PROGRAMME DESIGN DOCUMENT FORM FOR CDM PROGRAMMES OF ACTIVITIES (F-CDM-PoA-DD) Version 02.0

PROGRAMME OF ACTIVITIES DESIGN DOCUMENT (PoA-DD)

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

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BWC Wind Farm Power Programme of Activities in Viet Nam
Version number: 02.1
Date: 05/12/2012

A.2. Purpose and general description of the PoA

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Description of the PoA

The "BWC Wind Farm Power Programme of Activities in Viet Nam" (later on referred to as "PoA") will support the development of new wind farm power projects throughout Viet Nam that supply electricity to the Viet Nam National Electricity Grid (later on referred to as "the grid"). Each Component Project Activity (referred to later on as "CPA") under this PoA will comprise one or more such wind power plants that meets the criteria of applicable methodology ACM0002.

Prior to the implementation of the proposed PoA, the electricity that will be supplied by the CPAs under this PoA would have otherwise been generated by the operation of grid-connected power plants and by the addition of other new generation sources. The CPAs under this PoA will utilize the wind power to generate electricity supplied to the grid to replace partly power generation by fossil fuel thermal plants in entire country[1] and will therefore result in a reduction in greenhouse gas (GHG) emissions.

1. General operating and implementing framework of PoA

The PoA is operated and implemented by Blue World Vietnam Co., Ltd. (hereinafter referred to as BWC). BWC is the "Coordinating / Managing Entity" (hereinafter referred to as CME). The wind farm power plants developed under this PoA shall be addressed as Component Project Activities (CPA(s)) and the plant implementer(s) shall be addressed as "CPA implementer(s)" for this PoA.

BWC will take the following steps for the PoA implementation:
Step 1: Collect information of Project Activities.
Step 2: Scrutinize information regarding eligibility as CDM Program Activity as per Section I.B.2.
Step 3: Listing eligible CPAs.
Step 4: Propose DOE to check for the consistency of these CPAs.
Step 5: Inclusion of the eligible CPA(s) under PoA, as per the consistency check by DOE.
Step 6: Report on Monitoring Instruments & System to be installed at Project Site as per the Section E.7.2

[1] According to Viet Nam Seventh Master Plan for the period 2011-2020, outlook to 2030 approved by the Prime Minister in the Decision No. 1208/QD-TTg dated 21/07/2011, Viet Nam needs the power generation increased from 194 to 210 Bil. kWh in 2015; from 330 to 362 Bil. KWh in 2020 and from 695 to 834 Bil. KWh in 2030 to meet expected growth in electricity demand. All sources of power are being encouraged, including fossil fuel thermal, renewable and nuclear power generation. However, the majority of Viet Nam capacitys expansion is set to come from fossil fuels. Until 2020, shares of power sources in terms of electricity yield are still highly at 70.8% for fossil fuel thermal power.

Step 7: Undertaking periodic verification by engaging DOE.

BWC will work with wind farm power plant developers to promote and support wind farm power plant project activities in a way to reduce greenhouse gas emissions. Periodically the CME will include an undefined number of project activities in the programme.

2. Policy/measure or stated goal of the PoA

The main objective of the PoA is to contribute to the development and promotion of grid connected wind farms, by building a framework to secure carbon revenue for those projects that need additional income from CERs for its implementation because they are economically or financially unattractive or because they face institutional, financial and structural barriers. These barriers were identified at several recent presentations and workshops and in interviews with potential investors. Some of them have been mentioned below[2]:

- *Market barrier*: lack of reliable information on wind energy potential.
- *Economic and financial barriers*:
  - High production cost:
    Electricity from wind energy has become more costly over the last few years due to the rapid increase in material costs for wind turbine manufacture and there is an imbalance between wind turbine demand and supply; strong global demand is not matched by a corresponding expansion in supply.
  - Initial investment cost is relatively high: Specific investment costs fall in the range of USD 1,800 – 2, 000 per kW.
  - And difficult access to financial resources: Limited finance is available from international financial institutions and is granted depending on the project's feasibility. For substantial credit, a government guarantee is needed. Local commercial banks are quite small and a single bank is not able to supply sufficient finance for a wind power project. Furthermore, most domestic banks lack experience in assessing and appraising Renewable Energy (RE) projects.
- *Technical barrier*: lack of qualified personnel/businesses; undeveloped infrastructure; no indigenous technologies.
- *Institutional barrier*: no planning is available, lack of coordination; inadequate policies and mechanism to support wind energy.

By means of additional incomes, the PoA aims to increase the feasibility of such wind energy projects which otherwise would not be feasible. All CPAs within the PoA will consist of wind energy facilities. By replacing electricity from fossil fuel based power plants, this project will directly contribute to reduce greenhouse gas (GHG) emissions. The proposed PoA will improve the energy use in Viet Nam avoiding the use of fossil fuels and hence, promoting the sustainable development.

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

The PoA is a voluntary action and the CME is not in any way enforced to accomplish its objectives. There are currently no laws or regulations in place in Viet Nam that mandate wind power plant projects to seek CDM services. Likewise, no mandatory laws or regulations exist requiring the CME or any other party to develop a PoA for development of wind power plants in Viet Nam.

The contribution of the PoA to sustainable development in the country is as determined by the sustainable development criteria of Vietnam DNA[3] as follows:

[2] "Information on wind energy of Vietnam", GIZ/MoIT Wind Energy Project, 04/2011.
[3] http://www.noccop.org.vn/images/article/Viet%20Nam%20CDM%20Pipeline_a43.pdf

Environment:
The PoA is expected to have un-significant impact to the environment[4]. The CPAs under the PoA utilizes wind potential energy for power generation. The CPA, which is a zero emission electricity generation, will reduce GHG emissions produced from fossil based power generation.

Social:
Short term impact to the CPAs under this PoA is the creation of employment in the project area for either skilled or unskilled laborers during the construction of the project. Meanwhile, long term impact to local community is the benefit for obtaining access of electricity. Availability of electricity in the region will promote the development of rural industries. This will in turn result in the development of infrastructure leading to rural economy development. The presence of the CPAs under this PoA will have a positive impact to the local employees with regard to transfer technology and operation and maintenance of power plant through the training.

Economy:
The development of the CPAs under the PoA will invite other investments to the region in line with the people need around the project area. As a result, more rural industries such as shops and food stalls are encouraged to set up contributing to the improvement of the rural economy.

A.3. CMEs and participants of PoA
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1. Coordinating or managing entity of PoA as the entity which communicates with the Board.
2. Project participants being registered in relation to the PoA: (Project participants may or may not be involved in one of the CPAs related to the PoA).

- Blue World Vietnam Co., Ltd. (BWC) is a private company, the Coordinating or Managing Entity (CME) and participant of PoA.
- Blue World Carbon SEA Pte Ltd is a private company and participant of the PoA.

