



**Programme design document form for
CDM programmes of activities
(Version 06.0)**

PROGRAMME DESIGN DOCUMENT (PoA-DD)

Title of the PoA	Queiroz Galvão Energias Renováveis Wind Power Programme
Version number of the PoA-DD	Version 10
Completion date of the PoA-DD	03/08/2016
Coordinating/ managing entity	ÉOLOS ENERGIAS RENOVÁVEIS S.A.
Host Party(ies)	Brazil
Applied methodology(ies) and, where applicable, applied standardized baseline(s)	ACM0002 - Grid-connected electricity generation from renewable sources, version 16
Sectoral scope(s) linked to the applied methodology(ies)	Sectoral Scope 1 - Energy industries (renewable/non-renewable sources)

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

Queiroz Galvão Energias Renováveis Wind Power Programme
Version 10 – 03/08/2016

A.2. Purpose and general description of the PoA

This Programme of Activities (PoA) focuses on the construction of new Wind Power Plants (WPPs) connected to the Brazilian National Interconnected Grid (from Portuguese, *Sistema Interligado Nacional* – SIN), which displaces fossil fuel consumption at thermal plants that would be running in the absence of the PoA and thus reducing the Greenhouse Gas (GHG) emissions.

The policy/measure of this PoA is creating subsidies to invest in several WPPs and promoting the renewable sources of energy, reducing the national grid emission factor in a developing country. The proposed PoA is a voluntary action by the coordinating/managing entity (CME) – please see section A.3 below for information on project participants.

The geographical boundary for the PoA is the Federative Republic of Brazil. The expected increase in electricity demand in Brazil is around 4.5% per year until 2021 (EPE¹). And according to ANEEL², only 3.32% from the total installed capacity in Brazil comes from WPPs already constructed, with 36.72% of the installed capacity under construction from the same type of plants.

The expected results of sustainable development for the Host Country from this PoA are:

- Contribution of environmental sustainability once it reduces the use of fossil energy (non-renewable sources). Thus, the project contributes to the best use of natural resources and makes use of clean and efficient technologies;
- Increase of opportunity for employment in areas where the project is located;

Promotion of better conditions of the local economy, because the use of renewable energy reduces the dependence on fossil fuels, reduces the amount of pollution related to the fossil fuel emissions and the social costs related to it.

A.3. CME and participants of PoA

The PoA participant and the Coordinating/Managing Entity (CME) responsible for the communication with the CDM Executive Board is ÉOLOS ENERGIAS RENOVÁVEIS S.A.

ÉOLOS ENERGIAS RENOVÁVEIS S.A. is part of the Grupo Queiroz Galvão S.A.³, a group founded in 1953 and composed by more than 50 companies from several different but synergic areas.

A.4. Party(ies)

¹ http://www.epe.gov.br/imprensa/PressReleases/20120104_3.pdf (available in October 2013)

² <http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.cfm> (available in July 2016)

³ <http://portal.queirozgalvao.com/web/grupo>

Name of Party involved ("host" indicates host Party)	Private and/or public entity(ies) project participants, CME (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Brazil (host)	ÉOLOS ENERGIAS RENOVÁVEIS S.A. (private)	No

A.5. Physical/ Geographical boundary of the PoA

According to the methodology ACM0002 version 16, *"the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to"*.

The definition of an electricity system is given by the Tool to calculate the emission factor for an electricity system, where it is stated that *"a grid/project electricity system is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity (e.g. the renewable power plant location or the consumers where electricity is being saved) and that can be dispatched without significant transmission constraints"*

In order to satisfy the need for defining the configuration of the electricity grid system in Brazil, the Brazilian DNA issued the Resolution 8⁴, from 26/05/2008. In this document, the Project Electricity System in Brazil is defined as one single system formed by the union of the sub-markets from the Brazilian Interconnected Grid (SIN) for all CDM-related grid connected projects. Thus, the physical/geographic boundary is the Brazilian SIN and all power plants connected to it, corresponding to all Brazilian States.

The figure below illustrates the Brazilian interconnected system. The geographical area comprehends all WPP connected to that grid in all Brazilian states.

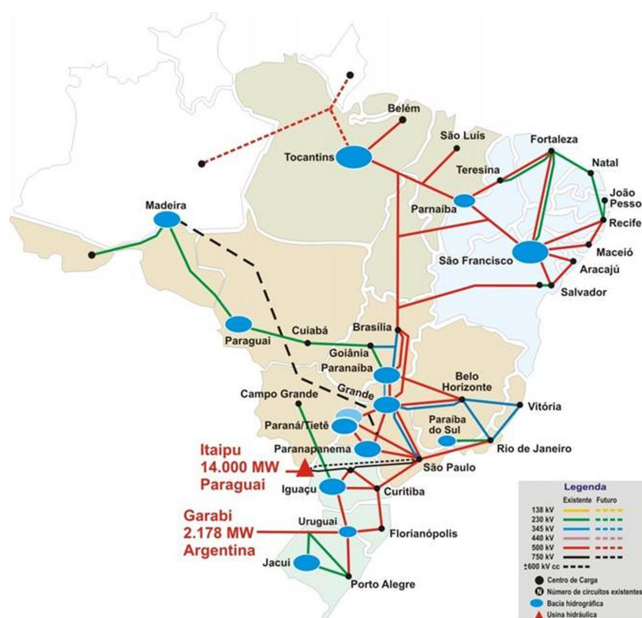


Figure 1: Diagram of the Brazilian interconnected system

A.6. Technologies/measures

This Programme of Activities (PoA) aims to use the CDM incentives to promote the investment on WPPs and contributes to partly displacing the fossil fuel consumption on thermal plants connected to the National Interconnected System, the Brazilian main Grid, and thus reducing the Greenhouse Gas (GHG) emissions.

⁴ http://www.mct.gov.br/upd_blob/0024/24833.pdf

WPPs produce energy by transforming the translational kinetic energy from wind into rotational kinetic energy using wind turbines. The energy produced is directly linked to the air density, the area covered by the blades and the wind speed. According to the World Meteorological Organization (WMO, *apud* ANEEL, 2005), only 13% of the Earth surface presents a mean wind speed of above 7 m/s at 50m. The CPAs to be included in this PoA may use better technologies if available at the time, please see Section B.2 item (c).

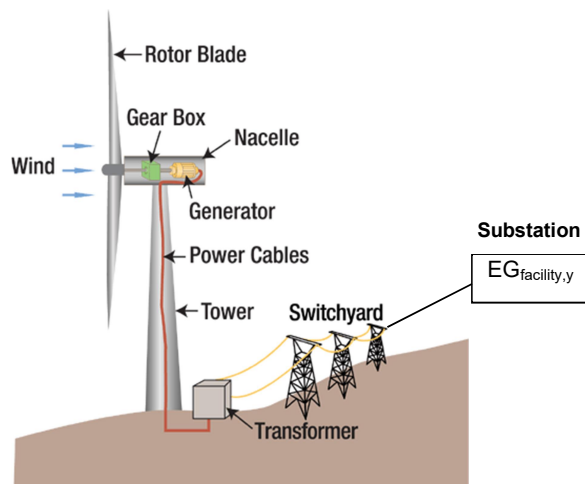


Figure – Wind energy generation scheme

The technology has been evolving constantly, going from a turbine diameter of 20m and a tower of 10m high to turbines with more than 100m of diameter and over 50m high (ANEEL, 2009)⁵. However, in spite of this evolution, this technology is totally dependent of specific natural and favorable conditions.

This PoA involves the construction of new WPPs in all states of Brazil. The installed capacity and detailed technical description from each WPP will be described in the individual CPA.

A.7 Public funding of PoA

The PoA did not receive any public funding from Parties included in Annex I of the UNFCCC or diversion from Official Development Assistance (ODA).

