CLEAN DEVELOPMENT MECHANISM
PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM-PoA-DD) Version 01

CONTENTS

Annexes

NOTE:

This form is for the submission of a CDM PoA whose CPAs apply a large scale approved methodology.

At the time of requesting registration, this form must be accompanied by a CDM-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-CPA-DD (using a real case).

SECTION A. General description of programme of activities (PoA)

A.1 Title of the programme of activities:

Tepeu Wind Programme of Activities

Version of PoA-DD: 8
Date: 23/11/2012

A.2. Description of the programme of activities:

The Tepeu Wind Programme of Activities aims at developing a series of wind projects located in different countries of the Latin America and Caribbean region, being Nicaragua and Peru the first PoA host countries.

1. General operating and implementing framework of PoA:

The Tepeu PoA will support the development of wind projects in the Latin America and Caribbean region that are to be connected to the National Interconnected System of the relevant host country. Each CDM Program Activity (hereafter referred to as CPA) under this PoA will comprise one or more wind power plant projects, which can be new facilities, capacity additions, replacements or retrofits.[1]

This PoA is a voluntary action jointly implemented by Mabanaft Carbon B.V. and ÉcoRessources Carbono S.A.C. The PoA is being coordinated and managed by ÉcoRessources Carbono S.A.C.[2] (hereafter referred to as ÉcoRessources or as the coordinating/managing entity or CME). ÉcoRessources will work closely with the developers of the wind power plants and with other organizations active in the energy sector in the PoA host countries to facilitate the development of new power plants and their inclusion to this PoA.

The CME will ensure that the CPAs meet all the eligibility criteria of the PoA before the submission of the project to the validation team, have registries of the operation of the programme, assist the project developers trough trainings (if needed) and periodic follow up during the operation of the PoA, among others. Then, the interaction of the CME and the PO will be permanent in order to solve any potential or existing problem in the project implementation and assure that the project complies with the PoA requirements[3]. The project will be pre-assessed by the CME before any formal agreement has been signed between the project participants and the project owner. The formal agreement between the project owner and the project participant (Mabanaft) will be signed before the CPA is submitted for inclusion to a DOE and the documentation will consider (as a requirement to be part of the PoA), to follow the instructions and answer the requirement set by the CME of the PoA. A more detailed description of the

[1] Or rehabilitation, refurbishment or modification.

[2] ÉcoRessources is a climate change consultancy company that develops projects in North, Central and South America. It has several years of expertise and a staff with specific and long-term experience in developing CDM projects in these regions. For more information please see: http://www.ecoressources.com/carbone – Web link last accessed on 20/12/2011.

[3] The CME has operative offices and professionals in both countries, Peru and Nicaragua, so the communications and follow up with the project developers and energy institutions can be directly done when required.

CME responsibilities and framework in the implementation of the PoA is in section A.4.4.1 and the CME Manual.

Mabanaft supports the development and management of the PoA giving strong financial backing and expertise regarding the development of the PoAs, carbon market and CDM regulation. The CME and participants of the programme will act as joint focal point for the Executive Board of the CDM in all aspects relating to validation, verification, registration and issuance of carbon credits.

The PoA will be implemented in two countries with early wind development energy use and regulatory frameworks aiming to not limit them. A permanent contact with the energy entities will provide sustainability to the PoA in the future.

In general, all Latin American countries have high wind capacity, especially those along the Pacific coast, from southern Chile to Baja California. However, at the end of the year 2010 only 2,008 MW of wind power had been installed in Latin America, of which 1,743 MW (86.8%) was concentrated only in four countries: 931 MW in Brazil, 517 MW in Mexico, 172 MW in Chile and 123 MW in Costa Rica. The region has delayed the development of this technology to its full potential, as well as other issues surrounding the development of the technology, such as regulations, stability of the power supply, and financial subsidies. Only recently, these issues are, and only in a few countries, starting to meet the needs of the wind energy business development.

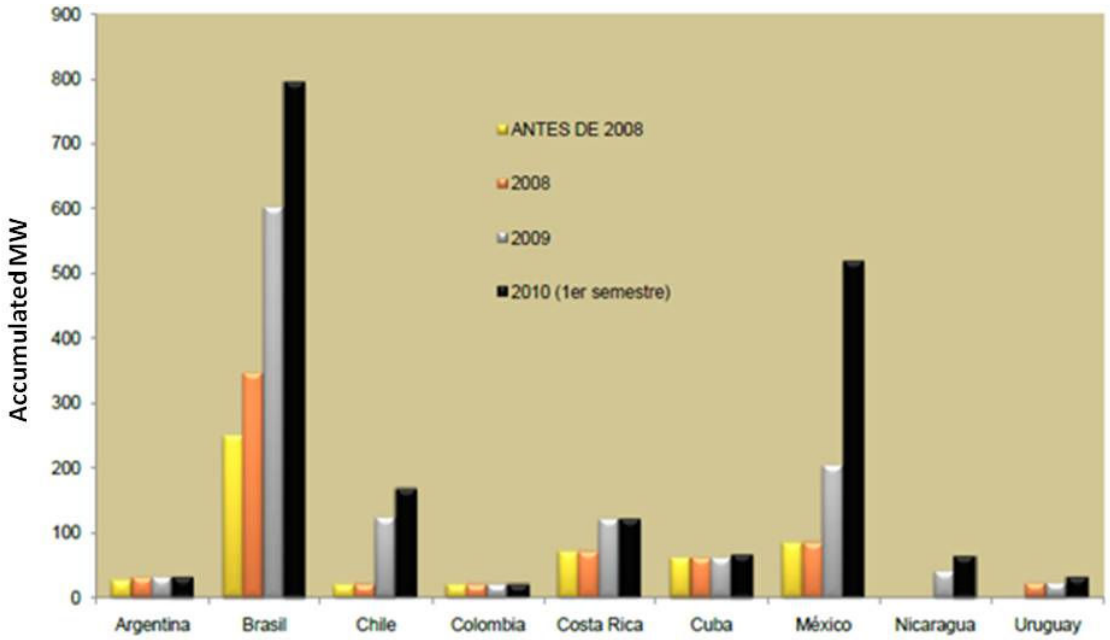
Nevertheless, in the year 2009 this sector began to grow at an increased rate in Latin America. Around 650 MW were installed that year, equivalent to 100% of the capacity installed over the previous years, and an even greater capacity was then installed in the year 2010 (703 MW). However, these numbers are still very distant from those of more advanced countries.

Hence, for the first time wind energy development in Latin America seems to have moved forward significantly, and the projects have adopted carbon revenues as a strategic part of their financial closure. According to a study illustrated at the 2010 meeting of the Latin American Association of Wind Energy (*Asociación Latinoamericana de Energía Eólica*), over the next few years the industry should grow at an average of about 13% a year until reaching a capacity of 46,000 MW in the year 2025. Under this scenario, the Tepeu Wind Programme of Activities will ensure in a more efficient way the carbon finance stimulus for the growing wind sector in Latin America.

"*The Latin American market seems to be waking up to the opportunity of its enormous wind power potential. While growth in 2010 was still small in absolute terms, with 703 MW installed across the continent, this represented a 50% increase in total installed capacity. In addition, the pipeline for new developments is substantial*."[4]

[4] Global Wind Energy Council. See: http://www.gwec.net/index.php?id=19 – Web link last accessed on 20/12/2011.

Figure 1: Wind power installed capacity breakdown by country



Source: GWEC – Global Wind Energy Council

Nicaragua has experienced recently a significant growth in wind energy projects, as can be appreciated in the figure above. Wind energy is part of Nicaragua's efforts to reduce its dependence on oil-based energy and so far, all the wind projects are part of the CDM. The country has also turned to geothermal power, hydroelectric power and sugarcane cogeneration. Nicaragua has released data suggesting that electricity generated by its growing wind energy industry is helping to keep wholesale electricity prices down.[5]

The electric market in Nicaragua, regulated in the year 1998 with Law 272, started its operation in the year 2000. In this market, a project participant can operate in free competition and requires a license from the Ministry of Energy and Mines due to the fact that the wind source is unstable and the government needs to decide its gradual incorporation to the grid to preserve the whole system's reliability. After the big energy crisis in Nicaragua in the year 2006, thermal power plants were prioritized as an answer to the circumstances, and that deepened the thermal dependence of the Nicaraguan Interconnected System (NIS).[6] Currently, the NIS mainly consists of thermal power plants, and in the year 2010 about 64.46% of the grid's generation depended directly on the combustion of either fuel oil or diesel. In contrast, the participation of renewable energy sources in electricity generation was significantly smaller: 14.84% for hydro, 7.97% for geothermal, 6.68% for biomass and 4.77% for wind.[7] The NIS has an estimated emission factor of 0.6984 tCO_2e per megawatt hour. The reduction of

[5] See: http://www.renewableenergymagazine.com/energias/renovables/index/pag/wind/colleft/colright/wind/tip/articulo/pagid/18017/botid/48/len/ame – Web link last accessed on 20/12/2011.

[6] Report Project "ALBA RIVAS" (2010). Analysis of the wind potential of the "La Fe" site, p.6.

[7] INE – Nicaraguan Energy Institute (2010). Statistics of the Electric Sector – Net Generation per power plant. See: http://www.ine.gob.ni/DGE/estadisticas/2010/GeneracionNeta_2010.pdf – Web link last accessed on 20/12/2011.

generation from thermal plants burning fuel oil or diesel in favor of generation from a renewable source will reduce CO_2 emissions to the atmosphere. This will occur since the availability of a cheaper source of electricity will allow the NIS to reduce the amount of generation required from more expensive fossil fuel plants. Therefore, the general baseline scenario is that the 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 into the grid.

Even though producing electricity from wind energy in Nicaragua results in reducing the greenhouse gas (GHG) emissions on a fossil fuel dependent electricity grid while supporting the sustainable development of energy sources to meet the country's growing demand for power, and though there are direct incentives for the renewable industry,[8] this is a struggling market in Nicaragua. The first wind energy project required CDM incentives to be implemented, and the other 3 are in the CDM Cycle.[9]

Peru has also experienced growth in wind energy projects. In past few years, two national bids were held in order to help the implementation of renewable energy projects in the country[10]. Only four large scale wind projects have won these bids and all of them had considered CDM incomes in the process. At this moment, none of the wind power plants are operative.

The electric market in Peru was regulated in the year 1992 with Law 25844 (Electric Concession Law) and since that date no renewable energy, other than mainly large scale hydro power plants, has operated in the *National Electric Power Grid* (SEIN, "Sistema Interconectado Nacional"). In this market, a project participant can operate in free competition and requires a definitive concession from the Ministry of Energy and Mines of Peru. As a result of the discovery of substantial gas fields in the country,[11] the government has been developing the domestic natural gas market to obtain energy self-sufficiency and attend the growing energy demand. Therefore, other technologies are not common practice in the country.

Natural Gas promotion in Peru began in 1999, when the law for the Promotion of Development of the Natural Gas Industry (Law No. 27133)[12] was promulgated. Thus, since the year 2000 the contracts were signed for the development of the Camisea Project. The studies to exploit the Camisea natural gas estimated that reserves were of 11 TCF (Trillion cubic feet) of natural gas and that the estimated recovery, considering the proven and probable, was of 8.24 TCF of gas and 482 million barrels of natural gas liquids. Natural Gas price and promotion policies of the government have made the use of this fuel in generating electricity more feasible, generating significant investments in the installation of new power plants since then. All this is reflected in the evolution of natural gas consumption, as natural gas has become one of the most important components in the electric power generation of the SEIN. The 2010 annual report of the Committee for the System's Economic Operation (COES) shows that the use of the

[8] Report Project "ALBA RIVAS" (2010). Analysis of the wind potential of the "La Fe" site, p.11.

[9] Registered project: Amayo 40 MW Wind Power Project – Nicaragua (Ref. 2315). Requesting registration project: Amayo Phase II Wind Power Project (Ref. 5305). Projects in validation: La Fe Wind Farm Project and EOLO Wind Power Project.

[10] OSINERG. Official web page with information about the renewable energy bids in Peru. See: http://www2.osinerg.gob.pe/EnergiasRenovables/EnergiasRenovables.html – Web link last accessed on 20/12/2011.

[11] The San Martín and Cashiriari fields (known as Block-88 - Camisea) are home to one of the most important non-associated natural gas reserves in Latin America, and represent around ten times all of the other existing natural gas reserves in Peru. http://www.camisea.pluspetrol.com.pe/project.asp - Web link last accessed on 20/12/2011.

[12] http://www.minem.gob.pe/minem/archivos/file/Hidrocarburos/normas_legales/ley27133.pdf - Web link last accessed on 10/10/2011.

Camisea natural gas for electricity generation has been increasing over time, while other technologies like hydropower production, has increased very little compared to this. In this general context, with regulatory incentives for natural gas projects and reduction of tariffs as a result of these incentives, renewable energy projects like wind power plants were not developed.

Therefore, the general baseline scenario for both initial countries in the PoA, is that the 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 into the grid.

Besides Nicaragua and Peru, other countries with growing wind potential are considered to be part of the PoA boundary in the future, but a more detailed analysis needs to be done in order to define priority host countries.

2. Policy/measure or stated goal of the PoA

The objective of this PoA is to develop a platform for overcoming institutional, financial and structural hurdles for the construction of a series of wind power projects or to increase the generation capacity of exiting power plants. All projects are grid connected facilities which will allow the NIS or SEIN to maintain in stand-by or delay the development of new thermal power plants, thus displacing expensive generation fuelled by heavy fuel oil, diesel, coal or natural gas, while reducing GHG emissions and increasing the amount of energy available to the grid.

The proposed PoA will provide a platform for project developers (CPA developers) and facilitate the access to carbon revenues for wind energy projects in the Latin America and Caribbean region with a more proactive and efficient cost approach. By means of an additional carbon cash flow, the PoA aims at increasing the feasibility of such wind energy projects which otherwise would not be feasible. By implementing the PoA, the access to CDM revenues for wind energy developers becomes less time consuming and less expensive than it has been so far. By providing such a platform for potential CPAs, the project participants are responsible for the CDM relevant tasks (inclusion, validation, verification) of the PoA. Additionally, the PoA will ensure a more efficient monitoring, reporting and verification process that will obtain a better rate of carbon revenues for project developers with less time and effort required from them.

All CPAs within the PoA will consist of wind energy facilities. By replacing electricity from fossil fuel based power plants, the project will directly contribute to reducing greenhouse gas (GHG) emissions.

The proposed PoA will improve energy security avoiding the use of fossil fuels and the consequent pollutant emissions and hence promoting the Latin America and Caribbean region's sustainable development. Moreover, the success of this project can be replicated, which implies the opening of new businesses, the promotion of social improvements and an increase in the participation of renewable energy in the energy grid.

So far, and as mentioned in section A.2, there remains a vast untapped potential for wind energy in the Latin America and Caribbean region. The proposed PoA will provide a key incentive to further boost the development of wind energy projects in the region and will enable project developers to benefit from the CDM without the typical high transactions costs and risks that are involved when developing individual CDM project activities.