A.4. Party(ies)

Name of Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Viet Nam (host)	Private Entity: Blue World Vietnam Co., Ltd.	No
Netherlands	Private entity: Blue World Carbon SEA Pte Ltd	No

A.5. Physical/ Geographical boundary of the PoA
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The PoA will be implemented within the geographical boundaries of Viet Nam (see figure A.5.1.1).

National and sectoral policies in the relevant sector are the same within the geographical boundaries of Viet Nam. With regard to this PoA there is no difference in the national or sectoral policies between regions or provinces.

[4] http://www.windenergy.org.vn/index.php?page=overview

Figure A.5.1.1 Map of Viet Nam

A.6. Technologies/measures

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A typical CPA (that will be included in this PoA) will involve the installation of a new (Greenfield) wind power project and may include one or more individual project sites in Viet Nam[5]. The project activity in a CPA of this PoA includes the following technology measures (type):

A typical CPA under the PoA comprises one or more grid-connected wind power generation project activities that install a new wind power plant at a site where no wind power plant was operated prior to the implementation of the project activity (Greenfield plant). The electricity generated will be supplied to the electricity to the Viet Nam National Electricity Grid that is the unique electricity network in Viet Nam.

[5] The DNA of Viet Nam or the CME of the PoA does not have specific requirements regarding the installed capacity of the CPAs under this PoA. Moreover, currently there is only one operating wind farm (Ref. No. 2228) in Viet Nam with the installed capacity of 30 MW. Hence, it is unlikely to determine the *range* of installed capacity applied for future CPAs at the moment. The CPAs will be included in the PoA as long as they meet the eligibility criteria in the table I.B.2.1 and II.5.1 of PoA-DD.

A wind farm consists of a wind turbine or multiple wind turbines connected with each other to produce electricity. A wind turbine captures the kinetic energy of the wind to drive a generator located within the wind turbine where this energy is subsequently converted into electricity.

Presently the government of Vietnam is working on new mechanisms to support the development of CPA under the PoA are expected to operate under largely similar technology specific parameters. However, the investment climate for CPA may develop through policies and regulations issued by the government for the development of the power sector and/or wind sector.

Monitoring system
Each CPA will have proper monitoring equipment to monitor the quantity of net electricity supplied. Staff involved will be trained to properly operate the monitoring system. Detailed description of the monitoring system is provided in each CPA-DD.

The data of the operational and monitoring parameters will be collected by CPA implementer and forwarded to BWC. Data will be recorded electronically (kept for two years after the end of the crediting period) and recorded separately. The monitoring data will be printed periodically as a backup procedure.

A.7. Public funding of PoA
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No public funding is used to implement this Programme of activities (PoA). Furthermore the CME will ensure that, at the time of inclusion of CPA, there is no public funding from Annex - I parties received. This can be confirmed through mandate / declaration given by CPA implementer to CME. In case public funding is received for CPA, an affirmation will be provided that such funding does not result in a diversion of Official Development Assistance (ODA).

SECTION B. Demonstration of additionality and development of eligibility criteria
B.1. Demonstration of additionality for PoA
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None of the CPA that is implemented under the PoA would occur due to the investment barrier that prevents the CPA from being established, without CDM. The existence of the investment analysis will be demonstrated for each CPA individually at CPA level.

B.2. Eligibility criteria for inclusion of a CPA in the PoA
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The CME has all competencies to check the features of potential CPAs and ensure that each CPA meets all requirements and eligibility criteria (as tabulated below) before inclusion in the registered PoA. The relevant documents for the compliance of paragraph 16 (for development and implementation of management system) annex 05 of EB 70 has been provided to the DOE for validation.

Each of the CPA to be included in the proposed PoA shall meet the following applicable eligibility criteria (considering paragraph 16, annex 05 of EB 70) in **table I.B.2.1**:

In order for a CPA to enrol in this PoA, the following conditions are to be met:

Table I.B.2.1 – Eligibility criteria for a CPA to enrol in the PoA according to Annex 05 of EB 70

Nr.	Eligibility criteria description
(a)	The CPA shall be located within the geographical territory of Viet Nam.
(b)	Confirmation that the CPA is not registered or being registered as a stand-alone CDM project outside of this PoA, a bundled CDM Project Activity or another registered PoA. The CPA shall not lead to double counting of emission reductions or other emission trading

Nr.	Eligibility criteria description
	schemes.
(c)	The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications;
(d)	The start date of the CPA shall be confirmed to be on or after the start date of the PoA (as the date of publication of the PoA-DD for global stakeholders consultation, i.e.**13/06/2012**)
(e)	The CPAs shall meet the applicability and other requirements of the methodology ACM0002, version 13.0.0
(f)	Demonstrate the compliance with the additionality requirements stated on section D.5 of each CPA-DD using the methodological tool "Tool for the demonstration and assessment of additionality" (Version 06.1.0).
(g)	The CPA shall conduct a local stakeholder consultation and Environmental Analysis (if mandated by law) at CPA level. This shall be carried out prior to the inclusion.
(h)	Confirmation on involvement of public funding or ODA from Annex I Parties in CPA.
(i)	The plant must be connected to Viet Nam National Electricity Grid.
(j)	Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys;
(k)	Where applicable, the conditions that ensure that every CPA in aggregate meets the small-scale or microscale threshold criteria[6] and remains within those thresholds throughout the crediting period of the CPA;
(l)	Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories.
(m)	The CPA implementer is aware of its participation in the PoA and has provided a declaration to confirm/accept relevant terms and conditions in relation to inclusion in the PoA
(n)	The CPA implementer shall be duly registered by the Vietnamese authorities prior to inclusion
(o)	The CPA shall be in conformance to statutory requirements of Viet Nam.
(p)	Confirmation on the crediting period of the CPA which shall not exceed the length of the PoA (28 years) regardless of the time of inclusion of CPA in the PoA
(q)	Energy generating equipment is not transferred from another activity
(r)	When establishing the baseline scenario, project participants shall take into account the national and/or sectoral policies which increase GHG emissions (also referred to as type E+) and which decrease GHG emissions (also referred to as type E-). The impact of these policies shall be assessed and addressed in accordance with the relevant guidance provided in the Project Standard for such national and/or sectoral policies.
(s)	The CPA shall be a greenfield on shore or off shore wind power plant (new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity).
(t)	The plant shall be a newly built plant and must not involve capacity addition, retrofitting or modifying of an existing facility for renewable energy generation.
As per ACM0002 version 13.0.0*: in addition to the requirements set out in the latest approved version of the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities", the following shall be applied for the use of this methodology in a project activity under a programme of activities (PoAs)*:	
(1)	The CME shall describe transparently and justify in the CDM-PoA-DD which CPAs are regarded to be of the same type. CPAs shall not be regarded to be of the same type if one of the following conditions is different:

[6] Please refer to the latest approved version of the Guidelines for demonstrating additionality of microscale project activities and the latest approved version of the General Guidelines to SSC CDM methodologies".

