VALIDATION REPORT

CALANGO AND CAETITÉ WIND FARMS COMPLEXES CDM PROJECT ACTIVITY IN BRAZIL

REPORT NO. 2011-1025

REVISION NO. 01

DET NORSKE VERITAS

DET NORSKE VERITAS

Report No: 2011-1025, rev. 01

VALIDATION REPORT

Date of first issue: 12 August 2011	ConCert Project No.: PRJC-315945-2011-CCS-BRA
Approved by Michael Lehmann	Organisational unit: DNV KEMA Energy & Sustainability Accredited Climate Change Services
Client: Neoenergia S/A	Client ref.: Flavia Antunes

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Summary:

Project Name: Calango and Caetité Wind Farms Complexes CDM Project Activity
Country: Brazil
Methodology: ACM0002 **Version:** 12.2.0
GHG reducing Measure/Technology: Grid-connected electricity generation from wind power (Sectoral Scope 1)
ER estimate: 343 708 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 for project activity "Calango and Caetité Wind Farms Complexes CDM Project Activity" in Brazil, as described in the PDD, version 3 of 9 April 2012, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.2.0. 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.: 2011-1025	Subject Group: Environment
Report title: Calango and Caetité Wind Farms Complexes CDM Project Activity in Brazil	
Work carried out by: Fernando Sasdelli, Gabriel Baines, Luis Filipe Tavares, Eduardo Camilo	
Work verified by: Andres Espejo	
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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 Expenditures
CAPM	Capital Asset Pricing Model
CAR	Corrective Action Request
CCEE	Electric Energy Commercialization Chamber
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CH_4	Methane
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	Det Norske Veritas
EPE	Energetic Research Company related to the Brazilian Ministry of Environment.
EUR	Euro, European currency
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GSC	Global Stakeholder Consultation
ICG	ANEEL tax for using substations with shared connection
IDEMA	Institute of Environment and Sustainable Development of the state of Rio Grande do Norte
INEMA	Institute of Environment and Hydric Resources of the state of Bahia
IPCC	Intergovernmental Panel on Climate Change
IPEA	Advanced Economic Research Institute
LI	Installation License
LoA	Letter of approval
Ltda	Brazilian limited company
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
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	Tariff for the Use of the Distribution System
TUST	Tariff for the Use of the Transmission System
UNFCCC	United Nations Framework Convention on Climate Change
WACC	Weighted Average Cost of Capital
WPP	Wind power plant

1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the project activity "Calango and Caetité Wind Farms Complexes 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 12.2.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

The project activity is a wind power project which involves the installation and operation of 120 wind turbines (15 wind turbines in each wind farm) with a total of 240 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 343 708 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 "Calango and Caetité Wind Farms Complexes CDM Project Activity" in Brazil, as described in the PDD, version 3 dated 9 April 2012, meets all relevant UNFCCC requirements for the CDM criteria and correctly applies the baseline and monitoring methodology ACM0002, version 12.2.0. 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, 18 April 2012

Gabriel Baines
CDM Validator
DNV Rio de Janeiro, Brazil

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

2 INTRODUCTION

Neoenergia S/A has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the Calango and Caetité Wind Farms Complexes 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 12.2.0). The validation was based on the recommendations in the Validation and Verification Manual /31/.

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/ Ecopart Assessoria em Negócios Empresariais Ltda.: *CDM-PDD for project activity "Calango and Caetité Wind Farms Complexes CDM* Project Activity*" in Brazil*, version 1.1 dated 9 June 2011 published for GSC and version 3 dated 9 April 2012.

/2/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Emission reduction calculation spreadsheet "Complexo Eólico_CERs_2012.02.02_v.2.xls"*, version 2 dated 2 February 2012.

/3/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Benchmark calculation spreadsheet "WACC ElectricGen_2011 01 v4.xlsx"*, version 1, dated January 2011.

/4/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Financial analysis calculation spreadsheet "Iberdrola_FCFs Complexo_2011.06.07_v.1.xls", version 1, dated 7 June 2011 and "Iberdrola_FCFs Complexo_2012.04.09_v.3.xls",* version 3, dated 9 April 2012.

/5/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Investment Break Down*, "Investimentos.xls", dated 3 August 2011.

/6/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Brazilian DNA grid emission factor for the year 2010.* Available at*:*
http://www.mct.gov.br/index.php/content/view/327118.html#ancora

/7/ Neoenergia S/A: *Notification form,* submitted to UNFCCC Secretariat for Prior Consideration of CDM on 9 November 2011 and confirmed by UNFCCC on 11 November 2011.

/8/ Neoenergia S/A: *Notification form*, submitted to DNA of Brazil for demonstration and assessment of prior consideration of the CDM on 9 November 2011 and confirmed by DNA on 17 November 2011.

/9/ Environmental licenses (some windfarms have current licenses expired because are awaiting the subsequent construction licenses – for these, construction has not started):
INEMA:

- *"Caetité 1, Caetité 2 and Caetité 3 Windfarms Construction License"* Ordinance N° 12 662 isued on 4 May 2010 and valid until 22 April 2014.

IDEMA:

- *"Calango 1 Windfarm Alteration License"* N° 2010-036182/TEC/LA-0021 on 10 May 2010 and valid until 18 September 2011.

- *"Calango 2 Windfarm Alteration License"* N° 2010-036179/TEC/LA-0020 on 10 May 2010 and valid until 18 September 2011.
- *"Calango 3 Windfarm Preliminary License"* N° 2010-036068/TEC/LP-0023 on 10 May 2010 and valid until 10 May 2012.
- *"Calango 4 Windfarm Preliminary License"* N° 2010-036069/TEC/LP-0024 on 10 May 2010 and valid until 10 May 2012.
- *"Calango 5 Windfarm Preliminary License"* N° 2010-036073/TEC/LP-0025 on 10 May 2010 and valid until 10 May 2012.

Available at: http://200.149.240.140/licencas/licencas_emitidas.asp

/10/ Environmental Studies:

- Kohän-Saagoyen Consultoria e Sistemas Ltda.: *Simplified Environmental Report (RAS): "Environmental studies for Wind Complex of Caetité – Caetité 1, Caetité 2 and Caetité 3,* version 1, dated February 2010.
- Planoambiental Consultoria: *Simplified Environmental Report (RAS): "Environmental Studies for Wind Park Calango 1, version 1, June 2009.*
- Planoambiental Consultoria: *Simplified Environmental Report (RAS): "Environmental Studies for Wind Park Calango 2, version 1, June 2009.*
- Planoambiental Consultoria: *Simplified Environmental Report (RAS): "Environmental Studies for Wind Park Calango 3, version 1, February 2010.*
- Planoambiental Consultoria: *Simplified Environmental Report (RAS): "Environmental Studies for Wind Park Calango 4, version 1, February 2010.*
- Planoambiental Consultoria: *Simplified Environmental Report (RAS): "Environmental Studies for Wind Park Calango 5, version 1, June 2009.*

/11/ Neoenergia S/A: *Receipt of Stakeholder Invitation,* dated May and June 2011. Receipts filled by postal service when delivering mail related to invitation to stakeholder's consultation.

/12/ Neoenergia S/A: *Social contract, "Complex_Social Contract.pdf",* with presence of shareholders Neoenergia S/A, Iberdrola Renovables S/A and Iberdrola Renováveis do Brasil S/A, dated 19 October 2010.

/13/ ANEEL: *Authorization for independent power producer:*

- *"ANEEL_prt353 - EOL Caetité 1.pdf",* stating 30 MW of installed capacity dated 8 June 2011.
- *"ANEEL_prt118 - PIE Caetité 2.pdf",* stating 30 MW of installed capacity and 11.20 MW as average guaranteed power output, dated 4 February 2011.
- *"ANEEL_prt124 - PIE Caetité 3.pdf",* stating 30 MW of installed capacity and 11.20 MW as average guaranteed power output, dated 23 February 2011.
- *"ANEEL_prt275 - PIE Calango 1.pdf",* stating 30 MW of installed capacity and 13.90 MW as average guaranteed power output, dated 26 April 2011.
- *"ANEEL_prt292 - PIE Calango 2.pdf",* stating 30 MW of installed capacity and 11.90 MW as average guaranteed power output, dated 6 May 2011.
- *"ANEEL_prt331 - PIE Calango 3.pdf",* stating 30 MW of installed capacity and 13.90 MW as average guaranteed power output, dated 26 May 2011.
- *"ANEEL_prt311 - PIE Calango 4.pdf",* stating 30 MW of installed capacity and 12.80 MW as average guaranteed power output, dated 18 May 2011.

- *"ANEEL_prt346 - PIE Calango 5.pdf",* stating 30 MW of installed capacity and 13.70 MW as average guaranteed power output, dated 1 June 2011.

/14/ Camargo Schubert: *Certificates of Wind Measurements and of Production of Energy:*

- Certificate C&S/Iberdrola 328/10-A, for "Wind farm Caetité 1" and about the plant load factor of the wind farm, dated 9 April 2010.
- Certificate C&S/Iberdrola 328/10-B, for "Wind farm Caetité 2" and about the plant load factor of the wind farm, dated 9 April 2010.
- Certificate C&S/Iberdrola 328/10-C, for "Wind farm Caetité 3" and about the plant load factor of the wind farm, dated 9 April 2010.
- Certificate C&S/Iberdrola 328/10-F, for "Wind farm Calango 1" and about the plant load factor of the wind farm, dated 12 April 2010.
- Certificate C&S/Iberdrola 328/10-G, for "Wind farm Calango 2" and about the plant load factor of the wind farm, dated 12 April 2010.
- Certificate C&S/Iberdrola 328/10-H, for "Wind farm Calango 3" and about the plant load factor of the wind farm, dated 12 April 2010.
- Certificate C&S/Iberdrola 328/10-I, for "Wind farm Calango 4" and about the plant load factor of the wind farm, dated 12 April 2010.
- Certificate C&S/Iberdrola 328/10-J, for "Wind farm Calango 5" and about the plant load factor of the wind farm, dated 9 April 2010.

/15/ *Power curve certificates:*

- Kaiser-Wilhelm-Koog GmbH: *Power curve certificate,* Nº WT 4887/06 for wind turbine Gamesa G90 DA 2.0 MW, dated 14 February 2006.
- C.R.E.S Laboratory for Wind Turbine Testing: *Power curve certificate,* N°263-02 for wind turbine Gamesa G87DMF 2M, dated 2 June 2005.

/16/ Gamesa Eólica Brazil Ltda.: *Site suitability statements:*

- *Site suitability of wind turbine model G90 – 2000 kW for Caetité 1, Caetité 2 and Caetité 3 Wind Farms*, dated 7 April 2010

Technical Specifications available at: http://www.gamesa.es/en/products-and-services/wind-turbines/gamesa-g90-20-mw-iia-en.html

- *Site suitability of wind turbine model G87 – 2000 kW for Calango 1, Calango 2, Calango 3, Calango 4 and Calango 5 Wind Farms*, dated 7 April 2010.

Technical Specifications available at: http://www.gamesa.es/en/products-and-services/wind-turbines/gamesa-g87-20-mw-en.html.

/17/ Iberdrola Renováveis do Brasil S/A: *Technical Summaries:*

- "Memorial Descritivo_Caetité 01.pdf", dated 19 April 2010;
- "Memorial Descritivo_Caetité 02.pdf", dated 19 April 2010;
- "Memorial Descritivo_Caetité 03.pdf", dated 19 April 2010;
- "Memorial Descritivo_Calango 01.pdf", dated 19 April 2010;
- "Memorial Descritivo_Calango 02.pdf", dated 19 April 2010;
- "Memorial Descritivo_Calango 03.pdf", dated 19 April 2010;
- "Memorial Descritivo_Calango 04.pdf", dated 19 April 2010;
- "Memorial Descritivo_Calango 05.pdf", dated 19 April 2010;.