SECTION B. Demonstration of additionality and development of eligibility criteria

B.1. Demonstration of additionality for PoA

(i) The proposed PoA is a voluntary coordinated action;

This PoA is a voluntary coordinated action by ÉOLOS ENERGIAS RENOVÁVEIS S.A. There are no existing laws and regulations in Brazil that enforce the implementation of wind energy projects under a PoA scheme.

(ii) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;

⁵ http://www.aneel.gov.br/visualizar_texto.cfm?idtxt=1689, chapter 5, page 81.

The participation of WPPs in energy sector is low, in spite of many government programs to incentive this kind of renewable energy, such as PROINFA or Auctions for Alternative Energy. Only 3.32% of the total installed capacity in Brazil comes from wind power. Similarly, the participation of wind in the installed capacity under construction is still low, representing 36.72% of the total capacity of under construction power plants.

It will be demonstrated at CPA level that the construction and operation of a WPP in Brazil is not financially attractive. This financial analysis will compare the revenues of investing in this type of project with the benchmark scenario. Incentives, such as CDM, are mandatory for the investments necessary. So, according to this and the “Tool for the demonstration and assessment of additionality (Additionality Tool) version 7.0”, the WPPs would not be implemented in the absence of the PoA.

B.2. Eligibility criteria for inclusion of a CPA in the PoA

According to the CDM-EB65-A03-STAN (Demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programmes of activities Version 03.0), “*the CME shall develop eligibility criteria for inclusion of CPAs in the PoA and shall include these criteria in the PoA-DD and demonstrate their usability to assess the inclusion of CPAs in the generic CPA-DD*”. Therefore, the eligibility criteria of CPAs to this PoA are the following:

(a) The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA.

The CPA must be within territorial boundaries of the Federative Republic of Brazil. Additionally, the CPA shall comply with the guidelines for inclusion as defined by the Brazilian DNA.

The criteria shall be validated by providing information such as GPS coordinates, address, environmental license, site visit or any information that can prove that the CPA is developed in Brazil. Additionally, the receipt of the Host Country Approval / LoA shall be sufficient to demonstrate that the PoA fulfills the guidelines as defined by the host country. All CPAs included under the PoA and issued with a ‘unique identification number’ shall be considered compliant with the guidelines of the host country.

(b) Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo).

Data provided to the CME prior to inclusion in the PoA:

- Name of the CPA
- Installed capacity in MW
- Location of the CPA
 - Address
 - GPS coordinates
- Name of the wind farm developer
- Contact information, namely:
 - Contact person,
 - Postal address,
 - Telephone number
 - Email address

Data included in CPA-DD:

- Unique Identification Number provided by the CME.

The CME shall be responsible for cross checking the data provided by the potential CPA owner/developer with publicly available online databases of wind projects and emission reduction projects in Brazil. Upon satisfactory conclusion of the “uniqueness” of the proposed project, a Unique Identification Number shall be issued by the CME (e.g. QGER-CPA-xxxx) which shall be considered sufficient to avoid against double counting of emission reductions.

The project manager will check on the UNFCCC website if the proposed CPA has already requested for registration a CDM project or a CPA inclusion. In case of registration of an already registered CDM component the PP will communicate immediately the UNFCCC and DOE.

(c) The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications.

For all CPA's that will be included in the PoA-DD the following conditions must be applied: Only projects that involve generation of electricity using wind turbine generator based technology are eligible for inclusion under the PoA. The electricity generated by the WPPs should be dispatched to the Brazilian National Interconnected Grid (SIN). The WPPs shall employ standard technology and specifications of the manufacturer and/or best practices of the market. The WPP must not be over 30MW of installed capacity. The wind average speed must be over 2 m/s, and plant load factor between 20% and 85%. The energy price will be defined by bilateral contracts, open-market or energy auctions. The tower will be at least 20m height and the rotor blade at least 10m of diameter.

(d) Conditions to check the start date of the CPA through documentary evidence.

The start date of each CPA should be the earliest date at which either the implementation or construction or real action of a CPA begins. There should be a documental evidence for this date, such as engineering contract, equipment purchase, or any document that defines the real date. If the actual start date is not available, an indicative start date can be provided. Evidence of the actual start date shall be made available at the time of verification. The start date of any proposed CPA is on or after the start date of the PoA.

(e) Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs.

Each CPA must be applicable to and needs to apply the UNFCCC approved large scale methodology ACM002 and necessary tools/guidelines/standards as indicated by this methodology.

Applicability condition (ACM0002)	Justification
This methodology is applicable to grid-connected renewable power generation project activities that: (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	A CPA will involve the installation of a new power plant at a site where no renewable power plant was operated prior to the implementation of the CPA (greenfield plant) – option a.
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	A CPA will involve the installation of a wind power plant (WPP).
Specific applicability conditions for capacity addition, replacements and/or retrofits.	A CPA will not involve capacity addition, replacements or retrofits, the conditions are not applicable.
Specific applicability conditions for hydroelectric plants	A CPA will not involve hydroelectric plants, the conditions are not applicable.
The methodology is not applicable to the following: <ul style="list-style-type: none"> 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 may be the continued use of fossil fuels at the site; Biomass fired power plants; 	A CPA will not involve fuel switch, biomass power plants and/or hydro power plants.

<ul style="list-style-type: none"> A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m². 	
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Applicability condition (GEF Tool)	Justification
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	A CPA will provide electricity to a grid.
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants.	Only grid power plants were considered.
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	A CPA will be located totally in a non-Annex I country.

Applicability condition (Additionality Tool)	Justification
The use of the "Tool for the demonstration and assessment of additionality" is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool.	No new methodology is being submitted.
Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	A CPA will follow the tool.

(f) The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality.

Additionality shall be demonstrated at CPA level by means of a financial analysis comparing the scenario of each individual CPA with a benchmark scenario. This comparison should clearly and reliably demonstrate that the CPA scenario is not financially attractive and the CPA would not have been implemented without the incentives of CDM and, in the absence of CDM PoA, none of the implemented CPAs would occur. Every CPA must apply the steps of the Additionality tool, using a financial analysis to compare the scenario of the CPA with a benchmark scenario.

(g) The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis.

Local stakeholder consultation (LSC) under PoA Level is carried out as required by the Brazilian DNA as part of the LoA process. Environmental Impact Assessment (EIA) – as one of the steps of the Environmental Licensing process in Brazil, if applicable – is carried out as required by the Brazilian applicable legislation and according to rules and requirements of the applicable environmental authority.

(h) Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance.

A sign letter for each CPA declaring that there is no Annex I parties funding, or if any, it does not result in a diversion of official development assistance will be provided.

- (i) **Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation).**

There is no specific target group for the energy consumption, since the power plants will be grid-connected to the national system (SIN). The energy can be sold to buyers in free-market base or energy auctions.

- (j) **Where applicable, the conditions related to sampling requirements for the PoA in accordance with the “Standard for sampling and surveys for CDM project activities and programme of activities”.**

Not applicable. Data will be 100% monitored.

- (k) **Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA;**

Not applicable. A large scale methodology is being applied.

- (l) **Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.**

Not applicable. A large scale methodology is being applied.

- (m) **All new CPAs must provide an application letter in the name of the wind project developer including the following information:**

- Formal application for inclusion of CPA in the PoA.
- Affirmation that the inclusion is a voluntary action.
- In case the project receives no 3rd party financial aid, then an affirmation of non-receipt of ODA shall be provided by the CPA implementer. In case the project receives any financial aid from an Annex 1 country, then a statement from the relevant authority of the Annex 1 country shall be submitted stating the financial aid does not result in diversion of ODA.
- Affirmation that all equipment purchased will be new so as to avoid any potential leakage emissions.
- Affirmation to understanding that the CPA crediting period shall not exceed the PoA end date.
- Acceptance that the project developers are aware of terms and conditions of the PoA and agree that their project be subscribed to the PoA.