Nr.	Eligibility criteria description
	(a) The project activity with regard to any of the following aspects: (i) Renewable power generation technology; • Hydro-power plant/unit; o Run-of-river reservoir; o Accumulation reservoir; • Wind power plant/unit; • Geothermal power plant/unit; • Solar power plant/unit; o Photovoltaic; o Heat concentration; • Wave power plant/unit; • Tidal power plant/unit; • Combination of any of the above; (ii) Project activity type: • Greenfield; • Capacity addition; • Retrofit of existing plants; • Replacement of existing plants; (b) The legal and regulatory framework; • Legal regulations; • Promotional policies.
(2)	When defining eligibility criteria for CPA inclusion for a distinct type of CPAs, the CME shall consider relevant technical and economic parameters, such as: (a) Technical and economic parameters that are technology specific (e.g. ranges of load factors, sizes of installation, wind speed) (b) Parameters reflecting the investment climate: (i) Subsidies or other financial flows; (ii) Tariffs; (iii) Depreciation; (iv) Power purchase agreements; (v) Other parameters determining market circumstances; (c) Ranges of costs (capital investment, operating and maintenance costs, etc.) and revenues (income from electricity sale, subsidies/fiscal incentives, ODA).

B.3. Application of methodologies

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The approved baseline and monitoring methodology applied to a CPA included in this PoA is:

ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources";
Version 13.0.0, EB 67.
Sectoral Scope: 01.

The methodology can be viewed by accessing the following link:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved

The methodology draws upon related tools:

- Combined tool to identify the baseline scenario and demonstrate additionality,
- Tool for the demonstration and assessment of additionality,
- Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion,
- Tool to calculate the emission factor for an electricity system.

For more information on the baseline and monitoring methodology we refer to the UNFCCC website:
http://cdm.unfccc.int/methodologies/DB/C505BVV9P8VSNNV3LTK1BP3OR24Y5L

For CPAs, the tools below will be applied:

- Tool for the demonstration and assessment of additionality, version 06.1.0
- Tool to calculate the emission factor for an electricity system, version 02.2.1

The methodology ACM0002 Version 13.0.0 is applicable for CPAs in this PoA under the following conditions:

Table I.B.3.1 Applicability conditions of methodology ACM0002

Applicability Conditions	CPA Status	Source(s)
1. *This methodology is applicable to grid-connected renewable power generation project activities that* *(a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant);* *(b) involve a capacity addition;* *(c) involve a retrofit of (an) existing plant(s); or* *(d) involve a replacement of (an) existing plant(s).*	Applicable. Each generic CPA will be a grid-connected renewable power generation project activity : (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);	One of the following documents could be used: ▪ Feasibility Study Report or ▪ Relevant documents (FSR's approval, technical bidding documents, etc.)
2. *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*	Applicable Each CPA is the installation of single or multiple wind farms power plant.	One of the following documents could be used: ▪ Feasibility Study

an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.		Report or ▪ Relevant documents (FSR's approval, technical bidding documents, etc.)
3. In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2 on page 10 to calculate the parameter $EG_{PJ,y}$): 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 expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	Not applicable. CPAs are the new wind farm power plants.	N/A
4. In case of hydro power plants. one of the following conditions must apply: • *The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or* • *The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of 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* • *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/m2.*	Not applicable. CPAs are single or multiple wind farms power plants, not hydropower plants.	N/A
5. 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 all of the following conditions	Not applicable. CPAs are single or multiple wind farms power plants, not hydropower plants.	N/A

must apply: o *The power density calculated for the entire project activity using equation 5 is greater than 4 W/m^2;* o *Multiple reservoirs and hydro power plants are located at the same river and where are designed together to function as an integrated project[7] that collectively constitutes the generation capacity of the combined power plant;* o *Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity;* o *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;* o *Total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than 4 W/m^2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.*		
6. *The methodology is not applicable to the following:* o *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;* o *Biomass fired power plants;* o *A hydro power plant that results in the creation of a new single reservoir or in the*	Not applicable. The CPAs will not involve switching from fossil fuels to renewable energy sources at the site of the project activity, or biomass fired power plants or a hydro power plant.	N/A

[7] *This requirement can be demonstrated, for example: (i) by the fact that water flow from upstream power units spilling directly to the downstream reservoir; or (ii) through the analysis of the water balance. Water balance is the mass balance of water fed to power units, with all possible combinations of multiple reservoirs and without the construction of reservoirs. The purpose of such water balance is to demonstrate the requirement of specific combination of multiple reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum three years prior to implementation of CDM project activity.*

increase in an existing single reservoir where the power density of the reservoir is less than 4 W/m2;		
7. *In the case of retrofits, replacements, or capacity additions, the methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "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".*	Not applicable. The CPAs will build newly single or multiple wind farms power plants.	N/A
In addition, the applicability conditions included in the tools referred to above apply. Tools below would be applied for CPAs: • "Tool to calculate the emission factor for an electricity system"; version 02.2.1: *(i) This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).* *(ii) In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex-I country.* • "Tool for the demonstration and assessment of additionality", version 06.1.0: *Applicable geographical area covers the entire host country as a default; if the technology applied in the project is not country specific, then the applicable geographical area should be extended to other countries. Project participants may provide justification that the applicable geographical area is smaller than the host country for*	The CPAs under this PoA will incorporate this requirement in its applicability conditions: • CPAs of the PoA shall calculate the combined margin emission factor for the grid which the CPAs is connected to at the time of inclusion and that emission factor shall be fixed ex-ante for the CPA. The EF of Vietnamese National Electricity Grid (Grid Company) applied for CPAs under this PoA will be the value that is published officially by DNA Viet Nam available at the time to inclusion. The EF will be qualified step by step based on the "Tool to calculate the emission factor for an electricity system". The details of EF calculation shown how the conditions of the tool would have been met will be presented in Appendix 4 of each specific CPA-DD. Information about the calculation of the emission factor will be presented in section in the specific-CPA-DD. The calculation of the emission factor is explained in appendix 4 of this PoA-DD. (i) The CPAs are the installation of new wind power plant supplying electricity to the Grid. (ii) The CPA electricity system is located in a non-Annex I country – Viet Nam. • "Tool for the demonstration and assessment of additionality", version 06.1.0 will be applied following the step-wise approach in D.5 section of each specific CPA-DD. The CPAs under this PoA will be located in Viet Nam as a default.	