Economic sustainability:

- The PoA will increase employment opportunities in the area where the CPAs are located, which will increase the income of local communities.
- The PoA will provide secure access to carbon revenues for small project owners that have no possibilities of overcoming the CDM registration costs and knowledge barrier, helping them achieve their project's financial closure.
- The PoA will reduce the time needed and the uncertainties faced when looking for carbon revenues for future CPAs, making the proposed activity more attractive to other sources of capital or equity.
- The PoA will create new sources of renewable energy in a sustainable way, promoting with local investment and a business environment, the sustainable development of the area influenced by each CPA, and thereby improving the local economy.
- The PoA will contribute to fiscal accounts through the payment of taxes from the new wind facilities related to their power generation activities.
- The PoA will help the country improve its hydrocarbon trade balance through a reduction of oil imports to be used for electricity generation.
- The PoA diversifies the sources of electricity generation, important for meeting growing energy demands and for transitioning away from fossil fuel electricity generation.
- The PoA allows a reduction in the generation costs, which benefits the energy users in the Latin America and Caribbean region.

Social sustainability:

- The PoA supports the development of wind resources that in several cases are located in remote parts of the host country, thereby providing access to power for populations that are socially disadvantaged and promoting their connection to the national grid.
- During project implementation, the CPAs are expected to generate employment opportunities for the local population.
- The PoA will generate demand for various kinds of related services, which will generate employment on a regular and permanent basis.
- The newer energy source will create better conditions for the promotion and the development of sustainable commercial activities on depressed areas.

Technological sustainability:

- The PoA supports technology and know-how transfer from other regions or even other countries through trainings and practical works, and facilitates the implementation of environmentally safe technologies to the country.

3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity.

The PoA is a voluntary action being coordinated and managed by ÉcoRessources. There are no mandatory laws or regulations in place in the host countries that require wind power plants to seek CDM services. Likewise, no mandatory laws or regulations exist requiring the coordinating/managing entity or any other party to develop a PoA for wind power plants in the host country.

A.3. Coordinating/managing entity and participants of POA:

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)
Nicaragua (host)	ÉcoRessources Carbono S.A.C. (CME)	No
Peru (host)	ÉcoRessources Carbono S.A.C. (CME)	No
The Netherlands	Mabanaft Carbon B.V.	No

A.4. Technical description of the programme of activities:

A.4.1. Location of the programme of activities:

A.4.1.1. Host Party(ies):

The PoA will have the following host countries:

- Nicaragua
- Peru

Other adjacent and Latin America and Caribbean region countries might be included in the PoA at a later stage.

A.4.1.2. Physical/ Geographical boundary:

All CDM programme activities (CPAs) included in the PoA will be implemented in Nicaragua or Peru. Other adjacent and Latin American countries might be included in the PoA at a later stage and then be part of the project boundary.

A.4.2. Description of a typical CDM programme activity (CPA):

A.4.2.1. Technology or measures to be employed by the CPA:

A typical CPA under this PoA will be a wind energy plant/park connected to its host country national grid. Even though the detailed technical characteristics might differ per CPA, the following general conditions will apply to all CPAs.

- CPAs are wind turbine farms which use wind energy converted into electricity with the help of wind turbine generators, electricity which is then supplied to the national grid/sub-national grid.
- The PoA will be open to all technology providers and projects that meet the eligibility criteria of this PoA.
- A CPA under this PoA may be a single plant or a cluster of such plants employing the same technology undertaken by the same project developer or project community.

The proposed PoA is a sectoral scope 1 programme (Energy industries, renewable - / non-renewable sources).

A.4.2.2. Eligibility criteria for inclusion of a CPA in the PoA:

A CPA to be included in the present PoA shall fulfill the following conditions:

1. The project activity could be implemented under this program if:

    a. It will be a new wind power plant that could be on-shore or off-shore; or
    b. It will be a capacity addition over an existing wind power plant to increase the installed power generation capacity by means of: (i) the installation of a new power plant/unit besides the existing power plant/units, or (ii) the installation of new power units, additional to the existing power plant/units. The existing power plant/units continue to operate after the implementation of the project activity; or
    c. It will be a retrofit (or rehabilitation or refurbishment) over an existing wind power plant that involves an investment to repair or modify an existing power plant/unit, with the purpose to increase the efficiency, performance or power generation capacity of the plant, without adding new power plants or units, or to resume the operation of closed power plants. Retrofits shall only include measures that involve capital investments and not regular maintenance or housekeeping measures to increase the power generation capacity; or
    d. It will be a replacement of one or several existing unit(s) at an existing power plant that involves investment to increase in the installed power generation capacity; or

2. The project activity will be a wind power plant/unit located in one of the PoA's host country or in a host country added to the PoA after registration, but a CPA will not consider multi country projects (i.e. a CPA cannot consider a project located both in Peru and Nicaragua)

3. The project activity requires no energy generating equipment to be transferred from another activity located in a non-annex I party, and no existing equipment is transferred from the project to another activity.

4. During the operation phase, the power plant will be connected to the national grid system.

5. The CPA under the PoA is neither registered as an individual CDM project activity nor included as a CPA in another registered CDM PoA. The CPA proponent shall sign a formal document stating that the project is not participating and will not participate in any other carbon market mechanism.

6. To avoid double counting of emission reductions, each CPA-DD shall be uniquely identified and defined in an unambiguous manner by providing geographic information (including coordinates).

With this information the CME can analyze if the project is deemed to be registered, either as an independent CDM project activity or as a CPA of another PoA, by checking the UNFCCC official website in ongoing validation processes for independent CDM projects and validation and registration sectors for PoAs.

7. The project activity shall not have a start date (as defined by the UNFCCC) before the Global Stakeholder Process (GSP) of the PoA on December 28th, 2011. Since the start date can be defined by different project milestone, the CPA developer shall provide formal documentary evidence when the start date has already occurred to the CME for its evaluation (e.g. contracts for supplying wind turbines, contract for civil works, payments set in PPAs, contracts with the entity financing the project, among others according to the project characteristics and party involved) or clearly state that the start date has not taken place at the moment of the CPA inclusion by signing a sworn declaration.

8. The project activity must fulfill the methodology ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* version 12.3.0, as listed in section E.2 of the PoA – DD. In addition, the baseline scenario shall comply with the list of plausible alternatives (based on the ACM0002 version 12.3.0), listed in section E.4 of the PoA – DD.

9. The CPA shall be able to demonstrate additionality as listed in section E.5 of the PoA – DD. This sections request the application of the *"Tool fo r the demonstration and assessment of additionality"* version 06*.0.0 and the "Combined tool to identify the baseline scenario and demonstrate additionality" version 4.0.0 in the alternative identification of the* retrofit or replacement projects. In the case of off-shore projects up to 15 MW, the PoA –DD refers to the *"Guidelines on the Demonstration of Additionality of Small-Scale Project activities (Version 09.0)"* and for the demonstration that the CPA up to 15 MW is not part of a larger project the CME will implement a debundling analysis with results set in a formal report.

10. The CPA proponent shall accommodate a local stakeholder consultation process before its inclusion in the PoA, as stated in Section D of the PoA – DD. The CPA proponent shall develop the consultation process following the DNA procedures if existent, or develop general and specific invitations to the stakeholders in the surrounding geographical areas (give at least one week between the invitations and the process, have a list of participants and give a minute of the meeting to describe the comments or agreements).

11. The CPA proponent shall describe the environmental impact analysis as the Environmental Impact Assessment, Environmental Evaluation or Environmental Description, as stated in section C of the PoA – DD. In order to be included in the PoA, the CPA developer shall have the Environmental Impact Assessment (EIA) or the Environmental Impact Declaration (DIA) approved, if applicable.

12. The CPA proponent will sign a formal document stating that funding from Annex I parties, if any, does not result in a diversion of official development assistance.

13. The CPAs can have the most suitable technology for the project implementation, but shall at least have 3 blade turbines complying with IEC 61400 or equivalent/better standards and with a lifetime of at least 20 years. The project will have SCADA system (or equivalent/better system) for data

management. The project developer shall evidence the type of equipment's to be implemented by submitting proposals, technical reports of the project or the acquisition contract if existent.

14. The CPA has to be a voluntary initiative by the CPA operator and not implemented as a result of a mandatory policy or regulation. The CME will review the regulatory framework and the CPA developer will sign a sworn declaration declaring its voluntary implementation and participation in the PoA.

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

(i) The proposed PoA is a voluntary coordinated action

The proposed PoA is a voluntary coordinated action of its Project Participants, namely ÉcoRessources (the CME) and Mabanaft Carbon B.V. With the implementation of the PoA, the project participants intend to facilitate the access to CDM revenues for wind energy developers and build an easier entrance for carbon financing for wind energy projects in the Latin America and the Caribbean region. When providing such a platform for potential CPAs, the CME is taking care of the development of the CDM cycle's related tasks of the project activity and will receive a certain return from the CERs generated from the CPAs.

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

The PoA is a voluntary coordinated action by the CME allowing conditional participation of individual CPAs in the wind energy sector of the Latin America and Caribbean region, in order to take part and be included in the PoA. The CME is developing and coordinating the PoA to enable the surrounding conditions for the CPA developer to take part in the CDM PoA.

Additionality has to be proven on the CPA level for each CPA separately following the CDM baseline and monitoring methodology ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0).

For most CPA cases, additionality will be proven based on the UNFCCC's *"Tool for the demonstration and assessment of additionality"* (version 06.0.0). An investment analysis will be carried out to demonstrate that the proposed CPAs are not the most economically or financially attractive choice of investment and the "Combined tool to identify the baseline scenario and demonstrate additionality" (version 04.0.0), will be used to identify the baseline scenario in case of retrofit or replacement projects.

At the moment of developing the PoA, there is no law or regulation in Nicaragua or Peru that would request the implementation of a wind programme. In both countries are initial regulatory frameworks to develop renewable energy (as previously only hydro power plant existed). The proposed PoA is the first wind PoA in both countries.

(iii) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced

Not applicable since there is no mandatory policy/regulation in connection with this PoA.

(iv) If mandatory a policy/regulation are enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.

Not applicable since there is no mandatory policy/regulation in connection with this PoA.

A.4.4. Operational, management and monitoring plan for the programme of activities:

A.4.4.1. Operational and management plan:

The coordinating/managing entity, ÉcoRessources, will have the following management and arrangement responsibilities related to operations and management:

- Define the roles and responsibilities of personnel involved in the process of inclusion of CPAs. The CME will have a procedure of responsibilities and organization.

- Assess the Potential CPAs before the formal inclusion in the PoA. The CME will have a procedure and an inclusion procedure for technical review of inclusion of CPAs and PoA's document modifications

- Assess the Potential CPAs during operation. The CME will have a procedure of monitoring CPAs development.

- Develop arrangements for training and capacity development for personnel. The CME will have a procedure for training CPA developers and will consider special training for CME staff if required.

- Develop a procedure to avoid double counting and therefore avoid the case of including a new CPA that has already been registered either as a CDM project activity or as a CPA of another PoA.

- Establish operational and management arrangements for the implementation of the PoA, including a record keeping system for each CPA under the PoA, that considers as minimum:
  - Name of the CPA and unique ID number.
  - CPA status.
  - Name of the implementing entity of the CPA.
  - Contact detail of the implementing entity, including contact person, address, telephone and e-mail.
  - Installed capacity and other relevant technical specifications of the CPA.
  - Location of the CPA (coordinates).
  - Verification status and monitoring reports.
  - Recording and storing of all relevant information of the PoA and CPAs in a minimum of two geographically distinct and secure digital locations.

  The CME will develop and implement a procedure of documentary and data control for the CPA process that will lead to records and documentation for each CPA under the PoA.

- Develop measures for continuous improvements of the PoA management system. The CME will have a procedure for this purpose.

- Maintain the existing relationship with the project implementers (e.g. ensure that proper training for data monitoring is being provided to project developers).

- Set a framework for the implementation of the PoA and approve the CDM program activity (CPAs) to be included under the PoA.

- Be the focal point for all communications with the UNFCCC related to the PoA.

- Implement a procedure to avoid double counting, based on the establishment of a formal arrangement or statement with project developers (e.g. to avoid the case of including a new CPA that has been already registered, either as CDM project activity or as a CPA of another PoA).

- Ensure that those operating the CPA are aware and agree that their activity is being subscribed to the PoA.

- Obtain letters of approval for the implementation of the PoA from the Host Party(ies) and the Annex I Party involved in the PoA.

- Submit to the DOE the necessary documents for validation and inclusion of CPAs.

- After having ensured that all the requirements established in the PoA and its specific CDM-CPA-DD are met, send the completed CDM-CPA-DD form to any DOE for consistency checking.

- Collect monitoring data of all CPAs.

- Prepare monitoring reports for emission reduction verification.

- Maintain all monitoring reports of all CPAs in accordance with the record-keeping system identified in the CDM-POA-DD.

- Make available all monitoring reports requested by a DOE for verification purposes.

- Submit a request for forwarding of CERs issued in accordance with the modalities of communication as agreed between project participants.

- Obtain or calculate the grid emission factor to be used by the CPA developers during their crediting period.

The project implementer will have the following management and arrangement responsibilities:

- Implement the wind power plant project activity accordingly to the registered CPA-DD, including the construction timeline and the operation and maintenance standards.

- Compile and record data according to the monitoring plan and provide the required information to the coordinating/managing entity in order to prepare monitoring reports according to the registered CPA-DD.

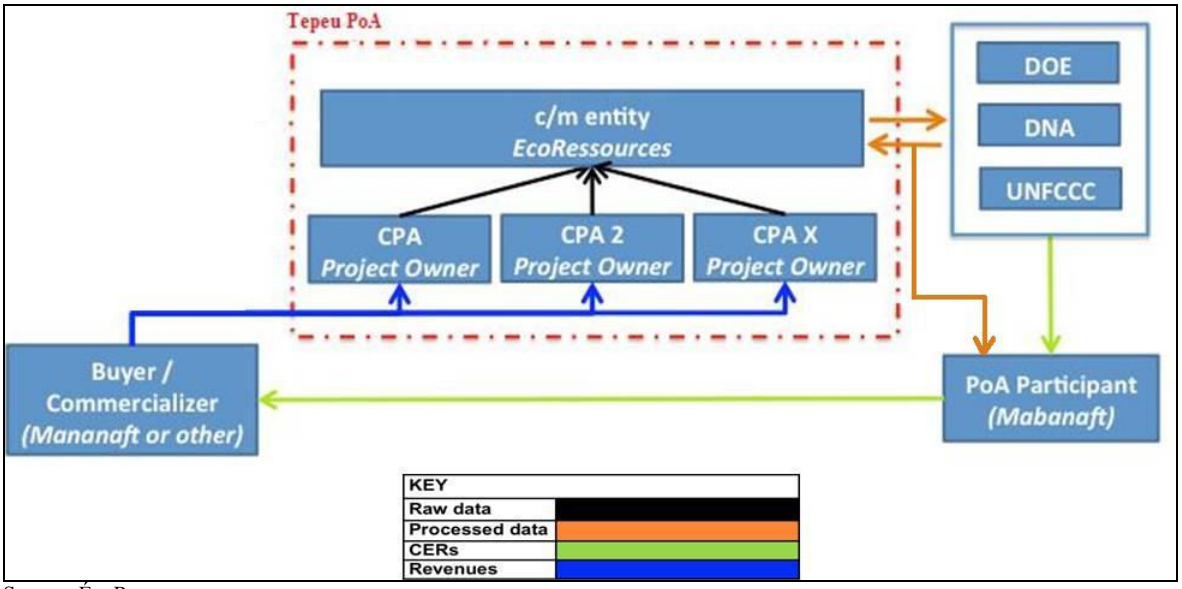
As part of the CME operation there will be also procedures for: the grid emission factor calculation, internal and external communications and origin and replacement of equipment – scrapping.

