as described in the final PDD submitted for registration.

A corrective action request (CAR) is raised if one of the following occurs:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

(b) The CDM requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

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

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

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 either acceptable based on evidence provided (**OK**) or a **corrective action request (CAR)** if a requirement is not met.*

Validation Protocol Table 2: Requirement Checklist				
Checklist question	***Reference***	***Means of verification (MoV)***	***Assessment by DNV***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the CDM-PDD	*Gives reference to documents where the answer to the checklist question or item is found.*	*Means of verification (MoV) are **document review (DR)**, **interview (I)** or any other follow-up actions (e.g., on site visit and telephone or email interviews) and **cross-checking (CC)** with available information relating to projects or technologies similar to the proposed CDM project activity under validation.*	*The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.*	*OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A **corrective action request (CAR)** is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A **clarification request (CL)** is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A **forward action request (FAR)** during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.*

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Corrective action and/ or clarification requests	***Ref. to checklist question in table 2***	***Response by project participants***	***Validation conclusion***
*The **CARs** and/ or **CLs** raised in Table 2 are repeated here.*	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants to address the CARs and/or CLs.*	*The validation team's assessment and final conclusions of the CARs and/or CLs.*

Validation Protocol Table 4: Forward Action Requests		
Forward action request	***Ref. to checklist question in table 2***	***Response by project participants***
The FARs raised in Table 2 are repeated here.	*Reference to the checklist question number in Table 2 where the FAR is explained.*	*Response by project participants on how forward action request will be addressed prior to first verification.*

Figure 1: Validation protocol tables

3.4 Internal quality control

The validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation team

				Type of involvement						
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 1.2 competence	Financial expertise
Team leader after 20 March 2012 (Validator)	Scalon	Juliana	Brazil	✓	✓	✓	✓			
Team leader before 20 March 2012 (Validator)	Tavares	Luis Filipe	Brazil	✓	✓	✓	✓		✓	
Validator	Sasdelli	Fernando	Brazil			✓				
Financial Expert	Rosas	Frederico	Brazil	✓		✓				✓
Technical reviewer	Antunes	Felipe	Brazil					✓	✓	

The qualification of each individual validation team member is detailed in Appendix B to this report.

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. 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.

The final validation findings relate to the project design as documented and described in the PDD, version 3 dated 13 April 2012 /1/.

4.1 Participation requirements

The project participants are REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda. of the host Party Brazil. The host Party (Brazil) meets all relevant participation requirements. There is no Annex I Party identified yet.

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

Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

4.2 Project design

The REB Cassino Wind Energy Complex CDM Project Activity project is located in the municipality of Rio Grande, state of Rio Grande do Sul, in Brazil.

The geographical coordinates of each turbine of the proposed project activity are listed below as confirmed in documents from the study of wind analysis and energy production /16/:

EOL REB Cassino I		
Equipment	**W longitude**	**S latitude**
Turbine G97 – I - 01	52.2031	32.2187
Turbine G97 – I – 02	52.2146	32.2241
Turbine G97 – I – 03	52.2190	32.2278
Turbine G97 – I – 04	52.2267	32.2305
Turbine G97 – I – 05	52.2099	32.2144
Turbine G97 – I – 06	52.2230	32.2207
Turbine G97 – I – 07	52.2330	32.2240
Turbine G97 – I – 08	52.2114	32.2188
Turbine G97 – I – 09	52.2235	32.2247
Turbine G97 – I - 10	52.2289	32.2203
Turbine G97 – I - 11	52.2211	32.2364

EOL REB Cassino II		
Equipment	**W longitude**	**S latitude**
Turbine G97 – II - 01	52.2112	32.2119
Turbine G97 – II – 02	52.2190	32.2161
Turbine G97 – II – 03	52.2183	32.2200
Turbine G97 – II – 04	52.2301	32.2269
Turbine G97 – II – 05	52.2099	32.2144
Turbine G97 – II – 06	52.2230	32.2207
Turbine G97 – II – 07	52.2330	32.2240
Turbine G97 – II – 08	52.2114	32.2189
Turbine G97 – II – 09	52.2235	32.2247
Turbine G97 – II - 10	52.2289	32.2203

EOL REB Cassino III		
Equipment	**W longitude**	**S latitude**
Turbine G97 – III - 01	52.2219	32.2004
Turbine G97 – III – 02	52.2282	32.2051
Turbine G97 – III – 03	52.2328	32.2096
Turbine G97 – III – 04	52.2199	32.2037
Turbine G97 – III – 05	52.2247	32.2082
Turbine G97 – III – 06	52.2363	32.2153
Turbine G97 – III – 07	52.2177	32.2068
Turbine G97 – III – 08	52.2225	32.2106
Turbine G97 – III – 09	52.2382	32.2182
Turbine G97 – III - 10	52.2155	32.2089
Turbine G97 – III - 11	52.2293	32.2148

The project is a wind power project which involves installation and operation of 32 WECs (GAMMESA G97 2MW model) /14/. The installed capacity of each WEC unit is 2.0 MW thus, constituting a total installed capacity of 64 MW. Out of the 32 WECs, 11 WECs will be installed in each wind farm except for EOL Cassino II wind farm where 10 WECs will be installed.

The wind turbines were manufactured by Gamesa /14/, which is an industrial company, specialized in the development and manufacturing of large wind power equipment and related main components. It has been cross-checked by DNV through the manufacturer product specifications /14/ that the project design engineering uses the megawatt-class, three-bladed, variable speed wind turbines, which is deemed to reflect good practices.

The project configuration has changed from the investment decision date. When the PPAs were signed /24/, the project participants expected a different availability of wind in the land areas. With a more recent wind study based on higher quantity of historical data available, prepared by consultancy Garrad Hassen Ibérica S.L.U., an independent third party /16/, the project participant realized that the original wind farms configuration could not deliver the

amount of electricity contracted in the PPAs. Hence, project participants had decided to rearrange the wind farms configuration in a manner to obtain a safe electricity production to fulfil the PPAs committed amounts. An EPC contract was signed with Gamesa Eólica Brasil Ltda. in order to adjust costs to the new configuration of the wind farms /21/.

Hence, as explained above, the original plant load factor available at the time of the investment decision /15/ /24/ of the project has changed (when the signature of the first Power Purchase Agreement took place). By that time, the plant load factors were evaluated and approved by the National Electric Energy Agency (ANEEL) and declared in the authorization for energy generation /12/. The most recent wind report from Garrad Hassen Ibérica S.L.U was made on 26 January 2012 /16/ – thus after the decision date – to confirm the electricity generation of the wind farms and consequently the load factor was adjusted. The initial average plant load factor was 44.1% and 62 MW of installed capacity /15/. The change in the project configuration and total installed capacity from 62 MW to 64 MW (at a plant load factor of 43.6%) does not impact the additionality of the project, as it is demonstrated in the additionality analysis.

The annual net electricity delivered to the National Interconnected System (SIN) is expected to be 244 579 MWh, corresponding to an average plant load factor of 43.6% sourced from the "*Cassino Wind Analysis and Energy Production Assessement"* prepared by Consultancy Garrad Hassen Ibérica S.L.U. /16/. The "*Guidelines on the Reporting and Validation of Plant Load Factors*"/41/ gives instruction for validation of plant load factor for renewable energy. One option is to use plant load factor provided by a third party while applying the project activity for implementation approval. The authorization for energy production was issued by Garrad Hassen Ibérica S.L.U. /15/ in which the plant load factors were evaluated. Such documents are according to current CDM regulation.

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Project Name	Installed capacity (MW)	Assured Energy (MW)	EG_y (MWh/year)	Capacity factor
EOL Cassino I	22	9.77	85 568	44.4%
EOL Cassino II	20	8.56	74 986	42.8%
EOL Cassino III	22	9.59	84 026	43.6%
Total	64	27.92	244 579	43.6%

The electricity generated by the project will be linked to a transformer substation and ultimately delivered to the SIN - which has part of its electricity generated by fossil fuel power plants - via transmission line as per indicated in the table below /12/.

Project Name	Transformer (kV)	Transmission (kV)	Distance (km)
EOL Cassino I, II and III	32.5	72.5	24.5

Being a renewable electricity project, the project activity will generate greenhouse gas (GHG) emission reductions by avoiding the CO_2 emissions from the electricity generation by fossil fuel power projects.

The project construction had not been initiated at the commencement of validation.

The starting date of the proposed project activity was defined as 9 August 2011, which represents the signature of the Power Purchase Agreement /24/, in which the three electricity generation facilities EOL REB Cassino I, II and III had their energy contracted. The starting date of a project activity, as defined in the *Glossary of CDM terms* /35/, should be the earliest date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity.

The expected operational lifetime of the project activity is 20 years derived from the lifetime of the wind turbine Gamesa G-97 /14/. The specific wind turbine is certified under the IEC system for conformity testing and certification of wind turbines /17//61/, where it is demonstrated that the turbine can reach an operational lifetime of 20 years.

A 10-year fixed crediting period has been chosen for the project, starting on 1 January 2013 or the registration date, whichever is later. The chosen crediting starting date is deemed to be reasonable. The emission reductions are estimated to be 54 978 tCO_2e per year and 549 780 tCO_2e over the ten-year fixed crediting period /2/.

DNV considers the project description of the project contained in the PDD to be complete and accurate. The PDD complies with the relevant forms and guidance for completing the PDD.

4.3 Application of selected baseline and monitoring methodology

The project correctly applies the approved baseline and monitoring methodology ACM0002 version 12.3.0. The applied baseline methodology is justified as it has been demonstrated that the project activity ensures that:

- The project activity is the installation of a grid-connected and greenfield wind power plant which was verified through the preliminary environmental licences /10/ and basic project /19/;
- Being a wind farm project, it does not involve any switching from fossil fuel to renewable energy at the project site, which could be verified by DNV through the follow-up interview /70/ - /75/ and the documentation presented to the environmental agency for requesting the installation licence /18/;
- The project is connected to the National Interconnected System (SIN), the electricity grid of Brazil, for which the geographical and system boundaries are clearly identified and information on the characteristics of this grid is made available by National Electric Energy Agency (ANEEL) /45/.

The assessment of the project's compliance with the applicability criteria of ACM0002 version 12.3.0 are documented in detail in section B.2 of Table 2 in the validation protocol in Appendix A to this report.

4.4 Project boundary

The spatial extent of the project boundary is correctly defined as the site of project activity and the system boundary for the grid electricity system is also correctly defined as all power plants connected physically to the National Interconnected System (SIN), the electricity grid of Brazil, to which the project will be connected. It is DNV's opinion that the project boundary of REB Cassino Wind Energy Complex CDM Project Activity is clearly defined in accordance with applicable guidelines of ACM0002 /36/, the "*Tool for the demonstration and assessment of additionality*" /37/ and the "*Tool to calculate the emission factor for an electricity system*" /38/.

Emission sources and gases included in the project boundary are:

	GHGs involved	*Description*
Baseline emissions	CO_2	The baseline emission factor for the project is determined *ex-post* as a combined margin (CM), consisting of combination of the operating margin (OM) and build margin (BM) of the National Interconnected System (SIN), the electricity grid of Brazil.
Project emissions	N/A	Project emission is regarded as zero as the project is a renewable energy (wind source) project.
Leakage	N/A	There are no leakages that need to be considered in applying this methodology.

The identified boundary and selected sources and gases are justified for the project activity. The validation of the project activity did not reveal other greenhouse gas 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 ACM0002 (Version 12.3.0) /36/.

4.5 Baseline identification

The baseline is in accordance with ACM0002 (version 12.3.0) /36/ that electricity delivered to the grid by project activity would otherwise have been generated by the operation of grid-connected power plants in SIN 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*" /38/.

According to ACM0002 (version 12.3.0) /36/ baseline emissions are equal to power generated by the project delivered to the SIN, multiplied by the baseline emission factor. The grid emission factor is determined *ex-ante* as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) emission coefficient for the project. The Brazilian grid emission factor was calculated by the project participant /5/. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid /6/. The weighting of the OM and BM is set to be 75% and 25% respectively, which are the default values stipulated for wind farm projects by "*Tool to calculate the emission factor for an electricity system*" /38/.

As the project activity is a new grid-connected wind power plant, the baseline scenario is already defined by the methodology and properly stated in section B.4 of PDD.

All the assumption and data used by the project participants are listed in the PDD and/or supporting documents. All documentation relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD.

DNV considers the chosen baseline to be applicable and in line with the methodology ACM0002 version 12.3.0.

4.6 Additionality

As required by ACM0002, the additionality of the proposed project is demonstrated by applying the "*Tool for the demonstration and assessment of additionality*" /37/.

4.6.1 Evidence for prior CDM consideration and continuous actions to secure CDM status

Project start date:

The starting date of the project activity was defined as 9 August 2011, which is the date when the Power Purchase Agreement, in which the three electricity generation facilities EOL REB Cassino I, II and III had their energy contracted. The main equipment contracts were signed on 15 February 2012 /21/ and the project starting date of construction is 1 April 2012 /1/. DNV assessed the signed PPAs between the project participants REB Cassino Wind Energy Complex CDM Project Activity and the power utilities /24/, and was able to confirm that this is the earliest commitment to financial expenditure as is obliges the PP to sell the amount of electricity accorded in the auction /47/. There were no signed contracts prior to 9 August 2011. The penalty of not providing this electricity to the grid equals the expected revenues of the project.

All expenditures occurred prior to the start date are considered sunk costs.

Serious consideration of CDM and efforts to secure CDM status:

In accordance with the guidance from the CDM Executive Board /39/, the proposed project is a newly built wind farm and the starting date of the project activity (9 August 2011) is after 2 August 2008. Thus, the notification letter for the proposed project was sent by the project participant to the Brazilian DNA on 25 August 2010 /8/. In parallel to this the project participants sent the prior consideration of the CDM Form to UNFCCC on 25 August 2010 /7/. CDM was therefore seriously considered in the decision to proceed with the project activity.