/18/ EPE: *Auction Application Form*, declaring project details such as location, installed

capacity, investment and operation and maintenance costs:

- Calango 1, number 897, issued on 21 April 2010
- Calango 2, number 898, issued on 21 April 2010
- Calango 3, number 1044, issued on 21 April 2010
- Calango 4, number 1045, issued on 21 April 2010
- Calango 5, number 1046, issued on 21 April 2010
- Caetité 1, number 1041, issued on 21 April 2010
- Caetité 2, number 1042, issued on 21 April 2010
- Caetité 3, number 1043, issued on 21 April 2010

/19/ Gamesa Eólica Brazil Ltda.: *EPC Contract, including purchase of wind turbogenerators*. The EPC values, including investment and O&M costs were available to the project participant July 2011. The EPC terms were accepted and signed by Neoenergia S/A on 25 October 2011.

/20/ Iberdrola Renováveis do Brasil S/A: *Contracts of land rental between local land owners and Heraklion Participações S.A.* dated before 2010 and *transference contracts between Heraklion Participações S.A. and Iberdrola Renováveis do Brasil S/A*, dated 10 February 2010.

/21/ Iberdrola Renováveis do Brasil S/A: *Contracts of real estate services between Tierno Souza Consultoria Administrativa e Imobiliária Ltda. and Iberdrola Renováveis do Brasil S/A*, dated 24 February 2010.

/22/ Neoenergia S/A: *Geographical coordinates of the wind farm "Geo coordinates - decimal format.xlsx"*, dated 2 August 2011.

/23/ Power Purchase Agreements, signed on between:

- Calango 1 and power utilities dated 4 November 2011
- Calango 2 and power utilities dated 4 November 2011
- Calango 3 and power utilities dated 4 November 2011
- Calango 4 and power utilities dated 4 November 2011
- Calango 5 and power utilities dated 4 November 2011
- Caetité 1 and power utilities dated 28 July 2011
- Caetité 2 and power utilities dated 28 July 2011
- Caetité 3 and power utilities dated 28 July 2011

/24/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Insurance cost,* "ENC Custo seguro eólicas.msg", dated 28 October 2011.

/25/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Rio do Fogo Administrative Expenses*, "Taxas Administrativas RiodoFogo.pdf", dated July 2011.

/26/ Neoenergia S/A: *Risk Assessment on Electricity Generaton*, "Resultados Simulación A-3 Agio 30V1.xls", dated 28 October 2011.

/27/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Common Practice Analysis*, "Calango e Caetité_Prática Comum.xlsx", dated 1 February 2012.

/28/ Ecopart Assessoria em Negócios Empresariais Ltda.: *Electricity Spot Prices*, dated 20 July 2010, available at: http://www.acenergia.com.br/sinrem/pdf/pdf_07.pdf

/29/ Ecopart Assessoria em Negócios Empresariais Ltda. and Neoenergia S/A: *Macroeconomic forecasts for Brazilian and European inflation, World economic growth and exchange rates*, spreadsheet "LCA_11_Mar.xls", dated March 2012.

3.1.2 Letters of approval

/30/ Comissão Interministerial de Mudança Global do Clima (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

/31/ CDM Executive Board: *Validation and Verification Manual,* version 1.2.

/32/ CDM Executive Board: *Glossary of CDM terms*, version 5.

/33/ CDM Executive Board: *Baseline and monitoring methodology ACM0002*, "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*, version 12.2.0.

/34/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*, version 6.0.0

/35/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system*, version 2.2.1.

/36/ CDM Executive Board: *Guidelines on the demonstration and assessment of prior consideration of the CDM,* version 4.0.

/37/ CDM Executive Board: *Guidelines on the Assessment of Investment Analysis,* version 5.0.

/38/ CDM Executive Board: *Guidelines on the Reporting and Validation of Plant Load Factors,* version 1.

/39/ CDM Executive Board: *Clarifications on the consideration of national and/or sectoral policies and circumstances in baseline scenarios*, Annex 3, EB22.

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

/40/ 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

/41/ BNDES: *Long Term Interest Rate*, 2012 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

/42/ National Operator of the System - *Grid Procedures*, available at: www.ons.org.br/procedimentos/index.aspx

/43/ ANEEL, *Bank of Information of Generation*, the capacity of electricity generation in Brazil. Available at: http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.asp

/44/ CCEE: *2nd Brazilian Auction of Renewable Energy* - Auction nº 07/2010 dated 26 August 2010 – Results. Available at: http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Leiloes/2_F_A/Resulta_Completo_2_LFA_Resumo_vendedor.pdf

/45/ 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

/46/ Treasury Department: *Brazilian Assumed Profit regulations*. Available at: http://www.receita.fazenda.gov.br/Publico/perguntao/dipj2011/CapituloXIII-IRPJ-LucroPresumido2011.pdf

/47/ Damodaran website: *30-year US Treasury Yields*, dated 2010. Available at: http://pages.stern.nyu.edu/~adamodar/

/48/ Federal Reserve: *Financial and Economics Research Data*, dated 2010. Available at: http://www.federalreserve.gov/econresdata/researchdata.htm

/49/ IPEA: *Brazilian Macroeconomics Data*, from 2006 to 2010. Available at: http://www.ipeadata.gov.br/

/50/ BNDES: *Brazilian Long-Term Bond Rates*, from 2006 to 2010. 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

/51/ BNDES: *Brazilian Funding Conditions,* dated 2010. Available at: http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/meio_ambiente.html

/52/ Brazilian Central Bank: *Inflation Targets*, for year 2010. Available at: http://www.bcb.gov.br/pec/metas/InflationTargetingTable.pdf

/53/ ANEEL: *Fiscalization Tariff for Electricity Services*, dated 22 December 2009: http://www.aneel.gov.br/cedoc/dsp20094774.pdf

/54/ ANEEL: *ONS Fee Calculation and Budget Approval*, from the document "Premissas Regulatorias Leilão A-3.23.08.2010.pdf", dated 23 August 2010

/55/ ANEEL: *Electric Distribution System Tariff*, dated 2010. Available at: http://www.aneel.gov.br/aplicacoes/consulta_publica/documentos/Petrobras1.pdf

/56/ ANEEL: *Electric Transmission System Tariff*, Ordinance #1.031/2010, available at: http://www.aneel.gov.br/aplicacoes/editais_geracao/documentos/052010_Resolu%C3%A7%C3%A3o_%20Homologat%C3%B3ria_Edital%2005-2010_.pdf

/57/ ANEEL: *ONS entity approval*, Ordinance #328/2004, available at: http://www.aneel.gov.br/cedoc/rea2004328.pdf

/58/ ANEEL: *ONS budget approval*, Ordinance #2.459/2010, available at: http://www.aneel.gov.br/cedoc/rea20102459.pdf

/59/ CCEE: *Contribution Fee,* from the document "Premissas Regulatorias Leilão A-3.23.08.2010.pdf", dated 23 August 2010

/60/ Ministry of Environment: *Renewable Sources of Energy in Brazil,* dated 2003.

/61/ 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

/62/ 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

/63/ 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

/64/ ANEEL, *Resolution nº 44 about depreciation rates*, dated 17 March 1999. Available at: http://www.aneel.gov.br/aplicacoes/leitura_arquivo/arquivos/Tabela_Taxas_Depriacao_RIT.pdf

/65/ Eduardo Camilo: *Financial Expert Assessments*, approving the choice of benchmark and the investment analysis. Dated 22 July 2011.

/66/ IBGE: *Official Territorial Area* dated 2010. Available at: http://www.ibge.gov.br/home/geociencias/areaterritorial/principal.shtm

/67/ ANEEL: *Brazilian Electricity Book*, 3rd edition, dated 2008. Available at: http://www.aneel.gov.br/visualizar_texto.cfm?idtxt=1687

/68/ ANEEL: *Distribution System Tariff for Rio Grande do Norte and Ceará*, "TUSD COSERN_reh20111139.pdf" dated 19 April 2011 and "TUSD CEAL_reh20111193.pdf", dated 1 February 2012.

/69/ CCEE: *Electric Energy Commercialization Chamber.* Assessed on 2012 and available at: http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=2e09a5c1de88a010VgnVCM100000aa01a8c0RCRD

/70/ ABNT: *Brazilian Association of Technical Standards*, Electricity Meters, dated 2011. Available at: http://www.abntcatalogo.com.br/norma.aspx?ID=89389

/71/ UNFCCC: *CDM Project Activity Website*, available at: http://cdm.unfccc.int/Projects/Validation/DB/94QY83ZX3XLHS9B4E73LV50IO6VBBH/view.html

/72/ ANEEL: ICG tax reports, available at: http://www.aneel.gov.br/aplicacoes/editais_transmissao/documentos_editais.cfm?IdProgramaEdital=93

/73/ BNDES: BNDES support to renewable energy projects, available at: http://www.fiesp.com.br/energia/pdf/tema6-painel2-antonio-andrada-tovar.pdf

3.2 Follow-up interviews with project stakeholders

On 26 and 27 of July 2011, DNV auditors Gabriel Baines, Fernando Sasdelli and Luis Filipe Tavares visited the Neoenergia S/A's office at Rio de Janeiro, Brazil, and performed interviews with project stakeholders. The project is a greenfield project and not yet constructed. DNV validated the project description through assessment of the Technical Summary /17/ and the study on the site suitability of wind turbine /16/.

On 30 September 2011, auditor Gabriel Baines visited Neoenergia S/A and cross-checked the accuracy and suitability of the investment costs presented through assessment of the purchase contract from the supplier Gamesa Eólica Brasil Ltda. /19/.

Based on the documents and information gathered, DNV was able to check the project design, construction, monitoring plan and all baseline scenario information. Thus, given that the project is a Greenfield project, DNV deemed that a physical site visit to the project site was not required during the validation process in accordance with paragraph 62 of the VVM /31/.

	Date	Name	Organization	Topic
/74/	26 and 27 July 2011	Flavia Antunes	Neoenergia S/A	• 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
/75/		Carolina Nunes		
/76/		Thaisa Alcoforado	Iberdrola Renováveis do Brasil S/A	
/77/		Laura Porto		
/78/		Carlos Jobim		
/79/		Ana Paula Veiga	Ecopart Assessoria em Negócios Empresariais Ltda.	
/80/		Renato Oliveira		
/81/		Peter Pehl		
/82/		Alejandro Hoz	Iberdrola Renovables S/A	
/83/		Juan Rivier Abad		

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 "Calango and Caetité Wind Farms Complexes 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 (Validator)	Baines	Gabriel	Brazil	✓	✓	✓	✓			
Validator	Tavares	Luis Filipe	Brazil	✓	✓	✓			✓	
Assessor under training	Sasdelli	Fernando	Brazil	✓	✓	✓				
Financial Expert	Camilo	Eduardo	Brazil	✓		✓				✓
Technical reviewer	Espejo	Andres	Italy					✓	✓	✓

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 9 April 2012 /1/.

4.1 Participation requirements

The project participants are Neoenergia S/A, Iberdrola Renováveis do Brasil S/A, Ecopart Assessoria em Negócios Empresariais Ltda. of 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 "Calango and Caetité Wind Farms Complexes CDM Project Activity" is located in the municipalities of Caetité at the state of Bahia, Bodó, Lagoa Nova and Santana do Matos in the state of Rio Grande do Norte, Brazil /9/.

