CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

Annexes

SECTION A. General description of project activity

A.1. Title of the project activity:

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Renova Area 1 Wind Power Project

Version: 03

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A.2. Description of the project activity:

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The proposed project activity consists in the implementation and operation of eight new wind electricity generation facilities: Alvorada, Candiba, Guanambi, Guirapá, Licínio de Almeida, Pindaí, Rio Verde and Serra do Salto, located in Caetité and Guanambi, in the Bahia state, Brazil. The project activity will employ 103 horizontal-axis aerogenerators (model: GE 1.6xle), each with 1.6 MW (total nominal capacity: 164.4 MW[1]). Alvorada will use 5 aerogenerators; Candiba will use 6 aerogenerators; Guanambi will use 13 aerogenerators; Guirapá will use 18 aerogenerators; Licínio de Almeida will use 15 aerogenerators; Pindaí will use 15 aerogenerators; Rio Verde will use 19 aerogenerators and Serra do Salto will use 12 aerogenerators.

The project activity is a result of the 2nd Reserve Power Auction (*2º Leilão de Energia de Reserva - Leilão nº 003/2009 - LER-2009*[2]), held on December 14th 2009, in order to commercialize electricity from wind power and start electricity supply on July 1st 2012[3]. The model adopted for the auction aims to promote high competition between the participants once the auction winners will be those who offers energy at the lowest price. Within this context, the rules of the auction determine that the winners may claim the carbon credits from the Clean Development Mechanism (CDM) themselves and it is their responsibility the conception of all necessary documents and the implementation of all steps for the registration of the project[4].

The project activity will deliver 733,734 MWh/year of renewable electricity to the National Interconnected System (*Sistema Interligado Nacional - SIN*[5]). In the baseline[6], electricity

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[1] One aerogenerator of Rio Verde Generation Facility will be limited by 0.4 MW therefore its total nominal capacity is 30 MW (18 aerogenerators of 1.6 MW plus 1 aerogenerator of 1.2 MW)

[2] Complementarily to the energy hired under regulated environment, since Decree 6.353, of January 16th 2008, the National Electric Sector Model began to count on the hiring of the so called Reserve Energy. Its objective is to increase security in electric energy supply of the National Interconnected System with energy from plants specially hired for this purpose. http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=fc347fea4559f110VgnVCM1000005e01010aRCRD. Accessed on 06/06/2011.

[3] 2nd Reserve Power Auction. Edital do Leilão nº 003/2009 - LER-2009.

[4] 2nd Reserve Power Auction. Portaria nº 211, 28/05/2009.

[5] The SIN is formed by companies from all Brazilian regions. With size and features which allow to consider it globally unique, Brazilian system of electric energy generation and transmission is a

delivered to the grid by the project activity would have been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations. Hence, the project activity will promote GHG emissions reductions by displacing fossil fuel-based electricity generation that would otherwise occur.

The project boundary includes CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. Project and leakage emissions are not expected.

According to United Nations Development Programme in Brazil (*Programa das Nações Unidas para o Desenvolvimento – PNUD Brasil*[7]) the Human Development Index (HDI[8]) of Bahia State is around 0.688[9], the 6th lowest index of Brazilian states in 2000. The implementation of the project activity will certainly bring several positive contributions to the region, such as: income levels, knowledge, health and others. Furthermore, the project activity contributes to the host country's sustainable development in the following ways:

- **Contribution to local environmental sustainability**: The project activity will produce renewable electricity from low environmental impact wind power plants.
- **Contribution to the net workplace generation**: New job posts will be created by the project activity, especially during project implementation.
- **Contribution to the increase of tax collection**: the project activity will increase the tax collection of the municipalities providing direct benefits to the population.
- **Contribution towards the diversification of the electric mix and towards energetic security**: The period when there is the greatest abundance of wind resources is coincident with the period of the smallest hydraulic availability, in Brazil. Hence, wind-based electricity generation is complementary to hydroelectricity, which contributes to the security of renewable electricity supply throughout the year and, hence, to the diminishment of the dependence upon fossil fuels during the dry season[10].
- **Contribution to technological learning and technological development**: This type of project can stimulate similar initiatives inside the Brazilian energy sector and encourage the development of modern and more efficient renewable energy units throughout Brazil.

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hydrothermal system of large scale, with strong prominence hydroelectric plants and multiple owners. http://www.aneel.gov.br/aplicacoes/atlas/aspectos_institucionais/2_1_1.htm. Accessed on 06/06/2011.

[6] The baseline scenario is the same as the scenario existing prior to the start of implementation of the project activity.

[7] http://www.pnud.org.br/pnud/. Accessed on 06/06/11.

[8] Created by Mahbub ul Haq with Amartya Sen collaboration, Economy Nobel Prize winner of 1998, the HDI intends to be a general, synthetic measure of human development. http://www.pnud.org.br/idh/. Accessed on 06/06/11.

[9] http://www.pnud.org.br/atlas/tabelas/index.php.

[10] Brasil, Agência Nacional de Energia Elétrica, *Atlas de Energia Elétrica do Brasil* (Brasília, DF: ANEEL) <http://www.aneel.gov.br/aplicacoes/Atlas/download.htm>.

A.3. Project participants:

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Table 1. Project participants.

Name of Party involved (*) ((host) indicates a host party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Federative Republic of Brazil (host)	Renova Energia S/A	No
	Key Consultoria e Treinamento Ltda.	

(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

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Host Party: Federative Republic of Brazil

A.4.1.2. Region/State/Province etc.:

>>

State: Bahia

A.4.1.3. City/Town/Community etc.:

>>

Municipality: Caetité and Guanambi

A.4.1.4. Details of physical location, including information allowing the unique identification of this project activity (maximum one page):

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Figure 1. Geographic location of the project activity. Top left panel: the localization of Bahia state within Brazil is depicted in red. Top right panel: the localization of the municipality of Caetité in Bahia state is depicted in red. Bottom left panel: the localization of the municipality of Guanambi in Bahia state is depicted in red.

The reference geographic coordinates of the units of the project activity are depicted in Table 2.

Table 2. Reference geographic coordinates of the project units[11]

Unit Name	Latitude	Longitude
Alvorada	- 14.1852	- 42.5911
Candiba	- 14.1857	- 42.6466
Guanambi	- 14.1977	- 42.6308
Guirapá	- 14.1544	- 42.6312
Licínio de Almeida	- 14.1886	- 42.6596
Pindaí	- 14.2093	- 42.6552
Rio Verde	- 14.1640	- 42.6006
Serra do Salto	- 14.1680	- 42.6329

A.4.2. Category(ies) of project activity:

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Sectoral scopes: 01: Energy Industries (renewable sources).

A.4.3. Technology to be employed by the project activity:

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Wind energy is defined as the kinetic energy contained by moving air masses (wind). Its use for the production of electricity occurs by means of the conversion of translational kinetic energy in rotational kinetic energy and, then, by means of the conversion of the former form of energy into electricity, through the employment of wind turbines or aerogenerators[10].

[11] Energetic Research Enterprise (*Empresa de Pesquisa Energética* – EPE). Entrepreneurship Data Sheet (*Ficha de Dados*). Alvorada, Candiba, Guanambi, Guirapá, Licínio de Almeida, Pindaí, Rio Verde and Serra do Salto. The geographic coordinates have been converted from degrees, minutes, seconds of arc to decimal degrees using a DMS Converter (http://vancouver-webpages.com/META/DMS.html).

Environmental pros of wind-based electricity generation recognizably include: contribution for atmospheric emissions reduction (including non-Greenhouse gases) by thermoelectric plants, smaller demand for the construction of new large hydropower plants reservoirs, and the reduction of the risk derived from hydrological seasonality, in light of the aforementioned complementary nature of wind-based and hydroelectric electricity generation in Brazil[10].

Amongst the main negative environmental impacts of wind power plants, noise generation impacts can be mentioned. The noise is generated by the movement of the blades and varies according to the equipment specifications. Also, one could mention the possibility of the electromagnetic interference, which may disturb communication and data transmission systems (radio, television etc.). Such interferences are particularly related to the material used in the manufacture of the blades. Additionally, possible interference upon bird routes should be considered[10]. The negative impacts of the Project Activity were identified and are being addressed by the project participants through specific programs. Section D2 presents such impacts and proposed programs.

As previously mentioned, the proposed project activity consists in the implementation and operation of eight new wind electricity generation facilities: Alvorada, Candiba, Guanambi, Guirapá, Licínio de Almeida, Pindaí, Rio Verde and Serra do Salto, located in Caetité and Guanambi, in the Bahia state, Brazil. The project activity will employ 103 horizontal-axis aerogenerators (model: GE 1.6xle), each with 1.6 MW (total nominal capacity: 164.4 MW). Alvorada will use 5 aerogenerators; Candiba will use 6 aerogenerators; Guanambi will use 13 aerogenerators; Guirapá will use 18 aerogenerators; Licínio de Almeida will use 15 aerogenerators; Pindaí will use 15 aerogenerators; Rio Verde will use 19 aerogenerators and Serra do Salto will use 12 aerogenerators. Table 3 summarizes the basic information about each electricity generation facility.