technologies that vary considerably from location to location depending on local conditions. *This tool provides for a step-wise approach to demonstrate and assess additionality. These steps include:* *a) Identification of alternatives to the project activity;* *b) Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible;* *c) Barriers analysis; and* d) *Common practice analysis.*	

SECTION C. Management system

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The CME in their management system has all competencies to check the features of potential CPAs and ensure that each CPA meets all requirements and eligibility criteria before inclusion in the registered PoA. The relevant documents for the compliance of para 19 (for development and implementation of management system) annex 5 of EB 70 has been provided to the DOE for validation.

i) **A clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies;**

As its operation and management plan the CME establish and maintain an electronic database that containing information of all the CPA's in the programme. Details of the operation and monitoring plan are as follows:

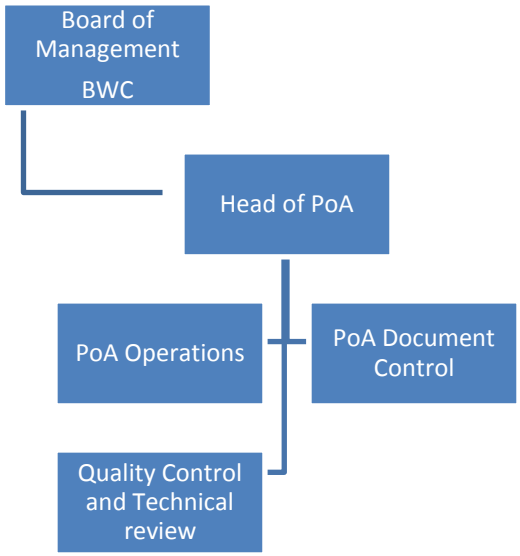


Figure C.1 - CME organisation chart for PoA Management and development

Based on the above defined chart the roles and responsibilities can be defined as shown in the table C.1:

Table– C.1 - CME organisation roles and responsibilities

Department	Management Responsibilities and Arrangements
Board of Management	▪ Registration of the PoA ▪ Implementation of the Program objectives ▪ Ensuring proper overall management of the PoA ▪ CER issuance
Head of the PoA	▪ Program operation as per CDM guidelines and board of management strategy. ▪ Proper and timely validation of the PoA ▪ Review of program compliance as per guidelines ▪ Awareness creation and promotion of the PoA ▪ Ensuring proper CDM project operation and management as per required guidelines and board of management strategy throughout the crediting period.
PoA Operations	This department has two main objectives: securitizing and preparation of documentation for initial inclusion of a CPA and monitoring and verification of included CPAs. (Pre) inclusion activities: ▪ Review of CPA compliance as per guidelines ▪ Identification of CPA ▪ Listing of eligible CPA's ▪ CPA-DD and PoA-DD Development ▪ Investment analysis for CPA's ▪ Ensure verification of CPAs ▪ Inclusion of eligible CPAs under PoA Validation and verification activities: ▪ Validation and verification support to CPA implementer throughout the crediting period. ▪ Preparation of monitoring report for Emission Reduction ▪ Monitoring and record keeping of monitoring parameters. ▪ Review and improvement suggestions of monitoring system and plan ▪ Monitoring Support to CPA implementers
PoA Document Control	▪ Collecting information and documentation of the CPA ▪ Collection and scrutiny of all documents related to the eligibility criteria of CPA inclusion ▪ Focal point for CPA Implementers ▪ Collection of necessary statutory approvals from CPA implementers ▪ General document control
Quality Control and Technical review	▪ Internal quality audit, ▪ Process and continuous improvement proposal reporting to stakeholders and management. ▪ Quality control of supporting documents and site information ▪ Technical review of the CPA-DD documentation.

Information regarding the assignment of roles on organizational level, as well as procedures and documentation to review the competences of staff involved in the CPA inclusion and PoA development process will be forwarded to the DOE at time of validation of the PoA and CPA inclusion.

ii) **Records of arrangements for training and capacity development for personnel;**

The CME will maintain and provide the DOE with a record of past training and a plan for the training and capacity development of its personnel at time of validation of the PoA-DD.

iii) **Procedures for technical review of inclusion of CPAs;**

A technical review procedure and associated forms have been developed. These are provided to the DOE for assessment during validation of the PoA-DD and at time of validation of CPA inclusion.

iv) **A procedure to avoid double counting**

The CME will confirm as per EB 70 Annex 5, that the Project activities included in the CPA is not registered in any other CPA of the PoA or any other registered CDM Project activity through following procedure to avoid double counting of CPA under any other CDM or PoA activities.

1. At time of CPA eligibility check, CME will seek confirmation in CPA and also check any- double counting using public information sources like UNFCCC website d.

2. The CME will maintain a record with the unique identification information that is publicly available.

Furthermore at the time of inclusion the CME is taking a declaration from the CPA implementer (as a part of mandate) as below:

Mandate by CPA operators shall state that "there is no double counting of CERs from this CPA under any CDM Project or CPA in another PoA or potential double counting by using other GHG trading schemes".

v) **Records and documentation control process for each CPA under the PoA;**

In order to unambiguously identify CPA participating in the PoA a serial numbering system will be implemented that uniquely identifies each CPA through numbers for the CPA and the CPA implementer. This serial numbering system will be used to record baseline and monitoring data on a continuous basis using a database. In this way, the PoA CME will be able to track the emission reduction of each CPA over the full duration of the crediting period.

In summary, BWC will record and document CPA detail information as follows:

- CPA Identification number
- Name of the CPA and its production capacity
- The name, address, and CPA implementer details of each participating CPA
- The geographical coordinates of each CPA
- The record of technical specification of CPA participating in the PoA

BWC will be responsible for the management of records and data associated with each CPA. The database will be updated manually using the data supplied by the participating CPA. It will form the basis for the verification of CPAs and be available for inspection by the DOE at any point in time.

The record keeping will be carried out by using the field instruments, hardware and software installed at every project site and/or manual data recording in the log book. The captured data will be stored by the CME, which will have provision to archive the data as per individual CPAs. Each CPA implementer will carry out a periodic analysis (quarterly) of data for the individual Project. In case of any anomalies identified during the review by the CPA implementer, appropriate corrective actions will be taken.

vi) **Measures for continuous improvements of the PoA management system;**
Measures for the continuous improvement of the PoA management system are described in the designated CME Management System Manual that is available during validation of the PoA-DD and provided to the DOE for assessment at time of CPA Inclusion validation.

vii) **Any other relevant elements.**

To ensure that the CPA Implementers are aware and have agreed that their activity is being subscribed to the PoA the following provisions are provided:

The CPA implementer will provide the mandate to CME stating that, they are aware and have agreed that their activity is subscribed to the PoA. The CPA implementer has to give a declaration to CME that the CPA is not a de-bundled component of large scale Project.