The project participants started the global stakeholder consultation on 12 August 2011 /60/. To the consideration of DNV, this shows sufficient actions to secure CDM status in parallel with the physical implementation of the project.

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

4.6.2 Identification of alternatives to the project activity

The project activity is the installation of a new grid-connected renewable power plant, thus according to the methodology ACM0002, version 12.3.0 /36/, the baseline scenario for the project activity is defined as follow:

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".

In accordance with the paragraph 105 of VVM /34/, the approved methodology ACM0002 version 12.3.0 /36/ that is selected by the proposed project activity has prescribed the baseline scenario as shown above, thus the only alternative to the project activity undertaken without

the CDM registration. Hence, the two scenarios listed by the project participant are:

- Scenario 1: continuation of the current situation (baseline scenario) and
- Scenario 2: the proposed project activity undertaken without being registered as a CDM project activity.

Both alternatives are consistent with mandatory regulations. To generate electricity with wind source is not mandatory in Brasil, which can be confirmed observing the different types of energy generation in the national grid /45/ and the installation of the proposed project is also in compliance with national and local regulation, as confirmed by the authorization for electricity generation granted by the by the National Electric Energy Agency (ANEEL) /12/ and the environmental licenses /10/.

4.6.3 Investment analysis

Choice of approach

As the project generates financial and economic benefits other than CDM related income through the sales of electricity, selected benchmark analysis for conducting the investment analysis is found to be appropriate.

Benchmark selection

The selected benchmark is calculated based on weighted average costs of capital (WACC) which is appropriate benchmark for the project activity and complies with the "Guidelines on the Assessment of Investment Analysis" version 5.0 /40/, as per the guidelines the project benchmark needs to be calculated based on bond rates. The nominal post tax WACC, uses data before August 2011 as the investment decision was made in 9 August 2011 and was calculated based in the Capital Asset Pricing Model (CAPM) as per the option 6 (a) presented in the additionally tool as follows:

$$K_e = ((1+R_f)/(1+I)-1)+ ß * (R_m – R_f) +R_c$$

Where:

- R_f (risk free rate): calculated as 4.25%, based on the 30-year US Treasury Yield on June 2011 /51/. DNV cross-checked the values presented with the Damodaran's home page and confirmed that this value is appropriate for the time of the investment decision with support of an independent financial expert /62/ and is thus correct
- R_m (equity risk premium): calculated as 6.03%, based on S&P500 historic and 10-year Treasury Bond Yield /52/. DNV cross-checked the values presented with the Federal Reserve data and confirmed that this value is appropriate for the time of the investment decision with support of an independent financial expert /62/ and is thus correct.
- R_c (estimated country risk premium): calculated as 2.37%, based on Brazilian Risk Premium on a 5-year average /53/. DNV cross-checked the values presented with the IPEA home page and confirmed that this value is appropriate for the time of the investment decision with support of an independent financial expert /62/ and is thus correct
- β (adjusted industry beta): calculated as 2.70, based on the covariance of the daily return of electric industries listed on S&P500 /51/. Beta when re-levered used the conditions of presumed (or assumed) profit regime, which tax rate is zero. DNV cross-checked the values presented with the Damodaran's home page and confirmed that

this value is appropriate for the time of the investment decision with support of an independent financial expert /62/ and is thus correct

- I (US expected inflation) is considered to be 2.15% based on a ten-year Treasury notes minus ten-year TIPS /51/.

Thus, K_e is calculated to be 20.73%.

The calculation of the cost of debt K_d is given by the formula:

$$K_d = (1+(a+b+c)*(1-t)) / ((1+d) -1)$$

Where:

- a is the financial cost considered as 6.27% based on the long term interest rate given by the BNDES on a 5-year average range /43/;
- b is the spread calculated as 0.90% based on the BNDES spread, as per the credit policy for power generation activities /54/;
- c is the credit risk rate as 3.57% given by the BNDES /54/.
- d is the inflation forecast in Brazil, calculated as 4.5% /55/;
- t is the marginal tax rate assumed as zero since the project IRR calculation is based on assumed profit, according to Brazilian tax regulation, is not applicable /50/.

Thus, the cost of debt is calculated to be 5.97%.

The weighted average cost of capital is calculated as follows:

$$WACC = K_e * w_e + K_d * w_d$$

Where:

- K_e (return on equity) is calculated as 20.73% as per indicated above;
- K_d (cost of debt financing) is calculated as 5.97% as per indicated above;
- w_e (weight of equity) and w_d (weight of debt) are 32.3% and 67.7%. 67.7% is the average financing granted by BNDES for wind farms from year 2003 to 2009 /54/.

Thus, WACC is calculated to be 10.74% /3/.

This benchmark is not specific to the project, since it was calculated based on public data considering the risks faced by any wind power project in Brazil. Although CAPM model is generally used to calculate a benchmark on an equity basis, in this case it is accepted to be applied for a benchmark on a project basis, because it was adapted to the project using re-levered beta for condition of a presumed (or assumed) profit regime, for which tax rate is zero in re-levering. DNV confirmed this approach is correct with independent financial experts Frederico Rosas /62/.

DNV confirmed that the assumptions taken and the values considered for the benchmark calculation are reasonable and relevant at the time of decision, according to statement from independent financial expert from Rio de Janeiro Federal University /62/.

Hence, DNV concludes that the benchmark calculated for the proposed project is reasonable.

Input parameters

REB Cassino Wind Energy Complex CDM Project Activity is composed of three wind farms with a total of 32 WECs, installed capacity of 64 MW, average plant load factor of 43.6% and the annual electricity delivered to the National Interconnected System (SIN) is expected to be 244 579 MWh /16/. This is different from the configuration of the date of investment decision on 9 August 2011 /24/, used in the investment analysis, which had 31 WECs, installed

capacity of 62 MW, average plant load factor of 44.1% and annual electricity delivered to the grid of 239 843 MWh /15/.

The configuration available at the time of decision making was used in the investment analysis. The second configuration was used in the *ex-ante* estimation of the emission reductions.

At the decision making, the 31 WECs configuration was the only available and therefore it was used as basis for the investment analysis. The modified configuration, which presents a higher number of WECs, was also analysed in terms of IRR in a way to assess its additionality in the sensitivity analysis.

DNV has validated all input values to the investment analysis based on appropriate evidence, as described below.

Investment costs:

The total investment is estimated to be BRL 245 375 980. From this amount:

- BRL 176 607 000 (72% of total investment) corresponds to the investment in the 31 wind towers (cost of BRL 5 697 000 each) and construction services as per WEC manufacturer proposal /20/ since by the time of investment decision /24/ the project owner has not started construction yet, and did not have an EPC contract signed;
- BRL 68 768 980 (28% of total investment) corresponds to voltage network, substation of elevation and transmission lines costs, civil works, as per the proposal from Gamesa to build the total wind farms /20/.

DNV cross-checked the values presented and confirmed that this value is appropriate for the time of the investment decision with support of an independent financial expert /62/ and is thus correct and reasonable for wind power plants.

Operation Expenses:

The operation expenses for the proposed project include:

- The operation and maintenance costs where extracted from Gamesa proposal /20/ for the wind farms and is divided by the following items:
  - O&M costs for years 1 and 2 are included in the investment proposal and are not considered in the O&M expenses spreadsheet;
  - BRL 2 665 008 for years 3, 4 and 5;
  - BRL 3 030 219 for the remaining years.
  - BRL 592 100 yearly for maintenance of the wind farm supporting installations, constructed by Gamesa as well.
- Administration expenses of BRL 883 118 per year as per tab "Administration Expenses" in the financial spreadsheet /4/. The salary of each job position and office rent is taken from public sources provided by the project participant /29/. DNV confirmed the salaries used by the project participant are in accordance with the typical values practised in the market /64/;
- Transmission charges were calculated following regulatory decrees /46/ and vary on the production of energy, totalling around BRL 2 239 440 for the first year of full operation. DNV confirmed that these values are in accordance with the Brazilian national regulation and is appropriate for the time of the investment decision.

- Insurance fees were calculated as 0.50% of the total CAPEX, totalling around BRL 1 226 880.00 for the first year of full operation onwards /27//28/. DNV confirmed that these values are appropriate for the time of the investment decision.
- Other energy charges identified in the spreadsheet as ANEEL, ONS and CCEE, totalling BRL 156 599 per year /28/. DNV confirmed that these values are in accordance with the Brazilian national regulation /65//66/ and is appropriate for the time of the investment decision.
- Land rent is 1.8% of the annual gross income, as per contract with land owners, totalling around BRL 589 681 for the first year of full operation /22//23/. DNV confirmed that these values are appropriate for the time of the investment decision.

Total annual estimate O&M represents less than 2% of the total investment.

The values for the O&M expenses used by in the financials have been cross checked by comparing with simulations presented in the book from the Ministry of Environment "Renewable Sources of Energy in Brazil" /56/, which considered values of operational expenses ranging from 1% to 4%, the costs of the project is reasonable.

DNV concludes that the operational expenses are reasonable for wind power plants.

Annual power generation:

According to the PDD /1/ and Certificates of Wind Measurements and of Production of Energy /16/, it is expected that the proposed project will supply to SIN approximately 244 579 MWh at a plant load factor (PFL) of 44.4% for Cassino I, 42.8% for Cassino II and 43.6% for Cassino III. However, as previously explained, the project design at the time of decision making estimated a yearly generation of 239 843 MWh at an average plant load factor of 44.7% for Cassino I, 43.4% for Cassino II and 44.2% for Cassino III /19/, and this configuration was used in the investment analysis The "*Guidelines on the Reporting and Validation of Plant Load Factors*"/41/ gives instruction for validation of plant load factor for renewable energy. One option is to use plant load factor provided by a third party while applying the project activity for implementation approval. The authorization for energy production was issued by Garrad Hassen Ibérica S.L.U. /15/ in which the plant load factors were evaluated. Such documents are according to current CDM regulation, and the cross-checking with the values should be considered sufficient for validation of plant load factor. Nevertheless, according to "*Renewable Sources of Energy in Brazil*", the average plant load factor of a wind park in Brazil is 40% /56/.

DNV confirmed that the values of the parameters were the latest available at the time of the investment decision and concludes that the assumed annual power generation based on the plant load factor from from Garrad Hassen Ibérica S.L.U. /15/ is appropriate and acceptable.

Power tariff:

In Brazil, the auctions for reserve energy follow the inverted auctions model, in which the smallest price charged by the producer in the bid wins the slot. In the 2nd Brazilian Auction of Renewable Energy - Auction nº 07/2010 /47/, REB Empreendimentos e Administradora de Bens S.A. offered the best prices for wind farms REB Cassino Wind Energy Complex CDM Project Activity, thus winning these slots. The price offered for the three wind farms were 136.59 BRL/MWh for Cassino I, 136.60 BRL/MWh for Cassino II and 136.58 BRL/MWh for Cassino III /13/. In this auction, the average price for the 6 662 slots was 134.23 BRL/MWh and present a range of 130.43 BRL/MWh to 137.99 BRL/MWh.

These prices will not change until the end of the PPA period of 20 years.

Taxes and depreciation:

DNV could also 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.

Values of 0.65% for the PIS/PASEP tax /57/, 3% for the Cofins tax /57/ were applied to the revenues. The social contribution on net income (CSLL) is calculated at the applicable rate of 9% on 12% of the revenues /59/ and income tax is calculated at the applicable rate of 15% on 8% of the revenues /58/ with an additional tax of 10% on 8% of the revenues for values above BRL 240 000 per year. DNV confirmed that all taxes are in accordance with the Brazilian national regulation /58//59/ and is appropriate for the time of the investment decision. 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 /58/.

DNV confirmed that the regulations and values of taxes used in the project are the latest available in the time of the investment decision (signature of the Power Purchase Agreement /24/) and are correct.

Calculation and conclusion

The IRR calculations were provided in spreadsheet /4/ and verified by DNV. The assumptions and calculations were verified and found to be correct by DNV. The IRR is after tax and the assessment period of 20 years is equivalent to the lifetime of the project /19//61/, in which the nominal IRR without CDM revenues is 6.60%. Considering the project assets will be completely depreciated during the 20 years of operation there is no fair value at the end of the project activity, which is in accordance to the Brazilian legal requirements /50/. This confirms that the project in the absence of CDM benefits when compared to the benchmark of 10.74% is not financially attractive /4/.

Sensitivity analysis

A sensitivity analysis has been carried out for parameters contributing more than 20% to the revenues or costs in order to check the robustness of the financial analysis. Reasonable variations of the electricity tariff, energy generation, operation and maintenance costs and capital expenditures were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation. DNV was able to verify that the project IRR will reach the benchmark only if the above mentioned parameters change by values as mentioned below:

Key Indicators	Variation of the parameter indicator needed to reach the benchmark
Electricity tariff	+25.70%
Electricity generation	+25.70%
Total investments	-24.40%

The operation and maintenance costs were not evaluated to the IRR reaches the benchmark. When the operation and maintenance costs are taken to zero, the project IRR is 7.95%.

1. **Electricity tariff:** To reach the 10.74% benchmark, power tariffs must increase by 8.28% above inflation, which is not likely to happen. In Brazil, the tariffs are strictly

set by ANEEL in the time of the auction and cannot be changed during the period of the PPA /24/, determined as 20 years in the rules of the auction /47/.

2. **Electricity generation:** According to the PDD and the study from Garrad Hassen Ibérica /15/, the expected electricity generation is based on the 50% probability (P50), which is deemed conservative. Despite that, According to "Renewable Sources of Energy in Brazil" /56/, the average plant load factor of a wind park in Brazil is 40%. Considering that the annual output calculations for the proposed project were carried out using professional software designed for wind energy and that the output was maximized by considering air density corrections, turbine efficiency, planned maintenance, contaminated rotors, and auxiliary power use, it is unlikely that the electricity delivered to the grid will suffer the additional increase necessary to reach benchmark.
3. **Investment costs:** According to the PDD, the project investment should not be subject to variations since the equipment purchase and wind farms construction will be done through an EPC contract with Gamesa /20/.