To consolidate all of its duties as CME, ÉcoRessources has developed a management procedure for the Tepeu PoA where all the specific procedures will be part of a CME Operation Manual, as well as all the templates and related documents.

Both project participants (Mabanaft and ÉcoRessources), have signed a formal agreement where is clearly stated that ÉcoRessources will develop as CME of the proposed PoA. There is also an agreement that each CPA will sign with Mabanaft Carbon B.V where the inclusion conditions are described, including the requirement to work directly with the CME for the project and PoA implementation. As an additional formal documentation, the PPs have developed an Agreement to be signed between the CME, the CPA developer and the other PP (Mabanaft), which is a direct contractual document where the CME and the CPA developer´s responsibilities in the PoA context are detailed.

The key relations between the PPs are summarized as follows:

Figure 2: Data flow and key roles within the actors of the Tepeu PoA



Source: ÉcoRessources

A.4.4.2. Monitoring plan:

Monitoring will be carried out by each CPA. For each CPA, all the parameters included in section E.7.1., will be monitored by the implementing entity of the CPA according to the procedures established

in E.7.2., mainly measuring the net electricity supplied to the grid and ensuring the correct operation and maintenance of the measuring equipment by respecting the calibration frequency as per industry requirements and/or national standards, and will be submitted to the coordinating/managing entity. The coordinating/managing entity will store the data in an electronic database. The CPA will comprise a single project activity, and hence the monitoring data will be monitored directly, recorded in the CPA monitoring record and submitted to the CME.

Verification will occur either separately for each CPA or in groups. In any case data shall be verified per CPA and the verification status of each CPA will be recorded by the coordinating/managing entity in the database. The coordinating/managing entity will be in charge of the preparation of the Monitoring Reports and of the communication with the DOE during the verification activities.

The Monitoring Report will compile all the required monitoring information for all CPAs (sampled and individually verified) that will be verified by the DOE. This report will unambiguously set out the data on emission reductions generated by each specific CPA during the monitoring period consistent with the requirements of this PoA-DD and the corresponding CPA-DD. The use of the PoA monitoring database of CPA information and QA/QC procedures will ensure that no double counting occurs.

The start and end date of each monitoring period together with the CPA monitoring records attributable to that monitoring period will be recorded in the PoA monitoring database. Record keeping procedures undertaken by the CME, will ensure that the CPA monitoring records attributed to a monitoring period can be clearly attributed to an individual CPA, and will furthermore prevent double counting of emission reduction data.

The monitoring plan for parameters included in section E.7.1 will be implemented for each CPA with assistance from the coordinating/managing entity as follows:

- The CPA owner will implement each CPA individually and monitor and record all the parameters included in section E.7.1.
- The coordinating/managing entity will provide guidance to the CPA owner on how the monitoring should be conducted and how the data should be collected with regards to the emission reductions calculation.
- The CPA owners will provide the data on the monitored parameters included in section E.7.1 to the coordinating/managing entity.
- The coordinating/managing entity will document and store, in an electronic database, all the data from the parameters included in section E.7.1 that is provided by CPA owners, while primary data will be stored by the SSC-CPA owner. Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.
- The coordinating/managing entity will review all relevant monitoring documents, prepare the monitoring report, and provide the monitoring report for the DOE.

A.4.5. Public funding of the programme of activities:

Neither the PoA nor the CPAs participating are receiving or will receive public funding that constitutes a diversion of official development assistances. The coordinating/managing entity has not received and will not receive public funding of any type for the purpose of developing and/or implementing this PoA.

SECTION B. Duration of the programme of activities

B.1. Starting date of the programme of activities:

20/12/2012

The starting date of the PoA is the expected date of the PoA registration.

B.2. Length of the programme of activities:

28 years

C.1. Please indicate the level at which environmental analysis, as per requirements of the CDM modalities and procedures, is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

1. Environmental Analysis is done at PoA level	☐
2. Environmental Analysis is done at CPA level	x

The PoA consists of individual wind energy project activities potentially implemented in different geographical regions throughout the boundary of the PoA. Hence it is deemed inappropriate to conduct an environmental impact assessment at the PoA level.

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

All CPAs within the PoA will consist of wind energy facilities. The particularities of each project, depending on the geographical location, capacity and construction among others, will be evaluated according to the host country's applicable regulation. As described in section C.3., no Environmental Impact Assessment –EIA is required for wind power plant facilities in the case of Nicaragua but for every Peruvian wind project over 20 MW, an EIA is required.

The environmental impacts of the project will be detailed in every CPA.

C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA),:

The requirements of each individual CPA will vary significantly depending on the host country regulations. The CME entity will be responsible for evaluating if a CPA wishing to be included in the propose programme complies with local regulations related to environmental impact assessment.

Nicaragua:
For the particular case of Nicaragua and in accordance with Article 18, point 19, from Nicaragua's Environmental Evaluation System, wind power plants do not need the preparation of an Environmental Impact Assessment (MARENA Environmental Evaluation System Decree No. 76-

2006)[13] but have to develop an "Environmental Evaluation" ("Environmental Valuation" is a simplified type of EIA for projects with moderate impacts). If this regulation is modified, the CPAs will have to comply with the existing regulation.

Peru:
In the case of Peru, according to the updated Energy Concession Law 25844[14], generation with renewable sources up to 20MW does not require the presentation of an Environmental Impact Assessment –EIA (Article 38 º). Then, every CPA over 20 MW will have to present and summarize its approved EIA in the CPA-DD, and every CPA under 20 MW will only describe its internal environmental evaluation results. If this regulation is modified, the CPAs will have to comply with the existing regulation.

Every CPA will describe the applicable regulation and its environmental evaluation results in the CPA – DD and will have the approval of the EIA or DIA, if applicable to the project case.

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

1. Local stakeholder consultation is done at PoA level	☐
2. Local stakeholder consultation is done at CPA level	x

The impact on the surrounding communities of the wind power plants depends entirely on the particular location, size, and how the plant is embedded in its environment. Therefore, the CPA level is the adequate choice for inviting stakeholder comments.

This PoA encourages a positive relationship between the project developer and its community based on transparent and permanent communications that in some cases will lead to special agreements between them. In these cases, all agreements shall be detailed in the CPA –DD.

The local stakeholder consultation process shall be done before its inclusion in the PoA. The CPA proponent shall develop general and specific invitation to the stakeholders in the surrounding geographical areas (give at least one week between the invitations and the process, have a list of participants and give a minute of the meeting to describe the comments or agreements).

If the local DNA develops specific local stakeholder consultation procedures applicable for CPAs in its country, any additional requirement, compared to the ones described in the previous paragraph, shall be applied by the future CPAs developers in order to be included in the present PoA.

[13] See: http://www.ine.gob.ni/DCA/leyes/decreto/Decreto_76-2006_SistemaEvaluacionAmbiental.pdf - Web link last accessed on 20/12/2011.

[14] Web link: http://www.minem.gob.pe/minem/archivos/file/Electricidad/normatividad/dl25844.pdf (Law 25844 updated with the current modifications). Downloaded on July 2011.

The project participants developed a general stakeholder consultation process on January 26th, 2012[15] in Managua, Nicaragua to assess the comments of different stakeholders within the country (from governmental or private institutions to individuals), since CPAs could be developed in any part of the country.

D.2. Brief description on how comments by local stakeholders have been invited and compiled:

Considering that the first general stakeholder consultation was developed to inform the energy sector of Nicaragua as part of the LoA process, 24 direct invitations letters were sent via e-mail. In addition and in coordination with the DNA (MARENA), a newspaper invitation was published on January 19th, 2012 in "El Nuevo Diario". During the consultation process, the PP made an explanation of the concepts of the programme of activities, the Tepeu PoA and the benefits and conditions for wind project activities.

D.3. Summary of the comments received:

During the workshop, were 20 stakeholders assisted, the following questions were made:

- Conditions to participate in the Tepeu PoA.
- Description on how the grid emission factor is calculated.
- Explanation of the European Union deadline for project registration.

D.4. Report on how due account was taken of any comments received:

All the questions were answered during the workshop according to the PoA eligibility criteria, *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1) and market information. As no additional information was required, no further actions were implemented.

SECTION E. Application of a baseline and monitoring methodology

This section shall demonstrate the application of the baseline and monitoring methodology to a typical CPA. The information defines the PoA-specific elements that shall be included in preparing the PoA-specific form used to define and include a CPA in this PoA (PoA-specific CDM-CPA-DD).

E.1. Title and reference of the approved baseline and monitoring methodology applied to each CPA included in the PoA:

The approved consolidated baseline and monitoring methodology ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0) is applied to each CPA included in the PoA.

Applied methodology:

- ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*. The latest version at the time for drafting this document is version 12.3.0, which has been used as the reference source for this document.

[15] This process was held January 26, 2012.

Related tools:

- *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1).
- *"Tool for the demonstration and assessment of additionality"* (version 06.0.0).
- *"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (version 2).*

*E.2. Ju*stification of the choice of the methodology and why it is applicable to each CPA:

The CPAs included in the PoA are grid-connected wind power plants and therefore, as version 12.3.0 of ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources",* is applicable to grid-connected renewable power generation project activities that could be (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s); the proposed CPAs will comply with the methodology requirements.

More details of the comparison of the project's characteristics and the applicability criteria as specified in ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0) are given in the following table.

Table 1: Comparison of CPAs characteristics and eligibility criteria of ACM0002 (version 12.3.0)

Applicability conditions of ACM0002 (version 12.3.0)	Methodology ACM0002 (version 12.3.0) is applicable to a CPA under the proposed PoA because:
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.	CPAs will be grid-connected wind power plants (new, capacity additions, retrofits or replacements).
In the case of capacity additions, retrofits or replacements (except for capacity addition projects for which the electricity generation of the existing power plant(s) or unit(s) is not affected: the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity addition or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	CPAs of capacity additions, retrofits or replacements (except for capacity addition for which the electricity generation of the existing power plant(s) or unit(s) is not affected) will have a minimum of 5 years of historical operational data and no capacity addition or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity. These facts will be verified with official reports of the electricity institutions (e.g. annual statistics and/reports)

In case of hydro power plants: • At least one of the following conditions must apply: o The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or o The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of the reservoirs is increased and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2 after the implementation of the project activity; or o The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the Project Emissions section, is greater than 4 W/m^2 after the implementation of the project activity.	This condition does not apply since the CPA will consist of a grid-connected wind power generation project.
In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m^2 after the implementation of the project activity, all of the following conditions must apply: • The power density calculated for the entire project activity using equation 5 is greater than 4 W/m^2; • All reservoirs and hydro power plants are located at the same river and where they are designed together to function as an integrated project that collectively constitutes the generation capacity of the combined power plant; • The water flow between the multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity; • The total installed capacity of the power units, which are driven using water from the reservoirs with a power density lower than 4 W/m^2, is lower than 15MW; • The total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than	This condition does not apply since the CPA is a wind power plant.

4 W/m^2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.	
The methodology is not applicable to the following: • 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 of an existing single reservoir where the power density of the reservoir is less than 4 W/m^2.	The CPAs will not use fossil fuels or biomass during its operations.
In the case of retrofits, replacements, or capacity additions, the methodology is only applicable if the most plausible baseline scenario is P2: "The continuation of the current situation, i.e. to use all power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance."	The CPAs will be grid-connected wind power plants where, according to the PoA DD, in case of retrofits, replacements, or capacity additions, the most plausible baseline scenario shall be P2 as per the methodology.

This comparison shows clearly that ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0) is applicable to the proposed PoA and all CPAs to be included.

The PoA, applying the procedures of ACM0002 (current version 12.3.0), is described considering the latest version of the following related tools:

- Version 02.2.1 of the *"Tool to calculate the emission factor for an electricity system"*. The tool is applied since the CPAs will calculate the baseline emissions as a project activity that substitutes grid electricity and are not total or partially located in an Annex I country. There is enough information to set the project electricity system and apply all the possible formulas set in the tool for Peru and Nicaragua (through the COES and INE institutions respectively). The tool is applied for the grid emission factor calculation in every host country of the PoA.
- Version 06.0.0 of the *"Tool for the demonstration and assessment of additionality"*. This tool is applied to demonstrate additionality in the case of new, capacity addition, retrofit and replacement projects as per the requirement of the methodology. The project will be applied using information of the entire country in the implementation of the tool. According to the tool, since CPAs use ACM0002 as methodology, they only need to identify that there is at least one credible and feasible alternative that would be more attractive than the proposed project activity, as stated in section E.5.
- Version 4.0.0 of the *"Combined tool to identify the baseline scenario and demonstrate additionality"*. This tool is applied to determine the baseline scenario for retrofit or

replacement projects following the specific guidelines of the ACM0002 version 12.3.0. The tool applies since any alternative to any for retrofit or replacement CPA under this PoA cannot be implemented in parallel to the proposed project activity.

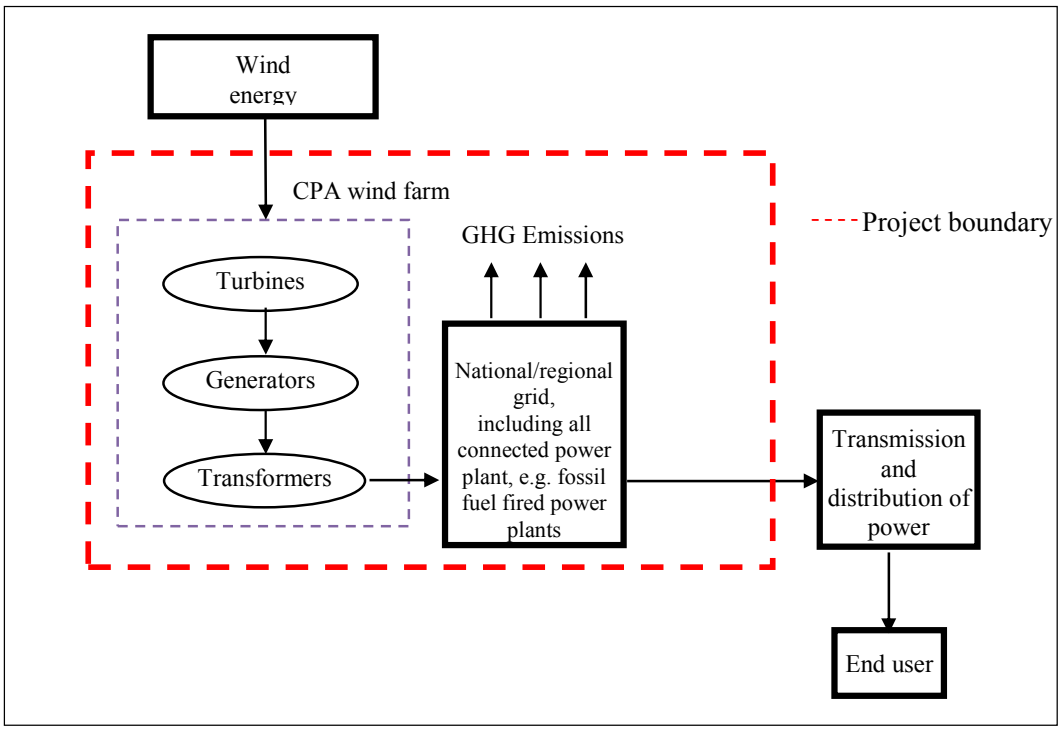
- Version 2 of the *"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"*. This tool is expected to not be applied in any CPA-DD since wind power plants do not use fossil fuels in its operation. In any potential case, the tool will be applied since CO_2 emissions from fossil fuel combustion in the generation process would be calculated based on the quantity of fuel combusted and its properties.