SECTION D. Duration of PoA

D.1. Start date of PoA

>>
The start date of the PoA is13/06/2012. The start date of the PoA is determined as the date of publication of the PoA-DD for global stakeholder consultation.

D.2. Duration of the PoA

>>
The duration of tthis PoA is 28 years.

SECTION E. Environmental impacts

E.1. Level at which environmental analysis is undertaken

>>
The Environmental Analysis would be carried out at the CPA level.

Based on Environmental Law 2005, all projects are required to get the Environmental Impact Assessment Approval from local authorities separately. Hence, performing the environmental analysis at CPA level is appropriate.

E.2. Analysis of the environmental impacts

>>
Not applicable.

Due to the nature of the individual CPA (depending on the location, size, and design). The impacts are confined to each CPA and all CPAs must follow all regulations under the Vietnamese Law which will guarantee the environmental integrity of each CPA at the time of inclusion.

This analysis shall be carried out at CPA level, and a summary included in the CPA-DD.

E.3. Environmental impact assessment

>>

Not applicable.

This assessment shall be carried out at CPA level, and a summary included in the CPA-DD.

SECTION F. Local stakeholder comments

F.1. Solicitation of comments from local stakeholders

>>

Local stakeholder consultation is done at CPA level. Local and focalized impacts of each wind farm power project justify a local stakeholder consultation at CPA level.
This is considered appropriate since the stakeholder associated with the different CPAs in different locations in Viet Nam would be specific to each CPA to get overall comments on developing this PoA from stakeholders.

F.2. Summary of comments received
>>
Not applicable.
This will be addressed at the individual CPA-DD level.

F.3. Report on consideration of comments received
>>
Not applicable.
The stakeholder consultation will be on CPA level.

SECTION G. Approval and authorization
>>
Letters of approval from Parties wishing to be involved in the PoA have been obtained. The letter of approval from the DNA of Viet Nam was issued on 28/08/2012. The letter of approval from the DNA of the Netherlands was issued on 25/09/2012.

(a) **Parties involved in the proposed PoA**

The following parties are involved in the PoA:

1. Viet Nam (host)
2. Netherlands

It is envisaged that other countries may be added to the Program in terms of the provisions of EB 70 Annex 5 Paragraph 23.

(b) **CME letters of authorization of its coordination of the PoA from each Party**

The DNA of Host Party Viet Nam has authorized "Blue World Vietnam Co., Ltd." (BWC) as the coordinating/managing entity (CME) of the "BWC Wind Farm Power Programme of Activities in Viet Nam" through the letter of approval that was issued by the DNA of Viet Nam on 28/08/2012. The DNA of annex 1 party i.e. The Netherlands has authorised the participation of "Blue World Carbon SEA Pte Ltd" in the letter of approval issued on 25/09/2012.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA
A.1. Purpose and general description of generic CPAs
>>
The purpose of each generic CPA is to generate electricity by using wind energy as a renewable source and exporting the GHG free emissions electricity to the national electricity grid available at the geographical area of the project site. This technology/measure allows satisfying part of the growing electricity demand of the host country and reduces GHG emissions produced by the fossil fuel based power plants of the grid. Each generic CPA is involved:

1. the installation of single new grid connected wind farm at a site where no wind farm was operated prior to the implementation of the activity; or

2. the installation of multiple grid connected wind farms at various sites where no wind farm has been operated prior to the implementation of the activities;

The CPA will contribute to climate change mitigation efforts through the reduction of Green House Gases (GHG) emissions through displacement from of more carbon intensive power generation in the grid.

SECTION B. Application of a baseline and monitoring methodology

B.1. Reference of the approved baseline and monitoring methodology(ies) selected

>>

The approved baseline and monitoring methodology applied to a CPA included in this PoA is: "Consolidated baseline methodology for grid-connected electricity generation form renewable sources", ACM0002; Version 13.0.0, EB 67, Sectoral Scope 01.

Reference to the approved baseline and monitoring methodologies:
http://cdm.unfccc.int/methodologies/PAmethodologies/approved

The methodology draws upon related tools:

- Combined tool to identify the baseline scenario and demonstrate additionality
- Tool for the demonstration and assessment of additionality
- Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion
- Tool to calculate the emission factor for an electricity system.

The CPAs under this PoA also refer to the latest approved versions of the following tools:

- "Tool to calculate the emission factor for an electricity system" , version 02.2.1
- "Tool for the demonstration and assessment of additionality" , version 06.1.0

Reference to the applied Methodological Tools:

http://cdm.unfccc.int/methodologies/PAmethodologies/tools/

B.2. Application of methodology(ies)

>>

The methodology ACM0002 Version 13.0.0 is applicable for CPAs in this PoA under the following conditions:

Table II.B.2.1: Applicability conditions of methodology ACM0002

Applicability Conditions	CPA Status	Source(s)
1. *This methodology is applicable to grid-connected renewable power generation project activities that* *(a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant);* *(b) involve a capacity addition;* *(c) involve a retrofit of (an) existing plant(s); or* *(d) involve a replacement of (an) existing plant(s).*	Each generic CPA will be a grid-connected renewable power generation project activity : (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);	One of the following documents could be used: ▪ Feasibility Study Report or ▪ Relevant documents (FSR's approval, technical bidding

		documents, etc.)
2. *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.*	Each CPA is the installation of single or multiple wind farms power plant.	One of the following documents could be used: ▪ Feasibility Study Report or ▪ Relevant documents (FSR's approval, technical bidding documents, etc.)
3. *In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use option 2 on page 10 to calculate the parameter $EG_{PJ,y}$): 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 expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity*	Not applicable. CPAs are the new wind farm power plants.	N/A
4. *In case of hydro power plants. one of the following conditions must apply:* • *The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or* • *The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of 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* • *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/m2.*	Not applicable. CPAs are single or multiple wind farms power plants, not hydropower plants.	N/A
5. *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 all of the following conditions must apply:* o *The power density calculated for the entire*	Not applicable. CPAs are single or multiple wind farms power plants, not hydropower plants.	N/A