The geographical coordinates of the proposed project activity, including positioning of each wind turbine, were validated by DNV and as presented in the document "Geo coordinates - decimal format.xlsx" /22/ from Neoenergia S/A and the Certificates of Wind Measurements and of Production of Energy /14/. Coordinates of Control Centres and wind turbines of each project are presented below:

Caetité 1 Wind Power Plants		
Aerogenerator	**S latitude**	**W longitude**
Control Centre	14.1603	42.4931
C1-01	14.1616	42.4883
C1-02	14.1639	42.4880
C1-03	14.1662	42.4878
C1-04	14.1686	42.4876
C1-05	14.1709	42.4872
C1-06	14.1732	42.4867
C1-07	14.1759	42.4867
C1-08	14.1782	42.4876
C1-09	14.1805	42.4877

C1-10	14.1828	42.4881
C1-11	14.1852	42.4881
C1-12	14.1875	42.4880
C1-13	14.1898	42.4885
C1-14	14.1916	42.4901
C1-15	14.1928	42.4921

Caetité 2 Wind Power Plants		
Aerogenerator	**S latitude**	**W longitude**
Control Centre	14.1850	42.5028
C2-01	14.1768	42.4928
C2-02	14.1786	42.4944
C2-03	14.1804	42.4959
C2-04	14.1820	42.4977
C2-05	14.1837	42.4994
C2-06	14.1854	42.5010
C2-07	14.1870	42.5028
C2-08	14.1885	42.5047
C2-09	14.1900	42.5065
C2-10	14.1914	42.5084
C2-11	14.1935	42.5105
C2-12	14.1952	42.5127
C2-13	14.1882	42.5116
C2-14	14.1902	42.5138
C2-15	14.1923	42.5154

Caetité 3 Wind Power Plants		
Aerogenerator	**S latitude**	**W longitude**
Control Centre	14.2194	42.5069
C3-01	14.2106	42.5082
C3-02	14.2127	42.5094
C3-03	14.2145	42.5109
C3-04	14.2166	42.5121
C3-05	14.2186	42.5134
C3-06	14.2207	42.5144
C3-07	14.2141	42.5001
C3-08	14.2159	42.5016
C3-09	14.2180	42.5028
C3-10	14.2199	42.5042

C3-11	14.2214	42.5061
C3-12	14.2226	42.5081
C3-13	14.2245	42.5094
C3-14	14.2269	42.5097
C3-15	14.2292	42.5101

Calango 1 Wind Power Plants		
Aerogenerator	**S latitude**	**W longitude**
Control Centre	6.0339	36.5442
C1-01	6.0348	36.5559
C1-02	6.0322	36.5548
C1-03	6.0299	36.5533
C1-04	6.0378	36.5531
C1-05	6.0361	36.5515
C1-06	6.0347	36.5498
C1-07	6.0333	36.5479
C1-08	6.0320	36.5461
C1-09	6.0306	36.5443
C1-10	6.0394	36.5429
C1-11	6.0376	36.5409
C1-12	6.0361	36.5391
C1-13	6.0346	36.5371
C1-14	6.0332	36.5353
C1-15	6.0317	36.5334

Calango 2 Wind Power Plants		
Aerogenerator	**S latitude**	**W longitude**
Control Centre	6.0156	36.4842
C2-01	6.0119	36.4865
C2-02	6.0099	36.4849
C2-03	6.0209	36.4921
C2-04	6.0193	36.4895
C2-05	6.0184	36.4865
C2-06	6.0162	36.4850
C2-07	6.0144	36.4835
C2-08	6.0127	36.4821
C2-09	6.0233	36.4872
C2-10	6.0219	36.4854
C2-11	6.0203	36.4830

C2-12	6.0187	36.4812
C2-13	6.0169	36.4796
C2-14	6.0151	36.4779
C2-15	6.0132	36.4762

Calango 3 Wind Power Plants		
Aerogenerator	**S latitude**	**W longitude**
Control Centre	6.0489	36.5464
C3-01	6.0447	36.5535
C3-02	6.0427	36.5523
C3-03	6.0506	36.5529
C3-04	6.0488	36.5508
C3-05	6.0471	36.5484
C3-06	6.0456	36.5460
C3-07	6.0436	36.5436
C3-08	6.0577	36.5516
C3-09	6.0563	36.5496
C3-10	6.0547	36.5478
C3-11	6.0533	36.5459
C3-12	6.0516	36.5438
C3-13	6.0497	36.5415
C3-14	6.0479	36.5396
C3-15	6.0464	36.5380

Calango 4 Wind Power Plants		
Aerogenerator	**S latitude**	**W longitude**
Control Centre	6.0236	36.4725
C4-01	6.0284	36.4839
C4-02	6.0269	36.4816
C4-03	6.0254	36.4794
C4-04	6.0238	36.4778
C4-05	6.0220	36.4762
C4-06	6.0204	36.4739
C4-07	6.0188	36.4713
C4-08	6.0173	36.4690
C4-09	6.0302	36.4737
C4-10	6.0287	36.4714
C4-11	6.0273	36.4694
C4-12	6.0257	36.4678

C4-13	6.0242	36.4662
C4-14	6.0228	36.4638
C4-15	6.0210	36.4616

Calango 5 Wind Power Plants		
Aerogenerator	**S latitude**	**W longitude**
Control Centre	6.0303	36.4883
C5-01	6.0270	36.4991
C5-02	6.0251	36.4974
C5-03	6.0234	36.4958
C5-04	6.0338	36.4978
C5-05	6.0317	36.4959
C5-06	6.0293	36.4936
C5-07	6.0273	36.4916
C5-08	6.0386	36.4944
C5-09	6.0352	36.4913
C5-10	6.0331	36.4894
C5-11	6.0313	36.4873
C5-12	6.0382	36.4841
C5-13	6.0363	36.4816
C5-14	6.0335	36.4781
C5-15	6.0319	36.4762

The project is a wind power project which involves installation and operation of 120 wind turbines (15 wind turbines in each wind farm). The installed capacity of each turbine is 2.0 MW thus constituting a total installed capacity of 240 MW /13/.

It has been cross-checked by DNV through the manufacturer's product specifications /16/ that the project design engineering uses the megawatt-class, three-bladed, variable speed wind turbines, which is deemed to reflect good practices.

The annual electricity delivered to the National Interconnected System (SIN) is expected to be 890 279 MWh, corresponding to an average plant load factor of 42.3% authorized by ANEEL, which is a government official source /13/.

Project Name	Installed capacity (MW)	ANEEL guaranteed power (MW)	ANEEL Plant Load Factor
Calango 1	30	13.90	46.3%
Calango 2	30	11.90	39.7%.
Calango 3	30	13.90	46.3%
Calango 4	30	12.80	42.7%
Calango 5	30	13.70	45.7%

Caetité 1	30	13.03	43.4%
Caetité 2	30	11.20	37.3%
Caetité 3	30	11.20	37.3%
Total	240		42.3%

The guaranteed power - as authorized by ANEEL /13/, was used for the calculation of emission reductions and financial analysis. Based on ANEEL authorization and installed capacity the PLFs were calculated. There is an exception for Caetité 1 Wind Power Plant, for which the ANEEL Ordinance has not been issued yet, therefore the third party assessment from Camargo Shubert /14/ was used for this project. Those values were determined at 50% of probability (P50), which is deemed conservative as financing institutions usually consider P90 for the financing agreement /51/.

In accordance with the design of the plants /16/ /17/, Calango 1 and Calango 3 wind farms will be connected to the same substation, called Calango 13 (of 34.5 kV) and located next to those plants, before connecting to the Lagoa Nova substation (of 69 kV). Calango 2, 4 and 5 will be connected to another substation, called Calango 245 (of 69 kV) and located next to the plants, before connecting to the Lagoa Nova substation linked to the SIN. Distance from Calango 13 to Lagoa Nova substation is approximately 3 kilometers /13/ and distance from Calango 245 to Lagoa Nova substation is approximately 4 kilometers.

Caetité 1, 2 and 3, as described in the engineering design /16/ /17/ of the projects will be connected to the same transmission system, with a transmission line of approximately 32 kilometers.

The electricity generated by the projects will be linked to a 34.5 kV onsite transformer substation.

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's system boundaries are clearly defined as the project site and the National Interconnected System (SIN), the grid of Brazil.

At the commencement date of validation the project construction had not been initiated yet as evidenced by the projects schedule presented in ANEEL authorization /13/. The starting date of the proposed project activity is 28 July 2011, which is the date when the Power Purchase agreements were signed with the power utilities. DNV assessed the signed PPAs between the project participants Calango and Caetité Wind Farms Complexes CDM Project Activity and the power utilities /23/.

The expected operational lifetime of the project activity is 20 years derived from the lifetime of the Wind Turbine Gamesa G90 and Wind Turbine Gamesa G87 /16/.

A 7-year renewable crediting period has been chosen for the project, starting on 27 August 2012. The chosen crediting starting date is deemed to be reasonable. The emission reductions are estimated to be 343 708 tCO_2e per year and 2 405 956 tCO_2e over the first seven years of crediting period.

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 12.2.0.

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 as evidenced by the ANEEL authorization for independent power producer /13/ about the construction of the wind farm and the results of the 2nd Brazilian Auction of Renewable Energy - Auction nº 07/2010 /44/.
- Being a wind farm project, it does not involve any switching from fossil fuel to renewable energy at the project site, which was verified by DNV through the follow-up interview /74//75//76//77//78//79//80/ and the ANEEL authorization for independent power producer /13/.
- 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) /13/.

The assessment of the project's compliance with the applicability criteria of ACM0002 version 12.2.0 are documented in detail in section B.2 of Table 2 in the validation protocol in Appendix A to this report.

DNV has concluded that the application of the baseline methodology is transparent and conservative.

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 Calango and Caetité Wind Farms Complexes CDM Project Activity is clearly defined in accordance with applicable guidelines of ACM0002 /33/, the "*Tool for the demonstration and assessment of additionality*" /34/ and the "*Tool to calculate the emission factor for an electricity system*" /35/.

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 12.2.0) /33/.

4.5 Baseline identification

The baseline is in accordance with ACM0002 (version 12.2.0) /33/ 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*" /35/.

According to ACM0002 (version 12.2.0) /33/ baseline emissions are equal to power generated by the project delivered to the SIN, multiplied by the baseline emission factor. The grid emission factor will be determined *ex-post* 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 has been published by the DNA of Brazil /6/. 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*" /35/.

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.

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 are 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 12.2.0 /33/.

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*" /34/.

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 28 July 2011, which is the date when the Power Purchase agreement was signed with the power utilities /23/. DNV assessed the signed PPAs between the project participants Calango and Caetité Wind Farms Complexes CDM Project Activity and the power utilities /23/, and was able to confirm that this is the earliest commitment to financial expenditure as it obliges the project participant to sell the amount of electricity accorded in the auction /44/. According to this agreement, the penalty of not providing this electricity to the grid equals the expected revenues of the project.
The expenditures that occurred prior to the start date do not comply with the definition of starting date as per Glossary of CDM terms /32/ as they are related to pre-project planning and therefore do not affect the project starting date.
Expenditures that occurred prior to the start date were considered as sunk costs and were not considered in the investment analysis. The first phase of those contracts was signed in order to evaluate the project feasibility, allowing the project participants to install wind masts to measure the wind characteristics in the region.

Serious consideration of CDM and efforts to secure CDM status:

According to the guidance from the CDM Executive Board /36/, the notification of host country DNA and UNFCCC secretariat is not required if the PDD has been published before the project activity starting date. Thus, the PDD publication date (21 June 2011) confirms that the CDM benefits were considered necessary in the decision to undertake the project as a proposed CDM project activity.

In order to re-confirm CDM consideration a notification letter for the proposed project was sent by the project participant to the Brazilian DNA 9 November 2011 and its reception confirmed 17 November 2011 /8/. In parallel to this, the project participants sent the prior consideration of the CDM Form to the UNFCCC 9 November 2011, which receipt was confirmed by UNFCCC on 11 November 2011 /7/.

The project participants started the global stakeholder consultation on 21 June 2011 /71/. 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 alternatives for the project activity have been suitably identified in accordance to the "*Tool for the demonstration and assessment of additionality*" /34/, where the project activity is only required to identify at least one credible and feasible alternatives, thus the following alternative were considered in the analysis:

a) Continuation of the current situation, i.e. electricity supplied by the Brazilian Interconnected Grid
b) The proposed project activity undertaken without being registered as a CDM project activity

The list of alternative scenarios to the project activity is in compliance with local mandatory legislation and regulations.
The project owner of a proposed project has no obligation to build or invest in the power plant to supply electricity for the local area. Hence this alternative is consistent with mandatory laws and regulations, while alternative b) does not face any barrier from the current law and

regulation in Brazil. Therefore, both alternatives a) and b) are the plausible alternative scenarios which are consistent with the current laws and regulations and thus will be discussed at the next steps.

DNV considers the listed alternatives to be credible and complete.