Table 3. Basic information about each electricity generation facility

Unit Name	Numbers of aerogenerators[12]	Model[12]	Installed Capacity[12]	PLF[12]
Alvorada	5	GE 1.6xle	8 MW	56.8%
Candiba	6	GE 1.6xle	9.6 MW	45.1%
Guanambi	13	GE 1.6xle	20.8 MW	47.4%
Guirapá	18	GE 1.6xle	28.8MW	51.3%
Licínio de Almeida	15	GE 1.6xle	24 MW	50.6%
Pindaí	15	GE 1.6xle	24 MW	49.8%
Rio Verde	19	GE 1.6xle	30 MW	57.3%
Serra do Salto	12	GE 1.6xle	19.2 MW	46.7%

As mentioned before, the project activity will deliver 733,734 MWh/year of renewable electricity to the SIN. The project activity will promote GHG emissions reductions by displacing fossil fuel-based electricity generation that would otherwise occur.

[12] Garrad Hassan Reports, nº 105197/ZR/01, Ref. A1.1 Alvorada, A1.2 Candiba, A1.3 Guanambi, A1.4 Guirapá, A1.5 Licínio de Almeida, A1.6 Pindaí, A1.7 Rio Verde and A1.8 Serra do Salto.

General Electric Company (GE) is one of the world's leading wind turbine suppliers. With over 13,500 wind turbine installations worldwide comprising more than 218 million operating hours and 127,000 GWh of energy produced, GE's knowledge and expertise spans more than two decades. Its wind manufacturing and assembly facilities are located in Germany, Norway, China, Canada and the United States[13].

The wind turbine is a three bladed, upwind, horizontal-axis wind turbine with a rotor diameter of 82.5 m. The turbine rotor and nacelle are mounted on top of a tubular tower giving a rotor hub height of 80 or 100 m. The machine employs active yaw control (designed to steer the machine with respect to the wind direction), active blade pitch control (designed to regulate turbine rotor speed), and a generator/power electronic converter system[14].

The 1.6 MW Series Wind Turbine machine is active yaw and pitch regulated with power/torque control capability and an asynchronous generator. It uses a bedplate drive train design where all nacelle components are joined on a common structure, providing exceptional durability. The generator and gearbox are supported by elastomeric elements to minimize noise emissions[15].

The overview of the technical characteristics of the GE aerogenerators is provided in Table 4.

Table 4. GE 1.6 MW Series Wind Turbine[14]

	GE 1.6 **xle**	Data source
Operational Data		
Rated power	1600 kW	- GE Energy. Technical Documentation. Wind Turbine Generator Systems. GE 1.6xle – 50 Hz / 60 Hz. Calculated Power Curve. - GE Energy. Mechanical Load Analysis.
Cut-in wind speed	3.5 m/s	
Cut-out wind speed	25 m/s	
Rated wind speed	11 m/s	
Wind Class - IEC	IIb (V_{ref} = 40 m/s)	
Rotor		
Diameter	82.5 m	- GE Energy. Technical Documentation. Wind Turbine Generator Systems. GE 1.6 xle - Technical Description and Data.
Swept area	5,346 m^2	
Rotor speed range	9-18 rpm	
Speed regulation	Pitch control	
Generator		
Type	Doubly fed induction type	- GE Energy. Technical Documentation. Wind
Rated Power	1600 kW	

[13] GE Energy. Primary Activities - http://www.ge-energy.com/businesses/ge_wind_energy/en/index.htm - Accessed in 14/07/2010.

[14] GE Energy. Technical Documentation. Wind Turbine Generator Systems. GE 1.6 xle - Technical Description and Data.

[15] GE Energy. 1.5 MW Series Wind Turbine – Features & Benefits - http://www.ge-energy.com/prod_serv/products/wind_turbines/en/15mw/index.htm - Accessed in 14/07/2010.

Rated Voltage	690 V	Turbine Generator Systems. GE 1.6xle – 50 Hz / 60 Hz. Technical Description and Data. - GE Energy. Technical Documentation. Wind Turbine Generator Systems. GE 1.6xle – 50 Hz / 60 Hz. Grid Interconnection.
Frequency	60 Hz	
Braking System		
	- Electrically actuated individual blade pitch systems - Mechanical brake	- GE Energy. Technical Documentation. Wind Turbine Generator Systems. GE 1.6 xle - Technical Description and Data.

Possible interference with environment will be minimized through the adoption of mitigation and environmental control measures.

The environmental aspects of the project activity are discussed in the Environmental Impact Assessment on the project activity, summarized in Section D.

The information provided above demonstrates that the project activity employs environmentally safe and sound technology.

The kinetic energy flows from the wind to the aerogenerators, which convert it into electricity and send it to the SIN. The only gas included in the project boundary is CO_2, according to the applied methodology. A flow diagram of the project boundary, physically delineating the project activity, representing emissions sources and gases included in the project boundary and the monitoring variables, is depicted in Figure 2, section B.3.

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

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Table 5. Estimated amount of emission reductions over the chosen crediting period.

Years	Annual estimation of emission reductions in tonnes of CO_2e
From July 2012	75,400.5
2013	150,801
2014	150,801
2015	150,801
2016	150,801
2017	150,801
2018	150,801
Till June 2019	75,400.5
Total estimated reductions (tonnes of CO_2e)	**1,055,607**
Total number of crediting years	7

Annual average over the crediting period of estimated reductions (tonnes of CO_2e)	150,801

A.4.5. Public funding of the project activity:

>>
There is no public funding involved on this project activity.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:

>>
Approved consolidated baseline and monitoring methodology ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 12.2.0.

This methodology also refers to the latest approved versions of the following tools:

- "Tool to calculate the emission factor for an electricity system". Latest approved version at the time of conclusion of the PDD: **02.2.0**;
- "Tool for the demonstration and assessment of additionality". Latest approved version at the time of conclusion of the PDD: 06**.0**;

B.2. Justification of the choice of the methodology and why it is applicable to the project activity:

>>
The proposed project activity consists in the installation of a grid-connected renewable power generation facility at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant). This is in accordance with the applicability conditions of ACM0002/Version 12.2.0. Therefore, this methodology was applied to the project activity.

Furthermore, the project activity fulfills the remaining applicability conditions of ACM0002/Version 12.2.0 in the following ways:

- "The project activity is the installation (…) of a wind power plant (…)";
- The project activity does *not* involve:
    - Switching from fossil fuels to renewable energy sources at the site of the project activity;
    - Biomass fired power plants;
    - Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m^2.

B.3. Description of the sources and gases included in the project boundary:

>>

The spatial extent of the project boundary includes the project power plants (constituted by Alvorada, Candiba, Guanambi, Guirapá, Licínio de Almeida, Pindaí, Rio Verde e Serra do Salto) and all power plants connected physically to the electricity system that the CDM project power plant is connected to, *i.e.*, SIN. Emission sources and gases included in the project boundary are depicted in Table 6.

Table 6. Emissions sources included in the project boundary, as per ACM0002/Version 12.2.0.

<table>
<tr><th colspan="2">Source</th><th>Gas</th><th>Included?</th><th>Justification/Explanation</th></tr>
<tr><td rowspan="3">Baseline</td><td rowspan="3">Power plants supplying energy to SIN</td><td>CO_2</td><td>Yes</td><td>Main emission source.</td></tr>
<tr><td>CH_4</td><td>No</td><td>Minor emission source.</td></tr>
<tr><td>N_2O</td><td>No</td><td>Minor emission source.</td></tr>
<tr><td rowspan="9">Project Activity</td><td rowspan="3">For geothermal power plants, fugitive emissions of CH_4 and CO_2 from non-condensable gases contained in geothermal steam.</td><td>CO_2</td><td>No</td><td>Not applicable.</td></tr>
<tr><td>CH_4</td><td>No</td><td>Not applicable.</td></tr>
<tr><td>N_2O</td><td>No</td><td>Not applicable.</td></tr>
<tr><td rowspan="3">CO_2 emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants.</td><td>CO_2</td><td>No</td><td>Not applicable.</td></tr>
<tr><td>CH_4</td><td>No</td><td>Not applicable.</td></tr>
<tr><td>N_2O</td><td>No</td><td>Not applicable.</td></tr>
<tr><td rowspan="3">For hydro power plants, emissions of CH_4 from the reservoir.</td><td>CO_2</td><td>No</td><td>Not applicable.</td></tr>
<tr><td>CH_4</td><td>No</td><td>Not applicable.</td></tr>
<tr><td>N_2O</td><td>No</td><td>Not applicable.</td></tr>
</table>

A flow diagram of the project boundary, physically delineating the project activity, representing emissions sources and gases included in the project boundary and the monitoring variables, is depicted in Figure 2.