E.3. Description of the sources and gases included in the CPA boundary

According to ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0), the spatial extent of the project boundary includes the project activity and all power plants connected physically to the national/regional grid to which the proposed projects (CPAs) are also connected. Since the project is connected to the national grid, this will be included in the project boundary.

The flow diagram of a typical CPA boundary is shown in the following figure:

Figure 3: Flow diagram of a typical CPA boundary



Source: ÉcoRessources

The GHGs and emission sources included in the project boundary are shown in the following table.

Table 2: Sources and gases included in or excluded from the project boundary

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_2O	No	Minor emission source
Project activity	Wind energy projects under the PoA	CO_2	No	Minor emission source. As a zero emission grid connected wind power project, no emissions will result.
		CH_4	No	As a zero emission grid connected wind power project, no emissions will result.
		N_2O	No	As a zero emission grid connected wind power project, no emissions will result.

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

According to the applicable methodology ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0), the following baseline scenarios or conditions shall be applied by the CPAs:

- **New wind power plants**
  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"*.

- **Capacity addition power plants**
  For capacity addition to existing grid-connected renewable power plants or units, the baseline scenario is the following:
  - In the absence of the CDM project activity, the existing facility would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted ($DATE_{BaselineRetrofit}$). From that point of time onwards, the

baseline scenario is assumed to correspond to the project activity and no emission reductions are assumed to occur.

- **Retrofit or replacement power plants**
  The following step-wise procedure shall be applied by the CPA in order to identify the baseline scenario:

  Step 1: Identify realistic and credible alternative baseline scenarios for power generation
  Apply Step 1 of the *"Combined tool to identify the baseline scenario and demonstrate additionality"*. The options considered should include:
  P1: The project activity not implemented as a CDM project;
  P2: The continuation of the current situation, i.e. to use all power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance. The additional power generated under the project would be generated in existing and new grid-connected power plants in the electricity system; and
  P3: All other plausible and credible alternatives to the project activity that provide an increase in the power generated at the site, which are technically feasible to implement. This includes *inter alia*, different levels of replacement and/or retrofit at the power plant/unit(s). Only alternatives available to project participants should be taken into account.

  Step 2: Barrier analysis

  The CPA shall apply Step 2 of the *"Combined tool to identify the baseline scenario and demonstrate additionality"*.

  Step 3: Investment analysis

  If this option is used, the CPA shall apply the following conditions as stated in the ACM0002:

  - Apply an investment comparison analysis, as per Step 3 of the *"Combined tool to identify the baseline scenario and demonstrate additionality",* if more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P3. Since all the CPAs will have to develop an investment analysis, all the projects will fulfill this condition.
  - Apply a benchmark analysis, as per Step 2b of the *"Tool for the demonstration and assessment of additionality"*, if more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P2. Since all the CPAs will apply a benchmark analysis, all the projects will fulfill this condition.

  Only if the CPA can define option P2 as the baseline scenario, the CPA-DD can be submitted to a DOE for validation to be included in the present PoA.

E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the CPA, being included as registered PoA (assessment and demonstration of additionality of CPA):

E.5.1. Assessment and demonstration of additionality for a typical CPA:

Additionality for shall be demonstrated by establishing that in the absence of CDM, none of the implemented CDM Project Activities (CPAs) would occur. The actual proof of additionality shall follow the methodology ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0) and the related tools. The additionality analysis will be done on CPA level.

According to ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0), the additionality of each CPA shall be demonstrated and assessed using the latest version of the *"Tool for the demonstration and assessment of additionality"* (version 06.0.0) for all project types. For retrofit or replacement projects the selection of the baseline scenario shall be identified with the help of the *"Combined tool to identify the baseline scenario and demonstrate additionality"* (version 04.0.0), as described in A.4.3 and E.5.2.

The CPA is additional if all the steps in the *"Tool for the demonstration and assessment of additionality"* are fulfilled with exception of Step 3 (Barrier Analysis), which is not used in the proposed PoA-DD.

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

According to methodology ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0), in cases where the project activity is the installation of a new grid-connected renewable power plant/unit or a capacity addition, the baseline scenario is defined by the methodology (no alternatives have to be listed and assessed) and then only in the case of retrofits or replacement projects credible alternatives shall be listed using *"Combined tool to identify the baseline scenario and demonstrate additionality"* (version 4.0.0,) as listed in section E.4.

Step 2: Investment analysis

According to the "*Guidelines on the assessment of investment analysis*", if the alternative to the project activity is the supply of electricity from a grid, a benchmark approach is considered appropriate. Therefore, the investment analysis will be developed applying a benchmark determined for each country conforming the PoA, and the financial indicator that will be used is the project internal rate of return (IRR).

The sensitivity analysis will be performed according to the current version of the "*Guidance on the assessment of investment analysis*", where is stated that variables that constitute more than 20% of either total project costs or total project revenues, should be subjected to this analysis.

Off-shore projects up to 15 MW, according to the *"Guidelines on the Demonstration of Additionality of Small-Scale Project activities (Version 09.0)"* are part of a list of grid-connected renewable electricity generation technologies that are automatically defined as additional. Paragraph 2 of the guideline states the following:

2. The positive list of grid-connected renewable electricity generation technologies that are automatically defined as additional, without further documentation of barriers, consists of the following grid-connected renewable electricity generation technologies of installed capacity up to 15 MW:
(a) Solar technologies (photovoltaic and solar thermal electricity generation);
(b) Off-shore wind technologies;
(c) Marine technologies (wave, tidal).

In the case of off-shore CPAs up to 15 MW the CME will confirm that the CPA is not part of a larger project by implementing a debundling analysis as per the "*Guidelines on assessment of debundling for SSC project activities*" version 03. The results of this analysis will be set in a formal report developed by the CME.

Therefore in order to comply with the methodology conditions and *"Guidelines on the Demonstration of Additionality of Small-Scale Project activities (Version 09.0"*, for off-shore projects the CPA evaluation will still be done using the *"Tool for the demonstration and assessment of additionality"* but step 2 will be dismissed in the additionality assessment. This type of projects shall detail its off-shore condition in the CPA-DD.

Step 3: Barrier Analysis

For the PoA, only Step 2 (investment analysis) of the "*Tool for the demonstration and assessment of additionality*" has to be undertaken for most of the CPAs.

In case of off-shore projects up to 15 MW the *"Guidelines on the Demonstration of Additionality of Small-Scale Project activities (Version 09.0"* shall be mentioned in the CPA-DD in order to demonstrate additionality. The CPA will describe the evidences supporting the project conditions in order to be qualified as an off-shore project with a capacity up to 15 MW (e.g. feasibility studies, turbine and execution proposal, licenses, environmental studies, among others according to the regulatory framework of the country or the technical evaluation of the project).

Step 4. Common Practice Analysis

The common practice analysis applies the guidance set in paragraph 47 of the "Tool for the demonstration and assessment of additionality".

E.5.2. Key criteria and data for assessing additionality of a CPA:

The key criteria and data for assessing additionally of a CPA are based in the latest version of the *"Tool for the demonstration and assessment of additionality"* (version 06.0.0) and the description given in section E.5.1. The tool includes the following steps:

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

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

- New grid-connected renewable power plant/unit or a capacity addition: baseline scenario is defined by the methodology.
- Retrofits or replacement projects: alternatives shall be listed using *"Combined tool to identify the baseline scenario and demonstrate additionality"* (version 04.0.0).

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

The regulatory framework that is currently relevant for renewable energy projects in Nicaragua involves the following:

- Law No. 217, *"Ley General del Medio Ambiente y los Recursos Naturales"* (General Law for the Environment and Natural Resources).
- Law No. 272, *"Ley de la Industria Eléctrica"* (Law of the Electrical Industry).[16]
- Decree No. 42-98, *"Reglamento a la Ley de la Industria Eléctrica"* (Regulatory Decree for the Law of the Electrical Industry).[17]
- Law No. 532, *"Ley para la Promoción de Generación Eléctrica con Fuentes Renovables"* (Law for the Promotion of Power Generation with Renewable Sources).[18]
- Decree 76-2006, *"Sistema de Evaluación Ambiental"* (Environmental Evaluation System).[19]

The regulatory framework that is currently relevant for renewable energy projects in Peru is related to the Electric Concessions Law.[20]

The baseline scenario, electricity delivered to the grid that would have otherwise been generated by the operation of grid-connected power plants, is in compliance with all existing applicable legal and regulatory requirements in both countries.

The continuation of the current situation (no project activity or other alternatives undertaken), would also be in compliance with all existing applicable legal and regulatory requirements.

In the case of retrofit or replacement projects, all the other plausible and credible alternatives to the project activity that provide an increase in the power generated at the site (P3), if existent, will be assessed case by case and the results described in the respective CPA-DD.

Step 2: Investment analysis

The following steps shall be applied to all the CPAs except the ones that are off-shore up to 15 MW.

[16] See: http://legislacion.asamblea.gob.ni/Normaweb.nsf/%28$All%29/4DC8E799B8201A02062570A1005777C0?OpenDocument - Web link last accessed on 20/12/2012.

[17] See: http://www.disnorte-dissur.com.ni/Documents/Reglamento_de_la_Ley_de_la_Industria_Electrica.pdf - Web link last accessed on 20/12/2012.

[18] See: http://legislacion.asamblea.gob.ni/normaweb.nsf/d0c69e2c91d9955906256a400077164a/525593f05f79d1bd062570a100584921?OpenDocument - Web link last accessed on 20/12/2012.

[19] See: http://www.caminic.org.ni/htm/web/indice_leyes.htm - Web link last accessed on 20/12/2012.

[20] http://www2.osinerg.gob.pe/MarcoLegal/pdf/LEYCE-DL25844.pdf - Web link last accessed on 20/12/2011.

Sub-step 2a: Determine appropriate analysis method

In order to demonstrate that the project is not economically attractive, a benchmark analysis will be undertaken. As stated in the "*Guidelines on the assessment of investment analysis*": *"if the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used. If the alternative to the project activity is the supply of electricity from a grid, it is not to be considered an investment and a benchmark approach is considered appropriate"*.[21]

For the PoA project activities, the project participant is not forced to make an investment in the same or similar products or services. The guidance further states that "*the benchmark approach is therefore suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest*".[22] As this is clearly the case for a private facility in general, and for the CPAs under the proposed PoA, this justifies the choice of Option III: Benchmark analysis.

A benchmark analysis shall also be applied for retrofits and replacement projects as stated in section E.4.

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

The Internal Rate of Return (IRR) is one of the most widely accepted financial indicators for project evaluation; therefore, an IRR will be calculated for every benchmark.

Nicaragua

As indicated in the "*Tool for the demonstration and assessment of additionality"* (version 06.0.0), the benchmark will be derived from government bond rates increased by a suitable risk premium in order to reflect project characteristics, substantiated by an independent (financial) expert, or by publicly available financial data. The benchmark shall be recalculated for every CPA if the parameters used are updated. The benchmark will be determined in accordance with the CPA starting date.

The risk premium is obtained using (i) Damodaran's[23] calculation of country default spreads and risk premiums, which gives a total risk premium for Nicaragua of 15% (which includes country risk and equity risk) in January 2012,[24] and (ii) a Nicaraguan electric sector risk.[25]

[21] See: http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf (page 5) – Web link last accessed on 20/12/2012.

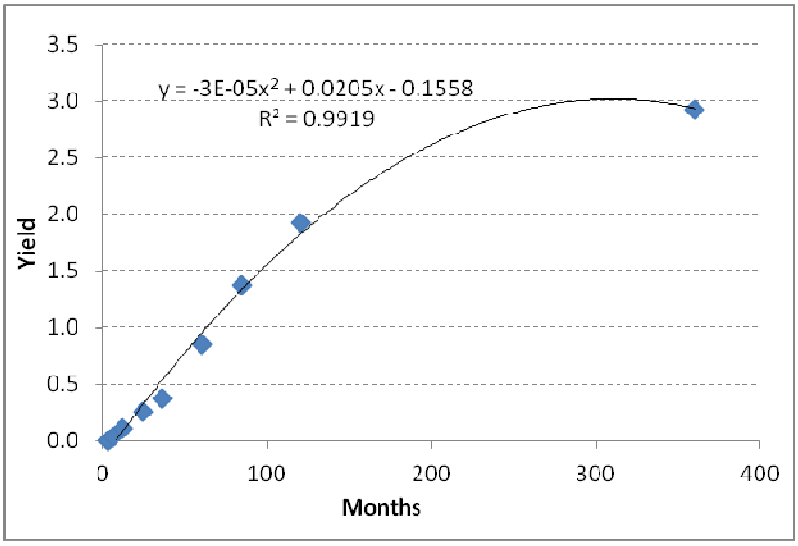
[22] See: http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf (page 5) – Web link last accessed on 20/12/2012.

[23] Aswath Damodaran is a Professor of Finance at the Stern School of Business at New York University (Kerschner Family Chair in Finance Education), where he teaches corporate finance and equity valuation. He is best known as the author of several widely used academic and practitioner texts on Valuation, Corporate Finance, and Investment Management. He is widely quoted on the subject of valuation.

[24] Obtained from Damodaran's public Country Default Spreads and Risk Premiums updated in January 2012 (the figures are updated regularly). See: http://people.stern.nyu.edu/adamodar/pdfiles/eqnotes/packet1pg2.pdf – Web link last accessed on 20/12/2012.

To calculate the government bond rate, the yields of the US Treasuries (US Government bonds) will be used. However, as a wind project lifetime is of 20 years and there is no point for this maturity in the US Treasury curve, a regression analysis is undertaken in order to obtain the type of regression with the best fit, and out of this, a polynomial regression is applied in order to obtain the 20 year point yield.