4.6.3 Investment analysis

Choice of approach

Since the project activity generates income by the sale of electricity, and the only alternative scenario (i.e. electricity supplied by the Brazilian Interconnected Grid) does not involve any similar investment, the benchmark analysis is appropriate for the demonstration of the financial barrier. DNV considers this approach is correct, as it is according to *"Guidelines on the Assessment of Investment Analysis"* /37/.

Benchmark selection

The selected benchmark is a weighted average costs of capital (WACC) which is an appropriate benchmark for a project IRR in line with the "Guidelines on the Assessment of Investment Analysis" version 5.0 /37/, The WACC calculation is based on parameters that are standard in the market, which in line with the *"Guidelines on the Assessment of Investment Analysis"* /37/ is suitable in the context of the underlying project activity as the proposed project activity could be developed by an entity other than the project participant. As the start date of the project was defined as 28 July 2011, which is the date when the Power Purchase Agreement was signed with the power utilities /23/, in order to guarantee availability of data for estimating the benchmark, the information used to determine the benchmark was based on data until the end of the previous year (i.e. 31 December 2010). DNV considers this approach was correct; thus avoiding lack of data that is consolidated annually. The real post-tax benchmark was calculated based in the equity and debt conditions.

The cost of equity was based on the Capital Asset Pricing Model (CAPM). Although CAPM model is generally used to calculate the return on equity of a benchmark based on equity basis, in this case it is accepted to be applied for the return on equity of a benchmark based 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 Eduardo Camilo /65/ and that is acceptable method as per the "*Guidelines on the Assessment of Investment Analysis"* /37/. The cost of equity through the application of the CAPM would be determined as follows:

$$K_e = [(1+ Rf) /(1+I)-1] + \beta \times (Rm-Rf) + Rc$$

Where:

- R_f (risk free rate): calculated as 4.25%, based on the 30-year US Treasury Yield of year 2010 /47/. As DNV cross-checked the values presented with the Damodaran's home page /47/ and confirmed that this value is appropriate and valid at the time of the investment decision with support of an independent financial expert /65/ and is thus correct.
- R_m-R_f (equity risk premium): calculated as 6.03%, based on S&P500 historic minus 10-year Treasury Bond Yield /48/. The vintage historical data for S&P500 and 10-year Treasury Bond Yield were based on the arithmetic average of annual returns from 1928 to 2010 /3/. DNV cross-checked the values presented with the Federal Reserve

data /48/ and confirmed that this value is appropriate and valid at the time of the investment decision with support of an independent financial expert /65/ and is thus correct.

- R_c (estimated country risk premium): calculated as 2.45%, based on Brazilian Risk Premium from years 2006, 2007, 2008, 2009 and 2010 /49/. The Brazilian Risk Premium is based on the factor EMBI+ (Emerging Markets Bond Index Plus), that accounts for the country risk embedded in the debt of a country, assuming US debt risk as zero /65/. DNV cross-checked the values presented with the IPEA home page /49/ and confirmed that this value is appropriate and valid at the time of the investment decision with support of an independent financial expert /65/ and is thus correct.
- β (adjusted industry beta): calculated as 0.79, based on the covariance of the daily return of electric industries listed on S&P500 of year 2010 /47/, beta was re-levered to 2.41, multiplying the original value by the Debt/Equity ratio (67.7%/32.3%) /3/ which is the typical leverage of Brazilian companies in the sector (c.f. w_e and w_d below). Income tax is zero as it used the conditions of presumed (or assumed) profit regime. DNV cross-checked the values presented with the Damodaran's home page /47/ and confirmed that this value is appropriate and valid at the time of the investment decision with support of an independent financial expert /65/ and is thus correct.
- I (US expected inflation) it is considered to be 1.98% based on a ten-year Treasury notes minus ten-year TIPS /48/. DNV cross-checked the values presented with the Federal Reserve data /48/ and confirmed that this value is appropriate and valid at the time of the investment decision with support of an independent financial expert /65/ and is thus correct.

Thus, K_e is calculated to be 19.18% (calculated without rounding decimal digits).

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 19.18% as per indicated above;
- K_d (cost of debt financing) is calculated as 4.71% (without rounding decimal digits), based on the sum of the financing cost (long term interest rate, 6.53% /50/), BNDES fee (0.9%) /51/, BNDES spread (2.0%) /51/ minus the inflation forecast (4.50%) /52/. DNV cross-checked the values presented with the BNDES home page /51/ and confirmed that this value is appropriate and valid at the time of the investment decision with support of an independent financial expert /65/ and is thus correct.
- w_e (weight of equity) and w_d (weight of debt) are 32.3% and 67.7% respectively. 67.7% is the average financing granted by BNDES for wind farms from year 2003 to 2009 /3/. DNV cross-checked the values presented with the BNDES presentation /3/ and confirmed that this value is appropriate and valid at the time of the investment decision with support of an independent financial expert /65/ and is thus correct. Furthermore, this debt/equity ratio would be in line with paragraph 18 of the "*Guidelines on the Assessment of Investment Analysis"* /37/ as it represents the typical debt/equity finance structure observed in the sector of the country.

Thus, the real post-tax WACC is calculated to be 9.39% /3/ (calculated without rounding decimal digits).

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.

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 /65/.

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

Input parameters

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

Investment costs: The total investment cost for each wind farm as per spread sheet "Investimentos.xls" /5/ and financial analysis /4/ is presented in the following table:

Investment Costs (values in kUSD)	**Calango 1**	**Calango 2**	**Calango 3**	**Calango 4**	**Calango 5**	**Caetité 1**	**Caetité 2**	**Caetité 3**
Wind turbines and generators	73 297	74 948	73 297	74 948	74 948	74 126	70 945	66 810
Civil works	28 355	21 828	28 355	21 828	21 828	28 094	26 443	26 361
Voltage network, substation elevation and transmission lines	9 146	11 382	9 146	11 382	11 382	7 555	7 104	7 104
Development costs	2 401	2 456	2 401	2 456	2 456	2 438	2 352	2 153
Total	113 199	110 613	113 199	110 613	110 613	112 212	106 844	102 427

These values represent the economic situation at the time of the investment decision as confirmed through the *Auction Application Form* /18/ issued by EPE on 21 April 2010 and the EPC contract /19/ which were available at the time of the investment decision. The EPC contract was signed in 25 October 2011, however the investment costs were already available at July 2011, during contract terms negotiation /19/. The EPC values are lower than the ones presented in the *Auction Application Form*, therefore assuring conservativeness in the presented financial analysis.

On 30 September 2011, the auditor Gabriel Baines visited Neoenergia S/A and confirmed the EPC investment costs /5/. Later these values were cross-checked with the values presented through assessment of the purchase contract from the supplier Gamesa Eólica Brasil Ltda. /19/ and confirmed that values are appropriate for the time of the investment decision. Therefore, DNV is able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

Operational Expenditures:

The operational expenditures for the proposed project include:

- Fiscalization Tariff for Electricity Services (TFSEE): fixed in 0.5% of 363.60 BRL/kW /4/. DNV confirmed that these values are in accordance with the Brazilian national regulation /53/ and is reasonable and appropriate for the time of the investment decision.
- ONS rate + insurance: 0.55 BRL/kW based on ANEEL ordinance #328/2004 /57/ and #2.459/2010 /58/. Insurance fees were calculated as 0.13% of the total CAPEX /24//54/. DNV confirmed that these values are in accordance with the Brazilian

national regulation /57//58/ and is reasonable and appropriate for the time of the investment decision.

- Tariff for the Use of the Transmission System (TUST): The costs of 3.97 BRL/kW/month for the Caetité projects and 4.71 BRL/kW/month for the Calango projects were based on ANEEL ordinance #1031/2010 /56/, which list the TUST applicable to the project substation that dispatches electricity to the grid. No discount was applied to the tariff TUST /56/ in accordance to Type E-Policy as defined by Annex 3, EB 22 /39/. DNV confirmed that these values are in accordance with the Brazilian national regulation /56/ and is reasonable and appropriate for the time of the investment decision.
- ICG: the cost of 0.68 BRL/kW/month was applied to the Calango projects /4/. ICG is a tax charged for projects using a shared substation /72/. DNV confirmed that these values are in accordance with ANEEL reports /72/ and is appropriate for the time of the investment decision.
- O&M: As per the first financial analysis "*Iberdrola_FCFs Complexo_2011.06.07_v.1.xls*" /4/ prices for the operation and maintenance of the wind power plants are variable through the years, starting on EUR 150 000 in the first year and reaching EUR 750 000 in the 4th year of operation, continuing with this value until the end of the contract. DNV cross-checked the O&M cost with the official *Auction Application Form* /18/ and the manufacturer contract /19/, available at the time of the investment decision. Costs during the warranty period of 25 months is 5 000 EUR/kW/year and after that, out-of warranty, is 25 000 EUR/kW/year. The exchange rate Euro/BRL was estimated based on 25-years macroeconomic forecasts /29/. DNV confirmed that these values reasonable and appropriate for the time of the investment decision.
- CCEE: The contribution of 0.14 BRL/MWh for Caetité 1 and 2 and 0.13 BRL/MWh for the other wind farms are annually paid to the CCEE, entity responsible to trade the electricity generated /59/. DNV confirmed that these values are in accordance with the Brazilian national regulation /59/ and is reasonable and appropriate for the time of the investment decision.
- Administrative expenses: 1.2% of total revenues plus the cost of the land lease which is equivalent to: 6 000 BRL/MW/year for Caetité 1, Caetité 2, Caetité 3, Calango 1, Calango 3 and Calango 5 /20/; 5 130 BRL/MW/year for Calango 2 /20/; and 5 330 BRL/MW/year for Calango 4 /20/. The fixed 1.2% of total revenues was based on project participant's results from the similar project Rio do Fogo /25/. DNV confirmed that these values are reasonable and appropriate for the time of the investment decision.
- Land rent: based on project success fee during operation and according to broker contract. For the Caetité projects the success fee is 6.0 BLR per installed kW /21/. For the Calango projects the success fee varies from 8.2 to 9.2 BLR per installed kW /21/.

Total estimate operational expenses vary from 2.06% to 2.58% of the total investment in the first year and reaches a maximum of 3.98% in the last year.

The values for the O&M expenses assumed in the financials have been verified by comparing with simulations presented in the book from the Ministry of Environment "Renewable

Sources of Energy in Brazil" /60/, which considered values of operational expenses ranging from 1% to 4%. Hence, the costs of the project can be considered as being reasonable.

Therefore, DNV is able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.

Annual power generation:

According to the PDD /1/ it is expected that the proposed project will supply to SIN approximately 890 279 MWh at an average plant load factor (PFL) of 42.35%. Annex 11 of EB48 /38/ gives "*Guidelines on the Reporting and Validation of Plant Load Factors*". One option is to use plant load factor provided to the government while applying the project activity for implementation approval and another is to use plant load factor determined by a third party. The plant load factor of the projects was determined by the government regulatory agency (ANEEL) /13/. There is an exception for Caetité 1 Wind Power Plant, for which the ANEEL Ordinance has not been issued yet, therefore the third party assessment from Camargo Shubert was used /14/ in the financial analysis. Therefore the applied load factors would be in accordance with Annex 11 of EB48 /38/.

DNV confirmed that the values of the parameters were available in the time of the investment decision and consider that the plant load factors reasonable for wind farms in Brazil /60/. It is DNV opinion the selected load factors are reasonable and acceptable.

Power tariff:

In Brazil, the auctions for reserve energy follow the inverted auctions model, in which the lowest price charged by the producer in the bid wins the slot. In the 2nd Brazilian Auction of Renewable Energy - Auction nº 07/2010 /44/, Neoenergia S/A offered the best prices for wind farm Calango and Caetité Wind Farms Complexes CDM Project Activity, thus winning these slots. The price offered was132.80 BRL/MWh for the Calango projects, 130.00 BRL/MWh for Caetité 1 and 137.99 BRL/MWh for Caetité 2 and 3 /44/.

However according to the PPA contract /23/ the amount of electricity generated has fixed tolerance bands per quadrennial. The tolerance bands are: +30% in the first year, +20% in the second year, +10% in the third year, 0% in the fourth year and -10% any year /23/. When generating above those bands the extra electricity may be sold in the spot market, which has a lower price than the PPA /28/. When generating below those bands the revenue will suffer a proportional discount by the price agreed in the auction..