Nonetheless, project participant has presented an sensitivity analysis with the new wind farms configuration, where the "*Certificates of Wind Measurements and of Production of Energy"* from Garrad Hassen /16/ states that the proposed project will supply to SIN approximately 244 579 MWh at an average plant load factor of 43.6%. Project participant has presented a sensitivity analysis with the information from the wind study, and adjusting the investment and O&M costs with IPCA index to the date of the certificates /16/, and the IRR resulted in 8.52%, which is below the benchmark of 10.74%. The total investment for the new wind farms configuration is smaller because there was a negotiation of values during the EPC signature between PP and Gamesa /21/. The investment values for the investment decision (old wind farm configuration) were based only in the available proposal from Gamesa /20/.

The sensitive analysis above shows that very unrealistic favorable circumstances would be needed for the IRR to reach the benchmark. In conclusion, the investment analysis and sensitivity assessment have shown that the proposed project is not financially attractive.

4.6.4 Barrier analysis

Barrier analysis was not applied for the proposed project.

4.6.5 Common practice analysis

According to the EB *"Tool for the demonstration and assessment of additionality"* /37/ the common practice analysis is carried out on similar projects which are considered to be in the same region, 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.

The applicable output range was calculated considering the installed capacity of 22 MW of Cassino I, 20 MW of Casion II and 22 MW of Cassino III. Therefore only projects wind projects between 10 and 33 MW of installed capacity were taken into consideration. Also regarding the three plant together sum 64 MW, projects of installed capacity between 32 and 96 MW will be considered.

The selected geographical scope for common practice analysis is the country Brazil, which is found to be appropriate.

Following the steps of the *"Tool for the demonstration and assessment of additionality"* /37/, N_{all} and N_{diff} have been calculated. According to ANEEL database /45/ there are 24 wind

power plants between 10 and 33 MW and between 32 and 96 MW. However six of those project are undergoing through CDM validation, resulting in N_{all} = 18.

From these 18 wind power plants only one has not received government incentives, such as PROINFA /63/, it was Eólica Prainha. However this wind farm started commercial operations in 1999, year in which there were different regulatory conditions as stated in the PDD for *Legal Regulations*. Such regulations are regarding the regulatory market during the 90's where the energy sector lack of incentive, regulatory framework and most of the companies were state-owned /67/. DNV also confirms that the proposed project is not part of any of the incentives and promotional polices such as PROINFA /68/.Therefore all 18 wind projects were classified as *different technologies* and N_{diff} equals to 18 /25/.

Finally, calculating F as $1-N_{diff}/N_{all}$;which equals to zero and $N_{all}-N_{diff}$ which equals to zero, it is possible to conclude that the development of wind farm REB Cassino Wind Energy Complex CDM Project Activity does not represent a common practice in Brazil.

In conclusion, it is DNV's opinion that the project is not a likely baseline scenario and that emission reductions from the project are thus additional.

4.7 Monitoring

The project applies the approved monitoring methodology ACM0002 "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*, version 12.3.0 /36/. The selected monitoring methodology is applicable for the project activity as it involves grid-connected renewable power generation using wind energy.

Monitoring of sustainable development indicators is not required by the DNA of Brazil. The monitoring plan will give opportunity for real measurements of achieved emission reductions. The environmental impacts are considered minor and will be monitored by the local environmental authority during the project lifetime.

The project monitoring plan is in compliance with the monitoring methodology ACM0002 version 12.3.0.

It is DNV's opinion, that the project participants are able to implement the monitoring plan.

4.7.1 Parameters determined ex-ante

The parameters determined *ex-ante* are the operating margin CO_2 emission factor in year y ($EF_{grid,OM-adj,y}$), the build margin CO_2 emission factor in year y ($EF_{grid,BM}$) and the combined margin CO_2 emission factor for grid connected power generation in year y ($EF_{grid,CM}$). Since the choice of the emission factor for the proposed project is *ex-ante*, it is not possible to use the national grid emission factors made available by the Brazilian DNA, which are calculated by the dispatch method /69/, as per "*Tool to calculate the emission factor for an electricity system*" version 2.2.1. Therefore the emission factors were calculated by the project participants and presented to DNV /5/.

Operating margin:

The *ex-ante* option was chosen for the calculation of the operating margin emission factor is according to the "*Tool to calculate the emission factor for an electricity system*" version 2.2.1, which determines to use a 3-year generation-weighted average, based on the most recent data available at the time of the PDD submission to DNV for validation. Since the PDD was published for global stakeholder process on 12 November 2011, the latest electricity generation data published by the National Operator System (ONS) for 2008, 2009 and 2010

years was available at the time of validation /6/. Therefore the project used the average of three years data for operating margin emission factor, resulting is 0.2609 tCO_2/MWh. The *ex-ante* operating margin emission factor was calculated with the simple adjusted method. Calculations were provided by the project participant in a spreadsheet /5/.

DNV has checked the calculations and generation of electricity raw data published by ONS for the calculations of the operating margin. The IPCC default values at the lower limit of uncertainty at a 95% confidence interval as per Chapter 1 of Volume 2 of IPCC 2006 Guidelines on National GHG Inventories /48/ were used for the CO_2 emission factor of fossil fuel type used in power unit m in year y ($EF_{CO2,m,i,y}$). The values chosen are different for each fuel type and power unit used in the calculation spreadsheet of the grid emission factor.

The net electricity generated by power plant/unit *m* or *k* in year *y* ($EG_{m,y}$ and $EG_{k,y}$) was obtained by the project participant directly with the National Operator System (ONS), which is the institution responsible for operating and managing the entire interconnected electric system in Brazil. Information is provided by the project participant to DNV in different daily reports obtained with ONS /6/.

Since the values from ONS are the daily energy generation for more than 170 energy production facilities, one year produces more than 62 000 records. Considering the simple adjusted operating margin method in which demands a period of three years of calculation, the total sample size is 186 000 data inputs to be cross-checked by DNV. DNV used a sampling procedure to cross-check the data in the emission factor calculation spreadsheet developed by the project participant against the raw data obtained in the ONS energy generation reports. Sampling procedure was based on the American Military Standard and tables for Inspection by Attributes (MIL-STD-105DE) Level II /49/, single sample for normal inspection. Since data size is higher than 1 200, the sample size should be 100. The sampling was randomly performed, for 100 numbers checked by DNV within the 3 years of data. No error was identified.

The average net energy conversion efficiency of power unit *m* or *k* in year *y* ($\eta_{m,y}$) was obtained by the project participant directly with the National Operator System (ONS), which is the institution responsible for operating and managing the entire interconnected electric system in Brazil. Information is provided by the project participant to DNV in different daily reports obtained with ONS /6/. The values were included in the cross-checking performed by DNV. No error was identified.

Build margin:

The *ex-ante* build margin emission factor was calculated by the project participant as per the "*Tool to calculate the emission factor for an electricity system*" version 2.2.1, with step 5 of the tool. Calculations were provided by the project participant in a spreadsheet. The resulting value is 0.1166 tCO_2/MWh and will be used for the entire crediting period.

The option 1 of the "*Tool to calculate the emission factor for an electricity system*" was chosen, i.e., the most recent information available at the time of the PDD submission to DNV for validation, the year 2010. The build margin emission factor was calculated as the weighted average emissions (in tCO_2e/MWh) of recent capacity additions of the system generation, where generation additions are defined as the greater (in MWh) of most recent 20% of existing plants (93 183 936 MWh) excluding the CDM project activities, or the 5 most recent plants (662 143 MWh). For the build margin, the 20% most recently installed plants generation has been chosen in terms of electricity generation. Following the tool, from the 20% most recently installed plants, the oldest plant which started to supply electricity to the

grid was in January 1998, hence, the power units supplying energy to the grid more than 10 years ago were excluded, and the CDM project activities were included back to the set of power units from the most recent until the generation reaches the 20% ($AEG_{SET\text{-}sample\text{-}CDM}$). The energy generation including the units with CDM project activities reaches 74 902 471 MWh ($AEG_{SET\text{-}sample\text{-}CDM}$). Since the value did not reach the original 20% (93 183 936 MWh), the power units that started to supply electricity to the grid more than 10 years ago were re-inserted in the set of plants again until it reaches the 20% (steps *e* and *f* of the tool, set called $SET_{sample\text{-}CDM>10yrs}$) resulting in an energy generation used for calculation as 94 545 640 MWh. DNV has checked the calculations and they are correct /5/.

The weighting is set to be 75% and 25% respectively, which are the default values stipulated for wind projects by "*Tool to calculate the emission factor for an electricity system*". Thus, the combined margin emission factor is 0.2248 tCO_2/MWh.

4.7.2 Parameters monitored ex-post

The parameter monitored *ex-post* is the net electricity generation from the proposed project activity. The net electricity dispatched will be measured through the metering equipment at the point of connection of electricity generation from the "REB Cassino Wind Energy Complex CDM Project Activity" to the Brazilian grid. In each point of connection, there will be a main and a back-up meter which technical specifications are defined by the National Operator System (ONS) /44/. The accuracy is 0.2% of maximum permissible error.

The net electricity generated by project activity and fed into the grid will be monitored continuously and recorded on a monthly basis. In addition, the electricity sales receipts will be provided for data quality control and cross check. All meters will be calibrated every two years by a qualified third party.

Data will be archived for 2 years following the end of the last crediting period or 2 years after the last issuance of CER for this project activity, whichever occurs later. The project owner will be responsible for the overall monitoring and reporting and will keep all the data and archived.

4.7.3 Management system and quality assurance

Detailed procedures have been elaborated in the PDD section B.7.2. The responsibility of monitoring parameters is clearly described, as well as frequency of reporting and calibration. Data quality control and the training program were presented.

These will be maintained and implemented to enable subsequent verification of emission reductions. The application of the monitoring methodology is transparent and DNV considers that the project participants are able to implement the monitoring plan.

4.8 Algorithms and/or formulae used to determine emission reductions

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

1) Baseline emissions: baseline emissions (BE_y in tCO_2) are the product of the baseline emissions factor (EF_y in tCO_2/MWh) times the electricity supplied by the project activity to the grid (EG_y in MWh).
2) Project emissions: there are no emissions from the project activity which is a renewable wind energy project.

3) Leakage: no leakage has to be considered for the proposed project activity and no equipment transfer is taking place.

The annual electricity delivered to the SIN is expected to be 244 579 MWh /2/ /16/, based on the calculations and results presented in the sections above the implementation of the project activity will result in an average *ex-ante* estimation of emission reduction conservatively calculated to be 54 978 tCO_2e per year for the selected crediting period.

All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

4.9 Environmental impacts

According to Brazilian environmental law (Federal Resolution CONAMA 001/86 /42/) a Simplified Environmental Report (RAS) is required to grant the installation license of elecrticity generation projects with more than 10 MW of installed capacity. As stated in the PDD, a Simplified Environmental Report (RAS) /9/ has been conducted according to Brazilian law and regulation /42/. The potential significant environmental impacts of the project have been sufficiently identified. No significant environmental impacts are expected from the project activity.

DNV was able to verify that all wind farms and transmission line were granted the Installation and Construction License for the issued by the State Foundation on Environmental Protection of the state of Rio Grande do Sul (FEPAM) which is valid for 2 years for the transmission line and 18 months for the wind farms /10/.

4.10 Comments by local stakeholders

Local stakeholders, such as the Municipal governments and City Councils, Federal and State Attorney, the environmental state and local agencies, the Brazilian forum of NGOs and local communities associations, were invited on 15 August 2011 to comment on the project - in accordance with the requirements of Resolution 7 (5 March 2008) of the Brazilian DNA - to visit the website http://sites.google.com/site/consultadcp/atividade-de-projeto-mdl-do-complexo-eolico-energetico-reb-cassino in order to access the project documentation which includes the CDM-PDD and a correspondent version in Portuguese.

DNV has checked all the invitation letters and the mail receipts /11/. No comments were received. DNV considers the local stakeholder consultation carried out adequately.

4.11 Comments by Parties, stakeholders and NGOs

The PDD, version 1 dated 25 August 2011 /1/, was made publicly available on the CDM website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period, from 27 August 2011 to 25 September 2011 /60/.

No comments were received.

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APPENDIX A

CDM 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. No participating Annex I Party is yet identified.
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	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.
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	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable

Requirement	Reference	Conclusion
		development.
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. The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK. The Brazilian designated national authority for the CDM is the Interministerial Commission on Global Climate Change.
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK. Brazil has ratified the Kyoto Protocol on 23 August 2002.
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK. No participating Annex I Party is yet identified.
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK. No participating Annex I Party is yet identified.
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

Requirement	Reference	Conclusion
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. DNV was able to verify that all wind farms and transmission line were granted the Preliminary License for the issued by the State Foundation on Environmental Protection of the state of Rio Grande do Sul (FEPAM) which is valid for 2 years for the transmission line and 18 months for the wind farms.
About stakeholder involvement		
13. 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
14. 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		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
17. 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
18. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and	CDM Modalities and Procedures §37f	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Requirement	Reference	Conclusion
relevant decisions of the COP/MOP.		