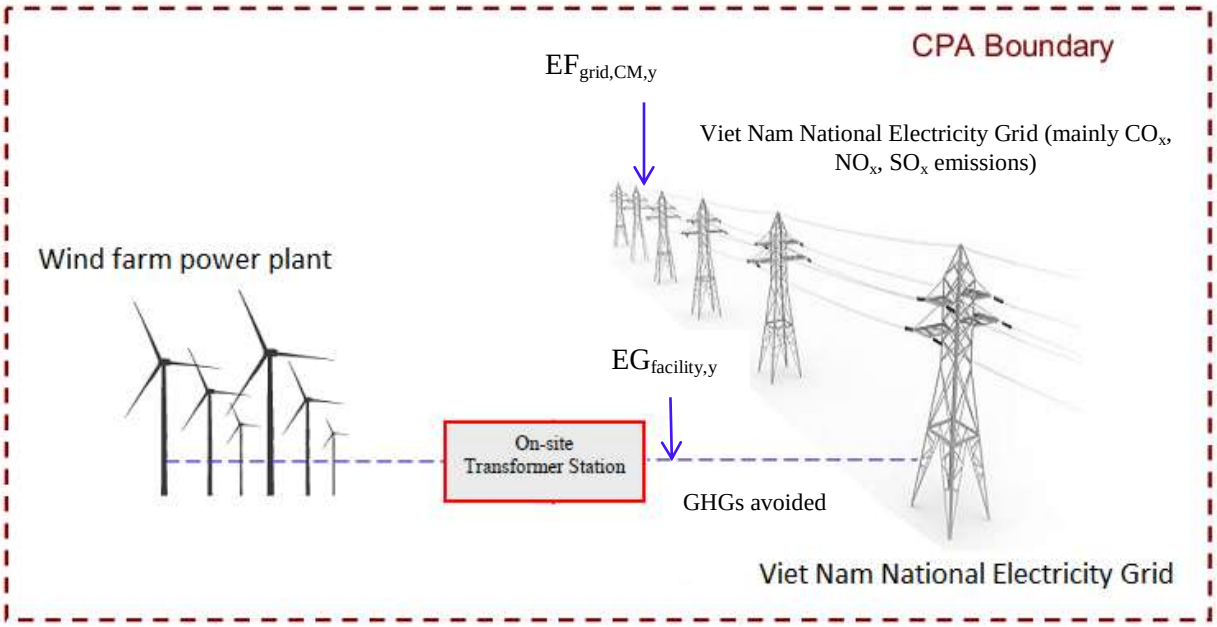
project activity using equation 5 is greater than 4 W/m^2; o *Multiple reservoirs and hydro power plants are located at the same river and where are designed together to function as an integrated project [8] that collectively constitutes the generation capacity of the combined power plant;* o *Water flow between multiple reservoirs is not used by any other hydropower unit which is not a part of the project activity;* o *Total installed capacity of the power units, which are driven using water from the reservoirs with a power density lower than 4 W/m2, is lower than 15MW;* o *The total installed capacity of the power units, which are driven using water from reservoirs with a power density lower than 4 W/m2, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.*		
6. *The methodology is not applicable to the following:* o *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;* o *Biomass fired power plants;* o *A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the reservoir is less than 4 W/m2;*	Not applicable. The CPAs will not involve switching from fossil fuels to renewable energy sources at the site of the project activity, or biomass fired power plants or a hydro power plant.	N/A
7. *In the case of retrofits, replacements, or capacity additions, the methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "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".*	Not applicable. The CPAs will build newly single or multiple wind farms power plants.	N/A
In addition, the applicability conditions included in the tools referred to above apply. Tools below would be applied for CPAs: • "Tool to calculate the emission factor for an	The CPAs under this PoA will incorporate this requirement in its applicability conditions:	

[8] *This requirement can be demonstrated, for example: (i) by the fact that water flow from upstream power units spilling directly to the downstream reservoir; or (ii) through the analysis of the water balance. Water balance is the mass balance of water fed to power units, with all possible combinations of multiple reservoirs and without the construction of reservoirs. The purpose of such water balance is to demonstrate the requirement of specific combination of multiple reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum three years prior to implementation of CDM project activity.*

electricity system"; *(i) This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).* *(ii) In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex-I country.* • "Tool for the demonstration and assessment of additionality". *Applicable geographical area covers the entire host country as a default; if the technology applied in the project is not country specific, then the applicable geographical area should be extended to other countries. Project participants may provide justification that the applicable geographical area is smaller than the host country for technologies that vary considerably from location to location.* *This tool provides for a step-wise approach to demonstrate and assess additionality. These steps include:* *a) Identification of alternatives to the project activity;* *b) Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible;* *c) Barriers analysis; and* *d) Common practice analysis.*	• CPAs of the PoA shall calculate the combined margin emission factor for the grid which the CPAs is connected to at the time of inclusion and that emission factor shall be fixed ex-ante for the CPA. The EF of Vietnamese National Electricity Grid (Grid Company) applied for CPAs under this PoA will be the value that is published officially by DNA Viet Nam available at the time to inclusion. This EF will be qualified step by step based on the "Tool to calculate the emission factor for an electricity system". The details of EF calculation shown how the conditions of the tool would have been met will be presented in Appendix 4 of each specific CPA-DD. **(i)** The CPAs are the installation of new wind power plant supplying electricity to the Grid. **(ii)** The CPA electricity system is located in a non-Annex I country – Viet Nam. • "Tool for the demonstration and assessment of additionality", version 06.1.0 will be applied following the step-wise approach in D.5 section of each specific CPA-DD. The CPAs under this PoA will be located in Viet Nam as a default.

B.3. Sources and GHGs

According to the Approved consolidated baseline and monitoring methodology ACM0002, Version 13.0.0, EB 67, 11/05/2012: "**Consolidated baseline methodology for grid-connected electricity generation from renewable sources**", the spatial extent of the CPA boundary includes the he project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to. Figure II.B.3.1 below shows the project flowchart and its boundaries.



Where:
$EG_{facility,y}$ (MWh/yr): Quantity of net electricity generation supplied by the CPA to the grid in year y
$EF_{grid,CM,y}$(tCO_2/MWh): Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of "Tool to calculate the emission factor for an electricity system".

Figure II.B.3.1 Description of the CPA boundary

Table II.B.3.1: Emissions sources included in or excluded from the CPA boundary

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the CPA	CO_2	Yes	Main emission source
		CH_4	No	Minor emission sources, excluded for simplification.
		N_2O	No	
Project scenario	GHGs emissions from electricity or fuel consumption in the CPA	CO_2	No	GHGs emissions for wind power generation projects are equal to zero.
		CH_4	No	
		N_2O	No	

B.4. Description of baseline scenario

>>

Based on ACM0002, version 13.0.0, EB 67, the baseline scenario of the CPAs which are the installation of new grid-connected renewable power plant/unit as 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".

Consideration of national and/or sectoral policies and circumstances in baseline scenarios based on Project Standard version 02.1 will be referred in table II.B.5.1 below and in specific CPA-DD.