B.3. Application of technologies/measures and methodologies

The Sectoral Scope is “1 - Energy industries (renewable/non-renewable sources)” and the category is “Renewable electricity generation for a grid”.

The methodology and tools used are:

Approved Methodology or Tool	Version
ACM0002 - Grid-connected electricity generation from renewable sources	16.0.0
Tool for the demonstration and assessment of additionality	7.0
Tool to calculate the emission factor for an electricity system	5.0.0

The “Tool to calculate project or leakage CO₂ emission from fossil fuel combustion” was not used because the methodology ACM0002 clearly states that “the use of fossil fuels for the back up or emergency purposes (e.g. diesel generators) can be neglected”. Similarly, the “Combined tool to identify the baseline scenario and demonstrate additionality” was not used because for additionality purposes it was used the “Tool for the demonstration and assessment of additionality”.

All CPAs will be monitored and verified and hence no sampling plan is required.

B.4. Date of completion of application of methodology and standardized baseline and contact information of responsible person(s)/ entity(ies)

The baseline was concluded in 10/10/2014 and the entity responsible was:

WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.
+55 31 3401 1074
contato@waycarbon.com

SECTION C. Management system

ÉOLOS ENERGIAS RENOVÁVEIS S.A. is the CME, responsible for all CDM-related issues – development of necessary documentation, validation, registration, verification and communication with DOE(s), UNFCCC Executive Board and Secretariat, communication with DNA(s).

Before including a new CPA in this PoA, the CME will analyse all information about the WPP(s) included, such as: name, location, crediting period, equipment details, technical description, relevant environmental and energy agency permits, contact details and reference to the contract. This information will be checked against DNA(s) and UNFCCC databases, or any other applicable database, in order to guarantee its uniqueness. If the project is deemed not unique, it will not be included in this PoA. In case of including a new CPA that has already been registered either as a CDM project activity or as a CPA of another PoA, the UNFCCC and DOE will be communicated as soon as possible.

The project manager will proceed with training for monitoring, according to the CDM requirements and certificates will be delivered for each personnel responsible for monitoring of each CPA of this Programme.

Monitoring information will be sent to the CME monthly by each CPA project manager through e-mail. The CPA project manager will keep a copy of the information sent and all references used in order to account for missing information at the end of any given monitoring period. The CME has a dedicated system to digitally store all CPA-related information and is able to provide digital copies of all documents involved.

The contract referenced in “CPA Control” must declare that company owner of the WPP is aware and agree with the subscription in the PoA.

Every CPA has a spreadsheet called “Workbook – [name of WPP]”, containing monitored information and CER calculation, as well as document version control. This document will be sent monthly by each CPA project manager to the CME by email indicated by the CME. At the end of monitoring period, or if any missing information is detected, a copy of all monitoring records will be requested and sent to CME, which will crosscheck all information available.

The workbook will record daily the readings from all electricity meters available at CPA site.

The CME will collect all information from the programme and the personnel involved in monitoring and the DOEs responsible for verifications can suggest improvements on the PoA management system.

The CPA will be prepared by the CME staff, followed by the approval of the CME board. This board will also execute the technical review before submitting to DOE for CPA inclusion.

SECTION D. Duration of PoA

D.1. Start date of PoA

21/10/2011 – Notification of prior consideration sent to UNFCCC.

D.2. Duration of the PoA

28 years and 0 months.

SECTION E. Environmental impacts

E.1. Level at which environmental analysis is undertaken

The environmental analysis will be undertaken at CPA level, due to local impacts of the power plant.

E.2. Analysis of the environmental impacts

This analysis shall be carried out at individual CPA level. In Brazil, the Environmental Licensing process consists on the issuance of sequential environmental licenses, depending on the stage of the enterprise, as follows:

- Previous Licence (from portuguese *Licença Prévia* - LP) – This is the first license to be provided to any enterprise, on the implementation planning phase. It does not authorizes the installation of the project, it merely approves its environmental viability and authorizes its location and technological conception.
- Installation License (from portuguese *Licença de Instalação* - LI) – Authorizes the beginning of the construction work of the enterprise.
- Operation License (from portuguese *Licença de Operação* - LO) – Authorizes the beginning of operation of the enterprise. Its issuance is conditioned to a site visit in order to verify if all demands and technical details described in the approved project were developed during the enterprise installation and if everything is in accordance with the LP and LI.

The process described above is very thorough and detailed, it covers all aspects of the applicable national and regional legislation, requiring whenever needed a series of reports, analysis and assessments. Therefore, the best and most up-to-date information regarding the Environmental Licensing process of the CPA will be provided.

E.3. Environmental impact assessment

The Environmental Impact Assessment is a requirement from the Environmental Licensing Process in Brazil. Therefore it will be performed, whenever required, at CPA level.

SECTION F. Local stakeholder consultation

F.1. Solicitation of comments from local stakeholders

Local Stakeholders Consultation (LSC) rules in Brazil are defined by the Brazilian DNA. For PoAs, the DNA issued specific rules as stated in the Resolution no. 9⁶, of 20/03/2009, as follows:

Art. 1 – Project activities that refer to local/regional/national policy or standard under a Programme of Activities can be registered as a single Clean Development Mechanism project activity provided that approved baseline and monitoring methodologies are used

⁶ http://www.mct.gov.br/upd_blob/0201/201428.pdf

that, inter alia, define the appropriate boundary, avoid double counting and account for leakage, and ensure that the emission reductions are real, measurable and verifiable and additional to any that would occur in the absence of the project activity.

(...)

Art. 4 – Aimed at obtaining approval of the Clean Development Mechanism Programme of Activities, the Programme's coordinating entity shall present the Executive Secretariat of the Interministerial Commission on Global Climate Change, on electronic media and in hard copy, copies of the invitations for comments as well as the respective acknowledgments of receipt sent at least to the following addresses:

I – the Executive Secretariat of the Interministerial Commission on Global Climate Change;

II - Brazilian NGO Forum and Social Movements for the Environment and Development – <http://www.fboms.org.br>;

III - National entities whose purposes are directly or indirectly related to the Programme of Activities;

IV - Federal Attorney General.

Single paragraph: The invitations for comments mentioned in the caption to this article shall be sent 15 days in advance of the start of the validation process in order to guarantee that any comments shall be incorporated in the documentation to be submitted to this Commission aimed at obtaining approval of the Programme of Activities by the Designated Operational Entity.

Therefore, the LSC was performed at PoA level, also taking into consideration the similar and homogeneous conditions of all WPPs. The institutions invited to comments are directly related to the project activity and represent of relevant form to all parties involved in project development. Local stakeholders were invited to raise their concerns and provide comments on the project activity for a period of 30 days after receiving the letter of invitation. The latest version of the PoA-DD, CPA and other relevant documentation will also be published on the internet by the project participants until the project is registered. The invited stakeholders were:

Stakeholder	Institution	Address
Brazilian Forum of NGOs	Fórum Brasileiro de ONGs e Movimentos Sociais - FBOMS	SCS, Quadra 08, Bloco B-50, salas 133/135 Ed. Venâncio 2000 Brasília/ DF CEP 70.333-970
Governmental agencies	Eletrobrás	Av. Presidente Vargas, 409/13º andar, Centro Rio de Janeiro, 20071-003
	ANEEL	SGAN 603 módulo J Brasília/ DF CEP 70830-030
Federal Attorney / Public Ministry	Ministério Público Federal	SAF Sul Quadra 4 Conjunto C Brasília/ DF CEP 70050-900
Brazilian DNA	Secretaria Executiva da Comissão Interministerial de Mudança Global do Clima	Ministério da Ciência e Tecnologia Esplanada dos Ministérios – Bloco E – Sala 240 – Brasília – DF 70067-900

The PoA-DD and CPA were made public available in English and Portuguese. The link to the project documentation has been online since 01/10/2013 at www.ambiopar.com/projetos/qger.zip (later replaced by <http://bit.ly/2ajQ3r6>) with the most recent version of the project documentation. The invitation letters were sent on 02/10/2013.