Table 2 Requirements checklist

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A General description of project activity						
A.1	**Title of the project activity (VVM para 55-57)**					
A.1.1	Does section A.1 of the PDD include a clearly identifiable project title, version number of the PDD and date of the PDD?	/1/	DR	☒ Clearly identifiable title of the project activity ☒ Version number of the PDD is included ☒ Date of the PDD is included.		OK
A.1.2	Is the PDD is in accordance with the applicable requirements for completing PDDs?	/1/	DR	☒ Yes *If no, list where the PDD is not in accordance:*		OK
A.2	**Description of the project activity (VVM para 58-64)**					
A.2.1	How was the design of the project assessed?	/1/	DR	*What type is the project?* ☐ Project in existing facility or utilizing existing equipment(s) ☐ Project is either a large scale project or a small scale project with emission reductions exceeding 15 000 tCO_2e per year. In this case, a site visit must be performed. ☐ Project is a bundled small scale project, with each project in the bundle with emission reductions not exceeding 15,000 tCO_2e per year. In such case the number of physical site visits may be based on sampling, if the sampling size is appropriately justified through statistical analysis. ☐ The project is an individual small scale		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			project activity with emission reductions not exceeding 15 000 tCO_2e per year. In this case, DOE may not conduct a physical site visit as appropriate. ☒ Greenfield project *How was the design of the project assessed?* ☐ Physical site inspection ☒ Reviewing available designs and feasibility studies The project is a newly built wind farm project; through the documents which the project participant provided, DNV could confirm the project design, construction, operation and monitoring plan and all baseline scenario information. The representatives of the project owner REB Empreendimentos e Administradora de Bens S.A. and project participants from Ecopart Assessoria em Negócios Empresariais Ltda. were interviewed on 13 and 14 October 2011 at Santander Bank office in São Paulo by DNV auditors Juliana Scalon and Luis Filipe Tavares, to resolve the issues identified during the desk review. During the desk review, DNV has assessed the relevant documents including PDD, receipts of delivery of mail to stakeholders, benchmark calculation, ER calculation spreadsheet, IRR spreadsheet, preliminary environmental licenses, basic project of the windparks, third party		

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				assessment of plant load factor. The construction of the project had not been initiated at the time of validation. Hence, DNV can justify that a physical site visit for this project was not required during the validation stage.		
A.2.2	If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/	DR	At the time of commencing of validation, the physical implementation of the project had not been started yet.		OK
A.2.3	If physical site visits were performed based on sampling (only applicable for bundled small scale projects, each with emission reductions not exceeding 15 000 tCO_2e per year), justify the sampling through a statistical analysis:	/1/	DR	It is not applicable for the proposed project since it is not a bundled small scale project.		OK
A.2.4	Is the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity?	/1/ /14/ /15/	DR	The REB Cassino Wind Energy Complex CDM Project Activity project is located in the municipality of Rio Grande, state of Rio Grande do Sul, in Brazil. The geographical coordinates of the proposed project activity are listed below as confirmed in documents from the study of wind analysis and energy production. The coordinates were not presented in decimal format. The project is a wind power project which involves installation and operation of 31 WECs (GAMMESA G97 2MW model). The installed capacity of each WEC unit is 2.0 MW thus, constituting a total installed capacity of 62 MW. Out of the 31 WECs, 10 WECs will be installed in each wind farm except for EOL Cassino II wind farm where 11 WECs will be installed. The wind turbines were manufactured by Gamesa, which is an industrial company,	~~CL 1~~	OK

<table>
<tr><th>Checklist Question</th><th>Ref</th><th>MoV</th><th>Assessment by DNV</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td></td><td></td><td></td><td>specialized in the development and manufacturing of large wind power equipment and related main components. It has been cross-checked by DNV through the manufacturer product specifications that the project design engineering uses the megawatt-class, three-bladed, variable speed wind turbines, which is deemed to reflect good practices.
The annual net electricity delivered to the National Interconnected System (SIN) is expected to be 239 621 MWh, corresponding to an average plant load factor of 44.1% sourced from the "Cassino Energy Production Assessment" prepared by Consultancy Garrad Hassen Ibérica S.L.U., an independent third party.
<table>
<tr><th>Project Name</th><th>Installed capacity (MW)</th><th>Assured Energy (MW)</th><th>EG_y (MWh/ year)</th><th>Capacity factor</th></tr>
<tr><td>EOL Cassino I</td><td>22</td><td>9.83</td><td>86 146</td><td>44.7 %</td></tr>
<tr><td>EOL Cassino II</td><td>20</td><td>8.68</td><td>76 037</td><td>43.4 %</td></tr>
<tr><td>EOL Cassino III</td><td>20</td><td>8.84</td><td>77 438</td><td>44.2 %</td></tr>
<tr><td>Total</td><td>62</td><td>27.35</td><td>239 621</td><td></td></tr>
</table>
The electricity generated by the project will be</td><td></td><td></td></tr>
</table>

<table>
<tr><th colspan="2">Checklist Question</th><th>Ref</th><th>MoV</th><th>Assessment by DNV</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td></td><td></td><td></td><td></td><td>linked to transformer substations and ultimately delivered to the SIN - which has part of its electricity generated by fossil fuel power plants - via transmission line as per indicated in the table below.
<table><tr><th>Project Name</th><th>Transformer (kV)</th><th>Transmission (kV)</th><th>Distance (km)</th></tr><tr><td>EOL Cassino I, II and III</td><td>32.5</td><td>72.5</td><td>24.5</td></tr></table>
Being a renewable electricity project, the project activity will generate greenhouse gas (GHG) emission reductions by avoiding the CO_2 emissions from the electricity generation by fossil fuel power projects.</td><td></td><td></td></tr>
<tr><td>A.2.5</td><td>Does the project activity involve alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?</td><td>/1/</td><td>DR</td><td>No, it is a greenfield project that will utilize new equipment. The project activity is the installation of a greenfield wind power plant that is connected to the national grid.</td><td></td><td>OK</td></tr>
<tr><td>A.2.6</td><td>Does the project design engineering reflect current good practices?</td><td>/1/</td><td>DR</td><td>It has been cross-checked by DNV through the manufacturer’s product specifications that the project design engineering uses the megawatt-class, three-bladed, variable speed wind turbines, which is deemed to reflect good practices.</td><td></td><td>OK</td></tr>
<tr><td>A.2.7</td><td>Would the technology result in a significantly better performance than any commonly used technologies in the host country? Is any transfer of technology from any Annex-I Party involved?</td><td>/1/
/25/</td><td>DR</td><td>DNV has confirmed that both the installed capacity and generation of wind power plants was only 0.99% of the total capacity and power generation of Brazil according to the ANEEL’s Bank of Information of Generation. DNV has confirmed that by November 2010, there were 56 wind farms operating in Brazil.</td><td></td><td>OK</td></tr>
</table>

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.3 Participation requirements (VVM para 51-54, 125-127)					
A.3.1 Do all participating Parties fulfil the participation requirements as follows:	/1/	DR	The involved party is Brazil as the host Party. There is no Annex I Party identified yet. The project participants are REB Empreendimentos e Administradora de Bens S.A. and Ecopart Assessoria em Negócios Empresariais Ltda.. The project participants are listed in Section A.3 of the PDD and the information is consistent with the contact details provided in Annex 1 of the PDD.		OK
	Brazil (host)				
a) Party has ratified the Kyoto Protocol	☒ Yes ☐ No				
b) Party has designated a Designated National Authority	☒ Yes ☐ No				
c) The assigned amount has been determined	☒ Yes ☐ No				
A.3.2 Do the letters of approval meet the following requirements?	/1/ /33/	DR	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development..		
	Brazil (host)				
a) LoA confirms that Party has ratified the Kyoto Protocol	☐ Yes ☐ No				
b) LoA confirms that participation is voluntary	☐ Yes ☐ No				
c) The LoA confirms that the project contributes to the sustainable development of the host country?	☐ Yes ☐ No				
d) The LoA refers to the precise project activity title in the PDD	☐ Yes ☐ No				
e) The LoA is unconditional with respect to (a) to (d) above	☐ Yes ☐ No				
f) The LoA is issued by the respective Party's DNA	☐ Yes ☐ No				