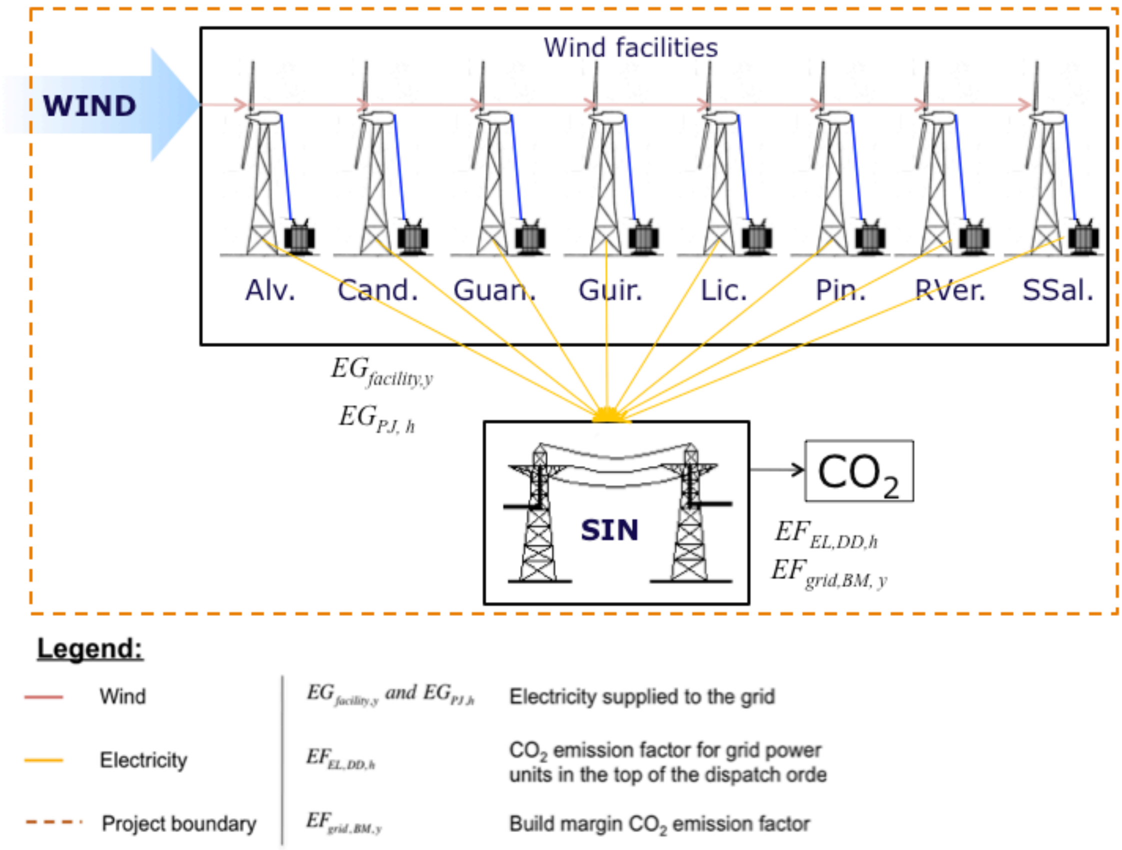

Figure 2. Project boundary. Monitored variables are depicted. Baseline emissions consist of CO_2 emissions from fossil fuel combustion for the generation of electricity by the plants connected to SIN as reflected in its combined margin.

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

>>

As per ACM0002/Version 12.2.0, since the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

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

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

>>

As per ACM0002/Version 12.2.0, the additionality of the project activity shall be demonstrated and assessed using the latest version (06.0) of the "Tool for the demonstration and assessment of additionality".

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a: Define alternatives to the project activity:

The identified realistic and credible alternative scenarios available to the project participants are:

- The project activity undertaken without being registered as a CDM project activity;
- The continuation of the current situation (no project activity undertaken).

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

All identified alternatives are in accordance with laws and regulations.

Outcome of Step 1: *The alternatives to the project activity that are consistent with current laws and regulations are (a) the project activity undertaken without being registered as a CDM project activity and (b) the continuation of the current situation (no project activity undertaken).*

Step 2: Investment analysis

The investment analysis determines whether the proposed project activity is not economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).

The investment analysis was conducted according to the "Tool for the demonstration and assessment of additionality" *version 6.0 and the* "Guidelines on the Assessment of Investment Analysis" *version 5.0*, therefore the following sub-steps shall be undertaken:

Sub-step 2a. Determine appropriate analysis method:

The project activity generates incomes other than CDM related income; therefore simple cost analysis cannot be applied. Investment comparison analysis is not used as other investment alternatives were not analyzed in the decision-making context. Hence, benchmark analysis (Option III) will be used.

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

Identification of the financial indicator

The method of the Equity Internal Return Rate (Equity IRR) was considered as the most appropriate, once it is the usual method for capital budget and decision-making adopted by the party proposing the project.

Identification of the benchmark

According to "Guidelines on the Assessment of Investment Analysis" vs. 5.0, paragraph 12: "Required/expected returns on equity are appropriate benchmarks for an Equity IRR".

The Required/expected return (K_e) was calculated according to the Capital Asset Pricing Model (CAPM), a widely used and accepted financial pricing model in the academy and businesses[16]. Input data include publicly available data and standard parameters in the Brazilian economy and utilities sector[17].

i) Calculation of the required/expected return on equity (K_e)

The required/expected return on equity was calculated using the Capital Asset Pricing Model (CAPM). The equations are described below:

$K_e = R_f + \beta\,(R_m - R_f)$ (Equation 1)

$$\beta = \frac{Cov(R_i, R_M)}{\sigma^2_M} \quad \text{(Equation 2)}$$

K_e= Required/expected return on equity obtained through equation 1.

R_f = Expected Return on a Risk Free Asset
Data used: Long Term Brazilian Treasury Bond (type NTN-B) of years 2006, 2007, 2008, 2009.
Rationale: Governments control the printing of currency, which reduces probability of default, approximating to a risk free asset concept. The Treasury bond used is NTN-B (maturity date: 15th of May 2035), which is a long-term bond that reflects a comparable horizon to an investment in a wind energy project in Brazil.
Source: Publicly Available - Brazilian National Treasury: http://www.tesouro.fazenda.gov.br/tesouro_direto/

R_m= Expected Return on a Risky Asset (Market Return)
Data used: Daily Return of Bovespa Index of years 2006, 2007, 2008, 2009.

[16] Cost of Capital to Energy Generation in Brazil by Small Hydroelectric Power Plants (SHPPs) and Hydroelectric Power Plants (HPPs) below 50 MW in the Clean Development Mechanism Context (*Custo de Capital para Geração de Energia Hídrica no Brasil por meio de Pequenas Centrais Hidrelétricas (PCHs) e Usina Hidrelétrica de Energia (UHE) até 50 MW no Contexto do Mecanismo de Desenvolvimento Limpo*). ISAE/FGV, Brazil: http://www.carbonnews.com.br/downloads/wacc.pdf. Accessed in: 04/03/2011.

[17] As defined in the "Tool for the Demonstration and Assessment of Additionality" vs. 06.0, Sub-step 2b, Option III: "*the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer*".

Rationale: According to BMF&Bovespa website: "The *Bovespa Index* is the main indicator of the Brazilian stock market's average performance. Ibovespa's relevance comes from two facts: it reflects the variation of BM&FBOVESPA's most traded stocks and it has tradition, having maintained the integrity of its historical series without any methodological change since its inception in 1968". Therefore it is a credible index to reflect returns on risky assets (market return).
Source: Publicly Available - BMF&BOVESPA: http://www.bmfbovespa.com.br
Note: In order to obtain market return rates (R_m) in real terms the following formula was used: Real R_m = [(1+ Nominal R_m) / (1 + Inflation Rate)] – 1. The inflation index used is the IPC-A, which is the most consistent rate once it is the index for annual energy price inflation adjustments (as per Reserve Power Energy Auction rules) and the inflation type used to calculate NTN-B public bond nominal yield.

R_i= Expected Return on an Energy Sector Asset
Data used: Daily Return of Bovespa Index of years 2006, 2007, 2008, 2009.
Rationale: According to the "Tool for the demonstration and assessment of additionality", Sub-Step 2b, Paragraph 5: "When applying Option II or Option III, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer".
The BMF&Bovespa's Electric Power Index (IEE) satisfies this applicable additionality tool as, according to BMF&Bovespa the index has "the purpose of providing a segmented view of the stock market performance. They are composed by the most significant publicly-held companies of specific economic sectors, representing the aggregated performance of the sector considered".
Source: Publicly Available - BMF&BOVESPA: http://www.bmfbovespa.com.br

β = Sensitivity of the assets returns to market returns calculated through equation 2. Where: Cov (R_i,R_m) is the covariance of the Asset Return (R_i) and the Market Return (R_m), and σ_M^2 is the Variance of Market Return.

Note: All data related to year 2009 considers the period from January 1st to December 11th in order to reflect information available until the Starting Date of the project activity in 14th of December 2009, that represents the realization of Brazilian 2nd Reserve Power Auction (further details in the end of item B.5.).

ii) Benchmark established

The required/expected rate of return achieved with the assumptions described and calculated in the "Electricity Sector Benchmark-Renova A1.xlsx" spreadsheet is 16.57% in real terms. This is the benchmark defined to assess the additionality of the project activity and may be compared to the Equity IRR.

Sub-step 2c. Calculation and comparison of financial indicators:

Calculation of the Equity IRR:

The cash flow spreadsheet contemplates the following main assumptions:

Assumption 1 – Electricity Tariff:

The electricity tariff of R$/MWh 144.94 price is evidenced by the document published by Electric Energy Commercialization Chamber (*CCEE – Câmara de Comercialização de Energia Elétrica*) regarding the 2nd Reserve Power Auction (December/2009) results (provided to the DOE).

Assumption 2 – Contracted and expected generation

The expected energy generation is evidenced by the Wind Certification made by Garrad Hassan[18] and reflects the long-term expected generation with 50% surplus probability (P50), which corresponds to 77.48 MW per year (after applying 2.5% discount due to losses following clause 5.3 of the "Annex II – Reserve Energy Contract").

The contracted energy of 72MW is the fixed amount of energy authorized for sale by the Brazilian regulatory agency, and the maximum amount of energy subject to sale in the auction. Variable energy (higher or lower than the fixed amount) must also be considered according to conditions explained in clause 6 of the "Annex II – Reserve Energy Contract" of the "2nd Reserve Power Auction Rules".

Note: This is an optmistic value for expected energy generation considering natural characteristics and the pioneering factor of wind energy projects in Brazil. To exemplify this, the National Bank of Economic and Social Development – BNDES[19] (according to BNDES presentation) considers a 90% surplus probability (P90), therefore a generation of roughly 17% lower (this reduction estimate may vary among each electricity generation facility and can be cross-checked in the wind generation certification provided to the DOE) than the P50.