Figure 4: US Treasuries Yield Curve (Polynomial Regression)



Source: Bloomberg

From the figure above, a 20-year maturity yield would result in:

$y = -0.00003x^2 + 0.0205x - 0.1558$
$y = 3.0362\%$

Therefore, the nominal benchmark[26] would be:

$IRR_{BENCHMARK}$ = Risk-Free Government Bond Rate + Suitable Risk Premium
$IRR_{BENCHMARK}$ = Risk-Free Government Bond Rate + (Nicaragua Total Risk Premium + Nicaragua Electricity Sector Premium)
$IRR_{BENCHMARK}$ = 3.0362% + 15.00% + 3%
$IRR_{BENCHMARK}$ = 21.0362%[27]

[25] Project ARECA (2010). "Renewable Energy Market Analysis for Nicaragua", undertaken for the Central American Bank for Economic Integration (BCIE), the United Nations Development Program (PNUD/UNDP) and the Global Environmental Facility (FMAM/GEF), p.35.

[26] The calculated benchmark is applicable for the first Nicaraguan CPA submitted for PoA Registration.

Peru

The financial indicator that will be used in the CPAs is the internal rate of return (IRR). The Project IRR is compared to an established benchmark, which is a discount rate of 12% that has been selected as a benchmark to evaluate the economic viability of an investment in the electricity sector in Peru[28]. This 12% discount rate is established by the government in the Electric Concessions Law as the reference rate to evaluate investments in the power sector in a real and ex-post basis. This rate has also emerged in several studies as well as in official governmental decisions related to project investment evaluation.[29] The Electric Concessions Law benchmark shall be applied to all Peruvian CPAs, therefore, if the discount rate is modified in the future, the CPA shall apply the value in force.

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

The analysis of each project activity's financial indicator (IRR) will be undertaken at each CPA level.

As per the "*Tool for the demonstration and assessment of additionality*", all relevant costs and revenues will be included. A clear comparison of the financial indicator for each proposed CDM activity and the financial benchmark calculated previously will be shown. If a CDM project activity has a less favorable indicator than the benchmark, then the CDM project activity would not be considered financially attractive.

Project IRR calculation

Project IRR calculations will be based on a list of economic parameters provided by the CPA owner that were available at the investment decision. This list of parameters includes:

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[27] The resulting benchmark is coherent with the statement of the "Renewable Energy Market Analysis for Nicaragua" undertaken by the Project ARECA for the Central American Bank for Economic Integration (BCIE), the United Nations Development Program (PNUD/UNDP) and the Global Environmental Facility (FMAM/GEF) in 2010. Page 12 of the document mentions that the rate of return estimated for investments in the electrical sector in Nicaragua are around the value of 23.5%, among the highest in Central America, due to the high risk perception of the country.

[28] CDM registered projects have used this benchmark i.e. Rehabilitation of the Callahuanca hydroelectric power station (registration Nº:1245), Carhuaquero IV hydroelectric power plant (registration Nº:1424), La Virgen hydroelectric plant (registration Nº:1445), Poechos II hydroelectric plant project (registration Nº:1836), La Joya hydroelectric plant (registration Nº:1889), El Platanal (registration Nº:2426), Santa Cruz I Hydroelectric Power Plant (registration Nº: 2405), Huanza Hydroelectric Project (registration Nº: 4306), Yanapampa Hydroelectric Power Plant (registration Nº: 3545) and Santa Cruz II Hydroelectric Power Plant (registration Nº: 3337).

[29] Law 25844 – Electric Concessions Law. Article 79, Page 40. A specific discount rate for the electric sector has been determined by the Ministry of Energy and Mines within the Peruvian Electric Concession Law, and is used principally by the electric sector regulator assessing the opportunity cost of investment for the new additions to the system in order to forecast and determine the regulated tariff in Peru. This discount rate is 12% and represents an official rate of discount for the Peruvian electric sector, and has been widely used for investment evaluations by both the private and the public sectors. It is considered to be a conservative discount rate since public investment is driven by social interests and often has access to attractive loan terms. In this analysis, the discount rate is used as a benchmark for the minimum rate of return expected by investors and borrowers in Peru. A copy of the concession law will be provided to the DOE.
http://www2.osinerg.gob.pe/MarcoLegal/pdf/LEYCE-DL25844.pdf - Web link last accessed on 10/10/2011.

Table 3. Parameters for calculation of project IRR

Parameter	Unit	Source
Technical Parameters		
Technical lifetime	Year	e.g. As per manufacturer specification, formal studies or reports, or as per expert's opinion.
Construction start date	Year	e.g. Project developer estimations or PPAs
Date project starts operating	Year	e.g. Project developer estimations or PPAs
Annual electricity generation	MWh	As per guidelines for the reporting and validation of plant load factors (version 1)
Financial Parameters		
Electricity tariff	US / kWh	e.g. As per PPA if signed at date of investment/ as per tariff published by the national authority/ external tariff estimation/internal estimations (with formal evidence).
Power tariff	US / kW	e.g. As per PPA if signed at date of investment/ as per tariff published by the national authority/ external tariff estimation/internal estimations (with evidence).
Exchange rate	US / local currency	If some costs/revenues are provided in local currency, the exchange rate as per date of investment decision shall be used to convert them into US.
Incomes		
Electricity	USD / year	Based on tariff and generation data.
Power	USD / year	Based on tariff and generation data.
Other Revenues	USD / year	To be included in the calculation only if applicable to the CPA. Formal evidences shall be provided.
Costs and Investment		
Total investment	USD	If the construction is expected to last several years, a yearly breakdown of investments can be provided. Data based on quotations or formal contracts if applicable.
Implementation technical studies	USD	Based on contracts or other formal evidence or reference.
Operation & Maintenance costs for the power plant and transmission line (including turbine periodic overhauls)	USD / year	Based on external or internal estimations and compared to similar project information (if needed). If not specified otherwise, O&M can be indexed using the consumer price index.
Payments to local authorities	USD / year	Formal regulations shall be submitted as evidence.
Insurance	USD / year	Based on formal proposals or internal estimations and compared to similar Project information (if applicable and needed).
Salaries	USD / year	Based on internal estimations.
Contingencies (investment	USD / year	Based on internal estimations and compared to

Parameter	Unit	Source
and operation)		similar Project information (if applicable and needed).
Land cost/rent	USD / year	Based on contracts or other formal evidence.
Legal expenses	USD / year	Based on internal estimations and compared to similar Project information (if applicable and needed).
Depreciation	USD/year	Based on the national regulation for construction and equipment.
Other operating expenditures	USD / year	To be included in the calculation only if applicable to the CPA with proper evidence.
Residual value	USD / year	To be included in the calculation only if applicable to the CPA.
Benchmark		
Benchmark and return rate	%	As determined in the PoA –DD for the party involved.

The parameter listed in the table above will be supported by valid evidence available for validation purposes. The list of parameter shall be adapted to the reality of the CPA (country and regulatory framework) if required.

If there is a substantial gap (> 1 year) between the date of the investment decision and the date at which the corresponding document was compiled, the respective item will necessarily be inflated accordingly using the corresponding price index of the host country or the consumer price index of the host country as inflator.

A standardized Excel worksheet has been developed into which data received from the CPA owner will be entered and which will in turn compute the project IRR cash flow. The same Excel worksheet will be used for all CPAs to be included in the proposed PoA and any changes will be explained in the respective SSC-CPA-DD or to the DOE if necessary.

Sub-step 2d: Sensitivity analysis

The inclusion of a sensitivity analysis shows whether the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions. The investment analysis provides a valid argument in favor of additionality only if it consistently supports (for a realistic range of assumptions) the conclusion that the project activity is unlikely to be financially/economically attractive (as per Step 2c).

The objective of the sensitivity analysis is to quantify the impact of reasonable variations of critical variables in the financial indicator (IRR) of the proposed project activity. According to the current version of the "*Guidance on the assessment of investment analysis*", variables that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation.

Typically, these would be the main variables considered in the sensitivity analysis:

1. Total investment cost of the CPA.
2. Income from energy prices or other related variables linked to main income (e.g. capacity and energy sales, feed-in-tariffs, sales of renewable energy certificates (RECs)).
3. Power generation output.

The financial analysis shall be performed by modifying each of the parameters by at least up to ±10%, and assessing the impact on the financial indicator (without revenues from selling CERs), or by establishing if the necessary variation that the parameter would have to undertake to reach the benchmark, exceeds the ±10% limit.

Only if the financial analysis results in a project activity with a less favorable indicator than the benchmark, and then not considered financially attractive, the CPA can finish the additionally analysis by implementing the common practice analysis.

Step 3: Barrier Analysis

The CPA shall identity if this section applies to the project. Only off-shore projects up to 15 MW shall use this section listing the appropriate evidences to support its fulfillment of the *"Guidelines on the Demonstration of Additionality of Small-Scale Project activities (Version 09.0"* conditions detailed in section E.5.1.

Step 4. Common Practice Analysis

The financial analysis shall be complemented with an analysis of the extent to which the proposed project type (technology) has already diffused in the relevant sector and region. This test will be made using official information in the energy sector of Nicaragua or Peru for all the operating wind power plants.

The following steps, as listed in the tool, shall be applied for every CPA:

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

The decision to use design output or capacity shall be clearly stated in every CPA –DD, as well as the resulting range.

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 that have started commercial operation before the start date of the project. Note their number N_{all}.

The applicable geographical area for CPAs in Nicaragua is the one covered by the NIS and considers only the projects that have started commercial operation before the start date of the project and are

connected to the grid. Information of energy generation, installed capacity or the date of commercial operation start shall be given by the Nicaraguan Energy Institution (INE).[30]

The applicable geographical area for CPAs in Peru is the one covered by the SEIN and considers only the projects that have started commercial operation before the start date of the project and are connected to the grid. Information of energy generation, installed capacity or the date of commercial operation start shall be given by the Committee for the System's Economic Operation (COES).[31]

Registered CDM project activities and projects activities undergoing validation shall not be included in the evaluation.

The start date of the CPA shall be one set in section A.4.2.1 if the respective CPA-DD.

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}.

For all CPAs under this PoA, plants using technologies different that the applied in the proposed project are: all thermal power plants (Diesel, Fuel Oil, Natural Gas, Petcoke, among others if applicable) and any other renewable energy power plant not using wind resources (solar, biomass, tidal, wave, geothermal, among others if applicable).

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.

Each CPA shall detail the estimations of the following two formulas:

a) $F = 1 - N_{diff} / N_{all}$

b) $N_{all}-N_{diff}$

If a) > 0.2 and b) is > than 3 the CPA is a common practice and then is not additional (the CPA shall not be included in the PoA). In any other case, the CPA is not the common practice in the country and then can be included in the PoA.

[30] Website: www.ine.gob.ni. If necessary, data can also be obtained in the National Dispatch Center (Centro Nacional de Despacho de Carga – CNDC, www.cndc.org.ni/).

31 Website: www.coes.org.pe. If necessary, data can also be obtained in the National Dispatch Center (Centro Nacional de Despacho de Carga – CNDC, www.cndc.org.ni/).

E.6. Estimation of Emission reductions of a CPA:

E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical CPA:

Each CPA under the PoA will use ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0). All applicable sections to wind power plants will be used by the CPAs, and then no formula or consideration made only for geothermal, hydro or solar power plant is considered.

The methodology is applicable for CPAs that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).

The CPAs will have no projects emissions since they do not consider using fossil fuels in the operation of the plants. Taking this into consideration the *"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"* will not be applied by CPAs.

Baseline emissions are based on the annual electricity generation of the project multiplied by the result of the application of the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1) in the respective country system. Different considerations in the electricity generation used in the formula, are set for type (a), (b), (c) and (d) CPAs. For type (b) projects, Option 2 of the ones listed in the methodology ACM0002 is chosen to determine the electricity generation of the projects, since the electricity fed into the grid by the added power plant(s) or unit(s) can be separately metered in wind projects.

No leakage emissions are considered for the CPAs, according to the ACM0002 version 12.3.0.

All specific formulas and parameters to be used by the CPAs in the emission reduction calculation are listed in section E.6.2.

E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a CPA:

The typical CPA is a wind power generation project connected to a national or/sub-national grid. The reduced emissions are calculated in accordance with the approved consolidated baseline methodology ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0) along with the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1).

The PoA will apply the options listed in the methodology for new projects and for capacity additions, rehabilitations and retrofitting cases. The formulas and considerations are listed below.

I. PROJECT EMISSIONS (PE_y)

For most renewable power generation project activities, including wind power, $PE_y = 0$ since the projects do not use fossil fuels, do not release non condensable gases, and do not release emissions from water reservoirs.

$PE_y = 0$

II. BASELINE EMISSIONS (BE_y)

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. 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	:	Baseline emissions in year *y* (tCO_2).
$EG_{PJ,y}$	:	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) .
$EF_{grid,CM,y}$	:	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"* (tCO_2/MWh).

A. DETERMINATION OF $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for (a) greenfield plants, (b) retrofits and replacements, and (c) capacity additions. The considerations to be taken into account by the CPAs are described next:

A.1. Greenfield renewable energy power plants

If the project activity is 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, then:

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

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

A.2. Retrofit or replacement of an existing renewable energy power plant

If the project activity is the retrofit or replacement of an existing grid-connected renewable power plant, the baseline scenario is the continuation of the operation of the existing plant.[32] The historical electricity generation data is needed to determine the electricity generation by the existing plant in the baseline scenario, assuming that the historical situation observed prior to the implementation of the project activity would continue addressing uncertainties by adjusting the historical electricity generation by its standard deviation.

$EG_{PJ,y} = EG_{facility} - (EG_{historical} + \sigma_{historical})$; until $DATE_{BaselineRetrofit}$

and

$EG_{PJ,y} = 0$; on/after $DATE_{BaselineRetrofit}$

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).
$EG_{facility,y}$	:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y* (MWh).
$EG_{historical}$	:	Annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the project site, prior to the implementation of the project activity (MWh).
$\sigma_{historical}$	:	Standard deviation of the annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the project site, prior to the implementation of the project activity (MWh).
$DATE_{BaselineRetrofit}$	:	Point in time when the existing equipment would need to be replaced in the absence of the project activity (date).

Calculation of $EG_{historical}$

To determine $EG_{historical}$, project participants may choose between two historical periods: (i) using a longer time period that may result in a lower standard deviation, or (ii) the use of the shorter period that may allow a better reflection of the (technical) circumstances observed during the more recent years.

Then, the project participants may choose among the following two time spans of historical data to determine $EG_{historical}$:

(a) The five last calendar years prior to the implementation of the project activity; or
(b) The time period from the calendar year following $DATE_{hist}$, up to the last calendar year prior to the implementation of the project, as long as this time span includes at least five calendar years, where $DATE_{hist}$ is latest point in time between:

[32] For hydro power plants, if the replacement involves the installation of a hydro power plant in a new reservoir, then the applicability conditions on multiple reservoirs must be satisfied by the project activity.

(i) The commercial commissioning of the plant/unit;
(ii) If applicable: the last capacity addition to the plant/unit; or
(iii) If applicable: the last retrofit of the plant/unit.

Calculation of $DATE_{BaselineRetrofit}$

In order to estimate the point in time when the existing equipment would need to be replaced/retrofitted in the absence of the project activity ($DATE_{BaselineRetrofit}$), project participants may take the following approaches into account:

(a) The typical average technical lifetime of the type equipment may be determined and documented, taking into account common practices in the sector and country, e.g. based on industry surveys, statistics, technical literature, etc.;

(b) The common practices of the responsible company regarding replacement/retrofitting schedules may be evaluated and documented, e.g. based on historical replacement/retrofitting records for similar equipment. The point in time when the existing equipment would need to be replaced/retrofitted in the absence of the project activity should be chosen in a conservative manner, i.e. if a range is identified, the earliest date should be chosen.