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	g) The LoA was received directly by the DNA or the PP h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic	☐ DNA ☐ PP				
A.3.3	Have all private/public project participants been authorized by an involved Party?	/1/	DR	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development..		
A.4	**Technical description of the project activity (VVM para 58-64)**					
A.4.1	Is the project's location clearly defined?	/1/ /15/	DR	The REB Cassino Wind Energy Complex CDM Project Activity project is located in the municipality of Rio Grande, state of Rio Grande do Sul, in Brazil. The coordinates were not presented in decimal format.	~~CL 1~~	OK
A.5	**Public funding of the project activity**					
A.5.1	In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided 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?	/1/ /30/	DR	The project does not involve public funding from Parties included in Annex I, 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. Project participant has provided evidence on the intention to receive funding from the National Bank for Economic Development (BNDES)		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B Application of a baseline and monitoring methodology						
B.1	**Methodology applied (VVM para 65-76)**					
B.1.1	Does the project apply an approved methodology and the correct and valid version thereof?	/1/ /36/	DR	The project correctly applies the approved baseline and monitoring methodology ACM0002 version 12.3.0.		OK
B.1.2	If applicable, has any specific guidance provided by the CDM EB in respect to the applied methodology been considered?	/1/ /37/ /38/	DR	Yes, the *Tool to calculate the emission factor for an electricity system* version 2.2.0 and the *Tool for the demonstration and assessment of additionality*", version 6.0.0, are also applicable.		OK
B.2	**Applicability of methodology (and tools) (VVM para 65-76)**					
B.2.1	How was it validated that project complies with the following applicability criteria: The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit??	/1/ /10/ /19/	DR	The project activity is the installation of a grid-connected and greenfield wind power plant which was verified through the preliminary environmental licences and basic project.		OK
B.2.2	How was it validated that project complies with the following applicability criteria: Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity are not eligible, since in this case the baseline may be the continued use of fossil fuels at the site?	/1/	DR	Being a wind farm project, it does not involve any switching from fossil fuel to renewable energy at the project site, which could be verified by DNV through the follow-up interview and the documentation presented to the environmental agency for requesting the installation licence.		OK
B.2.3	Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/ /45/	DR	The project is connected to the National Interconnected System (SIN), the electricity grid of Brazil, for which the geographical and system boundaries are clearly identified and information		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				on the characteristics of this grid is made available by National Electric Energy Agency (ANEEL). Therefore, it is deemed that the approved methodology ACM0002 version 12.3.0 is applicable to the project activity.		
B.3	**Project boundary (VVM para 78-80)**					
B.3.1	What are the project's system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/	DR	The spatial extent of the project boundary is correctly defined as the site of project activity and the system boundary for the grid electricity system is also correctly defined as all power plants connected physically to the National Interconnected System (SIN), the electricity grid of Brazil, to which the project will be connected. It is DNV's opinion that the project boundary of REB Cassino Wind Energy Complex CDM Project Activity is clearly defined in accordance with applicable guidelines of both ACM0002 and the "*Tool to calculate the emission factor for an electricity system*".		OK
B.3.2	Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/	DR	The only GHG source applied is the CO_2 generated by fossil fuel power plants connected to the National Interconnected System (SIN), the electricity grid of Brazil.		OK
B.3.3	Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/	DR	No, the project activity does not involve other emissions sources.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.4	**Baseline scenario determination (VVM para 81-88, 105-107)**					
B.4.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/ /36/	DR	The baseline is in accordance with ACM0002 (version 12.3.0) that electricity delivered to the grid by project activity would otherwise have been generated by the operation of grid-connected power plants in SIN 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*".		OK
B.4.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/ /36/	DR	Not applicable, as ACM0002 version 12.3.0 prescribes the baseline scenario.		OK
B.4.3	What is the baseline scenario?	/1/	DR	Refer to B.4.1.		OK
B.4.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/ /36/	DR	The baseline determination is in line with ACM0002, version 12.3.0.		OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /36/	DR	This is not applicable as the baseline is directly determined as per ACM0002, version 12.3.0.		OK
B.4.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /36/	DR	This is not applicable as the baseline is directly determined as per ACM0002, version 12.3.0.		OK
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /36/	DR	This is not applicable as the baseline is directly determined as per ACM0002, version 12.3.0		OK
B.4.8	Is the baseline determination adequately documented in the PDD? • All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced.	/1/ /36/	DR	The baseline determination has been adequately documented in the PDD: According to ACM0002 (version 12.3.0) baseline emissions are equal to power generated by the project delivered to the SIN, multiplied by the baseline emission factor. The grid emission factor		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
• 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. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity			is be determined *ex-ante* as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) emission coefficient for the project. Project participant has presented the emission factor calculations for OM, BM and CM. The Brazilian grid emission factor has been calculated by the project participant. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid. The weighting of the OM and BM is set to be 75% and 25% respectively, which are the default values stipulated for wind farm projects by "*Tool to calculate the emission factor for an electricity system*" (version 2.2.1). The approved baseline methodology has been correctly applied to identify a complete list of realistic and credible baseline scenarios, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity. As the project activity is a new grid-connected wind power plant, the baseline scenario is already defined by the methodology and properly stated in section B.4 of PDD.		
B.5 Additionality determination (VVM para 94-121)					
B.5.1 What approach/tool does the project use to assess additionality? Is this in line with the methodology?	/1/	DR	As required by ACM0002, the additionality of the proposed project is demonstrated by applying the "*Tool for the demonstration and assessment of additionality*" (version 6.0.0).		OK
B.5.2 Have the regulatory requirements correctly been taken into	/1/	DR	It is not clear in the PDD the regulatory	~~CL 2~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	account to evaluate the project activity and the alternatives?			requirements in which the proposed project activity complies to.		
B.5.3	Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Yes, as described below in the following items.		OK
B.5.4	What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/1/	DR	The additionality is based in investment analysis.		OK
	Prior consideration of CDM (VVM para 98-103)					
B.5.5	What is the evidence for serious consideration of CDM prior to the time of decision to proceed with the project activity?	/1/ /35/	DR	In accordance with the guidance from the CDM Executive Board, the proposed project is a newly built wind farm and the starting date of the project activity (9 August 2011) is after 2 August 2008. Thus, the notification letter for the proposed project was sent by the project participant to the Brazilian DNA and to the UNFCCC secretariat. Project participant did not present evidences on the notifications letters sent to Brazilian DNA and UNFCCC secretariat.	~~CL 3~~	OK
B.5.6	If the starting date is after 2 August 2008 and before the global stakeholder consultation, has the DNA and UNFCCC confirmed that the project participants have informed in writing of the project's intention to seek CDM status?	/1/	DR	Project participant did not present evidences on the notifications letters sent to Brazilian DNA and UNFCCC secretariat.	~~CL 3~~	OK
	Continuous efforts to secure CDM status (only to be completed if starting date is before 2 August 2008)					
B.5.7	What initiatives where taken by the project participants from the starting date of the project activity to the start of validation in parallel with the physical implementation of the project activity?	/1/	DR	It is not applicable to the proposed project activity as its starting date is after 2 August 2008.		OK
B.5.8	When did the construction of the project activity start?	/1/	DR	It is not applicable to the proposed project activity as its starting date is after 2 August 2008.		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.9	When was the project commissioned?	/1/	DR	It is not applicable to the proposed project activity as its starting date is after 2 August 2008.		OK
B.5.10	Does the timeline of the project confirm that continuous actions in parallel with the implementation were taken to secure CDM status?	/1/	DR	It is not applicable to the proposed project activity as its starting date is after 2 August 2008.		OK
	Investment analysis (VVM para 108-114)					
B.5.11	Does the project activity or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PDD?	/1/	DR	Yes, the proposed project activity generates financial and economic benefits through the sales of electricity other than CDM-related income		OK
B.5.12	Do any of the alternatives to the project activity involve investment? Is this reflected in the PDD?	/1/	DR	No, the other alternatives listed in the investment analysis do not involve investments.		OK
B.5.13	Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/1/	DR	Since the proposed project generates financial and economic benefits through the sales of electricity other than CDM-related income, a benchmark analysis is correctly selected as the analysis method.		OK
B.5.14	Is the benchmark/discount rate the latest available at the time of decision?	/1/	DR	The base year 2009 used in the calculation of the benchmark is not the last available at the time of decision of the project implementation.	~~CAR 3~~	OK
B.5.15	What is the financial indicator? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/1/	DR	The selected benchmark is a project benchmark calculated based in bond rates. The benchmark was calculated to be 9.28% by Ecopart Assessoria em Negócios Empresariais Ltda. based on paragraph 12 of the "Guidelines on the Assessment of Investment Analysis" version 5: "weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR". The WACC was calculated based in the Capital Asset Pricing Model (CAPM) as per the option 6 (a) presented in the additionality tool as follows:	~~CAR 2~~ ~~CL 4~~ ~~CL 5~~	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			$WACC = K_e * W_e + K_d * W_d$ Where: - K_e (return on equity) is calculated as 19.4% as per indicated below; - K_d (cost of debt financing) is calculated as 4.47% as per indicated below; - W_d (weight of debt) is 67.7%, which is the maximum financing granted by BNDES for wind farms for the period of August 2003 to August 2009; - W_e (weight of equity) is 32.3%, as the remaining of the W_d explained below; In accordance to the Guidelines on the Assessment of Investment Analysis, version 5 project participant shall demonstrate the choice of We and Wd. The calculation of the cost of equity K_e is given by the formula: $K_e = ((1+R_f)/(1+I)-1)+ ß * (R_m – R_f) +R_c$ Where: - R_f (risk free rate) is calculated as 4.08%, based on the US Treasury Yield for 30 years, on July 2009; - R_m (equity risk premium) is calculated as 6.58%, based on historical returns on stocks, bonds and bills;		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			- R_c (estimated country risk premium) is Brazilian country risk calculated as 2.85% based on a 5-year average; The reference of the source in the PDD as per the indicated in the WACC spreadsheet for Rf, Rm and Rf is incorrect. - β (Adjusted industry beta) is considered to be 2.11%, based on the market weighted average beta US power Co. re-levered to Brazilian leverage. Beta when relevered used the conditions of Presumed (or Assumed) Profit regime, which tax rate is zero when releveraging beta. Calculations and sources can be assessed in the WACC spreadsheet; - I (US expected inflation) is considered to be 1.39% based on a ten-year Treasury notes minus ten-year TIPS; Thus, K_e is calculated to be 19.4%. The calculation of the cost of debt K_d is given by the formula: $K_d = (1+(a+b+c)*(1-t)) / ((1+d) -1)$ Where: - a is the financial cost considered as 7.28% based on the long term interest rate given by the BNDES on a 5-year average range; - b is the spread calculated as 0.90% based on the BNDES spread, as per the credit policy for power generation activities; - c is the credit risk rate calculated as 1%		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				given by the BNDES. Project participant did not clarify or provide sufficient information on the use of 1% for the credit risk rate (c) according to the reference given in the PDD - d is the inflation forecast in Brazil, calculated as 4.5%; - t is the marginal tax rate assumed as zero since the project IRR calculation is based on assumed profit, according to Brazilian tax regulation, is not applicable. Thus, the cost of debt is calculated to be 4.47%. Thus, WACC is calculated to be 9.28%.		
B.5.16	Are the underlying assumptions appropriate, e.g. what is considered as waste in the baseline is considered to have zero value?	/1/	DR	The base year 2009 used in the calculation of the benchmark is not the last available at the time of decision of the project implementation.	~~CAR 3~~	OK
B.5.17	Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/ /50/	DR	Yes, depreciation is being taken into account. However the income taxes are based on the *Assumed Profit* and consequently depreciation will not impact in internal rate of return. As per *Assumed Profit* regulations taxes are calculated over the gross revenues and not gross profits of each year. The *Assumed Profit* is applicable to companies that have gross revenues below 48 million BRL per year.		OK
B.5.18	Is the time period of the investment analysis and operating time of the project realistic? Has salvage value been taken into account? Is working capital returned in the last year of operation?	/1/	DR	Project participant did not indicate in the PDD the period of contract defined in the auction and followed by the PPA. Depreciation is 5% per year therefore the salvage value will be zero at the end of the project activity.	~~CL 10~~	OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.19	When a feasibility study report or similar approved by the government is used as the basis for the investment analysis: Can it be confirmed that the values used in the PDD are fully consistent with the FSR and is the period of time between finalization of the FSR and the investment decision adequate?	/1/	DR	Not applicable.		OK
B.5.20	How was the amount of output (e.g. sales of electricity) assessed?	/1/ /19/ /41/	DR	☐ The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval ☒ The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company) ☐ Other approach. *Provide details on how the load factor was validated::* According to the PDD and Wind Analysis and Energy Production Assessment, it is expected that the proposed projects Cassino I, II and III will supply to SIN approximately 244 579 MWh at a plant load factor (PFL) of 44.7% for Cassino I, 43.4% for Cassino II and 44.2% for Cassino III. Annex 11 of CDM EB's 48th meeting report gives a guideline for validation of plant load factor for renewable energy. One option is to use plant load factor provided by a third party contracted by the project participants. The document of wind measurements and energy generation assessment has this purpose and hence, according to current CDM regulation, the	~~CAR 5~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			checking that the values are in line with the *Wind Analysis and Energy Production Assessment* should be considered sufficient for validation of plant load factor. This was the case for this project. Different plant load factors for each wind farm are stated in the basic project and the in the wind certification. Project participant is requested to evidence and define the most suitable plant load factor for the project. As per the study, the yearly data of wind resource used to estimate the electricity generation from the project was determined based on the on-site measured wind data from 1 December 2008 to 31 May 2011 and the historical meteorological data of 9 years (from November 2001 to December 2010), which was provided by Brazilian Meteorology National Institute (INMET station A-802 from Rio Grande municipality); the yearly data was then processed in professional software to calculate the annual theoretical power generation, from which the annual effective power generation was obtained through discount by considering factors such as air density, trailing stream, wind turbine efficiency etc. DNV concludes that the assumed annual power generation from the study of Garrad Hassen is appropriate and acceptable.		
B.5.21 How was the output price (e.g. electricity price) assessed? Were the data available and valid at the time of decision?	/1/ /47/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public	~~CL 10~~	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			announcements and annual financial reports related to the project and the project participants *Provide details on how the output price was validated:* In Brazil, the auctions for reserve energy follow the inverted auctions model, in which the smallest price charged by the producer in the bid wins the slot. In the 2nd Brazilian Auction of Renewable Energy - Auction nº 007/2010. The price offered for the three wind farms were BRL 136.59 for Cassino I, BRL 136.60 for Cassino II and BRL 136.58 for Cassino III. In this auction, the average price for the 6 662 slots was BRL 134.23 and present a range of BRL 130.43 to BRL 137.99. Project participant did not indicate in the PDD the period of contract defined in the auction and followed by the PPA.		
B.5.22 How were the investment costs assessed? Were the data available and valid at the time of decision?	/1/ /20/	DR	☒ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements, contracts and annual financial reports related to the project and the project participants *Provide details on how the investment costs were validated:* The total investment is estimated to be BRL 245 375 980.00. From this amount: • BRL 176 607 000 (72% of total investment) corresponds to the investment in the 31 wind towers (cost of BRL 5 697 000 each) and construction		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			services as per WEC manufacturer proposal since the project owner has not started construction yet, and does not have and EPC contract signed with Gamesa. • BRL 68 768 980 (28% of total investment) corresponds to voltage network, substation of elevation and transmission lines costs, civil works, as per the proposal from Gamesa to build the total windfarms; DNV concludes that the total investments for the proposed project are reasonable for wind power plants.		
B.5.23 How were the O&M costs assessed? Were the data available and valid at the time of decision?	/1/	DR	☒ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants *Provide details on how the O&M costs were validated:* The operation and maintenance cost for the proposed project includes O&M of the wind power plants, O&M of the transmission lines, transmission charges, insurance fees and land rent. The operation and maintenance costs where extracted from Gamesa proposal for the windfarms and is divided by the following items: • O&M costs for years 1 and 2 are included in the investment proposal and are not considered in the O&M expenses	~~CL 6~~ ~~CL 7~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				spreadsheet; • BRL 2 665 008 for years 3, 4 and 5; • BRL 3 030 219 for the remaining years. • BRL 592 100 yearly for maintenance of the windfarm supporting installations, constructed by Gamesa as well. Administration expenses of BRL 376 100 per year and operational fixed cost value of BRL 652 200 per year were not detailed and evidenced in the PDD and financial analysis spreadsheet. Transmission charges were calculated following regulatory decrees and vary on the production of energy, totalling around BRL 2 008 000.00 for the first year of full operation. Insurance fees were calculated as 0.50% of the total CAPEX, totalling around BRL 1 226 880.00 for the first year of full operation onwards. Project participant did not proper evidence the use of the value.		
B.5.24	Describe the assessment of the other input parameters. Were the data available and valid at the time of decision?	/1/ /22/ /56/ /57/ /58/ /59/	DR	☐ Cross-check against third-party or publicly available sources (e.g. invoices or price indices) ☐ Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants *Provide details on how other input parameters were validated:* Energy charges identified in the spreadsheet as ANEEL, ONS and CCEE were not detailed with units, calculations, source and values applied deemed evidenced. Land rent is 1.8% of the annual gross income, as per contract with land owners, totalling around	~~CL 8~~ ~~CL 9~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				BRL 589 137.00 for the first year of full operation. Project participant did not present the contracts evidencing the land O&M cost applied. Total annual estimate O&M represent 2.27% of the total investment. DNV could also 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. Values of 8% for the income rate basis and income tax of 25%, 0.65% for the PIS/PASEP tax, 3% for the Cofins tax and 12% of revenues basis and a 9% rate is applied as social contribution on net income (CSLL). In the presumed profit regime, depreciation has no impact in the project's internal rate of return. In this case, depreciation is not presented in the spreadsheet and tax rates are calculated over revenues and not over gross profits.		
B.5.25	Was the financial calculation spreadsheet verified and found to be correct?	/1/	DR	Detailed investment analysis and references were not presented for the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates.	~~CAR 4~~	OK
B.5.26	Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered?	/1/	DR	A sensitivity analysis has been carried out for parameters contributing more than 20% to the revenues or costs in order to check the robustness of the financial analysis. Reasonable variations of the electricity tariff, energy generation and capital expenditures were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen.		OK