B.5. Demonstration of eligibility for a generic CPA

>>

Table II.B.5.1 – Eligibility criteria for a CPA to enrol in the PoA according to Annex 05 of EB 70

Nr.	Eligibility criteria description	Information requirement	Eligibility check outcome (to be confirmed at CPA level by the CME)
(a)	The CPA shall be located within the geographical territory of Viet Nam.	One of the following documents shall be provided: ☐ Declaration from the CPA implementer confirm that the boundary of the implemented CPA is within the geographical territory of Viet Nam and including information regarding geographic reference (latitude and longitude), name and address of the CPA. ☐Investment license of each CPA issued by Vietnamese local authorities. ☐ The location of each CPA will be indicated in the approved FSR and/or the Approval of FSR by the local authorities ☐ The EIA's approval for each CPA	☐ Yes ☐ No
(b)	Confirmation that the CPA is not registered or being registered as a stand-alone CDM project outside of this PoA, a bundled CDM Project Activity or another registered PoA. The CPA shall not lead to double counting of emission reductions or other emission trading schemes.	One of the following document shall be provided: ☐ Declaration from the CPA Implementer confirming that the project is not registered or in the process of being registered as a stand-alone CDM project, outside of the PoA, a bundled CDM Project Activity or another registered PoA. And the CPA shall not lead to double counting of emission reductions or other emission trading schemes. And: ☐ Confirmation described in the CPA-DD that states that the project is not registered or in the process of being registered as a stand-alone CDM project, outside of the PoA. ☐ Confirmation check by reviewing the website of the UNFCCC/DNA or other relevant websites. ☐ Geographic coordinates information of each CPA	☐ Yes ☐ No
(c)	The specifications of technology/measure including the	Any following documents shall be provided:	☐ Yes

Nr.	Eligibility criteria description	Information requirement	Eligibility check outcome (to be confirmed at CPA level by the CME)
	level and type of service, performance specifications including compliance with testing/certifications;	☐ Performance guarantee for each CPA from technology/equipment providers, specifying specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications; ☐ Technical specification data sheets of each CPA from technology/equipment providers, specifying specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications; ☐ Feasibility Study / Project Proposal of each CPA that describes the project technology	☐ No
(d)	The start date of the CPA shall be confirmed to be on or after the start date of the PoA (as the date of publication of the PoA-DD for global stakeholders consultation, i.e. **13/06/2012**)	One of the following documents shall be provided: ☐ In case available, the earliest signed equipment or (sub) contractor agreement with a total contract value that is significant to the project activity (the date of signing the purchase order by CPA Implementer shall constitute the starting date of the CPA). ☐ Declaration of from the CPA Implementer that no contracts have been signed before the start date of the PoA (i.e. 13/06/2012)	☐ Yes ☐ No
(e)	The CPAs shall meet the applicability and other requirements of the methodology ACM0002, version 13.0.0	As described in section E.2 of the PoA DD, the CPA shall meet relevant requirement of the meth and the required document shall be supplied to the DOE at the time of inclusion. Applicability of the methodology shall be assessed at in the specific CPA-DD.	☐ Yes ☐ No
(f)	Demonstrate the compliance with the additionality requirements stated on section D.5 of each CPA-DD using the methodological tool "Tool for the demonstration and assessment of additionality" (Version 6.1.0).	Additionality must be assessed by the CME and relevant supporting documents provided by the CPA to the CME.	☐ Yes ☐ No

Nr.	Eligibility criteria description	Information requirement	Eligibility check outcome (to be confirmed at CPA level by the CME)
(g)	The CPA shall conduct a local stakeholder consultation and Environmental Analysis (if mandated by law) at CPA level. This shall be carried out prior to the inclusion.	One of the following document shall be provided: ☐ Meeting minutes and other related documents of the local stakeholder consultation. If law / regulations mandate environmental analysis: ☐ Copy of environmental analysis report of each CPA. If there is no law / regulation to mandate environmental analysis: ☐ Declaration from CPA implementer regarding applicable laws for the CPA and explanation why environmental analysis is not required.	☐ Yes ☐ No
(h)	Confirmation on involvement of public funding or ODA from Annex I Parties in CPA.	One of the following document shall be provided: ☐ Declaration from the CPA Implementer regarding the no involvement of public funding or ODA from Annex I Parties. And: ☐ Confirmation in the CPA-DD regarding no involvement of public funding or ODA from Annex I Parties. or: ☐ In case of public funding, an affirmation/ confirmation/declaration that such public funding does not result in diversion of ODA from Annex I Parties.	☐ Yes ☐ No
(i)	The plant must be connected to Viet Nam National Electricity Grid.	Any of the following documents shall be provided: ☐ Feasibility Study / Project Proposal of each CPA that describes the project technology. ☐ In case available, the connection agreement between the grid company and CPA implementers.	☐ Yes ☐ No
(j)	Where applicable, the conditions related to sampling requirements	Not applicable (NA) for this PoA	NA

Nr.	Eligibility criteria description	Information requirement	Eligibility check outcome (to be confirmed at CPA level by the CME)
	for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys;		
(k)	Where applicable, the conditions that ensure that every CPA in aggregate meets the small-scale or microscale threshold criteria[9] and remains within those thresholds throughout the crediting period of the CPA;	Not applicable since this PoA is not applying a small scale methodology.	NA
(l)	Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories.[10]	Not applicable for this PoA	NA
The CPAs shall meet additional criteria as below in case relevant:			
(m)	The CPA implementer is aware of its participation in the PoA and has provided a declaration to confirm/accept relevant terms and conditions in relation to inclusion in the PoA	The following document shall be provided: ☐ Declaration from the CPA Implementer confirming its participation in the PoA and affirmation of relevant terms and conditions.	☐ Yes ☐ No
(n)	The CPA implementer shall be duly registered by the Vietnamese authorities prior to inclusion	The following document shall be provided: ☐ Business license of the CPA Implementer issued by Vietnamese local authorities.	☐ Yes ☐ No
(o)	The CPA shall be in conformance to statutory requirements of Viet Nam.	One of the following document shall be provided: ☐ Business license of the CPA Implementer issued by Vietnamese local authorities. ☐ The approval document of Environmental Impact Assessment (EIA) Report of each CPA by Vietnamese local authorities. ☐ The investment license of each CPA approved by Vietnamese local authorities.	☐ Yes ☐ No
(p)	Confirmation on the crediting period of the CPA which shall not exceed the length of the PoA (28 years) regardless of the time of inclusion of CPA in the PoA	Confirmation described in the CPA-DD that states that the crediting period of the CPA shall not exceed the length of the PoA.	☐ Yes ☐ No

[9] Please refer to the latest approved version of the Guidelines for demonstrating additionality of microscale project activities and the latest approved version of the General Guidelines to SSC CDM methodologies".

[10] Please refer to the latest approved version of the "Guidelines on assessment of debundling for SSC project activities.