F.2. Summary of comments received

To date, no comments were received.

F.3. Report on consideration of comments received

To date, no comments were received.

SECTION G. Approval and authorization

The Host Country LoA will be made available after the validation process. No other party is included at this moment. The Letter of approval from the Party and CME will be made available before registration request on UNFCCC.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA

A.1. Purpose and general description of generic CPAs

This CPA is part of the “Queiroz Galvão Energias Renováveis Wind Power Programme”. It involves the construction of new Wind Power Plants (WPPs) connected to the Brazilian National Interconnected Grid (from Portuguese, *Sistema Interligado Nacional* – SIN), which displaces fossil fuel consumption at thermal plants that would be running in the absence of the CPA and thus reducing the Greenhouse Gas (GHG) emissions.

The CPA fulfils all requirements defined by the host country and by the Coordinating/Managing Entity (CME), in the PoA-DD.

The results of sustainable development for the Host Country from this CPA are:

- Contribution of environmental sustainability once it reduces the use of fossil energy (non-renewable sources). Thus, the project contributes to the best use of natural resources and makes use of clean and efficient technologies;
- Increase of opportunity for employment in areas where the project is located;
- Promotion of better conditions of the local economy, because the use of renewable energy reduces the dependence on fossil fuels, reduces the amount of pollution related to the fossil fuel emissions and the social costs related to it.

SECTION B. Application of a baseline and monitoring methodology and standardized baseline

B.1. Reference of methodology(ies) and standardized baseline(s)

The Sectoral Scope is “1 - Energy industries (renewable/non-renewable sources)” and the category is “Renewable electricity generation for a grid”.

The methodology and tools used are:

Approved Methodology or Tool	Version
ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources	16.0.0
Tool for the demonstration and assessment of additionality (Additionality Tool)	7.0
Tool to calculate the emission factor for an electricity system (GEF Tool)	5.0.0

The “Tool to calculate project or leakage CO₂ emission from fossil fuel combustion” was not used because the methodology ACM0002 clearly states that “the use of fossil fuels for the back up or emergency purposes (e.g. diesel generators) can be neglected”. Similarly, the “Combined tool to identify the baseline scenario and demonstrate additionality”, was not used because for additionality purposes it was used the “Tool for the demonstration and assessment of additionality”.

This CPA will be monitored and verified and hence no sampling plan is required.

B.2. Applicability of methodology(ies) and standardized baseline(s)

According to the PoA-DD item B.2, in order to be eligible to the PoA, each CPA must ensure compliance with applicability and other requirements of the methodologies and tools applied. Therefore, the applicability conditions are as follows.

Applicability condition (ACM0002)	Justification
This methodology is applicable to grid-connected renewable power generation project activities that: (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	This CPA involves the installation of a new power plant at a site where no renewable power plant was operated prior to the implementation of the CPA (greenfield plant) – option a.
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	This CPA involves the installation of a wind power plant (WPP).
Specific applicability conditions for capacity addition, replacements and/or retrofits.	Since this CPA does not involve capacity addition, replacements or retrofits, the conditions are not applicable.
Specific applicability conditions for hydroelectric plants	Since this CPA does not involve hydroelectric plants, the conditions are not applicable.
The methodology is not applicable to the following: <ul style="list-style-type: none"> • 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 may be the continued use of fossil fuels at the site; • Biomass fired power plants; • A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m². 	This CPA does not involve fuel switch, biomass power plants and/or hydro power plants.
Applicability condition (GEF Tool)	Justification
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would	This CPA provides electricity to a grid.

have been provided by the grid (e.g. demand-side energy efficiency projects).	
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants.	Only grid power plants were considered.
In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	The CPA is located totally in a non-Annex I country.

Applicability condition (Additionality Tool)	Justification
The use of the "Tool for the demonstration and assessment of additionality" is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool.	No new methodology is being submitted.
Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	The CPA is following the tool.

B.3. Sources and GHGs

Source		Gas	Included	Justification/Explanation
Baseline	CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO ₂	Yes	Main emission source
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
Project activity	For geothermal power plants, fugitive emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam	CO ₂	No	No geothermal plant involved.
		CH ₄	No	No geothermal plant involved.
		N ₂ O	No	No geothermal plant involved.
	CO ₂ emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO ₂	No	No solar plant involved.
		CH ₄	No	No solar plant involved.
		N ₂ O	No	No solar plant involved.
	For hydro power plants, emissions of CH ₄ from the reservoir	CO ₂	No	No hydro plant involved.
		CH ₄	No	No hydro plant involved.
		N ₂ O	No	No hydro plant involved.

B.4. Description of baseline scenario

According to the methodology ACM0002, if the project activity is the installation of a Greenfield power plant, the baseline scenario is:

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

B.5. Demonstration of eligibility for a generic CPA

The CPA fulfils all eligibility criteria defined by the CME in the PoA-DD, as follows:

- (a) The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA.**

CPA is inside the Brazilian territory.

- (b) Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo).**

CPA provided necessary identification and all information to state its unique nature. The search for similar projects was detailed to prevent double-counting of emission reductions.

- (c) The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications.**

CPA is an installation of a Wind Power Plant (WPP) connected to the grid and follows manufacturer specifications and/or best practices.

- (d) Conditions to check the start date of the CPA through documentary evidence.**

The evidence for the starting date is the Purchase Order for the wind turbines. That date cannot be before the starting date of the PoA.

- (e) Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs.**

As can be seen in section B.2, all applicability conditions are met.

- (f) The conditions that ensure that the CPA meets the requirements pertaining to the demonstration of additionality.**

CPA applies the steps of the Tool for the demonstration and assessment of additionality version 07, using a financial analysis to compare the scenario of the CPA with a benchmark scenario.

Step 0: Demonstration whether the proposed project activity is the first-of its-kind

This step is optional, thus not considered.

Step 1: Identification of alternatives to the project activity consistent with current laws and Regulations**Sub-step 1a: Define alternatives to the project activity:**

According to the approved methodology, ACM0002, selected for the present Programme Activity, the baseline scenario is:

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

Based on information provided above, the approved methodology, ACM0002 prescribes the baseline scenario, so no further analysis is required; the credible and realistic alternatives are not needed to be identified.

Only in the cases which *"the project activity is the retrofit or replacement of existing grid-connected renewable power plant/unit(s) at the project site"*, the same methodology determinates that a step-wise procedure to identify baseline scenario shall be used to identify alternative baseline scenarios for power generation. Therefore, considering that the power plants of project activity are new plants, no alternative scenarios shall be used in the present project activity.

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

This CPA is in compliance with all applicable regulations, according to the following entities:

- National Electric System Operator – ONS (from Portuguese Operador Nacional do Sistema Elétrico). Responsible agency for coordination and control of the Operation of the electrical energy Generation and Transmission in the SIN (National Interconnected System).;
- Electricity Regulatory Agency – ANEEL (from Portuguese Agência Nacional de Energia Elétrica). It is a Regulating Agency, tied with the Ministry of the Mines and Energy, with headquarters and forum in the Federal District, with the purpose of regulating and fiscalizing the generation, transmission and commercialization of electrical energy, in compliance with the Politics of the Federal Government.;
- Environmental State Superintendence – SEMACE (from Portuguese Superintendência Estadual de Meio Ambiente). It is the environmental agency from the state of Ceará, created to protect, conserve and recoup the environment to promote the sustainable development.

Step 2: Investment analysis

The investment analysis shall be performed in order to determine whether the proposed project activity is not:

- a) The most economically or financially attractive; or
- b) Economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).