The assumed electricity generation in the model is the net annual electricity production with a probability of exceeding of 50% (i.e. P50) which, as explained earlier, would be accurate as it provides the expected average generation and it would be conservative as financial institutions require the net annual electricity production with a probability of exceedance of 90% (i.e. P90) in the financials /73/. However, this figure represents the expected average, being the electricity generation variable and having values below or above that level; this would have an impact in the income by increasing the revenues by selling the electricity in the spot market (i.e. case of exceeding) or suffering a discount factor (i.e. case of underperformance) /23/. Considering the lower prices in the spot markets /28/ with respect to the PPA price /23/, it is expected that there would be a net discount. In order to estimate the net discount factor due to this variability, the project participant conducted a statistical analysis that considered 5 000 wind generation scenarios over the 20 years of the PPA taking

into account the expected variability of the wind resource /26/. The analysis showed that a net discount ranging from 2.72% to 4.25% would have to be applied to the respective PPA price /23/.
DNV assessed those scenarios at "Resultados Simulación A-3 Agio 30V1.xls" /26/ and confirmed that the analysis to determine the applicable discount is accurate and follows the best practices in the sector taking into consideration the risks associated with climate conditions, the inevitable uncertainty of electricity generation by wind farms.

These prices will not change until the end of the PPA period of 20 years /23/.

Taxes and depreciation:

DNV also confirmed 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. According to Brazilian Assumed Profit regulations /46/ taxes are applied directly on the project revenues, therefore there is no need to present the depreciation in the cash flow.
The taxes applied are 0.65% for the PIS/PASEP tax /61/ and 3% for the Cofins tax /61/.
The social contribution on net income (CSLL) is calculated at the applicable rate of 9% over 12% of the gross revenues /63/.
The income tax is calculated at the applicable rate of 15% over 8% of the gross revenues /62/ with an additional tax of 10% over 8% of the gross revenues for values above BRL 240 000 per year.
All taxes were calculated according to the Brazilian legal requirements. In the presumed profit regime, depreciation has no impact in the project's internal rate of return. In this case, tax rates are calculated over revenues and not over gross profits.

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 /16/, in which the real IRR without CDM revenues ranges from 3.87% to 6.46%.
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 /46/. This confirms that the project in the absence of CDM benefits when compared to the benchmark of 9.39% is not financially attractive /4/.

Sensitivity analysis

Two sensitivity analyses have been carried out. First for the scenario with the plant load factor based on ANEEL authorization /13/. The second scenario was made to evaluate the IRR impact without the electricity price discount.
Parameters contributing to more than 20% of the revenues or costs were simulated in order to check the robustness of the financial analysis. Reasonable variations of the electricity price, electricity generation, capital expenditures and operation and maintenance costs were checked by varying the parameters in 10%. The variations necessary to reach the benchmark were determined and demonstrated, and then the likelihood for that to happen was discussed for parameters electricity price, electricity generation, capital expenditures. The IRR does not suffer a significant change when the O&M costs vary. Even if disregarded from the costs, the highest IRR achieved of all wind farms would be 8.76%, which is below benchmark. Considering this the O&M costs were not presented in the table 1 below /4//37/. 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:

Table 1 – Scenario 1: Plant load factor determined in the auction

Key Indicators	Variation of the parameter indicator needed to reach the benchmark							
	Calango 1	Calango 2	Calango 3	Calango 4	Calango 5	Caetité 1	Caetité 2	Caetité 3
Electricity price	18.45%	34.40%	18.80%	26.15%	16.55%	23.85%	30.75%	27.20%
Electricity generation	18.65%	34.80%	19.00%	26.50%	16.75%	24.15%	31.10%	27.50%
CAPEX	-20.60%	-34.06%	-20.90%	-27.65%	-18.95%	-24.80%	-30.60%	-28.10%

1. **Electricity price:** To reach the benchmark, electricity price must increase at least by 16.55% (c.f. Calango 5) in real terms. This is not likely to happen as in Brazil electricity prices 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 /23/.

2. **Electricity generation:** According to the PDD the guaranteed average plant load factor was fixed in 42.35%, which is the guaranteed power for the project activity defined at the ANEEL Authorization /13/. The lowest variation would be 16.75% (i.e. Calango 5) which corresponds to a PLF of 45.7%. This is not likely to happen as according to "Renewable Sources of Energy in Brazil" /59/, the average plant load factor of a wind park in Brazil is 40%. Considering that the annual output calculations for the proposed project /13//14/ 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:** DNV was able to confirm that a decrease of 18.95% in investment costs is unlikely to happen, as more than 90% of the total investment of the proposed project goes towards civil works and purchase and installation of electric equipment /5/ (including wind turbines, towers and transformers) which has already been signed /19/. Therefore the total investment is not likely to decrease by more than 18.95%.

Table 2 – Scenario 2: IRR variation without the price correction factor

Key Indicators	Variation of the parameter indicator needed to reach the benchmark							
	Calango 1	Calango 2	Calango 3	Calango 4	Calango 5	Caetité 1	Caetité 2	Caetité 3
IRR without correction factor	6.77%	4.46%	6.77%	5.77%	6.98%	6.16%	5.18%	5.71%
Variation needed to reach benchmark	15.20%	30.10%	15.20%	21.25%	13.35%	19.30%	25.75%	21.80%

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"* /34/ 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 240 MW. Therefore only projects wind projects between 120 MW and 360 MW of installed capacity were taken into consideration. In DNV opinion this is in line with Step 1 of the *"Tool for the demonstration and assessment of additionality"*, which states that "*Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity."*
Brazil is a vast country with a large territorial extension /66/. As presented by the project participant and assessed by DNV /67/ the Brazilian wind conditions have high variability. While the Northeast region has a wind energy potential of 75.0 GW the Middle East has only 3.1 GW /67/. Also DNV assessed Brazilian regulation for electricity tariffs and confirmed that the applicable taxes are different for each state /68/. For example TUSD for Alagoas state is BRL 7.35/kW, BRL 4.55/kW for Bahia state and BRL 3.51/kW for Rio Grande do Norte /68/. DNV considers appropriate, as per Step 2 of the *"Tool for the demonstration and assessment of additionality",* the selection of Rio Grande do Norte state as the geographical scope for common practice analysis.
Following the steps of the *"Tool for the demonstration and assessment of additionality"* /34/, N_{all} and N_{diff} have been calculated. No wind power plants that became operational before 28 July 2011, within the output range and non-CDM were found in the Rio Grande do Norte state. DNV assessed document "Calango e Caetité_Prática Comum.xlsx" /27/, ANEEL Bank of Information of Generation /43/ and UNFCCC website to confirm this information.
DNV was able to confirm that despite of the available high technical potential for wind energy utilization in Brazil, only around 1.24% of electricity in Brazil is generated from wind farms /43/.and Rio Grande do Norte accounts for 14% of the operational wind power plants in Brazil.
Finally, it is DNV opinion that as N_{all} and N_{diff} are equal to zero, which means that there are no similar non-CDM project activities in the region, the development of wind farm Calango and Caetité Wind Farms Complexes 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

12.2.0 /33/. 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 12.2.0.

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

4.7.1 Parameters determined ex-ante

There is no parameter determined *ex-ante*.

4.7.2 Parameters monitored ex-post

The parameters monitored *ex-post* are the net electricity generation from the proposed project activity, the operating margin and the build margin emission factors.

The monitoring plan of the PDD is in accordance to the "*Tool to calculate the emission factor for an electricity system*" /35/, as the dispatch data analysis OM method was considered for the determination of the operating margin (OM). Thus, the combined margin CO_2 emission factor ($EF_{grid,CM,y}$) will be monitored *ex-post*. The Brazilian grid emission factors, OM and BM are published regularly by the Brazilian DNA /6/. Those emission factors are calculated by the Ministry of Science and Technology /6/. Although there are no further details on how this values are calculated, DNV confirms that the database is an official publication of the Brazilian Government for the purpose of CDM baselines and as stated in the Brazilian DNA website it is in line with the "*Tool to calculate the emission factor for an electricity system*" /35/.

The net electricity dispatched will be measured through the metering equipment at the point of connection of Calango and Caetité Wind Farms Complexes CDM Project Activity to the Brazilian grid at the substation of Coletora Lagoa Nova and Igaporã /13/ and so meters only the quantity of electricity supplied by the project activity to the grid.

The net electricity generated by project activity and fed into the grid will be monitored continuously by two meters (main and back-up) at the project substation named Serra Vermelha, in accordance to the Electric Energy Commercialization Chamber (*Câmara de Comercialização de Energia Elétrica – CCEE*) procedures /69/. The main meter values will be normally considered and the back-up will be used eventually.

Both meters (main and back-up) have a level of uncertainty, 0.2 precision class, as determined in the standards of the ABNT - Brazilian Association of Technical Standards. The main and backup meters will be installed at the substation of the wind farm.

All meters will be calibrated every two years by a qualified third party according to the national and industrial regulations.

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 programme 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 project correctly applies the baseline and monitoring methodology ACM0002 version 12.2.0 "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*. The emission reductions (ER_y) by the project activity during the crediting period are calculated as the difference between baseline emissions (BE_y) and project emissions (PE_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.

The baseline emission factor for the project will be determined *ex-post* as a combined margin (CM), consisting of combination of the operating margin (OM) and build margin (BM) according to "*Tool to calculate the emission factor for an electricity system*" /35/ for the 7-years crediting period.

The Brazilian grid emission factor has been published by the Brazilian DNA.

The system boundary for the grid electricity system affected by the project is defined as the system of the Brazilian grid (SIN).

It has been calculated as the weighted average (w_{OM} = 0.75; w_{BM} = 0.25) of the operating margin and the build margin emission factors.

Dispatch data analysis OM is used by the Brazilian DNA. The OM is calculated to be 0.4787 tCO_2/MWh.

The BM is calculated as 0.1404 tCO_2e/MWh, resulting in a combined margin emission factor of 0.3941 tCO_2e/MWh.

For emission reduction calculation purposes, the lower PLF was used, which was ANEEL authorization value /13/. The annual electricity delivered to the SIN is expected to be 890 279 MWh /1//2/, which is based on the guaranteed power by ANEEL multiplied by the hours of the year.

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 343 708 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 /40/) a Simplified Environmental Report (RAS) is required to grant the installation license of electricity generation projects with more than 10 MW of installed capacity. As stated in the PDD, a Simplified Environmental Report (RAS) /10/ has been conducted according to Brazilian law and regulation /40/. 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 were granted the Preliminary License issued by the Institute of Environment and Sustainable Development of the state of Rio Grande do Norte (IDEMA) which are valid for 2 years /9/.

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 25 May 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/ 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 1.1 dated 9 April 2012 /1/, was made publicly available on the CDM website /71/

(http://cdm.unfccc.int/Projects/Validation/DB/94QY83ZX3XLHS9B4E73LV50IO6VBBH/view.html) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period, from 21 June 2011 to 20 July 2011.

Two comments were received for the proposed project, and are available on the PDD publication page /71/. DNV has verified that the same comments have been posted to many proposed CDM project, and finds that the comments are not related specifically to the project in question, but represents general issues which shall be validated for proposed CDM projects. Some issues are also clearly not applicable to the project in question, such as issue about the “Baseline definition” which is clearly defined by the applied methodology ACM0002 version 12.2.0 and not a case proposed by the project participants.

The issues raised have been sufficiently covered in the validation process.

For example, issue “DOE to ensure that the PDD values are consistent and ensure that the CDM project is a genuine project”. The values in the PDD and the project itself were validated by DNV as described in section 4 of this report.

Information regarding for example issue “If applicable only: Is these machines, equipment was a part of any bundle of CDM activity envisaged and developed earlier”. As validated in

section 4.6.3 of this report, there is no use of second hand or remanufactured equipment; the project participants are purchasing new equipment for the wind farm from Gamesa /19/.
Hence, it is DNV's opinion that all issues raised have been sufficiently covered in the validation process, as illustrated by the examples above, and were addressed during the validation process as reflected in this validation report and validation protocol.