Assumption 3 – Investment Values:

The investment cost presented in the financial spreadsheet is based largely on a Memorandum of Understanding (MoU) between the project proponent and the wind turbine generator supplier, which represents roughly 80% of the cost of the Capital Expenditures (CAPEX). The complementary value of this assumption was achieved based on a technical study, "Implementation Study and Cost Estimative" (Portuguese: "Estudo de Implantação e Estimativa de Custo") developed by the consortium formed by the companies: Engineering S.A and Laureano & Meirelles Engenharia S.A – that aims the development of specialized services related to investment cost determination for power plants (a third party entity).

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[18] http://www.gl-garradhassan.com/en/aboutus.php. Accessed on 06/06/11.

[19] Federal public company, BNDES is currently the main long term financing instrument for investments in all economy sectors, in a policy that includes social, regional and environmental dimensions. http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/O_BNDES/A_Empresa/. Accessed on 06/06/11.

Both evidences available to this input value have well recognized companies involved. The first refers to GE (world big player of wind turbine generators provider) and the second to a local sector recognized company with expertise on several feasibility studies[20]. Such consistent, appropriate and conservative value of CAPEX totalizes R$ 3,927,479.86 / MW installed.

Assumption 4 – Operation and Maintenance (O&M)

The total O&M value is composed by the wind power plants O&M (evidenced by the MoU with GE) and O&M of the transmission lines (evidenced by commercial proposal of transmission) accounting for R$ 85,000/wind turbine per year.

Assumption 5 – Transmission Costs

The transmission costs of the project activity are divided in two categories. (i) TUST (*Tarifas de Uso do Sistema de Transmissão* – Transmission System Use Tariff), which is a transmission cost for the participants of the auction and refers to transmission costs of the grid (values considered in accordance to published document: Technical Note 092/2009 from 09th November 2009[21]. (ii) ICG charges (*Interesse Exclusivo de Centrais de Geração para Conexão Compartilhada* – Exclusive Interest of Generation Centres for Shared Connexion), which accounts for transmission costs regarding dedicated transmission solution for the project activity.

Assumption 6 - National and/or sectoral policies

According to the Sub-step 2c of the "Tool for demonstration and assessment of additionality" in the calculation of the suitable financial indicator of the project activity "*include all relevant costs (including, for example, the investment cost, the operations and maintenance costs), and revenues (excluding CER revenues, but possibly including inter alia subsidies/fiscal incentives[22], ODA etc, where applicable), and, as appropriate, non-market cost and benefits in the case of public investors if this is standard practice for the selection of public investments in the host country*". Regarding the "Clarifications on the consideration of national and/or sectoral policies and circumstances in baseline scenarios" (version 2), "*(b) National and/or sectoral policies or regulations that give comparative advantages to less emissions-intensive technologies over more emissions-intensive Technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs)*", are considered a type E- policy. If this type of policy has been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001), need not be taken into account.

Considering these clarifications from the Executive Board, the following specific sectoral policy was implemented in Brazil in order to provide incentives for implementation and diffusion of renewable energy plants:

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[20] Company website: http://www.engineering.com.br/

[21] http://www.aneel.gov.br/cedoc/nreh2009907.pdf

[22] *See EB guidance on the consideration of national/local/sectoral policies and measures for the baseline setting.*

Discount of 50% on electricity transmission tariffs

One of the costs associated to the operation of power plants in Brazil refers to the transmission and distribution of the electricity generated by the power plants. In order to induce the implementation of renewable power plants by the private sector, the Brazilian government has created a specific incentive related to the transmission costs for different types of plants.

The incentive mentioned created by the Brazilian Electricity Regulatory Agency (ANEEL) determines a sectoral policy of 50% reduction on tariffs for the use of electrical systems for transmission and distribution systems, by hydroelectric developments and for those based on solar, wind, biomass or qualified cogeneration, where the power injected into the transmission and distribution systems is less than or equal to 30,000 kW. This benefit was created on April 26th, 2002, by the Law number 10,438, where it was determined that ANEEL should stipulate a reduction not inferior to 50% on the tariffs of transmission.

The Normative Resolution number 77[23], issued on August 18th, 2004, establishes the procedures related to tariff's reduction, where in the same document it is cited that the Law number 10,762 from November 11th, 2003, extends to the generation projects typified above the reduction on TUST.

As described above, these types of policy do not need to be taken into account in the calculation of the project activity financial indicator if it was created after the adoption of the CDM M&P. Considering that, the TUST (transmission tariff) discount was not taken into account in the calculation of the suitable financial indicator – Equity IRR.

Assumption 7 – Debt and Financial Costs

The National Bank of Economic and Social Development – BNDES is considered for the financing structure and its standard terms for wind power facilities. The interest rate considered in the decision-making is composed of TJLP rate + 0.9% + 1.5% risk spread with two years grace period and 16 years of amortization. These terms reflect the expectation of the decision makers and it is in accordance to the indication of the BNDES for wind projects (according to BNDES presentation provided to the DOE).

Assumption 8 – Taxes

Income Rate – All Special Purpose Companies (SPE) of the project activity are eligible to the presumed profit regime as its gross revenues are lower than R$ 48,000,000.00 (article 46 of Law 10637 dated in 2002). According to the Income Rate Regulation of 1999 (RIR/99) the applicable income rate basis is 8% of gross revenues and the income rate is 25%.

PIS/PASEP Tax (*Programa de Integração Social/Programa de Formação do Patrimônio do Servidor Público* – Social Integration Program/Public Servant Patrimony Forming Program) – 0.65% is applied according to article 52 of the Normative Instruction #247, from November 2002.

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[23] Normative Resolution number 77 issued on 18th August 2004 by ANEEL: http://www.aneel.gov.br/cedoc/bren2004077.pdf

Cofins Tax (*Contribuição para o Financiamento da Seguridade Social* - Contribution to the Financing of Social Security) – 3.00% is applied according to article 52 of the Normative Instruction #247, from November 2002.

Assumption 9 – Period of Assessment

The total period of assessment is 20 years from the start of operations date of 01/July/2012 according to the auction PPA (Power Purchase Agreement).

The "Annex II – Reserve Power Contract" of the Auction Rules states that the end of the reserve power contract is set in 30th of June 2032 and that this date does not affects rights or obligations of the parts that occurred previously to this event (paragraphs 4.1 and 4.6). As the variable income is received in 24 monthly instalment payments of the next quadrennium (paragraph 8.14 of the Annex II – Reserve Energy Contract), two years must be added after the end of the PPA in order to account variable income receivables.

The summary of assumptions can be seen below:

Assumptions Summary		
Item	Value	Evidence/Rational
Electricity Tariff	R$/MWh 144.94	Auction Results
Contracted Energy	72 MW	Auction Results
Expected Net Energy	77.48 MW	Wind Certification
CAPEX	R$/MW 3,927,479.86	MoU with Wind Turbine Supplier and Technical Study
O&M	R$/turbine/year 85,000	MoU and Evidenced Negotiation
TUST	from 6.00 to 5.10 R$/KW/month	Technical Note 092/2009 from 09th November 2009
ICG charges	R$/MW 3,000	Internal Estimation by the Technical Team
Risk Spread	2.40%	BNDES Presentation, internal Estimation
Income Rate	25%	Income Rate Regulation (RIR/99)
PIS/PASEP	0,65% of Gross Revenues	Normative Instruction #247
Cofins	3% of Gross Revenues	Normative Instruction #247

Results:

After applying the assumptions enumerated above and others described in the financial analysis spreadsheet, the Equity IRR is 7.59% in real terms.

Comparison of the Equity IRR and the Benchmark rate:

According to the Tool for the demonstration and assessment of additionality, Sub-step 2c, sub-item 10. (b): *"The financial benchmark, if Option III (benchmark analysis) is used. If the CDM* *project activity has a less favourable indicator (e.g. lower IRR) than the benchmark, then the CDM project activity cannot be considered as financially attractive".*

Thus, without the CDM revenues, the proposed CDM project is not financially feasible, that is, the Equity IRR of 7.59% is lower than the reference of 16.57%.

Equity IRR of 7.59% < Benchmark rate of 16.57%

Sub-step 2d. Sensitivity analysis:

Sensitivity analysis was carried out to demonstrate that the conclusion regarding financial/economic (un)attractiveness is robust to reasonable variations in the critical assumptions. Variables that constitute more than 20% of either total project costs or total revenues were subject to variation until the benchmark is achieved:

<u>Electricity Tariff</u>

Required variation to achieve the benchmark: +28.70%

Comments: According to the Auction Rules this price will not change along the PPA period. Therefore this positive variation in the electricity tariff could never occur.

<u>Energy Generation</u>

Required variation to achieve the benchmark: +59.34%

Comments: According to the Auction Rules the contracted energy will not change along the PPA period. The effective energy generation has seasonal variations resulting in lower and higher production levels; therefore the long-term energy generation estimated by the specialized consultancy Garrad Hassan was used and may not differ much in a long-term perspective.

<u>CAPEX</u>

Required variation to achieve the benchmark: -28.23%

Comments: This reduction would never occur once around 80% of the expected CAPEX has a fixed price defined in the MoU with GE. This means that, even if the cost of remaining items of the project's CAPEX such as civil construction and electromechanical components becomes zero the benchmark would not be achieved.

<u>Operation and Maintenance (O&M)</u>

Required variation to achieve the benchmark: Not possible

Comments: Even if O&M costs become zero, the benchmark would not be achieved.