A.3. Capacity addition to an existing renewable energy power plant

In the case of wind power plants, it is assumed that the addition of new capacity does not significantly affect the electricity generated by existing plant(s) or unit(s). In this case, the electricity fed into the grid by the added power plant(s) or unit(s) could be directly metered and used to determine $EG_{PJ,y.}$

Option 2 of the methodology is chosen since the electricity fed into the grid by the added power plant(s) or unit(s) is separately metered in wind projects. The following formula shall be applied:

$EG_{PJ,y} = EG_{PJ\_Add,y}$

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).
$EG_{PJ\_Add,y}$	:	Quantity of net electricity generation supplied to the grid in year *y* by the project plant/unit that has been added under the project activity (MWh).

B. GRID EMISSION FACTOR

To calculate the emission factor of the grid, two options are possible according to ACM0002 *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* (version 12.3.0)**:**

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the *"Tool to calculate the Emission Factor for an electricity system"* (version 02.2.1); or,

(b) The weighted average emissions (in kg CO_2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used. Calculations must be based on data from an official source (where available) and made publicly available.

For all CPAs under this PoA (even for additional countries to be added in the future), option (a) will be used for calculating the baseline. Data used to calculate the emission factors has been included in Annex 3 of this document.

The emission factor is determined according to the procedures prescribed in the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1) following six steps:

STEP 1. Identify the relevant electricity systems.
STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional).
STEP 3. Select a method to determine the operating margin (OM).
STEP 4. Calculate the operating margin emission factor according to the selected method.
STEP 5. Calculate the build margin (BM) emission factor.
STEP 6. Calculate the combined margin (CM) emissions factor.

Currently, in this document the grid emission factor description refers only for Nicaragua and Peru, and other Latin American and Caribbean countries' models will be included when the respective country is added to the PoA.

- ***Grid Emission Factor: case Nicaragua.***

Step 1: Identify the relevant electric power system

Each CPA will supply energy to the National Interconnected System (NIS). Therefore, the identified electricity power system is the Nicaragua's National Interconnected System (NIS).

The Project will displace electricity from an electricity distribution system (in this case, the NIS) that is or would have been supplied by at least one fossil fuel fired generating unit.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional).

The tool provides 2 options, including:

Option I: Only grid power plants are included in the calculation.
Option II: Both grid power plants and off-grid power plants are included in the calculation

As the NIS represents around 99% of the national generation in Nicaragua, and considering the fact that the project will be delivering its output to the national grid, consequently only grid connected plants will be included in our calculations (i.e. Option I is chosen).

Step 3: Select an OM method

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

(a) Simple OM; or
(b) Simple adjusted OM; or
(c) Dispatch data analysis OM; or
(d) Average OM.

In Nicaragua, low-cost/must run resources constitute less than 50% of the total grid generation (see Table below); thus, option (a) will be used in the context of this project activity.

Figure 5: NIS generation GWh

Low Cost / Must Run Analysis	2006	2007	2008	2009	2010
Thermoelectric Power Plants	2,058.12	2,115.84	2,019.12	2,241.03	2,168.58
Hydro power plants	299.25	300.55	529.47	290.16	499.25
Geothermal Power plants	276.97	211.07	289.84	262.84	268.25
Wind power plants	0.00	0.00	0.00	109.22	160.30
Biomass power plants	194.35	235.28	197.62	206.00	224.56
Total	2,828.69	2,862.74	3,036.05	3,109.25	3,320.94
Share Low Cost / Must Run	0.27	0.26	0.33	0.28	0.35

Source: Based in INE statistics

Finally, the data vintage chosen for the estimation of the simple OM is the ex-ante option for Nicaragua:

Ex ante option: If the ex ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PoA-DD to the DOE for validation.

In this consideration, the CME will update the OM emission factor every year during the PoA crediting period and the Nicaraguan CPAs will use the applicable emission factor (with the latest information) as a fixed value during its particular crediting period. The CME manual will have a specific procedure to the grid emission factor annual update.

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

The simple OM emission factor is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

The simple OM may be calculated according to:

Option A: Based on the net electricity generation and a CO_2 emission factor of each power unit; or

Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

As the information required is available, the preferred option in the tool (option A) will be used in the context of this project activity. Under this option, the simple OM emission factor is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows:

$$EF_{grid,OMsimple,y} = \Sigma_m (EG_{m,y} * EF_{EL,m,y}) / \Sigma_m (EG_{m,y})$$

Where:

$EF_{Grid,OMsimple,y}$	:	Simple operating margin CO_2 emission factor in period *y* (tCO_2/MWh).
$EG_{m,y}$	:	Net quantity of electricity generated and delivered to the grid by power unit *m,* in period *y* (MWh).
$EF_{EL,m,y}$	:	CO_2 emission factor of power unit *m,* in period *y* (tCO_2/MWh).
m	:	All power units serving the grid in period *y,* except low-cost/must-run power units.
y	:	The relevant period as per the data vintage chosen in Step 3.

In turn, $EF_{EL,m,y}$ is determined according to (Option A1 is used as data on fuel consumption for each unit is publicly available in Nicaragua):

$$EF_{EL,m,y} = \Sigma_i (FC_{i,m,y} * NCV_{,i,y} * EF_{CO2,i,y}) / EG_{m,y}$$

Where:

$EF_{EL,m,y}$`	:	CO_2 emission factor of power unit *m,* in period *y* (tCO_2/MWh).
$FC_{i,m,y}$	:	Amount of fossil fuel type *i* consumed by power unit *m,* in period *y* (mass or volume unit) .
$NCV_{i,y}$	:	Net calorific value (energy content) of fossil fuel type *i,* in period *y* (GJ/mass or volume unit).
$EF_{CO2,i,y}$	:	CO_2 emission factor of fossil fuel type *i,* in period y (tCO_2/GJ).
$EG_{m,y}$	:	Net quantity of electricity generated and delivered to the grid by power unit *m,* in period *y* (MWh).
m	:	All power units serving the grid in period *y,* except low cost/must-run power units (imports from other countries are considered units with zero emissions).
i	:	All fossil fuel types combusted in power unit *m,* in period *y* (in Nicaragua: residual fuel oil and diesel).
y	:	The relevant period as per the data vintage chosen in Step 3.

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

In terms of vintage of data, project participants can choose between two options. Option 1, ex ante build margin is chosen for project activities in Nicaragua. In this consideration, the CME will update the BM emission factor every year during the PoA crediting period and each Nicaraguan CPA will use the applicable emission factor (with the latest information) as a fixed value during its particular crediting period.

Option 1: *For the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.*

The sample group of power units to be included in the build margin calculation (*m*) should be determined as per the following procedure, consistent with the data vintage selected following the guideline of the tool.

(a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently (SET5-units) and determine their annual electricity generation (AEG_{SET-5}-units, in MWh);

(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}, in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) (SET≥20%) and determine their annual electricity generation ($AEG_{SET-\geq 20\%,}$ in MWh);

(c) From $SET_{5\text{-units}}$ and $AEG_{SET\geq 20\%}$ select the set of power units that comprises the larger annual electricity generation (SET_{sample});

Identify the date when the power units in SET_{sample} started to supply electricity to the grid. If none of the power units in SET_{sample} started to supply electricity to the grid more than 10 years ago, then use SET_{sample} to calculate the build margin. In this case ignore steps (d), (e) and (f).

If projects in the sample are from less than 10 years ago, according to the tool, the following steps must be ignored (steps d, e and f). Based on the previous selection, the Build Margin is calculated as follows:

$$EF_{grid,BM,y} = \Sigma_m (EG_{m,y} * EF_{EL,m,y}) / \Sigma_m (EG_{m,y})$$

Where:

$EF_{grid,BM,y}$	:	Build margin CO_2 emission factor in period y (tCO_2/MWh).
$EG_{m,y}$	:	Net quantity of electricity generated and delivered to the grid by power unit m, in period y (MWh).
$EF_{EL,m,y}$	:	CO_2 emission factor of power unit m in period y (tCO_2/MWh), obtained in an analogous way to equation (4).
m	:	Power units included in SET_{sample}.
y	:	Most recent historical period for which power generation data is available.

Step 6: Calculate the combined margin (CM) emission factor

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

(a) Weighted average CM (used for this project); or
(b) Simplified CM (only available for Least Developed Countries or in the presence of data availability issues for Step 5 above).

The combined margin emissions factor ($EF_{grid,CM,y}$) is calculated as follows as a weighted average (option a) Latin American and Caribbean countries (except Haiti) are not LDC:

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

Where:

$EF_{grid,BM,y}$	:	Build margin CO_2 emission factor in period y (tCO_2/MWh).
$EFg_{rid,OM,y}$	:	Operating margin CO_2 emission factor in period y (tCO_2/MWh).
w_{OM}	:	Weight of the operating margin emission factor (%).
w_{BM}	:	Weight of the build margin emission factor (%).

The default values for wind projects ($w_{OM} = 0.75$ and $w_{BM} = 0.25$) are used in the context of this project.

For Nicaragua the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. Use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-CPA to the DOE for validation/inclusion.

Notice that the emission factor (OM and BM) will be use the ex ante option for CPAs in Nicaragua.

- ***Grid Emission Factor: case Peru.***

Step 1: Identify the relevant electric power system

Each CPA will supply energy to the National Interconnected Electric Grid (SEIN). Therefore, the identified electricity power system is the Peruvian National Electricity Grid (SEIN).

The Project will displace electricity from an electricity distribution system (in this case, the SEIN) that is or would have been supplied by at least one fossil fuel fired generating unit.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

The tool provides 2 options, including:

Option I: Only grid power plants are included in the calculation.
Option II: Both grid power plants and off-grid power plants are included in the calculation

All CPAs will use Option I for calculating the grid emission factor.

Step 3: Select an OM method

Out of four options for the OM, the Dispatch Data Analysis OM (OM -DD) is selected as the option for all CPAs located in Peru. The Simple OM method cannot be used since low cost/must-run resources constitute more than 50% of total grid generation in Peru.[33] Also, it was not necessary to use either the Simple Adjusted OM approach or the Average OM approach because detailed dispatch data is available. A Dispatch Data Analysis OM shall be calculated ex – post and updated annually. The CPA shall use the applicable updated value during verification. The CME will update the emission factor every year and the CME manual will have a specific procedure for the grid emission factor annual update.

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

The formula for the OM-DD emission factor ($EF_{grid,OM-DD,y}$) used was provided by the Tool as follows:

$$EF_{grid,OM-DD,y} = \frac{\sum_h EG_{PJ,h} \, x \, EF_{EL,DD,h}}{EG_{PJ,y}}$$

Where,

[33] COES Annual Statistics Report (2010) Table Nº 2.2A. According to this table, thermal generation in 2010 was 13 462.27 GWh, which represents 41.52%; while, hydro generation was 18 964.56 GWh, which represents 58.48%. Therefore, low cost, must-run resources constitute more than 50% of total grid generation in Peru. In internet http://www.coes.org.pe/wcoes/coes/estadistica/estadanual.aspx

$EF_{grid,OM-DD,y}$	=Dispatch data analysis operating margin CO_2 emission factor in year, *y* (tCO_2/MWh).
$EG_{PJ,h}$	= Electricity displaced by the CPA 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 CPA in year *y* (MWh).
h	= Hours in year *y*, in which the CPA is displacing grid electricity.
y	= Year in which the CPA is displacing grid electricity.

The hourly emissions factor is calculated based on the energy efficiency of the grid power unit and the fuel type used, as follows[34]:

$$EF_{EL,DD,h} = \frac{\sum_n EGn_{,h} x\, EF_{EL,n,y}}{\sum_n EG_{n,h}}$$

Where,

$EF_{EL,DD,h}$	= CO_2 emission factor for power units in the top of the dispatch order in hour *h*, in year *y* (tCO_2/MWh).
$EG_{n,h}$	= Net quantity of electricity generated and delivered to the grid by power unit, *n*, in hour *h* (MWh).
$EF_{EL,n,y}$	= CO_2 emission factor of power unit, *n*, in year *y* (tCO_2/MWh).
n	=Power units in the top of the dispatch.
h	= Hours in year *y*, in which the CPA is displacing grid electricity.

To determine the set of grid power units **n** that are in the top of the dispatch at each hour *h*, the power units were stacked using the merit order. The group of power units *n*, in the dispatch margin includes the units in the top x% of total electricity dispatched in the hour *h*, where x% is equal to the greater of either

a) 10%, or
b) The quantity of electricity displaced by the project activity during hour *h,* divided by the total electricity generations by grid power plants during that hour *h*.

The CO_2 emission factor of power unit ($EF_{EL,m,y}$) is calculated as per the guidance for the simple OM, using the **option A2.**

$$EF_{EL,m,y} = \frac{EF_{CO2,m,y,i} \; x \; 3.6}{n_{m,y}}$$

Where,

$EF_{EL,m,y}$	= CO_2 emission factor of power unit m in year *y* (tCO_2/MWh).
$EF_{CO2,m,y,i}$	= Average CO_2 emission factor of fuel type *I,* used in power unit *m,* in year *y* (tCO_2/GJ).
$n_{m,y}$	= Average net energy conversion efficiency of power unit *m*, in year *y*, (ratio).

[34] No hourly fuel consumption data is available in Peru.

m = All power units serving the grid in year *y,* expect low-cost/must-run power units.
y = Applicable year during monitoring (ex-post option).

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

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units *m*, during the most recent year *y*, for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \, x \, EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where,

$EF_{grid,BM,y}$: Build margin CO_2 emission factor in year *y* (tCO_2/MWh).
$EG_{m,y}$: Net quantity of electricity generated and delivered to the grid by power unit *m,* in year *y* (MWh).
$EF_{EL,m,y}$: CO_2 emission factor of power unit *m,* in year *y* (tCO_2/MWh).
m : Power units included in the build margin.
y : Most recent historical year for which power generation data is available.

According to the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1), the sample group of power units *m,* used to calculate the build margin should be determined as per the following procedure, consistent with the vintage data selected above:

(a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ($SET_{5\text{-units}}$) and determine their annual electricity generation ($AEG_{SET\text{-}5\text{-}units}$, in MWh);

(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG_{total}, in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of AEG_{total} (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation), $SET_{\geq 20\%)}$ and determine their annual electricity generation ($AEG_{SET\text{-}\geq 20\%,}$ in MWh);

(c) From $SET_{5\text{-units}}$ and $SET_{\geq 20\%}$ select the set of power units that comprises the larger annual electricity generation (SET_{sample}). Identify the date when the power units in SET_{sample} started to supply electricity to the grid. If none of the power units in SET_{sample} started to supply electricity to the grid more than 10 years ago, then use SET_{sample} to calculate the build margin. Ignore steps (d), (e) and (f).