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<table>
<tr><th colspan="2">Checklist Question</th><th>Ref</th><th>MoV</th><th>Assessment by DNV</th><th>Draft Concl.</th><th>Final Concl.</th></tr>
<tr><td></td><td></td><td></td><td></td><td>None of the parameters in the sensitivity analysis are considered to have any significant positive correlation.</td><td></td><td></td></tr>
<tr><td>B.5.27</td><td>Sensitivity analysis: Is the range of variations is reasonable in the project context?</td><td>/1/</td><td>DR</td><td>DNV was able to verify that the project IRR will reach the benchmark only if the above mentioned parameters change by values as mentioned below:
<table><tr><th>Key Indicators</th><th>Variation of the parameter indicator needed to reach the benchmark of 9.28%</th></tr><tr><td>Electricity tariff</td><td>+ 16.05%</td></tr><tr><td>Annual output delivered to the grid</td><td>+ 16.05%</td></tr><tr><td>Total investments</td><td>- 16.75%</td></tr></table>
1) Electricity tariff: To reach the 9.28% benchmark, power tariffs must increase by 16.05% above inflation, which is not likely to happen. In Brazil, the tariffs are strictly set by ANEEL in the time of the auction and cannot be changed during the period of the PPA, determined as 20 years in the rules of the auction.
2) Annual output delivered to the grid: According to the PDD and the study from Garrad Hassen Ibérica, the expected electricity generation is based on the 50% probability (P50). According to the Guidelines on the Assessment of Investment Analysis project participant shall explain and demonstrate the likelihood of generating more energy than expected and the necessary variation applied to the plant load</td><td>~~CAR 6~~
~~CAR 7~~</td><td>OK</td></tr>
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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				factor so the project IRR can reach the benchmark. **3) Investment costs:** According to the PDD, the project investment should not be subject to variations since the equipment purchase and wind farms construction will be done through an EPC contract with Gamesa. Project participant did not properly evidence the likelihood of the variation against public and available sources during the validation period.		
B.5.28	Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/	DR	Refer to B.5.27. According to the Guidelines on the Assessment of Investment Analysis project participant shall explain and demonstrate the likelihood of generating more energy than expected and the necessary variation applied to the plant load factor so the project IRR can reach the benchmark. According to the PDD, the project investment should not be subject to variations since the equipment purchase and wind farms construction will be done through an EPC contract with Gamesa. Project participant did not properly evidence the likelihood of the variation against public and available sources during the validation period.	~~CAR 6~~ ~~CAR 7~~	OK
	Barrier analysis (VVM para 115-118)					
B.5.29	Are the barriers identified complimentary to a potential investment analysis? Does the barrier have a clear impact on the financial returns so that it can be assessed in an investment analysis? Each barrier is discussed separately.	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.30	How were the investment barriers assessed to be real? Are the investment barriers substantiated by a source independent of the project participants?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.31	How does CDM alleviate the investment barriers?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.32	Is the project activity prevented by the investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.33	How were the technological barriers assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.34	How does CDM alleviate the technological barriers?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.35	Is the project activity prevented by the technological barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.36	How were the barriers due to prevailing practise assessed to be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.37	How does CDM alleviate the barriers due to prevailing practise?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.38	Is the project activity prevented by the barriers due to prevailing practise and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.39	How were the other barriers assessed to be real? Are the other barriers substantiated by a source independent of the project participants?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.40	How does CDM alleviate the other barriers?	/1/	DR	Not applicable as barrier analysis was not applied		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				for the proposed project.		
B.5.41	Is the project activity prevented by the other barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
	Common practice analysis (VVM para 119-121)					
B.5.42	What is the geographical scope of the common practice analysis? Is this justified?	/1/ /37/ /45/	DR	According to the EB *"Tool for the demonstration and assessment of additionality"* the common practice analysis is carried out on similar projects which are considered to be in the same region, 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. The geographical scope for common practice analysis was determined to be Brazil, since all power plants connected to the national grid have been analysed. DNV was able to confirm that despite of the available high technical potential for wind energy utilization in Brazil, about 1% of electricity in Brazil is generated from wind farms. By the November 2010, there were 56 operating wind plants and 14 wind plants under construction. In that time, 44 out of the 56 (79%) operating wind plants in Brazil had PROINFA (national program started in 2002 to foster the share of alternative energy) incentives. Three of the 12 non-PROINFA operating plants were being developed as CDM projects. All 9 non-CDM and non-PROINFA wind plants are not similar to the proposed project since they are with installed capacity much lower than 62MW	~~CAR 8~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				(project's total installed capacity). Project participant did not used the last available version of the "Tool for the demonstration and assessment of additionality" in order to support the common practise analysis provided in the PDD. Moreover, project participants are requested to clarify which are the items i to iv presented in Sub-Step 4b of the PDD.		
B.5.43	What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has this been justified?	/1/	DR	Refer to B.5.42.	~~CAR 8~~	OK
B.5.44	What is the data source(s) used for the common practice analysis?	/1/	DR	Refer to B.5.42.	~~CAR 8~~	OK
B.5.45	How many similar non-CDM-projects exist in the region within the scope?	/1/	DR	Refer to B.5.42.	~~CAR 8~~	OK
B.5.46	How were possible essential distinctions between the project activity and similar activities assessed?	/1/	DR	Refer to B.5.42.	~~CAR 8~~	OK
B.5.47	What is the conclusion of the common practice analysis?	/1/	DR	Refer to B.5.42.	~~CAR 8~~	OK
Conclusion						
B.5.48	What is the conclusion with regard to the additionality of the project activity?	/1/	DR	Pending the response of the outstanding issues raised in order to conclude on project's additionality.	~~CAR 2~~ ~~CAR 3~~ ~~CAR 4~~ ~~CAR 5~~ ~~CAR 6~~ ~~CAR 7~~ ~~CAR 8~~ ~~CL 2~~ ~~CL 3~~ ~~CL 4~~ ~~CL 5~~	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
					~~CL 6~~ ~~CL 7~~ ~~CL 8~~ ~~CL 9~~	
B.6	**Calculations of GHG emission reductions**					
	Data and parameters that are available at validation and that are not monitored (VVM para 199-203)					
B.6.1	How was the $EF_{grid,BM}$ available at validation verified?	/1/	DR	It is not clear which was the emission factor (build margin, operating margin and combined margin) used to calculate the GHG emission reductions. Consequently, parameters monitored ex-ante and ex-post should be *properly* addressed *in* the PDD at section B.6.	~~CAR 9~~	OK
B.6.2	How was the $EF_{grid,OM}$ available at validation verified?	/1/	DR	See B.6.1.	~~CAR 9~~	OK
B.6.3	How was the $EF_{grid,CM}$ available at validation verified?	/1/	DR	See B.6.1.	~~CAR 9~~	OK
	Baseline emissions (VVM para 89-93)					
B.6.4	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	See B.6.1.	~~CAR 9~~	OK
B.6.5	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Refer to B.6.4.	~~CAR 9~~	OK
B.6.6	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	Refer to B.6.4.	~~CAR 9~~	OK
	Project emissions (VVM para 89-93)					
B.6.7	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	There are no emissions from the project activity which is a renewable wind energy project.		OK
B.6.8	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	There are no emissions from the project activity which is a renewable wind energy project.		OK
B.6.9	Are uncertainties in the project emission estimates properly	/1/	DR	There are no emissions from the project activity		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	addressed?			which is a renewable wind energy project.		
	Leakage (VVM para 89-93)					
B.6.10	Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	No leakage has to be considered for the proposed project activity		OK
B.6.11	Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	No leakage has to be considered for the proposed project activity		OK
B.6.12	Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	No leakage has to be considered for the proposed project activity		OK
	Emission Reductions (VVM para 89-93)					
B.6.13	Algorithms and/or formulae used to determine emission reductions: • All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.	/1/	DR	It is not clear which was the emission factor (build margin, operating margin and combined margin) used to calculate the GHG emission reductions. Consequently, parameters monitored ex-ante and ex-post should be properly addressed in the PDD at section B.6.	~~CAR 9~~	OK
B.7	**Monitoring plan (VVM para 122-124)**					
	Data and parameters monitored					
B.7.1	Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/	DR	The project monitoring plan is in compliance with the monitoring methodology ACM0002 (version 12.3.0).		OK
B.7.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/ /44/	DR	The parameter monitored *ex-post* is the net electricity generation from the proposed project activity. The net electricity dispatched will be	~~CAR 10~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				measured through the metering equipment at the point of connection of electricity generation from the "REB Cassino Wind Energy Complex CDM Project Activity" to the Brazilian grid. The power exported to and imported from the SIN will be monitored continuously and recorded on a monthly basis. In addition, the electricity sales receipts will be provided for data quality control and cross check. All meters will be calibrated every two years by a qualified third party according to the national and industrial regulations "Grid Procedures" from the ONS Module 12, Sub-module 12.3. The PDD describes in a general way the equipment to be used for monitoring purposes. Additional relevant technical details about the type of electricity meter and accuracy were not included in appropriate sections of the PDD and the monitoring plan did not detail the information about the requirements for maintenance and calibration of the measurement equipment.		
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	Refer to B.7.2.	~~CAR 10~~	OK
B.7.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR	Refer to B.7.2.	~~CAR 10~~	OK
B.7.5	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR	Refer to B.7.2.	~~CAR 10~~	OK
B.7.6	Is the monitoring frequency adequate for all monitoring	/1/	DR	Refer to B.7.2.	~~CAR 10~~	OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	parameters? Describe each parameter.					
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	Refer to B.7.2.	~~CAR 10~~	OK
	Ability of project participants to implement monitoring plan					
B.7.8	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/	DR	The project's monitoring plan does not include detailed and sufficient information regarding data and parameters to be monitored, compilation of the monitored data and dealing with errors, QA/QC procedures, training plan, calibration and record keeping.	~~CAR 11~~	OK
B.7.9	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/1/		Refer to B.7.8.	~~CAR 11~~	OK
B.7.10	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/	DR	Refer to B.7.8.	~~CAR 11~~	OK
B.7.11	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	Refer to B.7.8.	~~CAR 11~~	OK
	Monitoring of sustainable development indicators/ environmental impacts					
B.7.12	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR	Monitoring of sustainable development indicators is not required by the DNA of Brazil. The monitoring plan will give opportunity for real measurements of achieved emission reductions. The environmental impacts are considered minor and will be monitored by the local environmental		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				authority during the project lifetime.		
B.7.13	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	Refer to B.7.12.		OK
B.7.14	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR	Refer to B.7.12.		OK
C	**Duration of the project activity / crediting period**					
C.1.1	**Start date of project activity (VVM para 99-100, 104)**					
C.1.2	How has the starting date of the project activity been determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/1/ /35/	DR	The starting date of the project activity was defined as 9 August 2011, which represents the signature of the Power Purchase Agreement, in which the three electricity generation facilities EOL REb Cassino I, II and III had its energy contracted. The starting date of a project activity, as defined in *Glossary of CDM terms*, should be the earliest date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. Project participant did not proper evidence the starting date stated in the PDD.	~~CAR 1~~	OK
C.1.3	Is the stated expected operational lifetime of the project activity reasonable?	/1/ /14/ /17/ /61/	DR	The expected operational lifetime of the project activity is 20 years derived from the lifetime of the wind turbine Gamesa G-97. The specific wind turbine is certified under the IEC system for conformity testing and certification of wind turbines where it is demonstrated that the turbine can reach an operational lifetime of 20 years.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
C.1.4	Is the start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/1/	DR	A 10-year fixed crediting period has been chosen for the project, starting on 1 January 2013 or the registration date, whichever is later. The chosen crediting starting date is deemed to be reasonable. The emission reductions are estimated to be 54 978 tCO_2e per year over the ten-year fixed crediting period.		OK
D	**Environmental Impacts (VVM para 131-133)**					
D.1.1	Are there any host country requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? Does the approval contain any conditions that need monitoring?	/1/	DR	According to Brazilian environmental law (Federal Resolution CONAMA 001/86) a Simplified Environmental Report (RAS) is required to grant the installation license. As stated in the PDD, a Simplified Environmental Report (RAS) has been conducted according to Brazilian law and regulation. The potential significant environmental impacts of the project have been sufficiently identified. No significant environmental impacts are expected from the project activity. DNV was able to verify that all wind farms and transmission line were granted the Preliminary License for the issued by the State Foundation on Environmental Protection of the state of Rio Grande do Sul (FEPAM) which is valid for 2 years for the transmission line and 18 months for the wind farms.		OK
D.1.2	Does the project comply with environmental legislation in the host country?	/1/	DR	Refer to D.1.1.		OK
D.1.3	Will the project create any adverse environmental effects?	/1/	DR	Refer to D.1.1.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
D.1.4	Have identified environmental impacts been addressed in the project design?	/1/	DR	Refer to D.1.1.		OK
D.1.5	Are transboundary environmental impacts considered in the analysis?			Refer to D.1.1.		OK
E	**Stakeholder Comments (VVM para 128-130)**					
E.1.1	Have relevant stakeholders been consulted?	/1/	DR	Local stakeholders, such as the Municipal governments and City Councils, Federal and State Attorney, the environmental state and local agencies, the Brazilian forum of NGOs and local communities associations, were invited on 15 August 2011 to comment on the project - in accordance with the requirements of Resolution 7 (5 March 2008) of the Brazilian DNA - to visit the website http://sites.google.com/site/consultadcp/atividade-de-projeto-mdl-do-complexo-eolico-energetico-reb-cassino in order to access the project documentation which includes the CDM-PDD and a correspondent version in Portuguese. DNV has checked all the invitation letters and the mail receipts. No comments have been received. DNV considers the local stakeholder consultation carried out adequately.		OK
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Refer to E.1.1.		OK
E.1.3	If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Refer to E.1.1.		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E.1.4	Is a summary of the stakeholder comments received provided?	/1/	DR	No comments have been received.		OK
E.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	No comments have been received.		OK