The sensitivity analysis shows that the investment analysis provided a valid argument in favour of the additionality of the proposed project activity, since it consistently supports, for a realistic range of assumptions, the conclusion that the project activity without CERs revenues is unlikely to be financially/economically attractive.

Outcome of Step 2: *The project activity without CERs revenues is unlikely to be financially/economically attractive.*

Step 3: Barrier analysis

This step was not applied.

Step 4: Common practice analysis

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

Most operating wind power plants in Brazil were constructed under the incentives of a governmental program based in feed in tariffs called PROINFA. This program was launched in 2002 and was later superseded by an auction-based system, in which fits the present project activity. In that sense, the common practice analysis was made considering all wind power projects in Brazil, which tend to be similar to the project activity by having the same access to financing, technology and regulatory framework. In sub-step 4b, such similar activities are analysed, leading to the conclusion that none of them can be compared to the present project activity, due to their financing instruments or their scale.

There are 36 operating wind power plants in Brazil, summing 106,569 MW of installed capacity, which represents 0.39 % of the total installed capacity in the country (Table 7**Error! Reference source not found.**).

Table 7: Installed Capacity in Brazil

Capacidade Instalada até 31/12/2009			
Empreendimentos em Operação			
TIPO	Quantidade	Potência (MW)	%
UHE*	165	75.484	70,83
UTE	1.313	25.350	23,79
PCH	356	2.953	2,77
CGH	307	173	0,15
UTN	2	2.007	1,99
EOL	36	602	0,39
SOL	1	0	0
SUBTOTAL	2.180	106.569	100

* Considerada Itaipu nacional (7.000 MW)

*Source: National Electric Energy Agency (*Agência Nacional de Energia Elétrica* - ANEEL)/Generation Database (*Banco de Informação de Geração* - BIG). Available at: http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.asp. Accession date: 28/11/2011.

The data depicted in Table 7 show that the participation of wind-based electricity is still not significant in the electric matrix in Brazil. Moreover, it should be noted that most wind-based electricity generation power plants in Brazil accrue from the national incentive mechanism, PROINFA[24].

PROINFA (*Programa de Incentivo às Fontes Alternativas de Energia Elétrica*/Program of Incentive to Alternative Sources of Electric Energy) was launched in 2002 with the objective of increasing the participation of electricity produced from wind and biomass sources and from small hydroelectric plants in the National Interconnected System (SIN). PROINFA is based on feed in tariffs and was designed to have 2 phases. The first phase initially set a quota of 3.3 GW of new generation capacity equally distributed among wind, biomass and small hydro. After the program was launched, part of the quota of biomass was transferred to wind projects[24].

The program foresees the implementation of 144 plants, totaling 3,299.40 MW of installed capacity, being 1,191.24 MW from 63 small hydroelectric plants (1 MW - 30 MW), 1,422.92 MW from 54 wind plants and 685.24 MW from 27 biomass plants[24].

Projects developed under PROINFA have a 20-year Power Purchase Agreement signed with the state-owned electricity utility ELETROBRÁS[24]. PROINFA presets the price of the electricity paid to generators as a technology specific economic value, which is defined as the value that guarantee, for a defined timeframe and efficiency level, the economic feasibility of a typical

[24] Programa de Incentivo às Fontes Alternativas de Energia Elétrica/ *Program of Incentive to Alternative Sources of Electric Energy*. Available at: http://www.mme.gov.br/programas/proinfa. Accession date: 08/02/2011.

project based on alternative sources of energy. It is worth mentioning that the prices paid by PROINFA are higher than those practiced by the market[25].

Sub-step 4b: Discuss any similar Options that are occurring:

Sub-step 4b is conducted according to the "*Guidelines on Common Practice*" version 01.0 (Annex 12, EB63)

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

The project activity has 164.4 MW installed capacity. Hence, only projects with installed capacity between 82.2 MW and 246.6 MW will be considered in the calculation.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all}. Registered CDM project activities shall not be included in this step;

The PP has conducted a research in ANEEL website, UNFCCC website and other reliable documents to identify the number of operational projects at the starting date and, from this base, all CDM registered projects. The number of projects identified in the applicable output area, N_{all}, is 1.

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

The only project identified in step 1 is Praia Formosa Power Plant, and it has received incentives from PROINFA, which is a clear promotional policy as explained previously in Sub-step 4a.

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

Factor F = 1 – 1/1 = 0

The proposed project activity is a "common practice" within a sector in the applicable geographical area if the factor F is greater than 0.2 and N_{all}-N_{diff} is greater than 3.
As none of these conditions is true, the project activity is not considered a common practice.

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[25] Alves de Brito, M.L. 2009. Investments in Wind Energy in Brazil: Comparing PROINFA and CDM project finance. Master Thesis. Graduate School of Humanities and Social Sciences. University of Tsukuba, Japan.

Outcome of Step 4: *The project activity is not common practice in the relevant sector in the country.*

Outcome of B5: *Since all steps above have been satisfied,* ***the project activity is additional.***

Demonstration and assessment of prior consideration of the CDM

As per the "Guidelines on the demonstration and assessment of prior consideration of the CDM" (Version 4 - Annex 13/EB62), "for project activities with a starting date on or after 02 August 2008, the project participant must inform a Host Party DNA and the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status".

The Starting Date of the project activity, 14 December 2009, represents the realization of Brazilian 2nd Reserve Power Auction (*2º Leilão de Energia de Reserva - Leilão nº 003/2009 - LER-2009*[26]), in which the eight electricity generation facilities Alvorada, Candiba, Guanambi, Guirapá, Licínio de Almeida, Pindaí, Rio Verde and Serra do Salto had its energy contracted and its contract for the supply of wind turbine generators and services, which represents over 75% of the project's capital expenditures, validated. According to the Memorandum of Understanding signed with General Electric on 04 December 2009, if the project proponent is successful in its participation at the Brazilian 2nd Reserve Power Auction, the project proponent and General Electric agree to enter[27] (or, in the case of the Buyer, to cause each of its affiliates to enter) into one or more contracts for the supply of wind turbine generators (the main component of total required investments). So, inline with the Glossary of CDM terms (version 05), the starting date of the project activity is 14 December 2009.

Project participants have informed the Brazilian DNA and the UNFCCC Secretariat of the commencement of the project activity and of their intention in seeking the CDM status. Such notification was made within six months of the project activity and contained a brief description of the project activity and the precise geographical location of the project plant.

The notifications, using the standardized form F-CDM- Prior Consideration, were sent for Brazilian DNA and UNFCCC Secretariat in 09/06/2010 and the receipt of such documents has been confirmed.

Documental evidences of these notifications were made available to DOE during validation.

B.6. Emission reductions:

[26] 2nd Reserve Power Auction (*2º Leilão de Energia de Reserva - Leilão nº 003/2009 - LER-2009*) - http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=ec41d74d98114210VgnVCM1000005e01010aRCRD - Accessed in 13/07/2010

[27] Article 1 of the Memorandum of Understanding signed with GE on 4 December 2009.

B.6.1. Explanation of methodological choices:

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Project emissions

As per ACM0002/Version 12.2.0, since the project activity is neither a geothermal, solar nor a hydropower plant, $PE_y = 0$.

Baseline emissions

The baseline emissions are to be calculated as follows:

(1) $BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$

Where:

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

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

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version (02.2.0) of the "Tool to calculate the emission factor for an electricity system" (tCO_2/MWh).

Calculation of $EG_{PJ,y}$

Since the project activity is the installation of a new grid-connected renewable power plant at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

(2) $EG_{PJ,y} = EG_{facility,y}$

Where:

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

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

Calculation of $EF_{grid,CM,y}$

The project plants will serve Brazilian Interconnected System (SIN). The Brazilian DNA has published the delineation of SIN to be adopted for the purposes of CDM projects. As per Resolution Nº8 of the Brazilian DNA, the electric grid considered in this project activity is considered as a single system consisted by the sub-markets of SIN as the definition of the electric system of the project. Off-grid plants will not be included in the calculation of $EF_{grid,CM,y}$.

$EF_{grid,CM,y}$ will be calculated using the latest version (02.2.0) of the "Tool to calculate the emission factor for an electricity system". The following formulae apply:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \cdot w_{OM} + EF_{grid,BM} \cdot w_{BM} \quad (3)$$

Where:

$EF_{grid,CM,y}$	= Combined margin CO_2 emission factor in year y (tCO_2/MWh);
$EF_{grid,BM,y}$	= Build margin CO_2 emission factor in year y (tCO_2/MWh);
$EF_{grid,OM,y}$	= Operating margin CO_2 emission factor in year y (tCO_2/MWh);
w_{OM}	= Weighting of operating margin emissions factor (75%);
w_{BM}	= Weighting of build margin emissions factor (25%).

The weighting factors for build and operating margin were selected according to guidance provided in the "Tool to calculate the emission factor for an electricity system", v. 02.2.0.

The $EF_{grid,OM,y}$ will be calculated according to the *dispatch data analysis*. As per this method OM emission factor is determined based on the grid power units that are actually dispatched at the margin during each hour h where the project is producing electricity and $EF_{grid,OM-DD,y}$ is calculated as follows:

$$EF_{grid,OM-DD,y} = \frac{\sum_h EG_{PJ,h} \cdot EF_{EL,DD,h}}{EG_{PJ,y}} \quad (4)$$

Where:

$EF_{grid,OM-DD,y}$	= Dispatch data analysis operating margin CO_2 emission factor in year y (tCO_2/MWh);
$EG_{PJ,h}$	= Electricity generation by the project activity in hour h of year y (MWh);
$EF_{EL,DD,h}$	= CO_2 emission factor for grid power units in the top of the dispatch order in hour h in year y (tCO_2/MWh);
$EG_{PJ,y}$	= Total electricity displaced by the project activity in year y (MWh);
h	= Hours in year y in which the project activity is generating electricity;
y	= Year in which the project activity is displacing grid electricity.