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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	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

Requirement	Reference	Conclusion
		DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable 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	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	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	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	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	No participating Annex I Party is yet identified.

Requirement	Reference	Conclusion
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	A preliminary environmental licence, as required by the Brazilian regulation /40/, was presented by the project participants /9/.
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	CDM Modalities and Procedures	OK

Requirement	Reference	Conclusion
manner and taking into account relevant national and/or sectoral policies and circumstances.	§45c,d	
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 relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

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/ /2/ /3/ /4/ /6/ /7/ /8/ /9/ /10/ /11/ /12/	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		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			analysis. ☐ The project is an individual small scale 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 *If a physical site inspection is not undertaken, justify why no site visit was undertaken:* The project is a newly built wind farm project; through the documents which the project participant provided, DNV can confirm the project design, construction, operation and monitoring plan and all baseline scenario information. The representatives of the project participants Neoenergia S/A, Iberdrola Renováveis do Brasil S/A and Ecopart Assessoria em Negócios Empresariais Ltda. were interviewed on 26 and 27 July 2011 at Neoenergia S/A office in Rio de Janeiro by DNV auditors Gabriel Baines, Fernando Sasdelli and Luis Filipe Tavares, to resolve the issues identified during the desk review.		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				During the desk review, the relevant documents including PDD, ER calculation spreadsheet, benchmark calculation, IRR spreadsheet , Brazilian grid emission factor calculation, notification to UNFCCC and its confirmation, notification to Brazilian DNA and its confirmation, preliminary environmental license, environmental studies for the wind farm, receipts of delivery of mail to stakeholders, social contract among shareholders have been assessed. The construction of the project had not been initiated at the time of validation, as was confirmed through the photographic report and satellite images. 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/ /13/	DR	The "Calango and Caetité Wind Farms Complexes CDM Project Activity" project is located in the municipality of Rio do Fogo, state of Rio Grande do Norte, Brazil. The geographical coordinates of the control centre of the proposed project activity are:		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<table><tr><th>Project</th><th>S latitude</th><th>W longitude</th></tr><tr><td>**Caetité 1 Wind Power Plants**</td><td>14.1603</td><td>42.4931</td></tr><tr><td>**Caetité 2 Wind Power Plants**</td><td>14.1850</td><td>42.5028</td></tr><tr><td>**Caetité 3 Wind Power Plants**</td><td>14.2194</td><td>42.5069</td></tr><tr><td>**Calango 1 Wind Power Plants**</td><td>6.0339</td><td>36.5442</td></tr><tr><td>**Calango 2 Wind Power Plants**</td><td>6.0156</td><td>36.4842</td></tr><tr><td>**Calango 3 Wind Power Plants**</td><td>6.0489</td><td>36.5464</td></tr><tr><td>**Calango 4 Wind Power Plants**</td><td>6.0236</td><td>36.4725</td></tr><tr><td>**Calango 5 Wind Power Plants**</td><td>6.0303</td><td>36.4883</td></tr></table> The project is a wind power project which involves installation and operation of 120 wind turbines. The installed capacity of each turbine is 2.0 MW thus, constituting a total installed capacity of 240 MW.		
A.2.5	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?	/1/ /44/	DR	No, it is a greenfield project that will utilize new equipments. The project activity is the installation of a greenfield wind power plant that is connected to the national grid, as confirmed in the 2nd Brazilian Auction of Renewable Energy - Auction nº 07/2010.		OK
A.2.6	Does the project design engineering reflect current good practices?	/1/ /16/	DR	It has been cross-checked by DNV through the manufacturer's product specifications that the		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				project design engineering uses the megawatt-class, three-bladed, variable speed wind turbines, which is deemed to reflect good practices.		
A.2.7	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?	/1/ /43/	DR	DNV has confirmed that both the installed capacity and generation of wind power plants was only 1.24% of the total capacity and power generation of Brazil according to the ANEEL's Bank of Information of Generation. DNV has confirmed that by the time of the project investment decision phase, there were 72 wind farms operating in Brazil.		OK
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 Neoenergia S/A, Iberdrola Renováveis do Brasil 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/ /30/	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		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			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		
g) The LoA was received directly by the DNA or the PP			☐ DNA ☐ 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					
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/ /13/ /22/	DR	Yes, the location of the project is clearly defined. The geographical coordinates of the control centre are:		OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<table><tr><th>Project</th><th>S latitude</th><th>W longitude</th></tr><tr><td>Caetité 1 Wind Power Plants</td><td>14.1603</td><td>42.4931</td></tr><tr><td>Caetité 2 Wind Power Plants</td><td>14.1850</td><td>42.5028</td></tr><tr><td>Caetité 3 Wind Power Plants</td><td>14.2194</td><td>42.5069</td></tr><tr><td>Calango 1 Wind Power Plants</td><td>6.0339</td><td>36.5442</td></tr><tr><td>Calango 2 Wind Power Plants</td><td>6.0156</td><td>36.4842</td></tr><tr><td>Calango 3 Wind Power Plants</td><td>6.0489</td><td>36.5464</td></tr><tr><td>Calango 4 Wind Power Plants</td><td>6.0236</td><td>36.4725</td></tr><tr><td>Calango 5 Wind Power Plants</td><td>6.0303</td><td>36.4883</td></tr></table> Also the coordinates of each wind turbine was presented at the document *"Geo coordinates - decimal format.xlsx"*		
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/	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. The project is using BNDES (Brazilian Development Bank) funding.		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/ /33/	DR	The project correctly applies the approved baseline and monitoring methodology ACM0002 "Consolidated *baseline methodology for grid-connected electricity generation from renewable sources"* version 12.1.0.		OK
B.1.2	If applicable, has any specific guidance provided by the CDM EB in respect to the applied methodology been considered?	/1/ /34/ /35/	DR	Yes, the "*Tool to calculate the emission factor for an electricity system*' and the "*Tool for the demonstration and assessment of additionality*" are also applicable.		OK
B.2	**Applicability of methodology (and tools) (VVM para 65-76)** *Insert a row for each applicability criteria of the applied methodology (and tools)*					
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/ /44/	DR	The project activity is the installation of a greenfield wind power plant that is connected to the national grid, as confirmed in the 2nd Brazilian Auction of Renewable Energy - Auction nº 07/2010.		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, since in this case the baseline	/1/ /44/	DR	The project does not involve switching from fossil fuel to renewable energy at the project site, as confirmed in the 2nd Brazilian Auction of Renewable Energy - Auction nº 07/2010.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	may be the continued use of fossil fuels at the site?					
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/ /33/	DR	Yes. The selected baseline of the project is based on the baseline described in ACM0002. Therefore, it is deemed that the approved methodology ACM0002 is applicable to the project activity.		OK
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/ /35/	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. Project and system boundaries are 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/ /17/	DR	No other emission sources may question the applicability of the methodology. As stated in the *Technical Summary* there is a continuous current system to supply the emergency lighting demand. This is deemed below 1% of the estimated emissions.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.4	**Baseline scenario determination (VVM para 81-88, 105-107)** *Ensure that the evaluation of all alternatives provided in the PDD and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. Check that all alternatives required to be considered by the methodology are included in the final PDD. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this.*					
B.4.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/ /33/ /35/	DR	The baseline is in accordance with ACM0002 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/ /33/	DR	Not applicable, as ACM0002 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/ /33/	DR	The baseline determination is in line with ACM0002.		OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /33/	DR	This is not applicable as the baseline is directly determined as per ACM0002.		OK
B.4.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic	/1/ /33/	DR	This is not applicable as the baseline is directly determined as per ACM0002.		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	trends and political aspirations?					
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /33/	DR	This is not applicable as the baseline is directly determined as per ACM0002		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. • 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	/1/	DR	The baseline determination has been adequately documented in the PDD: • Not applicable. • Not applicable. • Not applicable. • Not applicable. • The methodology has been correctly applied to identify what would occur in the absence of the proposed CDM project activity		OK
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/ /33/ /34/	DR	As required by ACM0002, the additionality of the project has been established using the "*Tool for the demonstration and assessment of additionality*" (version 5.2).		OK
B.5.2	Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR	Yes, the baseline alternative complies with regulatory requirements.		OK
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	/1/	DR	The additionality is based in investment analysis.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	(Investment analysis or barrier analysis)?					
	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/ /7/ /8/	DR	Notification on the CDM activity was submitted to both UNFCCC and the DNA and confirmed on 11 November 2011 and 17 November 2011. Since the validation started on 25 May 2011 by global stakeholder consultation, which is less than one year after that, sufficient efforts to secure CDM in parallel with the implementation have been demonstrated		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/ /7/ /8/	DR	Notification on the CDM activity was submitted to both UNFCCC and the DNA and confirmed on 11 November 2011 and 17 November 2011. Since the validation started on 25 May 2011 by global stakeholder consultation, which is less than one year after that, sufficient efforts to secure CDM in parallel with the implementation have been demonstrated.		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
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	/1/	DR	It is not applicable to the proposed project		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	actions in parallel with the implementation were taken to secure CDM status?			activity as its starting date is after 2 August 2008.		
	Investment analysis (VVM para 108-114) *The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation.*					
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 benchmark is defined as the weighted average cost of capital (WACC), it was estimated using an Adjusted-Beta based in the Capital Asset Pricing Model (CAPM) as per the option 6 (a) presented in the additionality tool.. The Brazilian Development Bank (BNDES) has a typical debt/equity finance structure for wind projects and that was not applied to the benchmark calculation.	~~CAR8~~	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 financial indicator is project IRR calculated after tax, and therefore in correspondence with the benchmark chosen.		OK
B.5.16	Are the underlying assumptions appropriate, e.g. what is	/1/	DR	See B.5.14.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	considered as waste in the baseline is considered to have zero value?					
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/ /46/	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/ /4/	DR	According to paragraph 3 of the "Guidelines on the Assessment of Investment Analysis" the indicator shall as a preference reflect the period of expected operation of the underlying project activity (technical lifetime), or if a shorter period is chosen include the fair value of the project activity assets at the end of the assessment period. Project participants did not correctly apply the Guideline. Depreciation is 5% per year therefore the salvage value will be zero at the end of the project activity.	~~CAR1~~	OK
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? Remember to include all the data sources used and	/1/ /38/	DR	☐ The plant load factor provided to banks and/or equity financiers while applying the project	~~CAR2~~	OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.			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:* The plant load factor, according to "Guideline for the Reporting and Validation of Plant Load Factors" shall be determined by *a third party.* *Project participants did not explain* why Camargo Schubert's plant load factor was not used.		
B.5.21	How was the output price (e.g. electricity price) assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /38/	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 output price was validated:* According to paragraph 6 of "Guidelines on the Assessment of Investment Analysis" all input values must be valid and applicable at the time of decision for the investment analysis. Project participants did not presented the references of the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions,	~~CAR3~~ ~~CL3~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				estimates. Project participants did not presented evidence of transmission distances and voltage transformation of wind park Caetité 1 and transmission distances of wind parks Calango 1 to Calango 5.		
B.5.22	How were the investment costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /38/	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:* According to paragraph 6 of "Guidelines on the Assessment of Investment Analysis" all input values must be valid and applicable at the time of decision for the investment analysis. Project participants did not presented the references of the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates. Project participants did not presented evidence of transmission distances and voltage transformation of wind park Caetité 1 and transmission distances of wind parks Calango 1 to Calango 5.	~~CAR3~~ ~~CL3~~	OK
B.5.23	How were the O&M costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph	/1/ /38/	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	~~CAR3~~ ~~CL3~~	OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	95.			related to the project and the project participants Provide details on how the O&M costs were validated: According to paragraph 6 of "Guidelines on the Assessment of Investment Analysis" all input values must be valid and applicable at the time of decision for the investment analysis. Project participants did not presented the references of the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates. Project participants did not presented evidence of transmission distances and voltage transformation of wind park Caetité 1 and transmission distances of wind parks Calango 1 to Calango 5.		
B.5.24	Describe the assessment of the other input parameters. Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /38/	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: According to paragraph 6 of "Guidelines on the Assessment of Investment Analysis" all input values must be valid and applicable at the time of decision for the investment analysis. Project participants did not presented the references of the costs related to the equipments, insurance, project installation and	~~CAR3~~ ~~CL3~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				operation/maintenance, prices, taxes, resolutions, estimates. Project participants did not presented evidence of transmission distances and voltage transformation of wind park Caetité 1 and transmission distances of wind parks Calango 1 to Calango 5.		
B.5.25	Was the financial calculation spreadsheet verified and found to be correct?	/1/	DR	According to paragraph 6 of "Guidelines on the Assessment of Investment Analysis" all input values must be valid and applicable at the time of decision for the investment analysis. Project participants did not presented the references of the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates. Project participants did not presented evidence of transmission distances and voltage transformation of wind park Caetité 1 and transmission distances of wind parks Calango 1 to Calango 5.	~~CAR3~~ ~~CL3~~	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	Yes, the key parameters: electricity price, total investment and amount of electricity generated were increased and decreased in 10% in order to do a sensitivity analysis of the project activity.		OK
B.5.27	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/	DR	The range of 10% of variation is reasonable to the project context.		OK
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	The parameters electricity price, total investment and amount of electricity generated were varied to reach the benchmark. However the electricity price that was set at a public auction will remain fixed throughout the years as it and will only be		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				adjusted accordingly to the Consumers Price Index (official Brazilian inflation). Also the amount of electricity generated is not expected to vary as it was based on the plant load factor of a third party estimative, carried out using professional software designed for wind energy and that the output was maximised by considering air density corrections, turbine efficiency, planned maintenance, contaminated rotors, and auxiliary power use. Therefore it is unlikely that the electricity delivered to the grid will suffer increase.		
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
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