Sub-step 2a: Determine appropriate analysis method

In order to determine the appropriate analysis method, the following options are available to be used in the additionality analysis:

- Option I - Apply simple cost analysis,
- Option II - Apply investment comparison analysis,
- Option III - Apply benchmark analysis.

According to the Tool, if the CDM project activity and the alternatives identified in Step 1 generate financial or economic benefits other than CDM related income, then the investment comparison analysis (Option II) or the benchmark analysis (Option III) shall be used. The benchmark analysis will be applied, because it is the most appropriated for this type of activity in Brazil. Moreover, the Option II shall be applied when there are credible alternative scenarios existed to the project activity. As there are no alternative to compare with the project's indicator (Internal Rate of Return) the Option III shall be applied.

Therefore, the Option III was chosen.

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

Benchmark – SELIC rate

The Option III – Benchmark analysis under the Step 2 (Tool for the demonstration and assessment of additionality version 07.0 item 4.3.4) – financial analysis is selected. The Benchmark is the daily

average of SELIC (Special Clearance and Escrow System, from Portuguese “Sistema Especial de Liquidação e Custódia”) rate since 3 years prior to the project start date, plus a 2.1% risk premium. SELIC is the Brazilian governmental bound rate, from Portuguese “taxa SELIC” plus a premium risk of 2.10% calculated based on BOVESPA – Brazilian Stock Market data (RAC 2011 page 943), thus the formula applied is benchmark = risk-free rate + market-risk = 10.16% + 2.10% = 12.26%. The SELIC rate has lower risk compared to investing on a new WPP, thus it is clearly demonstrated that the project developer would look for better opportunities at the financial market, such as fixed interest rates.

The financial cash flow of the CPA project considers the timeframe of 20 years, and includes the revenues, operation cost and investment cost, detailed below. The cash flow is used to determine the project IRR, which is compared to the benchmark. If the IRR is lower and the other requirements of the Tool for the demonstration and assessment of additionality version 07, are fulfilled, thus the CPA component is additional.

The information regarding investment cost was obtained from contracts and/or proposals to demonstrate the costs related to equipment, engineering, civil work, environmental action and studies, land cost, etc.

The taxation system should be the presumed income tax system. This system is used for more than 80% of the Brazilian⁷. Please see below all assumptions taken during financial analysis:

Investment costs

Item	Value	Unit	Source
WTGs		R\$	contracts and/or proposals
Civil works (Turn Key)		R\$	contracts and/or proposals
Electrical works (Turn Key)		R\$	contracts and/or proposals
Environmental costs		R\$	contracts and/or proposals
Insurance		R\$	contracts and/or proposals
Other costs		R\$	contracts and/or proposals
Total		R\$	

Operational cost

Item	Value	Unit	Source
First 2 years O&M		R\$/WTG/yr	Estimative from PP
Following years O&M		R\$/WTG/yr	Estimative from PP
Transmission fee -TUST		R\$/KW.month	Estimative from PP
PIS - Social contribution program		% of revenues	applicable legislation
COFINS - Social security financing transfers		% of revenues	applicable legislation
IR - Income tax		% over profit	applicable legislation
Additional IR		% over profit	applicable legislation
CSLL - Social contribution o net profit		% over profit	applicable legislation
CSLL base profit		% of revenues	applicable legislation
IR base profit		% of revenues	applicable legislation
Fiscalization fee - TFSEE		R\$/KW.year	Estimative from PP
Annual typical unitary economic benefit		R\$	Estimative from PP
Land lease		R\$ or % of revenues	Estimative from PP
Depreciation		%	applicable legislation

Operational revenues

⁷ <http://www.portaltributario.com.br/artigos/lucro-presumido-2014.htm>

Item	Value	Unit	Source
Energy price	xxx	R\$/MWh	Contracts, PPAs, last public auction price
Expected annual energy generation	xxx	MWh/year	= Installed capacity * load factor * working hours, or Information from wind study

The information regarding operational cost/revenues was obtained from applicable legislation, mainly related to the taxes, the revenue is the estimated energy generation, based on wind studies or official entities documents, times the energy price obtained from energy price contract and/or auction prices. The operation and maintenance cost was obtained from maintenance proposal and/or contract.

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

The CPA cash flow should demonstrate that the project IRR is lower than the Benchmark rate. This means that the project activity is not financially attractive to the investor:

Financial result		
Financial Result (20-y)	Value / unit	Source
IRR without carbon	xxx	calculated

As demonstrated, considering the investment costs and the net profit for a 20-year cashflow period frame, the project IRR is lower than the benchmark. .

After that, the IRR was compared to benchmark, and the sensitivity analysis was carried out, varying the main parameters until the IRR reaches the benchmark. All conditions are satisfied, thus the CPA can be considered additional.

Sub-step 2d. Sensitivity analysis

A sensitivity analysis should be conducted by varying the following parameters:

- Increase in the energy price and energy production;
- Reduction in project investments;
- Reduction in O&M cost

The results of the sensitivity analysis should be presented in the following table. The project IRR should remain below the benchmark even in the case when the parameters change in favour of the economic feasibility of the project.

Information	Variation	IRR	to IRR = Benchmark
Investment	-10%		
Gross revenue	+10%		
O&M Cost	-10%		

The sensitivity analysis is discussed below. To show the “gross revenue increase”, the items energy price and electricity production are used.

(a) Increase in the energy price

Energy price is unlikely to increase significantly in the decision making scenario. In comparison with energy tenders performed by the Brazilian government, the electricity prices for wind energy have always been very low. On top of that the energy prices involved in this PoA are fixed by contract and will not change.

Even considering that the PPA contracts includes an energy price correction due the inflation, it is important to note that the same projected increase will also occur for the project costs during the years, thus such correction in the energy price would not have significant impact in the project's IRR.

It is worth mentioning that energy auctions promoted by the government are an official reference for the energy prices analysis by energy players in Brazil. Official information regarding electric energy auctions are publicly available and can be obtained at the Chamber of Electric Energy Commercialization's website: <http://www.ccee.org.br/>.

Therefore, considering the information above, an increase in the market energy price to values significantly above the price used in the financial analysis in this CPA is not foreseen.

Each specific CPA-DD should consider as increase of 10% in gross revenues. The resulting IRR should not overcome the benchmark IRR.

(b) Increase in the project plant load factor (PLF)/energy production

The effective energy generation has seasonal variations resulting in lower and higher production levels. Meanwhile, an increase in energy production is unlikely to occur because wind studies are performed by known consultancies companies with proofed experience in the market. The wind studies are used to calculate/dimension the wind park project.

Therefore, considering the information above, an increase in the amount of electricity generated to values significantly above the ones used in the financial analysis in each CPA is not foreseen. Thus, it is very unlikely that the gross revenues increase to the amount needed for the IRR to cross the benchmark.

(c) Reduction in operation and maintenance (O&M) costs

Each specific CPA-DD should consider as increase of 10% in gross revenues. The resulting IRR should not overcome the benchmark IRR.

(d) Reduction in project investments

Each specific CPA-DD should consider a reduction of 10% in project investments. The resulting IRR should not overcome the benchmark IRR.

Step 3: Barrier analysis

Not necessary. As concluded in the sensitivity analysis the project activity is not financially attractive.

Step 4: Common practice analysis

This analysis is based in the version 03.1 of the "Methodological Tool: Common Practice", and has the purpose of complement the investment analysis, discussing the existing common practice of the sector and region relevant to project activity. The following stepwise approach clearly demonstrates the project activity do not represent common practice.

The list of wind power plants operating in the country is made available by ANEEL.

STEP 1:

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

The installed capacity of the plant in each specific CPA-DD is XX MW, the plants included in this analysis should have a minimum of XX+50% MW and a maximum of XX-50% MW.

(a) The projects are located in the applicable	In a conservative approach, the entire host
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geographical area	country was considered as a default.
(b) The projects apply the same measure as the proposed project activity	Only wind power plants were selected.
(c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;	Only wind power plants were selected.
(d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;	Only wind power plants were selected. The electricity energy is produced.
(e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;	The output range is present in the previous step.
(f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.	Only wind power plants that started operation before 2012 were selected.