For the first crediting period, the build margin emission factor will be updated annually, *ex-post*, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available.

Leakage

According to ACM0002, version 12.2.0, *"no leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected."*

Emission reductions

The emission reduction by the project activity during a given year y is calculated as follows:

(5) $$ER_y = BE_y - PE_y$$

Where:

ER_y = Emissions reductions of the project activity during the year y (tCO_2e)

BE_y = Baseline emissions during the year y (tCO_2e)

PE_y = Project emissions during the year y (tCO_2e)

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	w_{OM}
Data unit:	Fraction
Description:	Weighting of operating margin emissions factor
Source of data used:	"Tool do calculate the emission factor for an electricity system", Version 02.2.0
Value applied:	75%
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value for wind power plants.
Any comment:	This value will be applied in the subsequent crediting periods.

Data / Parameter:	w_{BM}
Data unit:	Fraction
Description:	Weighting of build margin emissions factor

Source of data used:	"Tool do calculate the emission factor for an electricity system", Version 02.2.0
Value applied:	25%
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value for wind power plants.
Any comment:	This value will be applied in the subsequent crediting periods.

B.6.3. Ex-ante calculation of emission reductions:

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Emission reductions were *ex-ante* estimated as follows:

(6) $BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$

Where:

BE_y = Baseline emissions in year y (150,801 tCO_2/yr);

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (733,734 MWh/yr);

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version (02.2.0) of the "Tool to calculate the emission factor for an electricity system" (0.2055 tCO_2/MWh, as detailed in Table 8)

As per ACM0002/Version 12.2.0 for this project activity, project emissions are zero ($PE_y = 0$) and leakage emissions are not considered.

(7) $ER_y = BE_y - PE_y$

Where:

ER_y = Emissions reductions of the project activity during the year y (150,801 tCO_2e)

BE_y = Baseline emissions during the year y (150,801 tCO_2e)

PE_y = Project emissions during the year y (0 tCO_2e)

See detailed ex-ante calculation in the annex spreadsheet "ex_ante_Renova_01.xls".
The parameters used for *ex-ante* calculations are compiled in Table 8.

Table 8. Parameters used for ex-ante calculations

Parameter	Unit	Value	Description	Comment
ER_y	tCO_2/yr	150,801	Emissions reductions in the year y	Calculated
BE_y	tCO_2/yr	150,801	Baseline emissions in year y	Calculated
PE_y	tCO_2/yr	-	Project emissions in the year y	For this project activity (wind-based electricity generation project emissions are null, as per ACM0002/Version 12.2.0)
$EG_{PJ,y}$	MWh/yr	733,734	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y	Estimated as the average total yearly net electricity generation by the project activity, as per Garrad Hassan Reports, nº 105197/ZR/01, Ref. GH_Alvorada, GH_Candiba, GH_Guanambi, GH_Guirapá, GH_Licinio_De_Almeida, GH_Pindai, GH_Rio_Verde, GH_Serra_Salto.
$EG_{facility,y}$	MWh/yr	733,734	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y	Estimated as the average total yearly net electricity generation by the project activity, as per Garrad Hassan Reports, nº 105197/ZR/01 Ref. GH_Alvorada, GH_Candiba, GH_Guanambi, GH_Guirapá, GH_Licinio_De_Almeida, GH_Pindai, GH_Rio_Verde, GH_Serra_Salto.
$EF_{grid,CM,y}$	tCO_2/MWh	0.2055	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version (02.2.0) of the "Tool to calculate the emission factor for an electricity system"	Calculated
$EF_{grid,OM,y}$	tCO_2/MWh	0.2476	Operating margin CO_2 emission factor in year y	Calculated as the average hourly emission factor, weighted by the hourly net electricity generation

$EF_{grid,OM-DD,y}$	tCO_2/MWh	0.2476	Dispatch data analysis operating margin CO_2 emission factor in year y	Calculated as the average hourly emission factor, weighted by the hourly net electricity generation
$EF_{EL,DD,h}$	tCO_2/MWh	0.2476	CO_2 emission factor for grid power units in the top of the dispatch order in hour h in year y	Hourly operating margin emission factor of the National Interconnected System (2009) from January to December, as published by the Brazilian DNA (http://www.mct.gov.br/index.php/content/view/74689.html, accession date 12/07/2010)
$EF_{grid,BM,y}$	tCO_2/MWh	0.0794	Build margin CO_2 emission factor in year y	Build margin emission factor of the National Interconnected System (2009) as published by the Brazilian DNA (http://www.mct.gov.br/index.php/content/view/74689.html, accession date 12/07/2010)
w_{OM}	Fraction	0.75	Weighting of operating margin emissions factor	Default value for wind-based electricity generation projects, as per Tool to calculate the emission factor for an electricity system /Version 02.2.0
w_{BM}	Fraction	0.25	Weighting of build margin emissions factor	Default value for wind-based electricity generation projects, as per Tool to calculate the emission factor for an electricity system /Version 02.2.0

B.6.4 Summary of the ex-ante estimation of emission reductions:

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Table 9. Summary of the ex-ante estimation of emission reductions

Year	Estimation of project activity emissions (tonnes of CO_2e)	Estimation of baseline emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of overall emission reductions (tonnes of CO_2e)
From July 2012	-	75,400.5	-	75,400.5
2013	-	150,801	-	150,801
2014	-	150,801	-	150,801
2015	-	150,801	-	150,801
2016	-	150,801	-	150,801
2017	-	150,801	-	150,801
2018	-	150,801	-	150,801
Till June 2019	-	75,400.5	-	75,400.5
Total (tonnes of CO_2e)	-	**1,055,607**	**-**	**1,055,607**

B.7. Application of the monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

Data / Parameter:	$EG_{facility,y}$
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied by the project plant to the grid in year y
Source of data to be used:	Measurements at project activity site.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	733,734
Description of measurement methods and procedures to be applied:	This parameter will be continuously analyzed and monitored values will be averaged monthly and yearly. Corresponds to the sum of the electricity generation by the eight units of the project activity.
QA/QC procedures to be applied:	Measurement results will be cross-checked through data available at the CCEE databank.
Any comment:	Corresponds to the yearly consolidation of $EG_{PJ,h}$. Ex-ante estimated

	as the predicted average total yearly net electricity generation by the project activity , as per Estimated as the average total yearly net electricity generation by the project activity, as per Garrad Hassan Reports, nº 105197/ZR/01, Ref. GH_Alvorada, GH_Candiba, GH_Guanambi, GH_Guirapá, GH_Licinio_De_Almeida, GH_Pindai, GH_Rio_Verde, GH_Serra_Salto.

Data / Parameter:	$EF_{grid,OM,y}$
Data unit:	tCO_2/MWh
Description:	Operating margin CO_2 emission factor in year y
Source of data to be used:	Brazilian Interministerial Commission on Global Climate Change
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.2476
Description of measurement methods and procedures to be applied:	As per the most recent version (02.2.0) of the “Tool to calculate the emission factor for an electricity system”.
QA/QC procedures to be applied:	As per the most recent version (02.2.0) of the “Tool to calculate the emission factor for an electricity system”.
Any comment:	Ex-ante estimated operating margin emission factor of the National Interconnected System (2009), as published by the Brazilian DNA (http://www.mct.gov.br/index.php/content/view/74689.html, accession date 12/07/2010).

Data / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	Build margin CO_2 emission factor in year y
Source of data to be used:	Brazilian Interministerial Commission on Global Climate Change
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.0794
Description of measurement methods and procedures to be applied:	As per the most recent version (02.2.0) of the “Tool to calculate the emission factor for an electricity system”.
QA/QC procedures to	As per the most recent version (02.2.0) of the “Tool to calculate the

be applied:	emission factor for an electricity system”.
Any comment:	Ex-ante estimated build margin emission factor of the National Interconnected System (2009), as published by the Brazilian DNA (http://www.mct.gov.br/index.php/content/view/74689.html, accession date 12/07/2010).

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2/MWh
Description:	Combined margin CO_2 emission factor for grid connected power generation in year y.
Source of data to be used:	Brazilian Interministerial Commission on Global Climate Change -
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.2055
Description of measurement methods and procedures to be applied:	As per the most recent version (02.2.0) “Tool to calculate the emission factor for an electricity system”.
QA/QC procedures to be applied:	As per the most recent version (02.2.0) of the “Tool to calculate the emission factor for an electricity system”.
Any comment:	Calculated using the latest version (02.2.0) of the “Tool to calculate the emission factor for an electricity system”, as detailed in Table 8.

B.7.2. Description of the monitoring plan:

>>

1. General Considerations

The objective of the monitoring plan is to ensure the complete, consistent, clear, and accurate monitoring and calculation of the emissions reductions achieved by the project activity during the whole crediting period. The project operator (Renova Energia S/A) will be responsible for the implementation of the monitoring plan, which is based in monitoring the net electricity dispatched to the grid and the emission factor of the electricity grid.

2. Monitoring Staff

The operational and management structure that the project operator will implement in order to monitor emission reductions achieved by the project activity is as given in the flowchart below:

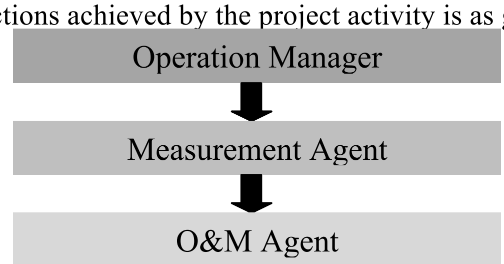

Figure 3. Operational and management structure that the project operator will implement in order to monitor emission reductions achieved by the project activity.