(d) Exclude from SET_{sample} the power units which started to supply electricity to the grid more than 10 years ago. Include in that set the power units registered as CDM project activity, starting with power units that started to supply electricity to the grid most recently, until the electricity generation of the new set comprises 20% of the annual electricity generation of the project electricity system (if 20% falls on part of the generation of a unit, the generation of that unit is

fully included in the calculation) to the extent is possible. Determine for the resulting set ($SET_{sample-CDM}$) the annual electricity generation ($AEG_{SET-sample-CDM}$, in MWh). If the annual electricity generation of that set is comprises at least 20% of the annual electricity generation of the project electricity system (i.e. $AEG_{SET-sample-CDM} \geq 0.2 \times AEG_{total}$), then use the sample group SETsample-CDM to calculate the build margin. Ignore steps (e) and (f).

Otherwise:

(e) Include in the sample group $SET_{sample-CDM}$ the power units that started to supply electricity to the grid more than 10 years ago, until the electricity generation of the new set comprises 20% of the annual electricity generation of the project electricity system (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation);

(f) The sample group of power units *m,* used to calculate the build margin is the resulting set ($SET_{sample-CDM->10yrs}$).

Out of $SET_{5-units}$ and $SET_{\geq 20\%}$, the latter group was selected as SET_{sample} due to the fact that it includes the larger annual electricity generation.

In terms of vintage data, to calculate the build margin Option 2 shall be chosen for the CPAs in Peru. The BM will be calculated ex – post and updated annually. The Peruvian CPAs shall use the applicable updated value during verification. The CME will update the emission factor every year and the CME manual will have a specific procedure for the grid emission factor annual update.

Option 2: *For the first crediting period, the build margin emission factor shall 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. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.*

Step 6: Calculate the combined margin (CM) emissions factor.

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

(a) Weighted average CM; or
(b) Simplified CM.

The simplified CM method (option b) can only be used if:

- The project activity is located in a Least Developed Country (LDC) or in a country with less than 10 registered projects at the starting date of validation; and
- The data requirements for the application of step 5 above cannot be met.

The weighted average CM method (option a) should be used as the preferred option:

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

Where:

W_{OM} : Weighting of OM emission factor (%)
W_{BM} : Weighting of BM emission factor (%)

For the proposed PoA, the default values for wind projects (w_{OM} = 0.75 and w_{BM} = 0.25) are used in the context of this project.

Notice that the emission factor will use the ex- post option for CPAs in Peru.

Since the OM and BM emission factors will be monitored ex-post, the emission factors will be determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring period. The data required to calculate the emission factors for year y is usually available in the first 6 months after the end of year y therefore the CPAs shall use the emission factors of the year y. This data vintage (y) will be used throughout all crediting periods.

III. LEAKAGE (L_y)

According to the applicable methodology, leakage emissions may arise due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport), but are neglected.

$L_y = 0$.

IV. EMISSION REDUCTIONS (ER_y)

The emission reduction attributable to the CPA during a given year *y* (ER_y) are the difference between the baseline emissions (BE_y) and project emissions (PE_y) and leakage emissions (L_y), as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y : Emissions reductions of the project activity during the year *y,* in t CO_2e.
BE_y : Baseline emissions during the year *y,* in t CO_2e.
PE_y : Project emissions during the year *y,* in t CO_2e.
LE_y : Leakage emissions in the year *y,* in t CO_2e.

E.6.3. Data and parameters that are to be reported in CDM-CPA-DD form:

The information will be updated for other Latin American and Caribbean countries when it is added to the PoA. Currently, the variables set in this section have Nicaraguan parameter since its grid emission factor will be set in an ex-ante basis for the CPAs in that host country. Peruvian CPAs will use a different OM method and the grid emission factor will be set in an ex-post basis and then the parameters are listed in this section but also in section B.7.1.

Grid Emission Factor Nicaragua:

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2/MWh
Description:	Emission factor for the National Interconnected System - Nicaragua.
Source of data to be used:	Calculated from $EF_{grid,OM,y}$ and $EF_{grid,BM,,y}$ as per the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1).
Value applied:	Determined at CPA level.
Justification of the choice of data or description of measurement methods and procedures actually applied :	The baseline emission factor ($EF_{grid,CM,y}$) is calculated as a combined margin (CM), consisting of the combination of operating margin ($EF_{grid,OM,y}$) and build margin ($EF_{grid,BM,y}$) factors according to the applicable methodology.
Any comment:	The PoA CPAs will use the $EF_{grid,CM,y}$ calculated by the coordinating/managing entity with the most recent values. The value will be updated by the CME using official information when the information is available. CPAs will use the most available grid emission factor as an ex ante value. See further detail in section E.7.2. Complete information of every year during the crediting period will be available for the CME during the first six months of the following year. The emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. Use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-CPA to the DOE for validation/inclusion.

Data / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	The build margin emissions factor - Nicaragua.
Source of data to be used:	Official data publicly available in National Electricity Institution (INE) or National Dispatch Center (CNDC) web sites, or directly sent to the coordinating/managing entity.
Value applied:	Determined at CPA level.
Justification of the choice of data or description of measurement methods and procedures actually applied :	This value is determined ex-ante using the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1) and applying to the CM a weight of 0.25 for the first crediting period.
Any comment:	-

Data / Parameter:	$EF_{grid,OMsimple,y}$
Data unit:	tCO_2/MWh
Description:	Simple operating margin CO_2 emission factor in period *y*. - Nicaragua.
Source of data to be used:	Official data publicly available in National Electricity Institution (INE) or National Dispatch Center (CNDC) web sites, or directly sent to the coordinating/managing entity.
Value applied:	Determined at CPA level.
Justification of the choice of data or description of measurement methods and procedures actually applied :	This value is determined ex-ante using the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1) and applying to the CM a weight of 0.75 for the first crediting period.
Any comment:	-

Data / Parameter:	$NCV_{i,y}$
Data unit:	TJ/Gg
Description:	Net calorific value (energy content) per mass unit of fuels *i,* in year *y.* - Nicaragua.
Source of data used:	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value applied:	Determined at CPA level for each host country. For 2010 calculations: - Fuel Oil: 39.8 TJ/Gg - Diesel: 41.4 TJ/Gg
Justification of the choice of data or description of measurement methods and procedures actually applied :	There is no information in supplier invoices, national official entities or individual power plant owners. IPCC values are accepted by the methodology.
Any comment:	If available, values provided by the fuel supplier of the power plants in invoices (if data is collected from power plant operators) or regional or national average default values are preferable sources in the calculation.

Data / Parameter:	$EF_{CO2,i,y}$
Data unit:	KCO_2/TJ
Description:	CO_2 emission factor of fossil fuel *i,* in year *y.* - Nicaragua.
Source of data used:	IPCC default values at the lower limit if the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol.2 (Energy) of the 2006 IPCC Guidelines on National Greenhouse Gas Inventories.
Value applied:	Determined at CPA level for each host country. For 2010 calculations: - Fuel Oil: 75,500 - Diesel: 72,600
Justification of the choice of data or description of measurement methods and procedures actually applied :	No other data is publicly available. IPCC guidelines have been used in a conservative manner.
Any comment:	If available, values provided by the fuel supplier of the power plants in invoices (if data is collected from power plant operators) or regional or national average default values are preferable sources in the calculation.

Data / Parameter:	$FC_{i,m,y}$
Data unit:	Thousand gallons
Description:	Amount of fossil fuel *i,* consumed by each power plant/unit *m,* in period *y.* - Nicaragua.
Source of data used:	INE - Instituto Nicaragüense de Electricidad (Nicaraguan Electricity Institute) or National Dispatch Center (CNDC) web sites, or directly sent to the coordinating/managing entity. Specific data source will be identified for each host country.
Value applied:	Data used is presented in the spreadsheet for the Grid Emission Factor calculation.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data is obtained from official publicly available sources.
Any comment:	-

Data / Parameter:	$EG_{m,y}$
Data unit:	MWh
Description:	Net electricity generated and delivered to the grid by power plant/unit *m,* in period *y.* - Nicaragua.
Source of data used:	INE - Instituto Nicaragüense de Electricidad (Nicaraguan Electricity Institute) or National Dispatch Center (CNDC) web sites, or directly sent to the coordinating/managing entity, or other utility or government records (official publications). Specific data source will be identified at each host country.
Value applied:	Data used is presented in the spreadsheet for the Grid Emission Factor calculation.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data is obtained from official publicly available sources.
Any comment:	-

Weight for the BM and OM factors for Nicaragua and Peru

Data / Parameter:	w_{OM}
Data unit:	(%)
Description:	Weight of the operating margin emissions factor. – Nicaragua and Peru.
Source of data to be used:	As indicated in the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1).
Value applied:	The first crediting period, $w_{OM} = 0.75$ The second and third crediting period, $w_{OM} = 0.75$
Justification of the choice of data or description of measurement methods and procedures actually applied :	---
Any comment:	For projects of solar or wind power generation. This weight is set fixed in the tool for all the crediting periods in a CPA.

Data / Parameter:	w_{BM}
Data unit:	(%)
Description:	Weight of build margin emissions factor. – Nicaragua and Peru.
Source of data to be used:	As indicated in the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1).
Value applied:	The first crediting period, $w_{BM} = 0.25$ The second and third crediting period, $w_{BM} = 0.25$
Justification of the choice of data or description of measurement methods and procedures actually applied :	---
Any comment:	For projects of solar or wind power generation. This weight is set fixed in the tool for all the crediting periods in a CPA.

Methodological parameters

Data / Parameter:	**$EG_{historical}$**
Data unit:	MWh
Description:	Annual average historical net electricity generation by the existing renewable energy plant that was operated at the project site, prior to the implementation of the project activity.
Source of data used:	Information from the project proponent or local authorities, based on the approaches listed in section E.6.2.
Value applied:	Varies in every CPA.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data from electricity meters of the project proponent and official information is reliable and can be cross-checked.
Any comment:	-

Data / Parameter:	**$\sigma_{historical}$**
Data unit:	MWh
Description:	Standard deviation of the annual average historical net electricity supplied to the grid by the existing renewable energy plant that was operated at the project site, prior to the implementation of the project activity.
Source of data used:	Based on project proponent or local authorities information.
Value applied:	Varies in every CPA.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data from electricity meters of the project proponent and official information is reliable and can be cross-checked.
Any comment:	-

Data / Parameter:	**$DATE_{BaselineRetrofit}$**
Data unit:	Date
Description:	Point in time when the existing equipment would need to be replaced in the absence of the project activity.
Source of data used:	Project activity site based in two approaches: (a) The typical average technical lifetime of the type equipment may be determined and documented, taking into account common practices in the sector and country, e.g. based on industry surveys, statistics, technical literature, etc.; (b) The common practices of the responsible company regarding replacement/retrofitting schedules may be evaluated and documented, e.g. based on historical replacement/retrofitting records for similar equipment.
Value applied:	Varies in every CPA.
Justification of the	Evidenced documents or references will be used in order to determine a real

choice of data or description of measurement methods and procedures actually applied :	and conservative date for future replacement of equipment.
Any comment:	-

Data / Parameter:	**$DATE_{hist}$**
Data unit:	Date
Description:	Point in time from which the time span of historical data for retrofit or replacement project activities may start.
Source of data used:	Project activity site information based on approaches listed in section E.6.2.
Value applied:	Varies in every CPA.
Justification of the choice of data or description of measurement methods and procedures actually applied :	Information is based on formal internal and/or external data.
Any comment:	-

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

Each project owner (CPA) will be implementing its monitoring plan. The CPA owner will monitor all parameters (included in section E.7.1.) according to the procedures established in the CPA-DD section B.6.1. Furthermore, each CPA will be responsible for implementing appropriate operation and maintenance procedures to ensure the measuring equipment met the PoA requirements, related to quality indicators such as pre-calibration, verification and/or calibration frequency.

Once the CPA owner records and stores the primary data, the CME entity will process the primary data and record and store the processed data in an electronic database. All data collected as part of monitoring should be archived electronically and be kept for at least two years after the end of the last crediting period or the last issuance of CERs for this project activity, whatever occurs later. 100% of the data should be monitored if not indicated otherwise in the tables below.

At the end of a monitoring period, the CME entity will be in charge on the preparation of the Monitoring Reports and communication with the DOE during verification activities. The Monitoring Report will compile all required monitoring information for all CPAs that will be verified by the DOE. This report will unambiguously set out the data on emission reductions generated by each specific CPA during the monitoring period consistent with the requirements of this PoA-DD and the corresponding CPA-DD. The monitoring provisions in the tools referred in the PoA-DD shall apply.

The parameters listed below under section D.7.1 need to be monitored during the crediting period.

The calculation of the operating margin and build margin emission factors should be documented electronically in a spread sheet that should be attached to the CPA-DD. This should include all data used

to calculate the emission factors according to the methodology and following the *"Tool to calculate the emission factor for an electricity system"* (version 2.2.1), as listed below:

- The following information for each grid-connected power plant/unit:
  - Information to clearly identify the plant;
  - The date of commissioning;
  - The capacity (MW);
  - The fuel type(s) used;
  - The quantity of net electricity generation in the relevant year(s);
  - The fuel consumption of each fuel type in the relevant year(s), if applicable;
  - In case where the simple OM or the simple adjusted operating margin is used: information whether the plant/unit is a low-cost/must-run plant/unit.

- Net calorific values used;
- CO_2 emission factors used;
- Plant efficiencies used, if applicable;
- Identification of the plants included in the build margin and the operating margin during the relevant time year(s);
- The quantity of electricity displaced by the project activity, if applicable;

The data should be presented in a manner that enables reproducing of the calculation of the build margin and operating margin grid emission factor.

D.7.1. Data and parameters to be monitored by each CPA:

Data / Parameter:	**$EG_{PJ,y}$ / $EG_{PJ, facility, y}$ / $EG_{PJ,Add,y}$**
Data unit:	MWh
Description:	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* / Quantity of net electricity supplied to the grid by the project plant/unit in year *y* / Quantity of net electricity generation supplied to the grid in year *y,* by the project plant/unit that has been added under the project activity (MWh).
Source of data to be used:	Measured by electricity meter(s) to be specified in each CPA.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	To be specified in each CPA.
Description of measurement methods and procedures to be applied:	The net electricity supplied to the grid will be measured continuously and recorded at least each hour or as established by the electricity sector requirements in Nicaragua and Peru. A high level of accuracy of the measurements will be achieved due to the use of high-precision equipment calibrated and tested according to recognized standards, as stated in section E.7.2.b. In this section, the project participants may provide description of the equipment used for measurement, its accuracy

	class and location (on site or at substation, according to specific characteristics of the project). Every CPA will define in detail the specific conditions to measure the net electricity imported to the grid. The following cases, among others, may occur: - The net electricity will be calculated by subtracting the electricity exported with the electricity imported by the CPA, both measured with calibrated meters. - The net electricity is calculated by subtracting electricity consumptions arriving not by the power plant transmission line (e.g. external lighting) listed in commercial invoices. At the moment of submitting this PoA –DD, regulation in Nicaragua states that the main meters shall be at least class 0.2 and comply with IEC norms, while backup meters can be at least class 0.5.[35] At the moment of submitting this PoA –DD, regulation in Peru states that the main meters shall be class at least 0.2.[36]
QA/QC procedures to be applied:	The meters shall be periodically verified or calibrated according to national regulation or manufacturer guidelines. The meter readings may be cross-check with available internal and/or external information as electricity invoices or official information of the electricity institutions in the host country. At the moment of submitting this PoA –DD, regulation in Nicaragua states that formal verifications for the meters shall be at least every two years[37]. In Peru, the meters will be calibrated and/or verified according to the national standards and reference points or IEC standards, and recalibrated at appropriate intervals according to manufacturer specifications, but at least once in three years.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

[35] CNDC. National Dispatch Center (Centro Nacional de Despacho de Carga - CNDC). Operation Norms, p. 22. See: http://www.cndc.org.ni/MarcoLegal/Normativa/Anexos%20a%20N.Oper/ANEXO.COM.pdf - Web link last accessed on 20/12/2011.