Table 3 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 1 The starting date of a project activity, as defined in *Glossary of CDM terms*, should be the earliest date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. Project participant did not proper evidence the starting date stated in the PDD.	C.1.2	The project starting date as well as the timeline presented at Sections B.5 and C.1.1 was revised. Considering the revised timeline of the proposed project activity, the identified project starting date corresponds to the Power Purchase Agreement signature, which occurred on August, 09th 2011. Please, refer to third version of the revised PDD.	DNV has assessed the documents presented by the project participant and the revised PDD version 3 dated 13 April 2012 /1/. The starting date of the project activity was defined as 9 August 2011, which is the date when the Power Purchase Agreement, in which the three electricity generation facilities EOL REB Cassino I, II and III had their energy contracted. The main equipment contracts were signed on 15 February 2012 /21/ and the project starting date of construction is 1 April 2012 /1/. DNV assessed the signed PPAs between the project participants REB Cassino Wind Energy Complex CDM Project Activity and the power utilities /24/, and was able to confirm that this is the earliest commitment to financial expenditure as is obliges the PP to sell the amount of electricity accorded in the auction /47/. There were no signed contracts prior to 9 August 2011. The penalty of not providing this electricity to the grid equals the expected revenues of the project. Therefore this CAR is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CAR 2 In accordance to the *Guidelines on the Assessment of Investment Analysis*, version 5 project participant shall demonstrate the choice of W_e and W_d.	B.5.15 B.5.48	The "*Guidelines on the assessment of investment analysis*" states that: "*If the benchmark is based on parameters that are standard in the market, then the typical debt/equity finance structure observed in the sector of the country should be used"*, the applied values for We and Wd are 32.3% and 67.7%, respectively, considered that these numbers derive from the typical leverage of similar projects in the sector in Brazil, based on the rules for available long term loans from Brazilian Development Bank (*BNDES* - from the Portuguese *Banco Nacional de Desenvolvimento Econômico e Social*). Also, paragraph 18 of the *Guidelines* affirms that "*if the financial structure is not readable available 50% debt and 50% equity should be assumed as a default",* which is not the case of this CDM project activity.	DNV assessed additional documentation presented by the project participant /31/ and confirmed that the choice of We and Wd as 32.3% and 67.7% is in line with the "*Guidelines on the Assessment of Investment Analysis"* and the local practices. Therefore this CAR is closed
CAR 3 The base year 2009 used in the calculation of the benchmark is not the last available at the time of decision of the project implementation.	B.5.14 B.5.16 B.5.48	Considering that the project starting date is considered the power Purchase Agreement signature (PPA) which occurred on August, 09th 2011, project participants revised the WACC calculation considering the most recent data available, *i.e.*, July, 2011. Please, refer to the revised version of	DNV has assessed the documents presented by the project participant and the revised PDD version 3 dated 13 April 2012 /1/ and WACC spreadsheet /3/. As the project start date is 9 August 2011, therefore data based on July 2011 is being correctly used to calculate the benchmark.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		the WACC spreadsheet and to the PDD attached to this response.	Therefore this CAR is closed.
CAR 4 Detailed investment analysis and references were not presented for the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates.	B.5.25 B.5.48	Project participants revised the investment analysis and included costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates. Please, refer to the revised version of the PDD. The investment and operation and maintenance costs considered are from Gamesa proposal. The insurance is considered an estimative adopted by project participants, since it was not hired yet. The value applied is based on project participant experience and on the market practice at the sector. Please, find attached the email sent by Santander Group confirming that the Insurance was not hired yet and can be considered as being of 0.50% of the total CAPEX of the wind power plants. The TFSEE data was updated considering the base year of 2011. Please, refer to the revised version of *REB Cassino* cash flow and to the file "*TFSEE_2011.pdf*" to access the new value applied.	DNV has assessed the documents presented by the project participant and the revised PDD version 3 dated 13 April 2012 /1/ and the financial analysis /4/. Sufficient references were presented for equipment, insurance, project installation, O&M, prices, taxes, resolution and estimates /20//22//23//24//29/. A declaration from Santander was presented with the insurance calculation /27/. Also the tax TFSEE was updated and now reflects the price for the base year /28/. DNV cross-checked the values presented and confirmed that values are appropriate for the time of the investment decision with support of an independent financial expert /62/ and is thus correct and reasonable for wind power plants. Therefore this CAR is closed.
CAR 5	B.5.20	Regarding the values of the plant load	DNV has assessed the documents

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
Different plant load factors for each wind farm are stated in the basic project and the in the wind certification. Project participant is requested to evidence and define the most suitable plant load factor for the project.	B.5.48	factor and the net power output of the wind power plants EOL REB Cassino I, EOL REB Cassino II and EOL REB Cassino III presented in the Basic Project, it corresponds to the wind power plants previous configuration and is in accordance with the wind certification performed by Garrad Hassen on June, 13th 2011. However, as it is stated in the PDD, the wind power plants were optimized and an alteration in its configuration occurred. The new wind certification, also performed by Garrad Hassen, states the following plant load factor and output energy for the wind power plants: EOL REB Cassino I: 44.4% and 85.71 GWh/yr; EOL REB Cassino II: 42.8% and 75.1 GWh/yr; EOL REB Cassino III: 43.6% and 84.1 GWh/yr. Considering this difference raised during the documents checking, Project Participants clarify that the plant load factor as well as the net power output that will be applied in the calculation of emission reductions, are those presented in the most recent wind certification conducted by Garrad Hassen.	presented by the project participant and the revised PDD version 3 dated 13 April 2012 /1/ and Certificates of Wind Measurements and of Production of Energy /16/, it is expected that the proposed project will supply to SIN approximately 244 579 MWh at a plant load factor (PFL) of 44.4% for Cassino I, 42.8% for Cassino II and 43.6% for Cassino III The presented values are in line with the revised wind certification and are acceptable. Therefore this CAR is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		Also, as stated by the ACM002 methodology, the net electricity ($EG_{facility,y}$) will be monitored yearly by Project Participants and crosschecked to the reports issued by the local power utility and/or CCEE – Câmara de Comercialização de Energia Elétrica, a Brazilian.	
CAR 6 According to the *Guidelines on the Assessment of Investment Analysis* project participant shall explain and demonstrate the likelihood of generating more energy than expected and the necessary variation applied to the plant load factor so the project IRR can reach the benchmark.	B.5.27 B.5.28 B.5.48	P50 is the annual energy production level that is reached with a probability of 50%[1]. It means that the probability of reaching a higher or lower annual energy production is 50:50[2]. Furthermore, the Wind Certification (*page 22*) states that the value calculated for the 50% probability is the best estimative of an average long term net power output production that can be expected for the wind power plants. Even considering long periods, there is a hypothesis of 50% that the average net power output be lower than the calculated value. Also, as observed in the Wind Certification, the values of the net power output considering the probabilities P50 is higher than the ones	The revised PDD version 3 dated 13 April 2012 /1/ was assessed and DNV confirmed the inclusion of the amount of electricity generated in the sensibility analysis. Electricity generation should increase 25.70% so the project IRR could achieve the benchmark. According to the PDD and the study from Garrad Hassen Ibérica /15/, the expected electricity generation is based on the 50% probability (P50), which is deemed conservative. Despite that, According to "Renewable Sources of Energy in Brazil" /56/, the average plant load factor of a wind park in Brazil is 40%. Considering that the annual output calculations for the proposed project were carried out using professional software designed for wind energy and

[1] Green Rhino Energy. Available at: http://www.greenrhinoenergy.com/finance/modelling/revenue_uncertainties.php
[2] What does Exceedance Probabiities P90-P75-P50 Mean? Available at: http://www.dewi.de/dewi/fileadmin/pdf/publications/Magazin_28/07.pdf

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		estimated for P75 and P90. Therefore, the P50 estimative is the most conservative value that could be applied in order to perform the additionality analysis of the project activity. Please, refer to Section B.5 of the revised version of the PDD to obtain detailed information.	that the output was maximized by considering air density corrections, turbine efficiency, planned maintenance, contaminated rotors, and auxiliary power use, it is unlikely that the electricity delivered to the grid will suffer the additional increase necessary to reach benchmark. Therefore this CAR is closed.
CAR 7 According to the PDD, the project investment should not be subject to variations since the equipment purchase and wind farms construction will be done through an EPC contract with Gamesa. Project participant did not properly evidence the likelihood of the variation against public and available sources during the validation period.	B.5.27 B.5.28 B.5.48	According to the proposal sent by GAMESA, the mentioned prices are subject to the Amplified Consumers Price Index (in a free translation from the Portuguese *Índice Nacional de Preços ao Consumidor Amplo – IPCA*) from July, 1st 2011. Therefore, the investment price defined at the proposal would not decrease which would compromise the project additionality. To obtain more details, please, refer to the file "*Proposta Gamesa_2011.pdf*".	DNV has assessed the documents provided by the project participant and the Gamesa proposal /20/ is clearly stating the price correction index as the IPCA, based on 1 July 2011. DNV considers this information sufficient. Therefore this CAR is closed.
CAR 8 Project participant did not used the last available version of the "*Tool for the demonstration and assessment of additionality*" in order to support the common practise analysis provided in the PDD. Moreover, project participants are requested to clarify which are the items *i* to *iv* presented in Sub-	B.5.42 B.5.43 B.5.44 B.5.45 B.5.46 B.5.47 B.5.48	This section of the PDD was revised following the "*Tool for the demonstration and assessment of additionality*", version 6.0.0 which included the requirements established by the "*Guidelines on Common Practice"*, recently approved by the board (Annex 12, EB 63). In addition, the ANEEL website was consulted in	In the revised PDD version 3 dated 13 April 2012 /1/, the last available version of the "*Tool for the demonstration and assessment of additionality*" is being correctly applied in the common practice analysis. Also items *i* to *iv* presented in Sub-Step 4b were removed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
Step 4b of the PDD.		order to update the wind power plants in operation in Brazil. Please refer to the revised version of the PDD and find attached the documents from ANEEL website used to support the analysis "*Prática Comum Revisada.rar*".	Therefore this CAR is closed.
CAR 9 It is not clear which was the emission factor (build margin, operating margin and combined margin) used to calculate the GHG emission reductions. Consequently, parameters monitored *ex-ante* and *ex-post* should be properly addressed in the PDD at section B.6.	B.6.1 B.6.2 B.6.3 B.6.4 B.6.5 B.6.6 B.6.13	Project Participants have opted to use the ex-ante approach for the calculation of the Brazilian grid emission factor ($EF_{grid,CM,y}$). Also, a correction was conducted in the second version of the spreadsheet to the one previously sent to the DOE and it corresponds to the alterations in the procedures provided by the tool to identify the sample group of power units *m* used to calculate the build margin emission factor. The result obtained is slightly different from the previous one and was updated. Please, refer to section B.6 of the revised version of the PDD in order to verify that the *ex-ante* approach was chosen and the correct build margin emission factor ($EF_{grid,BM,y}$) was applied and the revised version of the CERs spreadsheet considering the updated build margin value. Project participants provided the revised version of the CERs spreadsheet.	DNV assessed the revised PDD version 3 dated 13 April 2012 /1/ containing sufficient information on the selected ex-ante approach for the emission factors. The revised CER spreadsheet was presented /2/. Sections B.6.2 and B.7.1 are properly presenting the parameters monitored *ex-ante* and *ex-post*. Therefore this CAR is closed.
CAR 10	B.7.2	No contract for monitoring equipments	DNV assessed the revised PDD version

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
The PDD describes in a general way the equipment to be used for monitoring purposes. Additional relevant technical details about the type of electricity meter and accuracy were not included in appropriate sections of the PDD and the monitoring plan did not detail the information about the requirements for maintenance and calibration of the measurement equipment.	B.7.3 B.7.4 B.7.5 B.7.6 B.7.7	supply has been signed. Therefore, the supplier of electricity meter to be installed is not defined yet. Nevertheless, it shall meet the requirements established by *ONS*. The relevant procedures set by the regulatory agencies were included at section B.7.2 in the second version of the PDD attached to this response.	3 dated 13 April 2012 /1/. The net electricity dispatched will be measured through the metering equipment at the point of connection of electricity generation from the "REB Cassino Wind Energy Complex CDM Project Activity" to the Brazilian grid. In each point of connection, there will be a main and a back-up meter which technical specifications are defined by the National Operator System (ONS) /44/. The accuracy is 0.2% of maximum permissible error. The net electricity generated by project activity and fed into the grid will be monitored continuously and recorded on a monthly basis. In addition, the electricity sales receipts will be provided for data quality control and cross check. All meters will be calibrated every two years by a qualified third party. Data will be archived for 2 years following the end of the last crediting period or 2 years after the last issuance of CER for this project activity, whichever occurs later. The project owner will be responsible for the overall monitoring and reporting and will keep all the data and archived.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			Therefore this CAR is closed.
CAR 11 The project's monitoring plan does not include detailed and sufficient information regarding data and parameters to be monitored, compilation of the monitored data and dealing with errors, QA/QC procedures, training plan, calibration and record keeping**.**	B.7.8 B.7.9 B.7.10 B.7.11	The only parameter to be monitored is electricity dispatched to the grid. Project Participants understand that the procedures established by the regulatory agencies already conforms the CDM requirements regarding monitoring of electricity. Nevertheless, the monitoring plan was further elaborated to present information regarding the QA/QC procedures such as cross check of information supplied by Project Participants with official data provided by CCEE. Please, refer to section B.7.1 and B.7.2 of the revised version of the PDD in order to obtain the fully information. The monitored data will be kept in electronic format during and at least two years after the end of the crediting period. The information was included at Section B.7.2 of the PDD. Please, refer to the revised version of the PDD.	DNV assessed the revised PDD version 3 dated 13 April 2012 /1/ and section B.7.1 and B.7.2 were updated with QA/QC procedures, monitoring responsibilities and calibration. PP clearly declares in section B.7.2 that data will be kept for two years after the end of the crediting period or the last issuance of CERs. Therefore this CAR is closed.
CAR 12 The project participant did not present evidenced calculations that project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity		Project participants clarify that there will be one diesel generator located at REB Cassino substation, according to the description in the Executive Project (from the Portuguese Memorial do Projeto Básico). In order to demonstrate that emissions from the	DNV has assessed the estimations and calculations of project emissions due to diesel generators located at the project site /32/. Calculations have demonstrated that the expected emissions are less than 1% of total project emission reductions (2

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by ACM0002, version 12.3.0, as per *Validation and Verification Manual*, version 1.2, paragraph 77.		operation of the diesel generator will not surpass 1% of the overall expected average annual emission reductions, it was considered the maximum annual electricity generated by the generators according to the nominal power of the generator determined in the Executive Project which is 100 kW. The total emission related to the diesel generator is as of 234 tCO_2e per year which corresponds to 0.43% of the overall expected average annual emissions reductions. Therefore, it won´t be taken into account and the use of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" remains not applicable for this project activity. The Executive Project as well as the spreadsheet with the calculation is attached to this response.	tCO_2e/year). Moreover, DNV could verify that in order to reach project emissions at 1% of project emission reductions, the diesel consumption would have to be 250% higher. Therefore this CAR is closed.
CL 1 The coordinates were not presented in decimal format.	A.2.4 A.4.1	The geographical coordinates as it is stated in the Wind Certification was converted from UTM format to decimal degrees. Please, find below the location of each aerogenerator of the wind power plants *EOL REB Cassino I* (CI), *EOL REB Cassino II* (CII) and *EOL REB Cassino III* (CIII).	DNV assessed the revised PDD DNV assessed the revised PDD version 3 dated 13 April 2012 /1/ and confirmed that the geographical coordinates are being presented in decimal format. The geographical coordinates of each turbine of the proposed project activity are listed below as confirmed in documents from the study of wind