The roles and responsibilities within the structure outlined in Figure 3 are described in detail in the paragraphs below.

Operation Manager: Responsible to go along with the auditor during the verification visit and provide all necessary documents related to the records of the net electricity supply to the grid. If applicable, at the time of verification by DOE, the Administrative Staff will provide access to the records of CCEE database in order to demonstrate that electricity generation data is consistent and accurate. The Administrative Staff will forward all electronic media-based information to Key Consultoria e Treinamento Ltda. at a minimum bimonthly frequency.

Measurement Agent: Responsible for the record keeping and indexing of the data pertaining to the net electricity supply to the grid. Its attributions also include ensuring that the monitored data pertaining to the net electricity generation is continuously sent (online) to CCEE. Monitored data will be collected in a monthly basis and will be kept in a specific folder in electronic media.

O&M Agent**:** Responsible for the general supervision of the plant operation and for the supervision of the metering. Its attributions also include ensuring that meters included in the present monitoring plan are calibrated and undergo maintenance as per the applicable regulations and manufactures' recommendations. Any meter calibration procedures will be reported to the Administrative Staff.

3. Training procedures

Key Consultoria e Treinamento Ltda, right after the register of the project "Renova Area 1 Wind Power Project" by the UNFCCC, will train the staff from Renova Energia S/A responsible for the monitoring of the necessary parameters.
The training will involve:

- the description of the **variables** to be monitored by Renova Energia S/A staff (electric generation registered by meters of Renova Energia S/A and of CCEE);
- the procedures of **collection and archiving** of such variables; and
- procedure of **dispatch** of such data to Key Consultoria e Treinamento Ltda.

4. Data and Parameters monitored

4.1. Emission Factor – $EF_{grid,BM,y}$, $EF_{grid,OM,y}$ and $EF_{grid,CM,y}$

The monitoring plan also includes parameters such as the operating margin CO_2 emission factor for power units in the top of the dispatch order ($EF_{grid,OM,y}$), the build margin CO_2 emission factor ($EF_{grid,BM,y}$) of SIN and the combined margin CO_2 emission factor ($EF_{grid,CM,y}$). These parameters will be obtained from the Brazilian Interministerial Commission for Climate Change, which calculates and publishes $EF_{grid,OM,y}$ and $EF_{grid,BM,y}$ according to the most recent version (02.2.0) of the "Tool to calculate the emission factor for an electricity system". These published parameters, along with the records of the net electricity supplied to SIN by the project activity, will be used for the calculation of the yearly combined margin ($EF_{grid,CM,y}$) and, ultimately, for the calculation of the emission reductions achieved by the project activity.

4.2. Net electricity dispatched to the grid – $EG_{facility,y}$

Monitoring consists of metering the net electricity generated by the project activity. Measurement results will be crosschecked with records for sold electricity and/or with the data provided in CCEE database. Data will be measured continuously and will be consolidated hourly and monthly. Monthly values will be used for crosschecking electricity sales records. Records pertaining to the meters used in the project activity (type, model and calibration reports) will be kept accordingly.

The Operator of National Electric System (*Operador Nacional do Sistema Elétrico* - ONS) regulates, by means of its Grid Procedures[28] (*Procedimentos de Rede*), *inter alia*, the measurements of electricity production for invoicing (12nd module)[29]. Information related to this module are necessary to maintain the Measurement for Invoicing System (*Sistema de Medição para Faturamento – SMF*) according to the standard specified in the document Technical Specifications of Measurement for Invoicing (*Especificação Técnica das Medições para Faturamento*) to assure not only the control of energy accounting process by *CCEE*, but also the determination of demands by ONS[30].

[28] Operator of National Electric System (*Operador Nacional do Sistema Elétrico* - ONS). Grid Procedures (*Procedimentos de Rede*). www.ons.org.br/procedimentos/index.aspx. Accessed in 14/07/2010.

[29] National Agency of Electric Energy (*Agência Nacional de Energia Elétrica* – ANEEL). Regulatory Resolution 109/04 (*Resolução Normativa nº109/04*). http://www.aneel.gov.br/cedoc/ren2004109.pdf. Accessed in 06/06/2011.

[30] Operator of National Electric System (*Operador Nacional do Sistema Elétrico* - ONS). Grid Procedures (*Procedimentos de Rede*). Module 12 – Submodule 12.1 (*Módulo 12 - Submódulo 12.1*). www.ons.org.br/procedimentos/index.aspx.

Generally, SMF is a system composed of the main and backup measurers, by the potential and current transformers, the channels of communication between energy agent/project participant and CCEE, and the system for data collection and measurement for invoicing[31].

According to the ONS Grid Procedures – Submodule 12.1, the SMF should be installed in the connection of the plants with the energy network to measure the net generation of these plants, which will be used for accounting and settlement of electricity in the CCEE.

Data stored on the meters is collected by the System of Energy Data Collection (*Sistema de Coleta de Dados de Energia – SCDE*) of CCEE, remotely and automatically through direct access to the meters of the project participant (Renova Energia S/A). These collected data are processed in SCDE for electricity accounting by CCEE and are available to all energy market participants to control their respective incomes[31].

The energy meters and emergencies procedures

The energy meters shall be: multi-phase, 3 elements, 4 wire (for 4 wire systems), of system rated frequency, rated current according to the secondary of current transformer, nominal voltage according to the secondary of potential transformer. The meters shall have independence of elements and sequence of phases, ensuring the same performance in monophasic and three-phasic testing[31].

The measurement systems are designed and implemented in accordance with the standards of the Brazilian Association of Technical Standards (*Associação Brasileira de Normas Técnicas – ABNT*) or International Electrotechnical Commission - IEC, ensuring the quality of the system. In addition, the meters will have certificate of conformity of design approved and issued by the National Institute of Metrology Standardization and Industrial Quality (*Instituto Nacional de Metrologia, Normalização e Qualidade Industrial – INMETRO*)[31].

Regarding the class of accuracy of energy meters, they will meet all relevant metrological requirements prescribed in Metrological Technical Regulation (*Regulamento Técnico Metrológico – RMT*) for Class 0.2 of energy meters, approved by INMETRO. Class 0.2 of energy meter, also identified as index D energy meters admits error in measurements of up to ± 0.2%[31].

The energy meters possess mass memory capable of storing the data of active, reactive and demand energy in a bidirectional manner, voltages and currents at intervals of integration programmable from 5 to 60 minutes during the minimum period of 32 days. These meters will also be equipped with a system of preservation and salvage of records in case of power loss, storing data in non-volatile memory for at least 100 hours. In addition, they possess at least two independent communication ports with concurrent access or that allow the prioritization of one of them. One will be for the exclusive use of the CCEE and the other for access of agents involved in the measurement point. The CCEE communication port will be coupled to a stable and good performance internet channel, which will be established under a VPN tunnel (Virtual Private Network) between the meter and the CCEE. The meters will be able to manage concurrent access to its communications ports in order to allow full time access to mass memory records of meters via CCEE communication port[31].

[31] Operator of National Electric System (*Operador Nacional do Sistema Elétrico* - ONS). Grid Procedures (*Procedimentos de Rede*). Module 12 – Submodule 12.2 (*Módulo 12 - Submódulo 12.2*). www.ons.org.br/procedimentos/index.aspx.

Besides electricity measurements performed by the project owners, all the electricity dispatched to the grid by the project activity will be monitored online by CCEE. This entity is responsible for the monthly readings and keeping the records of the energy generated. If any problem happens at the local meter level, the reading lecture corresponding to the amount of energy during the time of the problem will not be lost due to online reading performed by CCEE. As mentioned before, in order to assure the quality of data used in the emission reductions calculation, the project proponents will provide access to the DOE on the CCEE databank (during the verification's site visit), because the data from this entity will serve to crosscheck the electricity dispatched to the grid.

Each connection point has a pair of meters, the main and the backup, so that data are permanently monitored, even during any eventual interruption on the operation of the main meter, which automatically starts the backup meter. In that case, the O&M agent will implement the procedures necessary to maintenance and return of the main meter to normal operation. The backup meters are equal or equivalent to the main meters, installed on the same panel, with the same information for current and voltage and under the same technical standards.

In order to ensure the effectiveness operation of SMF, preventive maintenance must be carried out and, where necessary, also corrective maintenance. Inspections are also conducted in order to verify the correct operation of meters[31].

The frequency for preventive maintenance of the SMF is a maximum of two years. This schedule may be changed based on the historical occurrence observed in all plants, considering the schedule of stops. The meter that, after calibration, displays errors outside the range specified by the standard must be replaced[32].

The calibration of meters shall be conducted by a qualified organization that must comply with national standards and industrial regulations to ensure the accuracy. After calibration, the meters must be sealed to assure the safety and the calibration certificates must be archived with the other monitoring records.

5. Procedures

The procedures of collection and archiving of parameters to be monitored include activities to be undertaken by Renova Energia S/A, by third party and by Key Consultoria e Treinamento Ltda.

The electric generation data are registered hourly by Renova Energia S/A meters, located in the connection of the wind plants with the SIN.

The generation data of CCEE are obtained in the SIN and shall be collected monthly by the Measurement Agent. As SIN is the national and official system for invoicing, there is possibility of cross-checking of generation data between both sources: Renova Energia S/A and CCEE, minimizing the probability of errors in measurement.