[36] COES. Procedure # 20. See: www.coes.org.pe

[37] CNDC. National Dispatch Center (Centro Nacional de Despacho de Carga - CNDC). Operation Norms, p. 26. See: http://www.cndc.org.ni/MarcoLegal/Normativa/Anexos%20a%20N.Oper/ANEXO.COM.pdf - Web link last accessed on 12/20/2011.

Grid Emission Factor Peru:

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO_2/MWh
Description:	Emission factor for the Peruvian interconnected grid (SEIN) - Peru
Source of data to be used:	Calculated from $EF_{grid,OM\ DD,y}$ and $EF_{grid,BM,,y}$ as per the *"Tool to calculate the emission factor for an electricity system"* (version 02.2.1) based on official data provided by the administrator of the grid or the relevant national authority.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	2010: 0.70448
Description of measurement methods and procedures to be applied:	The baseline emission factor ($EF_{grid,CM,y}$) is calculated as a combined margin (CM), consisting of the combination of operating margin ($EF_{grid,OM,DD,y}$) and build margin ($EF_{grid,BM,y}$) factors.
QA/QC procedures to be applied:	---
Any comment:	The PoA CPAs will use the $EF_{grid,CM,y}$ calculated by the coordinating/managing entity with the most recent value. The value will be updated using official information from the administrator of the national grid when the information is available. See further detail in section E.7.2. Complete information of every year during the crediting period will be available by COES during the first six months of the following year. Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EF_{grid,OM-DD,y}$
Data unit:	tCO_2/MWh
Description:	The Dispatch Data Analysis OM emission factor - Peru.
Source of data to be used:	Official data provided by the administrator of the grid or the relevant national authority (COES) publicly available in its web site, or directly sent to the coordinating/managing entity. Raw data for generation is based on the 15 minute records of every power plant.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	2010: 0.74952
Description of measurement methods and procedures to be applied:	The dispatch data analysis operating margin emission factor ($EF_{OM-DD,y}$ = $EF_{grid,OM,y}$ in tCO_2/MWh) is a method which involves the power units that are actually dispatched at the margin during each hour *h,* where the power units are separated in power unit in the top of the dispatch *n,* and other power unit.
QA/QC procedures to be applied:	---
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO_2/MWh
Description:	The build margin emissions factor - Peru.
Source of data to be used:	Official data provided by the administrator of the grid or the relevant national authority (COES) publicly available in its web site, or directly sent to the coordinating/managing entity.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	2010: 0.56934
Description of measurement methods and procedures to be applied:	---
QA/QC procedures to be applied:	---
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EG_{PJ,h}$
Data unit:	MWh
Description:	Electricity displaced by the project activity in hour *h,* of year *y* - Peru.
Source of data to be used:	Project records and/or COES.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Data used is presented in the spreadsheet for Grid Emission Factor calculation.
Description of measurement methods and procedures to be applied:	Directly measured and/or based on the information provided by COES. The proportion of data to be monitored is 100% and the data will be archived electronically. The CPA will specify the value and measurements used (same value as $\mathbf{EG_{BL,y}}$ / $\mathbf{EG_{PJ,\ facility,\ y}}$ for new power plants and only the incremental electricity in the case on retrofitting, replacement and capacity additions).
QA/QC procedures to be applied:	Information of invoices of electricity sold to the grid will be crosschecked with metered information and/or COES information. . To ensure consistency, and if it's applicable, other records may be used if it is necessary.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EG_{PJ,y}$
Data unit:	MWh
Description:	Total electricity displaced by the project activity in year *y* - Peru.
Source of data to be used:	Project records and/or COES.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Data used is presented in the spreadsheet for Grid Emission Factor calculation.
Description of measurement methods and procedures to be applied:	The proportion of data to be monitored is 100% and the data will be archived electronically. The CPA has to specify the value and measurements used (same value as $\mathbf{EG_{BL,y}}$ / $\mathbf{EG_{PJ,\ facility,\ y}}$ for new power plants and only the incremental electricity in the case on retrofitting, replacement and capacity additions). .
QA/QC procedures to be applied:	---
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EF_{EL,DD,,h}$
Data unit:	tCO_2/MWh
Description:	CO_2 emission factor of power unit in the top of the dispatch order in hour *h,* in year *y* - Peru.
Source of data to be used:	Input data provided by COES.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Data used is presented in the spreadsheet for Grid Emission Factor calculation.
Description of measurement methods and procedures to be applied:	To calculate $EF_{EL,DD,h}$ the second option is chosen because for the power units data on fuel consumption and electricity generation is available. The proportion of data to be monitored is 100% and the data will be archived electronically.
QA/QC procedures to be applied:	---
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EG_{n,h}$
Data unit:	MWh
Description:	Electricity generated and delivered to the grid by power units *n,* in hour *h* - Peru.

Source of data to be used:	Data provided by COES.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Data used is presented in the spreadsheet for Grid Emission Factor calculation.
Description of measurement methods and procedures to be applied:	The proportion of data to be monitored is 100% and the data will be archived electronically.
QA/QC procedures to be applied:	Is official data.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EF_{EL,n,y}$
Data unit:	tCO_2/MWh
Description:	CO_2 emission factor of power unit *n,* in year *y* - Peru.
Source of data to be used:	Input data provided by COES.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Data used is presented in the spreadsheet for Grid Emission Factor calculation.
Description of measurement methods and procedures to be applied:	The $EF_{EL,n,y}$ is determined for method the simple operating margin option A.2. The proportion of data to be monitored is 100% and the data will be archived electronically.
QA/QC procedures to be applied:	---
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EG_{m,y}$
Data unit:	MWh
Description:	Net quantity of electricity generated and delivered to the grid by power unit *m,* in year *y* - Peru.
Source of data to be used:	Data provided by COES.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Data used is presented in the spreadsheet for Grid Emission Factor calculation.
Description of	The proportion of data to be monitored is 100% and the data will be archived

measurement methods and procedures to be applied:	electronically.
QA/QC procedures to be applied:	Is official data.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EF_{EL,m,y}$
Data unit:	tCO_2/MWh
Description:	CO_2 emission factor of power unit *m,* in year *y* - Peru.
Source of data to be used:	Input data provided by COES.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Data used is presented in the spreadsheet for Grid Emission Factor calculation.
Description of measurement methods and procedures to be applied:	The $EF_{EL,m,y}$ is determined for method the simple operating margin option A.2. The proportion of data to be monitored is 100% and the data will be archived electronically.
QA/QC procedures to be applied:	---
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$\eta_{m,y}$
Data unit:	---
Description:	Average net energy conversion efficiency of power unit *m,* in year *y* (ratio) - Peru.
Source of data to be used:	Data provided by COES.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Data used is presented in the spreadsheet for Grid Emission Factor calculation.
Description of measurement methods and procedures to be applied:	Each year this data will be checked with the last available annual report of COES. The proportion of data to be monitored is 100% and the data will be archived electronically.
QA/QC procedures to be applied:	If the data used is significantly lower than the default value of the applicable technology, project proponents should assess the reliability of the values and provide appropriate justification if deemed reliable. Otherwise, the default values above shall be used.

Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	$EF_{CO2,m,i,y}$
Data unit:	$kgCO_2$ /TJ
Description:	Average CO_2 emission factor of fuel type *i,* used in power unit *m,* in year *y* - Peru.
Source of data to be used:	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Diesel Oil = 72,600 Residual Fuel Oil = 75,500 Natural Gas = 54,300 Coal = 87,300
Description of measurement methods and procedures to be applied:	---
QA/QC procedures to be applied:	Every update of IPCC reports will be taken into account.
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

Data / Parameter:	**Merit Order**
Data unit:	Text
Description:	The merit order in which power plants are dispatched by documented evidence Peru.
Source of data to be used:	Data provided by COES.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Data used is presented in the spreadsheet for Grid Emission Factor calculation.
Description of measurement methods and procedures to be applied:	For each year, the variable cost of thermal plants in the SEIN that are in effect in December will be used. The proportion of data to be monitored is 100% and the data will be archived electronically.
QA/QC procedures to be applied:	---
Any comment:	Data will be kept for two years after the end of the crediting period or the last issuance of CERs for this project activity, whatever occurs later.

E.7.2. Description of the monitoring plan for a CPA:

The purpose of the monitoring plan will be to measure and record the net electricity delivered to the electrical grid. Details of the CPA monitoring plan will be described within each CPA, considering the following elements.

1. Management structure and responsibilities

The project owner is responsible for daily monitoring and reporting of net electricity generation. The manager of the proposed project is the responsible person for reporting the monitoring data in a monthly basis and assuring the correct maintenance and operation of the measuring and monitoring equipment, including the existence of appropriate calibration certificates. If deemed necessary, the manager of the proposed project will implement an internal team to comply with the monitoring duties.

Data Collection: The electricity supplied by the project activity to the grid will be measured by calibrated electricity meters. The parameter will be monitored at the project site and/or at the substation and crosschecked with the invoices of electricity commercialized. Data will be monitored continuously, recorded hourly and consolidated in a monthly basis as required by the applicable methodology.

Data Recording: For each CPA, all parameters included in E.7.1, if applicable, will be monitored by the CPA developer and recorded electronically in a CPA monitoring record. The CPA developer will provide the CPA monitoring records to the CME. The CME will document and store all data related to parameters included in section E.7.1 provided by CPA developer in an electronic PoA monitoring record (PoA monitoring database), while primary data will be stored by each CPA developer.

Data Calibration: All measurements will be conducted with equipment certified to national and/or IEC standards and calibrated and/or verified according to the national standards and reference points or IEC standards and recalibrated and/or verified at appropriate intervals according to manufacturer specifications.

Data Report: To be defined at each CPA level.

Data Archives: The data recorded and the reports will be archived, together with this monitoring plan. All data collected as part of the monitoring should be archived electronically and be kept at least for 2 years after the end of the last crediting period or the last issuance of CERs, whichever occurs later. The coordinating/managing entity will also keep a copy of this data for at least 2 years after the end of the last crediting period or the last issuance of CERs, whichever occurs later.

2. Data Quality Assurance and Control

Key personnel will be assigned for overall project management, operation, monitoring and reporting as required by the project activity.

A competent supervisor will be appointed to be in charge of and accountable for the generation of CERs including monitoring, record keeping, computation of ERs, audits and verification.

Well-defined protocols and routine procedures, with good, professional data entry, extraction and reporting will be encouraged to maximize transparency of data archiving.

Data and reports will be cross-checked internally by the CME to ensure the accuracy and completeness of data. In case of mistakes, corrective actions will be applied to avoid future similar mistakes.

3. Training and monitoring personnel

The CME will provide all necessary information and training material that enables CPA developers to conduct the monitoring process as required by the PoA. The CPA developer ensures that all persons that participate in the actual monitoring process for the CPA will be suitably qualified and trained in the operation and maintenance of the CPA project activity. If required, these persons will also receive training on the application of the monitoring plan by the CME.

4. Emission factor calculation

The combined margin emission factor used in the emission reduction calculation will be the annually updated factor provided by the coordinating/managing entity. The emission factor will be updated using information published by the local authorities or sent after a formal request. The spreadsheets used in the calculation of the 2010 emission factor (submitted for evaluation during the PoA registration) will be updated each year when all the required information is available. An internal report of the coordinating/managing entity will register the format, source of data, new power plants in the system and any other change in the process or data used in the grid emission factor calculation.

5. Verification and Monitoring Results

The monitoring report will be prepared by the coordinating/managing entity. It shall contain the data report, the emission factor calculation and the results of the emissions reductions of the project for a certain period.

Leakage monitoring:
No energy generating equipment is transferred from another activity developed in a non-Annex 1 Parties to this project and there is no existing equipment to be transferred to another activity.

Even when the methodology does not request it, the CME will implement a scrapping procedure in case of equipment replacements in order to eliminate any potential leakage. The scrapping procedure is developed as part of the CME manual.

E.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 baseline study and monitoring methodology: 23/11/2012.

The baseline and monitoring sections have been prepared by the ÉcoRessources Carbono team with assistance from ÉcoRessources Carbone (www.ecoressources.com).

Contact Person: Luis Salgado – Director for Latin America

Company name: ÉcoRessources Carbono S.A.C.
Address: Avenue República de Panamá 6084, Office 302, San Antonio - Miraflores
Lima (18). Perú
Telephone number: +51 (1) 446-6531
E-mail: luis.salgado@ecoressources.com

Annex 1

CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and PARTICIPANTS IN THE PROGRAMME of ACTIVITIES

Organization:	ÉcoRessources Carbono S.A.C.
Street/P.O.Box:	Avenida República de Panamá
Building:	6084
City:	Lima
State/Region:	San Antonio – Miraflores
Postfix/ZIP:	
Country:	Peru
Telephone:	+51 (1) 446-6531
FAX:	
E-Mail:	lima@ecoressources.com
URL:	www.ecoressources.com
Represented by:	
Title:	Latin American Director
Salutation:	Mr.
Last Name:	Salgado
Middle Name:	
First Name:	Luis
Department:	
Mobile:	-
Direct FAX:	-
Direct tel:	+51 1 4466531
Personal E-Mail:	luis.salgado@ecoressources.com

Organization:	Mabanaft Carbon B.V.
Street/P.O.Box:	Wilhelminakade 101 (43rd floor)
Building:	Maastoren, 43rd floor
City:	Rotterdam
State/Region:	
Postfix/ZIP:	3072AP
Country:	The Netherlands
Telephone:	+31 (0) 10 - 290 69 46
FAX:	+31 10 411 0753
E-Mail:	patricia.rosenthal@mabanaft.nl
URL:	www.mabanaft.nl
Represented by:	Mrs. Patricia Rosenthal Liebesny
Title:	Business Developer Manager
Salutation:	
Last Name:	Rosenthal Liebesny
Middle Name:	
First Name:	Patricia
Department:	Global Carbon Markets
Mobile:	+31(0)6 31007936
Direct FAX:	+31 10 411 0753
Direct tel:	+31 10 2906946
Personal E-Mail:	patricia.rosenthal@mabanaft.nl

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The PoA does not involve any public funding from parties included in Annex 1. This will be cross verified for individual CPAs in respective CPA-PDDs

Annex 3

BASELINE INFORMATION

Annex 4

MONITORING INFORMATION

Monitoring information is included under chapter E.7.2. Each CPA will provide details on their monitoring plan according to the guidelines provided by the PoA.

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