<table>
<tr><th>Corrective action and/ or clarification requests</th><th>Reference to Table 2</th><th>Response by project participants</th><th>Validation conclusion</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td colspan="3">Geographic Coordinates in decimal degrees of the aero generators location</td></tr>
<tr><td colspan="3">EOL REB Cassino I</td></tr>
<tr><td>Aero generator</td><td>Longitude (West)</td><td>Latitude (South)</td></tr>
<tr><td>CI-1</td><td>52.2031</td><td>32.2187</td></tr>
<tr><td>CI-2</td><td>52.2146</td><td>32.2241</td></tr>
<tr><td>CI-3</td><td>52.2190</td><td>32.2278</td></tr>
<tr><td>CI-4</td><td>52.2267</td><td>32.2305</td></tr>
<tr><td>CI-5</td><td>52.2099</td><td>32.2144</td></tr>
<tr><td>CI-6</td><td>52.2230</td><td>32.2207</td></tr>
<tr><td>CI-7</td><td>52.2330</td><td>32.2240</td></tr>
<tr><td>CI-8</td><td>52.2114</td><td>32.2188</td></tr>
<tr><td>CI-9</td><td>52.2235</td><td>32.2247</td></tr>
<tr><td>CI-10</td><td>52.2289</td><td>32.2203</td></tr>
<tr><td>CI-11</td><td>52.2211</td><td>32.2364</td></tr>
<tr><td colspan="3">EOL REB Cassino II</td></tr>
<tr><td>Aero generator</td><td>Longitude (West)</td><td>Latitude (South)</td></tr>
</table>
</td><td>analysis and energy production /16/. Therefore this CL is closed.</td></tr>
</table>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants			Validation conclusion
		CII-1	52.2112	32.2119	
		CII-2	52.2190	32.2161	
		CII-3	52.2183	32.2200	
		CII-4	52.2301	32.2269	
		CII-5	52.2099	32.2144	
		CII-6	52.2230	32.2207	
		CII-7	52.2330	32.2240	
		CII-8	52.2114	32.2189	
		CII-9	52.2235	32.2247	
		CII-10	52.2289	32.2203	
		EOL REB Cassino III			
		Aero generator	***Longitude (West)***	***Latitude (South)***	
		CIII-1	52.2219	32.2004	
		CIII-2	52.2282	32.2051	
		CIII-3	52.2328	32.2096	
		CIII-4	52.2199	32.2037	
		CIII-5	52.2247	32.2082	
		CIII-6	52.2363	32.2153	
		CIII-7	52.2177	32.2068	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		CIII-8 | 52.2225 | 32.2106 CIII-9 | 52.2382 | 32.2182 CIII-10 | 52.2155 | 32.2089 CIII-11 | 52.2293 | 32.2148	
CL 2 It is not clear in the PDD the regulatory requirements in which the proposed project activity complies to.	B.5.2 B.5.48	Section B.5, B.7.2 and section D.1 of the PDD were revised and detailed information about the regulations that the project activity and the proposed scenarios are in compliance with Brazilian Regulations in electrical and environmental sectors were included. Please, refer to the revised version of the PDD attached to this response to access the provided information, which describe the procedures established by *ONS* applied by the project activity and the environmental norms and laws that the project activity complies to.	DNV assessed the revised PDD version 3 dated 13 April 2012 /1/ and it is stated that the project activity complies with the Brazilian requirements, including ONS and CONAMA regulations. DNV has checked the construction license granted by the environmental agency /10/ and the authorization for electricity generation granted by ANEEL /12/ and both states that the project is in compliance with the relevant regulations for generating electricity as specified in the Simplified Environmental Report /9/ and in the documentation presented for requiring the installation license /18/. DNV considers this CL closed.
CL 3 Project participant did not present evidences on the notifications letters sent to Brazilian DNA and UNFCCC secretariat.	B.5.5 B.5.6 B.5.48	Project participants provided the confirmation of receipts by the UNFCCC Secretariat and by the Brazilian DNA. Please, refer to the attached file "*Confirmação Prior Consideration.rar*" and to the UNFCCC website	The "Prior Consideration of the CDM" forms and e-mails for UNFCCC /7/ and the Brazilian DNA /8/ were presented. Therefore this CL is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		(http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html) to access the provided information	
CL 4 The reference of the source in the PDD as per the indicated in the WACC spreadsheet for R_f, R_m and R_f is incorrect.	B.5.15 B.5.48	The references of the sources for the parameters R_f, R_m and R_c were revised according to the WACC spreadsheet. Please, refer to the revised version of the PDD attached to this response.	The revised PDD version 3 dated 13 April 2012 /1/ is now correctly presenting the references for R_f, R_m and R_c, which are in line with the WACC spreadsheet. Therefore this CL is closed.
CL 5 Project participant did not clarify or provide sufficient information on the use of 1% for the credit risk rate (c) according to the reference given in the PDD	B.5.15 B.5.48	The evidence to support the credit risk rate applied in the WACC calculation is available at BNDES website: http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/meio_ambiente.html. The credit risk rate defined by BNDES can reach 3.57% per year according to the investor credit risk. Therefore, as evidenced at the BNDES website, project participants changed the risk rate to 3.57%. Please, refer to the third version of the WACC spreadsheet and to the revised PDD.	DNV assessed the revised WACC spreadsheet. PP are using the credit risk value of 3.57% per year. This is in line with the BNDES funding conditions /54/. Therefore this CL is closed.
CL 6 Administration expenses of BRL 376 100 per year and operational fixed cost value of BRL 652 200 per year were not detailed and	B.5.23 B.5.48	As requested, *Administration Expenses* and *Operational Fixed Costs* values and detailed evidences were included in the PDD and in the IRR spreadsheet.	The administration expenses and operational costs were detailed and properly referenced in the revised PDD version 3 dated 13 April 2012 /1/ and

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
evidenced in the PDD and financial analysis spreadsheet**.**		Please, refer to the revised version of the PDD and of the financial analysis.	financial analysis /4/. Therefore this CL is closed.
CL 7 Insurance fees were calculated as 0.50% of the total CAPEX, totalling around BRL 1 226 880.00 for the first year of full operation onwards. Project participant did not proper evidence the use of the value.	B.5.23 B.5.48	The Insurance value is presented at "*Premissas.xls*" and is an estimative adopted by project participants considering its experience and a market practice at the sector. Also, find attached an email sent by Santander Group confirming that the Insurance was not hired yet and can be considered as being of 0.50% of the total CAPEX of the wind power plants.	The insurance costs were presented in the spreadsheet "Premissas.xls". Also a formal declaration from Santander, the owner of REB Empreendimentos e Administradora de Bens S.A. was presented declaring the insurance fee calculation. Insurance fees were calculated as 0.50% of the total CAPEX, totalling around BRL 1 226 880.00 for the first year of full operation onwards /27//28/. DNV confirmed that these values are appropriate for the time of the investment decision. Therefore this CL is closed.
CL 8 Energy charges identified in the spreadsheet as ANEEL, ONS and CCEE were not detailed with units, calculations, source and values applied deemed evidenced.	B.5.24 B.5.48	The project activity cash flow was revised and *ANEEL*, *ONS* and *CCEE* fees were detailed including the units, the calculation, the source and the values applied. Please, refer to the revised financial analysis and to the spreadsheet "*Premissas.xls*" which presents the detailed explanation concerning the mentioned fees.	At the revised PDD version 3 dated 13 April 2012 /1/ and revised IRR spread sheet the taxes from ANEEL, ONS and CCEE are being presented with adequate units and formulas, allowing DNV to correctly audit those values. The energy charges identified in the spreadsheet as ANEEL, ONS and CCEE, totalling BRL 156 599 per year /28/. DNV confirmed that these values are in accordance with the Brazilian national regulation /65/ /66/ and is appropriate for the time of the investment decision.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			Therefore this CL is closed.
CL 9 Land rent is 1.8% of the annual gross income, as per contract with land owners, totalling around BRL 589 137.00 for the first year of full operation. Project participant did not present the contracts evidencing the land O&M cost applied.	B.5.24 B.5.48	The contracts evidencing the land O&M cost applied is attached to this response. Please, refer to the file "Arrendamento do Terreno.pdf" in order to crosscheck the information.	DNV received the land rent contracts and confirmed the cost of 1.8% of the annual gross income, as per contract with land owners, totalling around BRL 589 681 for the first year of full operation /22//23/. DNV confirmed that these values are appropriate for the time of the investment decision. Therefore this CL is closed.
CL 10 Project participant did not indicate in the PDD the period of contract defined in the auction and followed by the PPA.	B.5.18 B.5.21	According to the auction public notice (from the Portuguese *Edital do Leilão*) at page 3, *item 1.1.2*, the period established in the PPA for the electric power commercialization is of 20 years. Also, refer to Section B.5 of the revised version of the PDD and to the file "*Edital_Leilão.pdf*" to check the provided information concerning the period of assessment considered in the project additionality.	DNV assessed the revised PDD and confirmed the period of contract defined in the energy auction is clearly stated in section B.5. Therefore this CL is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
CL 11 It is not clear in the PDD if the presented projects are a bundle of independent projects or if the financial decisions of the wind farms are interdependent projects that would not happen separately.	-	As it is stated in the PDD, the wind power plants are controlled by different Special Purpose Company (from the Portuguese Sociedade de Propósito Específico – SPE), REB Cassino I, REB CAssino II and REB Cassino III. The SPEs are controlled by the company REB Empreendimentos e Administradora de Bens S.A. which is part of Capital de Riesgo Global (CRG), a company from the Santander Group. Even considering that the wind power plants are controlled by different SPEs, all of them are under the control of REB Empreendimentos, which is responsible for the implementation of the three wind power. Furthermore, it is important to mention other characteristics of the wind power plants that permit the conclusion that they would not be implemented separately: - The wind power plants are located in the same area, side by side, as determined by the wind certification performed by Garrad Hasen; - Other consideration is that the Installation Permit issued by FEPAM on October, 20th 2011 ,	DNV assessed the revised PDD version 3 dated 13 April 2012 /1/ and concluded that the three wind farms are located in the municipality, are all connected to the same substation and are listed in the same installation licence issued by FEPAM. Considering the above DNV confirms that the wind farms are interdependent project that would not be implemented separately. Therefore this CL is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		mentions the three wind power plants (refer to the file "REB Cassino_Licença de Instalação.pdf"); - Finally, REB Cassino I, REB Cassino II and REB Cassino III wind power plants will be interconnected to REB Cassino substation which will deliver the electricity to Quinta substation from CEEE-GT and then transmit the generated electricity by the plants to the Interconnected Electricity System (from the Portuguese Sistema Interligado Nacional – SIN), as defined in the Executive Project of the wind power plants. From the above explanation, it is concluded that the wind power plants would not have be implemented separately and is reasonable for project participants conducted the investment analysis considering the three plants together.	

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
No FAR was identified during validation.	-	-

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APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Juliana Scalon

Ms. Juliana Scalon holds a Bachelor Degree in Civil Engineering having an overall experience of around 10 years. Prior to joining DNV having 5.5 years of experience in waste handling and disposal service industry, covering technical operation and environment aspects of landfills and gas management, and 5 years of experience in CDM consultancy services, responsible for the development of several Project Design Documents for landfill gas to energy projects, project management on CDM projects of renewables, transport, and the development of greenhouse gas inventories for chemical industry.

She is part of DNV team for validation and verification of CDM projects/JI and other 3rd party validation/verification services.

Her qualification, industrial experience and experience in CDM demonstrate her sufficient sectoral competence in waste handling and disposal.

Fernando Sasdelli

Fernando Sasdelli holds a Bachelor's Degree in Mechanical Engineering from University of São Paulo and has a Specialization in Business Administration from FGV.

Prior to joining DNV Fernando has four years of experience in cogeneration projects, including project design and development for biomass and natural gas power plants. Fernando has worked in middle and large size cogeneration projects, from hotels and commercial buildings to chemical industries and large sugar cane mills.

His qualification and industrial experience demonstrate his sufficient sectoral competence in thermal energy generation from fossil fuels and biomass.

Luis Filipe Aboim Tavares

Mr. Luis Filipe Tavares holds a Technician's Degree in Chemistry and Bachelor's Degree in Metallurgical Engineering. Having an overall experience of thirty tree years. Prior to joining DNV having around twenty tree years experience in steel production industry covering utilities (water, steam, wastewater treatment), environment control (atmosphere emissions, water emission and waste dumping).

His experience also covers the development of nitrification biological wastewater station as well as other activities as head of Utilities and Environmental Laboratory control. He has also been actively involved in implementation of Management Systems such as ISO 9001 standard on coke oven department of steel industry as well as the ISO 140001 standard in all steel plant (the second steel company certified in the world) for more than three years.

He has experience of around 8 years in validation and verification of numerous CDM projects in DNV, both in Brazil & South America.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in Iron and Steel; Metal production; Oil and Gas industry, CMM recovery and use; Generation from renewable energy sources; Waste handling and disposal and Animal waste management.

Frederico Rosas

Frederico holds a Bachelor Degree in Management and a specialization in Business Administration.

He is a professor at Fundação Getúlio Vargas, where he teaches financing, costs management, price management, investment analysis and controllership.

He presents a working experience of more than 15 years in companies of areas such as of finances, mining and cosmetics.

Felipe Antunes

Felipe Lacerda Antunes holds a Master's Degree in Production Engineering (Quality) and a Post Graduate Diploma in Environmental Management and Industrial Waste Management and Treatment. Possesses an International experience of more than 10 years in the field of quality and environmental auditing, working two years as the responsible of the QMS of Rede Metrológica RS and since 1999 as a QMS and EMS auditor in DNV.

He has experience of more than 3 years in validation and verification of numerous CDM projects in DNV, both in South America & abroad. He has also been actively involved in Management System Audits such as ISO 9001, ISO 140001 and OHSAS 18001 standards in various industrial sectors for more than 10 years in DNV.

His qualification and experience in CDM demonstrate him sufficient sectoral competence in energy generation from renewable energy sources, waste handling and disposal, and animal waste management.