[32] Operator of National Electric System (*Operador Nacional do Sistema Elétrico* - ONS). Grid Procedures (*Procedimentos de Rede*). Module 12 – Submodule 12.3 (*Módulo 12 - Submódulo 12.3*). www.ons.org.br/procedimentos/index.aspx.

The Measurement Agent compiles both the data transmitted remotely by Renova Energia S/A and the information from CCEE system, and sends them monthly to the Operation Manager of Renova Energia S/A through Microsoft Excel spreadsheets. The Operation Manager then archives these spreadhseets in Renova Central System, and sends them bimonthly to Key Consultoria e Treinamento Ltda. Key Consultoria e Treinamento Ltda. electronically archives the data in the Internal Monitoring System of the company, and keeps such archives for at least 2 years after the end of the last crediting period.

The CER calculation is made annually by Key Consultoria e Treinamento Ltda. through its own calculator developed in a Microsoft Excel spreadsheet. The spreadsheet uses the hourly electric energy generation of each plant, previously compared to CCEE registries, and multiplies it for the hourly emission factor of SIN, provided by the Designated National Authority (DNA) of Brazil, currently available in the Ministry of Science and Technology (MCT) website.

Annually, Key Consultoria e Treinamento Ltda. uses the calculation spreadsheets for the verification process of the project. Furthermore, the spreadsheets are also sent to Renova Energia Ltda., so that there is an archive with all data in both companies, improving the reliability of the registry in emergency case.

All data collected as part of monitoring will be archived and kept at least for 2 years after the end of the crediting period or 2 years after the last issuance of CER for this project activity, whichever occurs later.

B.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies):

>>

Date of completion of the application of the baseline and monitoring methodology: 24/02/2011.

Responsible person:
Mr. Breno Rates;
Mr Carlos Henrique Delpupo;
Mr. Carlos Shiguematsu Junior;
Miss. Iris Gobato Gercov;
Miss. Laura Araujo Alves;
Miss. Luísa Guimarães Krettli;
Mr. Matheus Alves de Brito;
Mr. Rui Dolabella Pereira.

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SECTION C. Duration of the project activity / crediting period

C.1. Duration of the project activity:

C.1.1. Starting date of the project activity:

>>

14/12/2009

The Starting Date indicated above represents the realization of Brazilian 2nd Reserve Power Auction (*2º Leilão de Energia de Reserva - Leilão nº 003/2009 - LER-2009*[33]), in which the eight electricity generation facilities Alvorada, Candiba, Guanambi, Guirapá, Licínio de Almeida, Pindaí, Rio Verde e Serra do Salto had its energy contracted. Additionally, according to the Memorandum of Understanding signed with General Electric, if the project participant is successful in its participation at the Wind Auction, the Buyer and the Seller agree to enter (or, in the case of the Buyer, to cause each of its affiliates to enter) into one or more contracts for the supply of wind turbine generators (the main component of total required investments).

For the project activity in reference this is the earliest of the date(s) on which the implementation or construction or real action has begun.

C.1.2. Expected operational lifetime of the project activity:

>>

20 years and zero months[34].

C.2. Choice of the crediting period and related information:

C.2.1. Renewable crediting period:

C.2.1.1. Starting date of the first crediting period:

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01/07/2012 or the registry date of the project activity at the CDM-UNFCCC, whichever is later.

C.2.1.2. Length of the first crediting period:

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7 years and zero months.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

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[33] 2nd Reserve Power Auction (*2º Leilão de Energia de Reserva - Leilão nº 003/2009 - LER-2009*) - http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=ec41d74d98114210VgnVCM1000005e01010aRCRD - Acessed in 13/07/2010

[34] Wind turbine lifetime as stated in the Technical Note #368 of ANEEL's Superintendency of Economic Regulation.

Not Applicable.

C.2.2.2. Length:

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Not Applicable.

SECTION D. Environmental impacts

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

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The main objective of Environmental Licensing in Brazil is to standardize environmental impacts assessments and establish control plans for polluting enterprises. The state level environmental agencies are the authority in charge to issue Environmental Permits. In Bahia state, the State Council of Environment (*Conselho Estadual de Meio Ambiente* - CEPRAM) is responsible for environmental licensing.

According to the Federal Resolution CONAMA 001/86, activities that utilize natural resources and that are considered as entrepreneurships with high degradation or pollution potential must have their environmental impact assessment and environmental impact report elaborated to obtain the environmental licenses. Electricity generation, independently of the energy source, with potential higher than 10 MW, is amongst these activities.

By the time of completion of this PDD, the CEPRAM, based on Process nº 2010-011713/TEC/LL-0030, has granted a Localization License (*Licença de Localização* - LL), identified as Resolution nº 4115 (*Resolução nº 4115*), issued in 30/07/2010 and valid until 10/07/2015.

Moreover, the Environmental Institute of Bahia (*Instituto do Meio Ambiente* – IMA) has granted an Implementation License for each of the eight plants, published on 01/02/2011 and valid for 5 years, as described in the table below.

Table 10. Implementation Licenses

Plant	IMA ordinance number
Alvorada	14.119
Candiba	14.116
Guanambi	14.115
Guirapá	14.114
Licínio de Almeida	14.118
Pindaí	14.120
Rio Verde	14.121
Serra do Salto	14.117

All Licenses described above are available for DOE during validation.

CEPRAM has imposed some restrictions and actions for the granting of the Operation Licenses, the final step on the licensing process. In that sense, the project developer is currently working in order to meet all such requirements.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

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The interventions on the physical environment by the project activity in its planning, implementation and operation phases were categorized and their associated environmental impacts were identified in the AIA (*Environmental Impact Assessment*), part of the RAS (Simplified Environment Report), and actions to prevent, mitigate or compensate them were proposed in this document.

The AIA has identified positive and negative impacts during the construction and operational phase. No expressive negative impact has been identified and for all negative impact identified, mitigation actions were proposed. Impacts were classified as physical, biotic and socioeconomic. Most negative environmental impacts predicted fall, especially, on the physical environment of the wind complex intervention area. Over the biotic environment, the predicted events are of reduced expression. Finally, over the socioeconomic environment, the negative impacts are fewer, especially when compared to positive events, i.e., improvements to the specific localities and to Bahia state.

The RAS, which assesses the environmental impacts brought by the project activity, identified the following items as main drawbacks:

- Changes of local landscape;
- Spot decreases of areas with remaining vegetation (prevalent Cerrado and Caatinga in transitional zones);
- Increased risk of changes on the native fauna;
- Increased risk of accidents; and
- Interference in the structure of local communities.

RAS also proposes Environmental Programs, which aim at mitigating negative impacts and expanding positive ones. These programs emphasise the construction phase. Thus, their main objective is to guarantee that the main negative environmental impacts predicted, even though inexpressive when compared to similar phenomena from entrepreneurships of other nature, are controlled and neutralized in short term after construction. The proposed Environmental Programs are:

- Social Communication Program;
- Environmental Education Program;
- Program of Control of Particulate Matter, Gases and Noises;
- Archaeological Survey Program;
- Program of Workforce Training and Capacitation;
- Workforce Safety and Health Program;
- Heritage Education Program;

- Erosion Control Program;
- Fauna Monitoring Program; and
- Degraded Areas Recuperation Program.

The mitigation and compensation measures, as well as the programs cited above, are better described in the RAS and in DNA Annex 3, which described the contribution of the project activity to sustainable development.

It is worth mentioning that CEPRAM has granted the localization and implementation licenses through a simplified environmental licensing process, which did not require the EIA/RIMA (Environmental Impacts Study and Report). The EIA/RIMA would be otherwise required by CEPRAM in case relevant negative impacts had been identified, in order to deeper assess the project environmental feasibility.

SECTION E. Stakeholders' comments

E.1. Brief description how comments by local stakeholders have been invited and compiled:

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Stakeholders' comments were invited in 28/07/2010 following the Designated National Authority procedures for such purpose, defined by Resolution number 07 of the Interministerial Comission for Global Climate Change (CIMGC).

Accordingly, the relevant stakeholders were mapped and invited to visit the website <http://blog.munduscarbo.com/wp-content/uploads/2009/09/DCP-Renova-%C3%A1rea-1-v.01.pdf> in order to access the project documentation which includes the CDM-PDD and a correspondent version in Portuguese. This documentation will be accessible on the above mentioned website along the whole registration period.

The following stakeholders received letters communicating the CDM project activity:

- Mayor from project activity Municipalities;
- Representatives of the Legislative Chambers from project activity Municipalities;
- Locals Environmental Non-Government Organizations (NGOs);
- State and local environmental agencies;
- Brazilian Forum of NGOs and Social Movements for the Environment and Development (FBOMS);
- National NGOs which objectives are related to the project activity;
- National and international environmental NGOs;
- State and Federal Prosecutors.

E.2. Summary of the comments received:

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So far, amongst the consulted parties only the Federal Prosecution has replied to the invitation to comment the CDM project activity. In this comment, the Federal Prosecutor acknowledges having received the invitation letter, and informs that despite of the relevance of the subject, the they cannot comment or analyze the project activity as per its constitutional mandate.

E.3. Report on how due account was taken of any comments received:

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The only communication received during the stakeholder consultation, sent by the Federal Prosecution, does not include any comment related to the project activity.

Annex 1

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

Not-Applicable. No public funding was granted to the project activity.

Annex 3

BASELINE INFORMATION

All pertinent information is provided throughout the text.

Annex 4

MONITORING INFORMATION

All pertinent information is provided throughout the text.

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