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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 for the proposed project.		OK
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/	DR	The common practice analysis is made for the state of Rio Grande do Norte. This is reasonable since the wind conditions and tariffs applied by ANEEL are different from state to state.		OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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	According to *Tool for the demonstration and assessment of additionality"* only projects wind projects between 10 MW and 30 MW of installed capacity were taken into consideration.		OK
B.5.44	What is the data source(s) used for the common practice analysis?	/1/ /43/	DR	ANEEL data from the Bank of Information of Generation in Brazil is used to analyze other wind power plants.		OK
B.5.45	How many similar non-CDM-projects exist in the region within the scope?	/1/ /43/	DR	No wind power plants that became operational before 28 July 2011, within the output range and non-CDM were found in the Rio Grande do Norte state.		OK
B.5.46	How were possible essential distinctions between the project activity and similar activities assessed?	/1/ /43/	DR	No wind power plants that became operational before 28 July 2011, within the output range and non-CDM were found in the Rio Grande do Norte state.		OK
B.5.47	What is the conclusion of the common practice analysis?	/1/	DR	The project activity cannot be considered a common practice once the similar projects existents in the region have all received some type of financial incentive, either PROINFA or CDM. Project participants did not explain which are the items i *to* iv *presented* in Sub-Step 4b of the PDD	~~CL1~~	OK
	Conclusion					
B.5.48	What is the conclusion with regard to the additionality of the project activity?	/1/	DR	It is DNV's opinion that the project is additional.		OK

	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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 $EF_{grid,BM}$ parameter available at validation verified?	/1/	DR	Project participants are requested to determine which emission factor will be 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	~~CAR7~~	OK
B.6.2	How was the $EF_{grid,OM}$ parameter available at validation verified?	/1/	DR	Project participants are requested to determine which emission factor will be 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	~~CAR7~~	OK
B.6.3	How was the $EF_{grid,CM}$ parameter available at validation verified?	/1/	DR	Project participants are requested to determine which emission factor will be 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	~~CAR7~~	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	Project participants are requested to determine which emission factor will be 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	~~CAR7~~	OK
B.6.5	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	See B.6.2	~~CAR7~~	OK
B.6.6	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	See B.6.2	~~CAR7~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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 resulted from the operation of project activity which is a renewable energy project based in wind generation.		OK
B.6.8	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Not applicable.		OK
B.6.9	Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Not applicable.		OK
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/ /33/	DR	As per ACM0002 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	Not applicable.		OK
B.6.12	Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	Not applicable.		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	/1/	DR	Project participants are requested to determine which emission factor will be 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	~~CAR7~~	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	submitted for registration.					
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/ /33/	DR	Yes. The means of monitoring described in the plan complies with ACM0002.		OK
B.7.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	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 "Calango and Caetité Wind Farms Complexes 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. Data will be archived for 2 years following the end of the last crediting period. 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.	~~CAR4~~	OK
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	See B.7.2	~~CAR4~~	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.7.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR	See B.7.2	~~CAR4~~	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	See B.7.2	~~CAR4~~	OK
B.7.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	See B.7.2	~~CAR4~~	OK
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	See B.7.2	~~CAR4~~	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	Authorities and responsibilities for project management, monitoring and reporting activities are clearly defined. However, the project's monitoring plan did not include detailed 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	~~CAR5~~	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/	DR	See B.7.8	~~CAR5~~	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	See B.7.8	~~CAR5~~	OK
B.7.11	Will all monitored data required for verification and issuance	/1/	DR	See B.7.8	~~CAR5~~	OK

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	Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	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?					
	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	Neither ACM0002 nor the Brazilian DNA requires collection and archiving of relevant data concerning environmental, social and economic impacts.		OK
B.7.13	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	See B.7.12		OK
B.7.14	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR	See 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/	DR	The start date of the project activity must be in accordance to the Glossary of CDM terms. Project participants did not clearly describe in section C.1.1 the start date of the project activity	~~CAR6~~	OK
C.1.3	Is the stated expected operational lifetime of the project activity reasonable?	/1/	DR	The expected operational lifetime of the project activity is 20 years and it is deemed reasonable		OK
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 7-year renewable crediting period has been chosen for the project. The chosen crediting period starting date, on 27 August 2012 or the registration date is deemed to be reasonable.		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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/ /10/ /40/	DR	According to Brazilian environmental law a Simplified Environmental Report (RAS) is required to grant the installation license of electicity generation projects with more than 10 MW of installed capacity.. As stated in the PDD, a Simplified Environmental Report (RAS) has been conducted according to Brazilian law and regulation.		OK
D.1.2	Does the project comply with environmental legislation in the host country?	/1/ /9/	DR	Yes, the project complies with Brazilian environmental legislation. DNV was able to verify that all wind farms were granted the Preliminary License issued by the Institute of Environment and Sustainable Development of the state of Rio Grande do Norte (IDEMA) which were valid for 2 years.		OK
D.1.3	Will the project create any adverse environmental effects?	/1/	DR	No significant environmental impacts are expected from the project activity. The wind farm was granted the Preliminary Licences, which is part of the environmental regulatory process.		OK
D.1.4	Have identified environmental impacts been addressed in the project design?	/1/	DR	See D.1.3		OK
D.1.5	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	See D.1.3		OK
D.1.6	Are transboundary environmental impacts considered in the analysis?			See D.1.3		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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 2 August 2010 to comment on the project - in accordance with the requirements of Resolution 7 (5 March 2008) of the Brazilian DNA.		OK
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Yes, DNV has checked all the invitation letters and the postal service mail receipts.		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
E.1.4	Is a summary of the stakeholder comments received provided?	/1/	DR	Two comments were received for the proposed project, and are available on the PDD publication page. DNV has verified that the same comments have been posted to many proposed CDM project, and finds that the comments are not related specifically to the project in question. It is DNV's opinion that these general comments have been sufficiently covered in the validation process and reflected in the validation protocol.		OK
E.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	See E.1.4		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
CAR1 According to paragraph 3 of the "Guidelines on the Assessment of Investment Analysis" the indicator shall as a preference reflect the period of expected operation of the underlying project activity (technical lifetime), or if a shorter period is chosen include the fair value of the project activity assets at the end of the assessment period. Project participants did not correctly apply the Guideline.	B.5.18	The investment analysis (cash flow) spreadsheet was revised as requested. In line with Guidance 3 of Annex 5, EB62, the total assessment period is 20 year, which reflects the technical lifetime of the wind power plant. Please refer to the revised versions of the spreadsheet and PDD.	Ok, the investment analysis was assessed by DNV and the period of 20 years of operation was considered in the cash flow, according to the Guidelines on the Assessment of Investment Analysis. Therefore this CAR is closed.
CAR2 The plant load factor, according to "Guideline for the Reporting and Validation of Plant Load Factors" shall be determined by a third party. Project participants did not explain why Camargo Schubert's plant load factor was not used.	B.5.20	The Camargo Schubert Wind Certification presents the gross load factor. From the plant load factor reported by Camargo Shubert, it has to be deducted the forced and programmed unavailability effects as well as the transmission losses. These deductions are based on project sponsors experience. Nevertheless, the "*Guidelines for the reporting and validation of plant load factors*" (Annex 11, EB48) provides another option to define the plant load factor which is: *(a) The plant load factor provided to banks and/or equity financiers while*	The plant load factor defined during energy auction (CCEE) was used in the investment analysis. Despite for Caetité 1 Wind Power Plant that is still awaiting for the ANEEL issuance and instead used the Camargo Schubert, which is also acceptable as it was defined by a third party. ANEEL's load factor, establishing the available electricity guaranteed by the Brazilian Regulatory Agency, was considered at the sensitivity analysis presented at the revised PDD. The presented sensitivity analysis was assessed by DNV and found to be in

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		applying the project activity for project financing, or to the government while applying the project activity for implementation approval; On July 25th, 2011 Iberdrola made a formal presentation to BNDES (Brazilian Development Bank) with the purpose of obtaining the project financing in which declares the plant load factor. The plant load factor (PLF) referred to in the presentation is consistent with the PLF approved by the Brazilian Electricity Regulatory Agency in the Ordinances of each one of the sites, and this PLF is going to be used. Nevertheless, this approach is not applicable for Caetité 1 Wind Power Plant, for which the ANEEL Ordinance has not been issued yet. Specifically to this power plant, the third party assessment will be used. For details please refer to section B.6.3. of the revised version of the PDD.	accordance with Option (a) "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" of the *Guidelines on the Reporting and Validation of Plant Load Factors,* version 1 /38/. Therefore this CAR is closed.
CAR3 According to paragraph 6 of "Guidelines on the Assessment of Investment Analysis" all input values must be valid and applicable at the time of decision for the investment	B.5.21 B.5.22 B.5.23 B.5.24	Wind industry in Brazil has become very competitive in the latest years. In this sense, some items of the total costs of the project (e.g. equipment cost) are considered confidential. Therefore, PPs	DNV assessed the references presented in the investment analysis spreadsheet, including costs of equipment, insurance, project installation and operation/maintenance, prices, taxes,

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
analysis. Project participants did not presented the references of the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates.	B.5.25	have opted to include the requested information in the IRR calculation spreadsheet, instead of making it publicly available in the PDD. Following guidance 8 of the Annex 5, EB 62, a different version of the spreadsheet will be made available to the DOE for publication in the UNFCCC website. Moreover, in order to increase the consistency between the values considered in the IRR calculation and the evidences that were available when the investment decision was made, the following information was adjusted in the project's cash-flow: *For Caetité 1, 2 and 3:* - O&M costs: the values presented in the first version of the spreadsheet were wrongly calculated; - The payment for the Land Use was revised to be consistent with the rental contract; *For Calango 1, 2, 3, 4 and 5:* - TUST: the first version of the spreadsheet considered a TUST value, which is wrong. As detailed in the PDD, the project are going to be	resolutions and estimates were found to be valid and applicable at the time of decision for the investment analysis, in line with the requirement of the "Guidelines on the Assessment of Investment Analysis"/37/. A second site visit was held on 30 September 2011 at Neoenergia offices and DNV crosschecked the values presented with the original documents and contracts. DNV assessed the revised PDD and could confirm that sufficient evidences were presented. According to the PPA the amount of electricity generated has decreasing tolerance bands every quadrennial. When generating above those bands the extra electricity may be sold in the free market. When generating below those bands the revenue will suffer a proportional discount by the price agreed in the auction. The discount reflects the most probable variation after a statistical analysis of 5 000 wind generation scenarios over 20 years. Therefore this CAR is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		connected to the transmission system and the values of the tariffs were available at the time the investment decision was made; - O&M costs: the values presented in the first version of the spreadsheet were wrongly calculated; - The payment for the Land Use was revised to be consistent with the rental contract; PPs also clarify that the total investment mentioned in the PDD includes the development cost, as it can be seen in the IRR calculation spreadsheet. In the other hand, the total cost of the project used to calculate the warranties does not consider the development costs. In addition, Section B.5. of the PDD was revised in order to present a detailed explanation as to how the price correction factor was calculated and why it is important to consider this correction while conducting the investment analysis of the project.	
CAR4 The PDD describes in a general way the equipment to be used for monitoring	B.7.2	No contract for equipment supply has been signed. Therefore, the type of electricity meter to be used is not defined yet. Nevertheless,	Considering that no contract for monitoring equipment has been signed yet, this will be classified as a FAR and shall be verified during the first