STEP 3:

Within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number Nall.

Nall = Y

STEP 4:

Within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number Ndiff.

To the common practice analysis, a survey was conducted including wind power plants which became operational between July 2004 (when the New Model of Brazilian Electric Sector started to operate) and specific CPA-DD project activity starting date, in order to establish a range of projects that can be considered similar to the project activity, like the definition of item 4, in the "Methodological Tool: Common Practice", version 03.1.

Based on the above premises, were selected renewable energy generation projects, through wind power plants with installed capacity between +/- 50% of the specific CPA-DD.

In the analysis should be considered the project activities that are similar to the plant in the specific CPA and have or not financial incentives. This is related to the investment climate in the date of the investment decision: Subsidies or other financial flows, Promotional Policies and Legal regulations.

Legal Regulations**History of the Brazilian Electric Sector**

In recent decades, the Brazilian Electric Sector has undergone several changes until the current model. The energy sector was composed almost exclusively of government-owned companies, but since 1995, due to an increase in international interest rates and the incapacity of investment, the government was forced to seek for alternatives. The recommended solution was to begin a privatization process and deregulation of the market.

During the years 2003 and 2004 the Federal Government has issued the foundations for a new model of Brazilian Electric Sector, supported by Laws No 10,847/14 (which creates the Energetic Research Company – EPE that is responsible for the long term planning of the electrical sector) and No 10,848/15, of 15 March 2004 (which establishes the ways of energy commercialization in free regulated ambiances, among other issues), and the Decree No 5,163, of 30 July 2004 (that rules the energy commercialization and concession procedures to the electricity generation).

The table below shows the summary of the main changes between the pre-existing models and the current model, which resulted in changes in the activities of some agents of the sector. As can be seen in the table, the current energy model was implemented in 2004, having as legal milestone the Decree number 5,163 issued on 30 July 2004. Before the issuance of this Decree, the investment environment was different from the current, so no similar to the proposed project activity.

Table - Summary of the several changes in the Brazilian Electric Sector

Former model (until 1995)	Free market model (1995 to 2003)	New model (2004)
Financing using public funds	Financing using public and private funds	Financing using public and private funds
Verticalized companies	Companies classified by activity: generation, transmission, distribution and commercialization	Companies classified by activity: generation, transmission, distribution, commercialization, imports and exports
Predominantly State-controlled companies	Opening up of the market and emphasis on the privatization of the companies	Coexistence between State-controlled and Private Companies
Monopolies – No competition	Competition on generation and commercialization	Competition on generation and commercialization
Captive consumers	Both free and captive consumers	Both free and captive consumers
Tariffs regulated to all sectors	Prices are free negotiated for the generation and commercialization	In a free environment: prices are freely negotiated for the generation and commercialization. In a regulated environment: auctions and bids for the least tariffs
Regulated market	Free market	Coexistence between regulated and free market
Determinative Planning-Coordinator Group for the Planning of Eclectic Systems (GCPS)	Indicative Planning accomplished by the National Council for Energy Policy (CNPE)	Planning accomplished by the Energy Research Company (EPE)

Subsidies or other financial flows and promotional policies it is important to consider that, in the incentive and investment matters, Brazil has two main foment lines to renewable energy projects: the Clean Development Mechanism (CDM), established by the Kyoto Protocol, and the Alternative Electrical Energy Sources Incentive Program (PROINFA), established for the Decree 5,025/2004.

The PROINFA, as described in Decree No. 5,025, 2004, was established in order to increase the share of electricity produced by designed projects based on wind, biomass and small hydro hydropower (SHP) in the National Interconnected System (SIN). According to Law No. 11,943, of May 28, 2009, the deadline for the start of operation of these projects ends on December 30, 2010⁸. Its target is to diversify the Brazilian Electrical Matrix, creating alternatives to improve the security in the electrical energy supply and to allow the appreciation of local and regional characteristics and potentialities.

⁸ <http://www.mme.gov.br/programas/proinfa/>

Since the cut-off for the PROINFA was based on the starting date of operation (2010), this activity was not qualified to the program.

The Ministry of Mines and Energy (MME) is the responsible to define the rules, elaborates the Program planning and defines the economic value of each source. The Eletrobrás (Electrical Brazilian Centrals - from Portuguese Centrais Elétricas Brasileiras S.A.) is the executor agent, with the mission to do the Contracts of Purchase and Sale of Energy (from Portuguese Contratos de Compra e Venda de Energia – CCVE) or, in English, Power Purchase Agreement – PPA.

In PROINFA, the financial incentives provided by the Federal Government are based on differentiated lines of finance, guarantees of minimal revenues through of the PPAs to be firm with entrepreneur and Eletrobrás, which assures to the entrepreneur minimal revenue through the purchase of 70% of the generated energy during the financing period. The PROINFA gives also protection against the risks of exposure in the short-term market besides other benefits of adhesion in the program.

Projects qualified by the PROINFA are eligible to participate in the CDM, agreeing to the decision of the UNFCCC regarding eligibility of project derived from public policies. The legislation that created the PROINFA considered the possible CDM revenues to implement the program.

In Brazil regulatory environments, all the projects of generation, transmission, distribution and commercialization of electric energy are supervised and regulated by ANEEL in compliance with the law 9,427 of 26 of December of 1996, guaranteeing, then, the same regulatory requirements to the similar activities of the plant included in this CPA.

Others project activities registered in CDM were not included in the common practice analysis. Considering the explanation above and the “Methodological Tool: Common Practice” which states that CDM project activities are not be included in this analysis.

Among the WPPs listed above that have become operational in this period, 15 of them were implemented with PROINFA incentives. The only exception is the plant “Mel 02”, in the city of Areia Branca (RN), with installed capacity of 20MW, which a reference was found neither for CDM nor for PROINFA.

Result of this Step:

$N_{diff} = Z$

STEP 5:

Calculate factor $F = 1 - N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

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.

According the requirements of the version 03.1 of “Methodological Tool: Common Practice”, the factor F that represents “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” must be calculated as follows:

$$F = 1 - N_{diff}/N_{all} = 1 - Y/Z < 0,2$$

$$N_{all} - N_{diff} = Y - Z < 3$$

Final Result of the common practice analysis:

In the light of all the explanation provided above and considering the values of factor “F” and “Nall -Ndiff”, it is possible to conclude that the implantation of wind power projects similar to the project activity is not a common practice in Brazil, being therefore eligible to CDM according its additionality requirements.

(a) The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis.

The Local stakeholder consultation (LSC), as required by the Brazilian DNA, was performed at PoA level. However, in addition to this LSC, the local communities and associations, as well as local government were consulted and a summary of the CPA was made available/sent by mail. No comments were received so far.

The CPA is in accordance with all environmental legislation applicable in the host country as evidenced by the Environmental License provided.

(b) Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance.

A sign letter declaring that there is no Annex I parties funding, or if any, it does not result in a diversion of official development assistance was provided.

(c) Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation).

The CPA involves WPP(s) with no specific target group and the distribution will occur by the connection to the national system (SIN)

(d) Where applicable, the conditions related to sampling requirements for the PoA in accordance with the “Standard for sampling and surveys for CDM project activities and programme of activities”

No sampling method was applied in this PoA. All CPAs are monitored.

(e) Where applicable, the conditions that ensure that every CPA (in aggregate if it comprises of independent sub units) meets the small-scale or microscale threshold and remains within those thresholds throughout the crediting period of the CPA;

Not applicable, this is a large scale programme, using ACM0002.

(f) Where applicable, the requirements for the debundling check, in case the CPAs belongs to small-scale or microscale project categories.

Not applicable, this is a large scale programme, using ACM0002.