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
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.		independently of the type used, it shall meet the requirements established by ONS. The relevant procedures set by the regulatory agencies were mentioned in the revised version of the PDD.	verification. Therefore this CAR is closed.
CAR5 Authorities and responsibilities for project management, monitoring and reporting activities are clearly defined. However, the project's monitoring plan did not include detailed 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	The only parameter to be monitored is electricity dispatched to the grid. PPs 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.	DNV assessed the revised PDD and confirmed that additions made to the monitoring plan are satisfactory under requirements of ACM0002 version 12.2.0.. Therefore this CAR is closed.
CAR6 The start date of the project activity must be in accordance to the Glossary of CDM terms. Project participants did not clearly describe in section C.1.1 the start date of the project activity	C.1.2	The starting date of the proposed project activity was updated. The date mentioned in the revised version of the PDD represents the one which it is forecasted the PPA was signed. Considering there are relevant penalties in the case the plant is not built, it is assumed that this event characterize a	DNV assessed the signed PPAs between the PP and the power utilities. All PPA were signed in 28 July 2011, in accordance to the start date presented in the PDD. Therefore this CAR is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		strong commitment towards the implementation of the project. The signed versions of the PPA and the equipment supplier contract are also attached as evidence of the information provided in the PDD. Please note that the date of the documents is different than the one stated previously. In this sense, sections B.5 and C.1.1. of the PDD were revised. Besides, differently than what was stated in the first version of the PDD, the GSP started after the identified starting date of the project activity. Therefore, evidences confirming that both UNFCCC and the Brazilian DNA were notified of the Project Participants' intention to seek CDM certification are attached.	
CAR7 Project participants are requested to determine which emission factor will be 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	Instead of the ex-ante option previously adopted to determine the grid emission factor, PPs have chosen to apply the ex-post vintage. The data used to determine the combined margin was taken from the Brazilian DNA, i.e. official source. The information is made available revised versions of the PDD and CERs calculation spreadsheet.	The revised PDD and CER spreadsheet were assessed by DNV and the emission factor was correctly presented. The dispatch data operating margin was correctly applied for the calculation of the emission grid. DNV crosschecked the information provided by the project participants with the data from the ONS (Brazilian

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			National System Operator). Calculations, lambda values and emission factors BM and OM were found to the in order. Therefore this CAR is closed.
CAR8 The Brazilian Development Bank (BNDES) has a typical debt/equity finance structure for wind projects and that was not applied to the benchmark calculation.	B.5.14	The investment decision took place on May 11th, 2011. The benchmark was updated in order to reflect the available information at that time, as requested. It is PPs understanding that the publicly available information regarding BNDES' typical debt/equity finance structure applies for items eligible for financing and is only valid for the first year of the cash flow. Usually, for alternative energy generating project, BNDES finances up to 80% of the items eligible for financing. Considering the total investment necessary to build a plant, it can be assumed that approximately 70% of the project is financed. Therefore this percentage corresponds to the Initial Debt/Equity ratio for the energy generation companies, which is the portion disbursed by the bank to the investor and paid on the beginning of the project.	DNV understands that the debt/equity financial structure is the ratio between the total amounts of capital funded by a third party (loan) divided by the project participant private capital invested at the time of decision of the project. The project participants presented in the file "WACC ElectricGen_2011 01 v4.xlsx", tab "Target Debt" a BNDES presentation relating the approved projects from 2003 to 2009 and their debt/equity ratio. This presentation is also available at: http://www.canalenergia.com.br/zpublisher/secoes/Especial_Biblioteca.asp?IDE=14. DNV assessed this document and could confirm a typical debt/equity ratio for wind projects in line with the expected. Therefore this CAR is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		Nevertheless, for the WACC calculation it should be considered the Long-term Debt/Equity structure, which considers not only the debt/equity ratio in the beginning of the project but also how this structure is expected to vary during the project. As a consequence of using the long term debt/equity structure, the 70% proportion decreases with the duration of the project. In general, the investor has a grace period before starting to pay the amortization and, at the same time, receives all the financing from BNDES on the beginning of the project. For the remaining time, the investor does not receive additional financing (debt proportion decreases), while investor starts to pay the amortization from the financing with his equity capital (equity proportion increases), increasing the ratio between Equity/Debt until there is no Debt in the 16th year of the BNDES funding period. This rationale is illustrated using a hypothetical example presented in the attached Excel file named "*50_50_table*". Despite of the explanation provided	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		above, this information is not readily available for similar project being developed in Brazil. Then, the typical debt/equity finance structure as reported by the BNDES and mentioned by the DOE was considered, which is 70/30. The WACC and IRR calculation spreadsheets as well as the PDD were revised accordingly.	
CAR9 PP are not applying the correct version of the *Tool for the demonstration and assessment of additionality*.	Raised after DVR stage	The approval process of the project in the Brazilian DNA requires at least two months to be completed, as a minimum. In this sense, PPs opted to update the methodology and related tools to avoid further delays while requiring the registration of the proposed project activity.	DNV assessed the revised PDD and confirmed that version 6.0.0 of the *Tool for the demonstration and assessment of additionality* was applied. Therefore this CAR is closed.
CL1 Project participants did not explain which are the items *i* to *iv* presented in Sub-Step 4b of the PDD	B.5.47	This section of the PDD was revised following the stepwise approach proposed in the latest version of the "*Tool for the demonstration and assessment of additionality"* (Annex 21, EB 65). Please refer to the revised version of the PDD.	The "Tool for the demonstration and assessment of additionality", Annex 21, EB65 was accessed and DNV confirmed that all the steps were correctly followed by the project participants.. Therefore this CL is closed.
CL2 Project participants are presenting evidences in accordance to VVM, version 1.2, paragraph	Raised after DVR stage	All data, rationales, assumptions, justification and documentation provided to support the demonstration	DNV assessed the presented evidences and concluded that the motivation on implementing the project activity is

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
95. However when the financial indicator is compared to the benchmark, even with the addition of the estimate CER revenues, the project is not financially attractive. It is not clear why the project participants would decide to invest in the project based on the above.		of additionality are reliable and credible. As "motivation" the PPs call the attention to the pioneering aspect of the joint venture created by the project owners, Iberdrola and Neoenergia, which are strongly committed to renewable energy based power generation and with reducing GHG emissions. Neoenergia is one of the largest groups in the Brazilian electricity sector and has been developing several activities related to energy efficiency and special projects such as solar panel installation in isolated areas (http://www.neoenergia.com/section/projeto-social_en.asp). Likewise, Iberdrola has also oriented its business activities related to climate change, by implementing several renewable energy project both in developed countries and developing ones (http://www.iberdrola.es/webibd/gc/prod/en/doc/responsabilidad_cambioclimatico.pdf http://www.iberdrola.es/webibd/gc/prod/en/doc/EnergiaSostenible10.pdf). It is also important to mention that Iberdrola	related to the main goals, of the joint venture between Neoenergia S/A and Iberdrola Renováveis do Brasil S/A, that are renewable energy generation and reduction of GHG emissions. DNV considers that the project motivation is well justified. Therefore this CL is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		is also involved in the European Carbon Markets, is strongly involved with wind project (over 10,000MW of installed capacity), and possess an important portfolio to be implemented in developing countries. Iberdrola has made a major commitment to the use of cleaner technologies, becoming a world leader in wind energy and one of the companies with the lowest CO_2 emission levels in the electricity sector. The Company's environmental strategy and management have been recognized in different international environmental indices. Among the most prestigious is the Dow Jones Sustainability Index, where Iberdrola has been distinguished as a world leader among utilities, or the Climate Leadership Index, where we are considered Best in Class: the best electric company in the world due to its strategy to fight climate change. In other words, one can clearly states that key "motivations" of the project owners in developing the project as presented to the DOE are related both to their strong commitment towards the implementation of renewable projects	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		and to greenhouse emission reductions. Another relevant point is the barrier imposed to new entrants competing for wind power projects in energy auctions. The joint venture had to overcome this barrier in terms of qualification, rules for trading in the regulated energy market and competition from other large national and international wind power companies.	
CL3 Project participants did not presented evidence of transmission distances and voltage transformation of wind park Caetité 1 and transmission distances of wind parks Calango 1 to Calango 5.	B.5.21 B.5.22 B.5.23 B.5.24 B.5.25	Caetité 1 Wind Power Plant (WPP) is located next to Caetité 2 and Caetité 3 WPPs, as it can be observed in the engineering design of the projects (please also refer to the geographic coordinates). Therefore, it will be connected to the same transmission system, or rather, the voltage and the extent of the transmission line is the same. As evidence that Caetité 1 WPP connection point is the same as the other plants (Caetité 2 and 3) the EPE Report *Estudos para a Licitação da Expansão da Transmissão* as well as the Basic Design of the WPP also describing the transmission system are attached.	DNV assessed ANEEL's Authorization for independent power producer /13/, engineering design /16/ /17/ of the projects and confirmed the voltage and location of the wind farms and respective substations. Therefore this CL is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		The transmission systems of Calango 1 to 5 WPP are briefly described in the ANEEL Ordinance of each WPP. All of these WPPs are going to be connected to the Lagoa Nova Substation, which can also be checked in the EPE Report mentioned above. In accordance with the basic design of the WPPs, Calango 1 and Calango 3 WPP will be connected to the same substation, called Calango13 (34.5kV) and located next to the WPPs, before connecting to the Lagoa Nova Substation (69kV). Calango 2, 4 and 5 will be connected to another substation, called Calango245 (69kV) and located next to the WPPs, before connecting to the Lagoa Nova Substation. The detailed basic design of Calango 1 and 2, which describe the transmission system are attached. The transmissions distances are not directly described in the documents, but the location of the substations are. Then, using Google Earth it was possible to estimate the distances of the lines as follows: - from Calango 13 to Logoa Nova Substation: approx. 3km	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		- from Calango 245 to Lagoa Nova Substation: approx. 5km The Google Earth image presenting the future location of the substation and the distances is attached.	

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
FAR1 The PDD describes in a general way the equipment to be used for monitoring purposes. Additional relevant technical about the type of electricity meter and accuracy details shall be presented during the first verification, as well as, the information about the requirements for maintenance and calibration of the measurement equipment.	-	The information requested by the DOE is going to be reported in the project's Monitoring Report to be issued during its periodic verifications.

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APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Gabriel Baines

Gabriel Baines holds a Bachelor's Degree in Environmental Engineering in the University of São Paulo (Brazil) and has done a short term course in the Environmental School of the University of Leeds (England), having an overall work experience of around 5 years. Prior to joining DNV, has had two and a half years experience in the aluminium industry covering the areas of production and environment. His experience also covers the fields of environmental management and management systems such as ISO 14.001.

He has experience of around 2 years in validation and verification of numerous CDM projects in DNV, both in Brazil and abroad.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in 9.1. metal production.

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 Fundação Getúlio Vargas.

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.

Eduardo Camilo da Silva

Eduardo holds a Doctor Degree in Business Administration and is Adjunt Professor at Federal University of Rio de Janeiro, where he develops researches in the areas of Microstructure of Market and Behavioural Finances.

He holds a Bachelor's Degree in Electronic Engineering from the Army Institure of Engineering.

Has working experience of over 20 years in corporations in the area of Finances, Retail and Information Technology.