(g) All new CPAs must provide an application letter in the name of the wind project developer including the following information:

- Formal application for inclusion of CPA in the PoA.
- Affirmation that the inclusion is a voluntary action.
- In case the project receives no 3rd party financial aid, then an affirmation of non-receipt of ODA shall be provided by the CPA implementer. In case the project receives any financial aid from an Annex 1 country, then a statement from the relevant authority of the Annex 1 country shall be submitted stating the financial aid does not result in diversion of ODA.
- Affirmation that all equipment purchased will be new so as to avoid any potential leakage emissions.
- Affirmation to understanding that the CPA crediting period shall not exceed the PoA end date.
- Acceptance that the project developers are aware of terms and conditions of the PoA and agree that their project be subscribed to the PoA.

B.6. Estimation of emission reductions of a generic CPA

B.6.1. Explanation of methodological choices

According to the methodology ACM0002, some project activities may involve project emissions that can be significant. However, for most renewable power generation project activities, $PE_y = 0$. This is exactly the case of this CPA, involving the construction and operation of WPP(s) and not expecting to consume any fossil fuels.

According to the same methodology, baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the CPA. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

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

Where:

- BE_y = Baseline emissions in year y (tCO₂/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 CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO₂/MWh)

For the calculation of $EG_{PJ,y}$, it will be used option (a), Greenfield plants, since the CPA involves the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity. The calculation should be as follows:

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

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)

For the calculation of $EF_{grid,CM,y}$, it will be used data Brazilian Designated National Authority (DNA). The Brazilian DNA makes available the information of Dispatch Data Analysis - Operating Margin Emission Factor and the Build Margin Emission Factor following stepwise approach of the GEF Tool, as follows:

Step 1: Identify the relevant electricity systems

The Interconnected National System is defined as the relevant electric system of the Project Activity, as recommended by Brazilian DNA through the resolution #08.

Step 2: Choose whether to include off-grid power plants in the project electricity systems

The Option 1 (only grid power plants are included in the calculation) was chosen for project activity, once the OM and BM emission factor is calculated by the Brazilian DNA based in the data from power plants connected to the grid.

Step 3: Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on (c) Dispatch data analysis Operation Margin.

Step 4: Calculate the operating margin emission factor according to the selected method

The calculation of the operation margin emission factor follows the dispatch data analysis emission factor ($EF_{grid,OM-DD,y}$) and it is calculated and defined by the Brazilian Designated National Authority in accordance with the dispatch data of the Electric System National Operator – [ONS](#).

The CO₂ emission factors resulting from the power generation in the Brazilian National Interconnected System (SIN) are calculated based on the generation record of plants centrally dispatched by ONS.

According to the “Tool to calculate the emission factor for an electricity system” for the dispatch data analysis (OM) it must be used the year in which the project activity displaces grid electricity and it must be updated the emission factor annually during monitoring.

Dispatch data OM emission factors for year 2012 was used for an ex-ante estimation of CERs that will be generated as a result of project’s implementation.

The Emissions Factor Operating Margin is calculated for the Brazilian National Interconnected System hourly from the value of energy exported from each plant, the cost of generation of each plant (scheduling priority), schedules of exchanges with the neighbouring subsystems and emission factors of thermal power plants.

The dispatch order for Brazilian Interconnected System is: hydroelectric power plants, wind, nuclear, imports from other systems in ascending order of cost, thermoelectric power plants in ascending order of generation cost.

Step 5: Calculate the build margin (BM) emission factor

The Option 2 was selected. 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.

The build margin emission factor is calculated by the Brazilian DNA. The procedure for calculation was elaborated in cooperation between ONS, MME and MCTI and follows the “Tool to calculate the emission factor for an electricity system”. Data of Build Margin emission factor for year 2012 was used for an *ex-ante* estimation of CERs generation, because they are the latest data available.

Step 6: Calculate the combined margin emissions factor

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on (a) Weighted average CM. The combined margin emission factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,BM,y} * W_{BM} + EF_{grid,OM,y} * W_{OM}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/ MWh)

$EF_{grid, OM, y}$	=	Operating margin CO ₂ emission in year y (tCO ₂ / MWh)
W_{OM}	=	Weighting of operating margin emissions factor (%)
W_{BM}	=	Weighting of build margin emissions factor (%)

According to the Methodology, 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, and transport). These emissions sources are neglected. Therefore, emission reductions is calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y	=	Emission reductions in year y (tCO ₂ e/yr)
BE_y	=	Baseline emissions in year y (tCO ₂ /yr)
PE_y	=	Project emissions in year y (tCO ₂ e/yr)

Due to specific CPA conditions, the emission reductions for this CPA will be calculated based on the methodology approach as follows:

$$ER_y = BE_y = EF_{grid, CM, y} * EG_{facility, y}$$

Where:

ER_y	=	Emission reductions in year y (tCO ₂ e/yr)
BE_y	=	Baseline emissions in year y (tCO ₂ /yr)
$EF_{grid, CM, y}$	=	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO ₂ /MWh)
$EG_{facility, y}$	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

B.6.2. Data and parameters fixed ex-ante

Data / Parameter:	W_{BM}
Data unit:	%
Description:	Weighting of build margin emissions factor
Source of data:	Tool to calculate the emission factor for an electricity system
Value(s) applied:	25
Choice of data or Measurement methods and procedures:	Default value recommended by the GEF tool for Wind and solar power generation project activities, for the first crediting period and for subsequent crediting periods.
Purpose of data	Calculation of baseline emissions
Additional comment:	-

Data / Parameter:	W_{OM}
Data unit:	%
Description:	Weighting of operating margin emissions factor
Source of data:	Tool to calculate the emission factor for an electricity system
Value(s) applied:	75
Choice of data or Measurement methods and procedures:	Default value recommended by the GEF tool for Wind and solar power generation project activities, for the first crediting period and for subsequent crediting periods.
Purpose of data	Calculation of baseline emissions
Additional comment:	-

B.6.3. Ex-ante calculations of emission reductions

As described in section B.6.1 above, ex-ante calculations of emission reductions follow guidance provided by the methodology ACM0002. The global equation is:

$$ER_y = BE_y = EF_{grid,CM,y} * EG_{facility,y}$$

Where:

ER_y = Emission reductions in year y (tCO₂e/yr)

BE_y = Baseline emissions in year y (tCO₂/yr)

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO₂/MWh)

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

$EF_{grid,CM,y}$, as stated in section B.7.1 below, is to be defined ex-post, since it is provided by the Brazilian DNA. Nevertheless, for ex-ante calculation purposes, it is used an average of the most recent year available.

$$EF_{grid,CM,y} = EF_{grid,BM,y} * W_{BM} + EF_{grid,OM,y} * W_{OM}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/ MWh). For this project, it is used the most recent year available.

$EF_{grid,OM,y}$ = Operating margin CO₂ emission in year y (tCO₂/ MWh).

W_{OM} = Weighting of operating margin emissions factor (%). For this project, it is used **75%** as described in section B.6.2 above.

W_{BM} = Weighting of build margin emissions factor (%). For this project, it is used **25%** as described in section B.6.2 above.

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

This Section was left blank on purpose.

B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter:	EG_{facility,y}
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data:	Electricity meter(s)
Value(s) applied	
Measurement methods and procedures:	The monitoring involves both the quantity of electricity supplied by the project plant/unit to the grid and the quantity of electricity delivered to the project plant/unit from the grid.
Monitoring frequency:	Continuous measurement and monthly recording.
QA/QC procedures:	Cross check measurement results with records for sold electricity. Meter(s) calibrated and/or maintained according to the Normative from the National System Operator (ONS).
Purpose of data	Calculation of baseline emissions
Additional comment:	-

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 calculated using the "Tool to calculate the emission factor for an electricity system"
Source of data:	Brazilian DNA
Value(s) applied	
Measurement methods and procedures:	The monitoring consists on checking the Brazilian DNA website for EF _{grid, BM,y} and EF _{grid, OM,y} most recent data available.
Monitoring frequency:	Each verification event the website will be checked and the most updated data available will be used.
QA/QC procedures:	Monthly values will be used whenever possible for verifications, since it will reflect the most reliable data. The Brazilian DNA is responsible for the calculations of EF _{grid, BM,y} and EF _{grid, OM,y} , done as described in section B.6.1.
Purpose of data	Calculation of baseline emissions
Additional comment:	Ex-ante value calculated as described in section B.6.3.

B.7.2. Description of the monitoring plan for a generic CPA

The key parameter required to be monitored is the net electricity, EG_{PJ,y} measured in MWh exported to the Brazilian National Electricity Grid (SIN). There is no sampling involved, hence no sampling plan is required. All data monitored and required for verification and issuance be kept and archived electronically for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later. All measurements should be conducted with calibrated measurement equipment according to relevant industry standards.

The CPA xxx connection to xxxxx substation is made through xxx km extension power line, with xxx kV, interconnecting the xxxxx substation, property of xxxx., to xxxx substation.

The official monitoring equipment are located at xxxx - xxx meters, xxxxx model xxxxx.

The transformer present at xxxxx Substation is xxxx xxxxx MVA S/N xxxx manufacturer date xxxx.

Operation and Management Structure

The operation and management structure of the monitoring plan can be observed through the following flow chart:

Project Manager → Engineering sector → Metering operator
--

Project manager: Represents de board of the company responsible for manage the wind power plant, in charge of the company's management and responsible for the CDM project development.

Engineering Sector: Is responsible to centralize all monitoring information provided by the Metering Operator. All data collected as part of the monitoring should be archived electronically and be kept at least for two years after the end of the last crediting period

Metering Operator: Represents the agent responsible to conduct the entire invoice metering, and the maintenance and calibration of the energy metering equipment.

Internal Data Collection Procedures

Each parameter required by the monitoring plan will be documented in a quality control program, including internal audits every 6 months, which shall monitor the conditions and procedures that ensure consistency of all/data procedures, specially the following:

Calibration and maintenance of equipment: All equipment used for monitoring purposes will be calibrated and maintained according to the manufacture's specifications and Module 12 of the ONS by the **Metering Operator**, at least every 2 years.

EG_{facility,y} – The net electricity supplied to the grid will be continuously measured in the wind power plant by the **Metering Operator** through electricity meters with 0.2% of accuracy.

Since the value from the invoice will be used for emission reduction calculation, it will also be cross checked with the gross energy generation metered internally to account eventually losses. Only energy generated by the wind power plants included in this project activity will be considered for ER calculations.

EF_{grid, CM,y} – The grid emission factor will be provided by the Brazilian DNA, which usually is made public available each year, and calculated by the latest version of the *Tool to calculate the emission factor for an electricity system*.

Requirement	Responsible	Action plan/ procedure
Emission reduction calculation	Project Manager	The calculations of CO ₂ emissions will be based solely on net value production. The calculations of avoided GHG emissions will be carried out on a periodic basis by Project Manager, applying the methodologies and calculations detailed in the CPA-DD.
Review of CPA inclusion	Project Manager	The Project Manager will be responsible to check the features of potential CPAs to ensure that each CPA meets all requirements and eligibility criteria before inclusion in the registered PoA. The staff has acknowledged experience in registered CDM projects.
Training and	Project	Project Manager will be responsible for training the CPA

capacity development for personnel	Manager	operational staff, so as to execute the CER monitoring according to the monitoring plan and best practices.
Technical review of CPA	Project Manager	Project Manager will be responsible for cross checking the information from the project developer, collecting the necessary documentation to the CPA validation, such as equipment details, proposals/ contracts, etc.
Double counting	Project Manager	The Project Manager will check on the UNFCCC website if the proposed CPA has already requested for registration a CDM project or a CPA inclusion. In case of registration of an already registered CDM component the PP will communicate immediately the UNFCCC and DOE.
Records and documentation control	Project Manager	The server will contain all documentation related to each CPA and backed up annually. A copy of the documents may also be kept online or at the CPA system.
Measures for continuous improvements of the PoA management system	Project Manager	The Project Manager will be responsible for checking the UNFCCC procedures and apply the QA/QC processes to improve the PoA management system.

Appendix 1. Contact information of coordinating/managing entity and responsible person(s)/ entity(ies)

CME and/or responsible person/ entity	<input checked="" type="checkbox"/> CME <input type="checkbox"/> Responsible person/ entity for application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the PoA
Organization	ÉOLOS ENERGIAS RENOVÁVEIS S.A.
Street/P.O. Box	Av. Dom Luis, 807 – 5 andar do Anexo - Aldeota
Building	Etevaldo Nogueira
City	Fortaleza
State/Region	CE
Postcode	60.160-230
Country	Brazil
Telephone	+55 85 3025-9130
Fax	-
E-mail	luiz.santos@qgrenovaveis.com
Website	http://qgrenovaveis.com
Contact person	Luiz Antonio dos Santos
Title	Development Superintendent
Salutation	Mr.
Last name	Santos
Middle name	

CME and/or responsible person/ entity	<input type="checkbox"/> CME <input checked="" type="checkbox"/> Responsible person/ entity for application of the selected methodology(ies) and, where applicable, the selected standardized baseline(s) to the PoA
Organization	WayCarbon Soluções Ambientais e Projetos de Carbono Ltda
Street/P.O. Box	R. Prof. José Vieira de Mendonça, 770, Sala 210, Engenho Nogueira.
Building	Parque Tecnológico de Belo Horizonte - BH-Tec
City	Belo Horizonte
State/Region	MG
Postcode	31.310-260
Country	Brazil
Telephone	(31) 3401-1074
Fax	-
E-mail	fbittencourt@waycarbon.com
Website	www.waycarbon.com
Contact person	Felipe Bittencourt
Title	Commercial Director
Salutation	Mr.
Last name	Bittencourt
Middle name	

Appendix 2. Affirmation regarding public funding

There is no Annex 1 public funding for this CPA

Appendix 3. Applicability of methodology(ies) and standardized baseline(s)

Application of methodology already described in details in section B.2.

Appendix 4. Further background information on ex ante calculation of emission reductions

This Section was left intentionally blank

Appendix 5. Further background information on the monitoring plan

This Section was left intentionally blank

Appendix 6. Summary of post registration changes

This Section was left intentionally blank

Document information

Version	Date	Description
06.0	15 April 2016	Revision to ensure consistency with the "Standard: Applicability of sectoral scopes" (CDM-EB88-A04-STAN) (version 01.0).
05.0	9 March 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to choice of start date of PoA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Add exception for generic CPA where technology is under positive lists; • Editorial improvement.
04.1	5 August 2014	Editorial revision to correct the document information table.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the project design document form for CDM programme of activities (these instructions supersede the <i>Guideline: Completing the programme design document form for CDM programme of activities</i> (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the PoA in B.4 and Appendix 1; • Add general instructions on post-registration changes in paragraph 2 and 3 of general instructions and Erro! Fonte de referência não encontrada.; • Change the reference number from <i>F-CDM-PoA-DD</i> to <i>CDM-PoA-DD-FORM</i>; • Editorial improvement.
03.0	3 December 2012	EB 70 Revision to reflect changes to the <i>Guideline: Completing the programme design document form for CDM programmes of activities</i> (EB 70, Annex 6)
02.0	13 March 2012	EB 66 Revision required to ensure consistency with the "Guidelines for completing the programme design document form for CDM programmes of activities" (EB 66, annex 12).
01.0	27 July 2007	EB 33, Annex 41 Initial adoption.
Decision Class: Regulatory		
Document Type: Form		
Business Function: Registration		
Keywords: programme of activities, project design document		