Nr.	Eligibility criteria description	Information requirement	Eligibility check outcome (to be confirmed at CPA level by the CME)
(q)	Energy generating equipment is not transferred from another activity	The following document shall be provided ☐ Confirmation letter from CPA implementer that the energy generating equipment is new and has not been transferred from another activity.	☐ Yes ☐ No
(r)	When establishing the baseline scenario, project participants shall take into account the national and/or sectoral policies which increase GHG emissions (also referred to as type E+) and which decrease GHG emissions (also referred to as type E-). The impact of these policies shall be assessed and addressed in accordance with the relevant guidance provided in the Project Standard for such national and/or sectoral policies.	☐ Verifiable literature review prepared by the CME or credible third party (e.g. government agency, Non-Government Organizations, law firms) to take into account the national and/or sectoral policies which increase GHG emissions (also referred to as type E+) and which decrease GHG emissions (also referred to as type E-). The impact of these policies shall be assessed and addressed in accordance with the relevant guidance provided in the Project Standard for such national and/or sectoral policies. And: ☐ Information described in the CPA-DD how the impact of these factors has been considered for the CPA.	☐ Yes ☐ No
(s)	The CPA shall be a greenfield on shore or off shore wind power plant (new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity).	Any of the following documents shall be provided: ☐ Feasibility Study / Project Proposal of each CPA that describes the project technology.	☐ Yes ☐ No
(t)	The plant shall be a newly built plant and must not involve capacity addition, retrofitting or modifying of an existing facility for renewable energy generation.	Any of the following documents shall be provided: ☐ Feasibility Study / Project Proposal of each CPA that describes the project technology.	☐ Yes ☐ No
As per ACM0002 version 13.0.0, page 11-13: *In addition to the requirements set out in the latest approved version of the "Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities", the following shall be applied for the use of this methodology in a project activity under a programme of activities (PoAs):*			
1	The CME shall describe transparently and justify in the CDM-PoA-DD which CPAs are	The PoA is only applicable to the CPA project scenario that is defined in section A.6, which is the	☐ Yes ☐ No

Nr.	Eligibility criteria description	Information requirement	Eligibility check outcome (to be confirmed at CPA level by the CME)
	regarded to be of the same type. CPAs shall not be regarded to be of the same type if one of the following conditions is different: (a) The project activity with regard to any of the following aspects: (i) Renewable power generation technology; • Hydro-power plant/unit; o Run-of-river reservoir; o Accumulation reservoir; • Wind power plant/unit; • Geothermal power plant/unit; • Solar power plant/unit; o Photovoltaic; o Heat concentration; • Wave power plant/unit; • Tidal power plant/unit; • Combination of any of the above; (ii) Project activity type: • Greenfield; • Capacity addition; • Retrofit of existing plants; • Replacement of existing plants; (b) The legal and regulatory framework; • Legal regulations; • Promotional policies.	installation of a greenfield grid-connected wind power plant. No other technologies are applicable for inclusion under this PoA. Hence, all CPAs are regarded to be of the same type (i.e. Greenfield wind power plant/unit). There is only legal and regulatory framework (including legal regulations and promotional policies) applying for this PoA. The below conditions shall be specify at CPA level: (i) Renewable power generation technology; ☐ Wind power plant/unit; ii) Project activity type: ☐ Greenfield; Any of the following documents shall be provided: ☐ Feasibility Study / Project Proposal of each CPA that describes the project technology. (b) Any of the following documents shall be provided: ☐ Verifiable literature review prepared by the CME to provide an overview of the legal regulations and promotion policies affecting the CPA and description. OR ☐ Documentary evidences regarding the legal regulations and promotion policies affecting the CPA from credible third party, e.g. law firms, non-government agency, government agency, etc.	
2	When defining eligibility criteria for CPA inclusion for a distinct type of CPAs, the CME shall consider relevant technical and economic parameters, such as:	As explained above, the CPAs under this PoA are considered to be of one type only, i.e new (greenfield) wind power plants and there is only one legal and	☐ Yes ☐ No

Nr.	Eligibility criteria description	Information requirement	Eligibility check outcome (to be confirmed at CPA level by the CME)
	(a) Technical and economic parameters that are technology specific (e.g. ranges of load factors, sizes of installation, wind speed) (b) Parameters reflecting the investment climate: (i) Subsidies or other financial flows; (ii) Tariffs; (iii) Depreciation; (iv) Power purchase agreements; (v) Other parameters determining market circumstances; (c) Ranges of costs (capital investment, operating and maintenance costs, etc.) and revenues (income from electricity sale, subsidies/fiscal incentives, ODA).	regulatory framework for this PoA. Hence, the following shall be considered: (a) Technical and economic parameters that are technology specific (e.g. ranges of load factors, sizes of installation, wind speed): has been considered in section I.A.6 of PoA-DD and A.5 of each CPA-DD. (b) Parameters reflecting the investment climate have been considered in investment analysis in section II.B.5 of PoA-DD and D.5 section of each CPA-DD. (c) Since all CPAs under this PoA are regarded to be of one type only, hence, ranges of costs (e.g. capital investment, operating and maintenance costs, etc.) and revenues (e.g. income from electricity sale) have been considered by demonstrate the compliance with the additionality requirements stated on II.B.5 (generic CPA-DD part) and section D.5 of each CPA-DD using the methodological tool "Tool for the demonstration and assessment of additionality" (Version 6.1.0).	

As per eligibility criteria defined in section I.B.2 of the PoA-DD, the CPA under this PoA shall demonstrate additionality based on the information provided in section II.B.5 of this PoA-DD (below).
The determination of additionality for a CPA under the present PoA shall be performed as presented below, in accordance with the methodological tool "Tool for the demonstration and assessment of additionality", version 06.1.0, EB 69.

The additionality tool provides a general stepwise framework for demonstrating and assessing additionality. These steps are:

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations
Step 2: Investment analysis
Step 3: Barrier analysis
Step 4: Common practice analysis
The application of the tool is as follows:

Step 1: Identification of Alternatives to the Project Activity Consistent with Current Laws and Regulations

Since the baseline scenario of CPAs is prescribed in the approved methodology (ACM0002, version 13.0.0), no further analysis of the credible and realistic alternatives is required (paragraph 115 of the Clean Development Mechanism Validation and Verification Standard (V.V.S), version 03.0.

Step 2: Investment Analysis
According to the relevant Tool it has to be determined whether the proposed project activity is not:

(a) The most economically or financially attractive; or

(b) Economically or financially feasible without the revenue from the sale of Certified Emission Reductions (CERs).

The BWC shall demonstrate that all activities in the proposed CPAs are not economically or financially feasible without the revenue from the sale of CERs using the following Sub-steps:

Sub-step 2a: Determine appropriate analysis method

Sub-step 2b: Apply simple cost analysis (Option I), investment comparison analysis (Option II) or benchmark analysis (Option III)

Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III)

Sub-step 2d: Sensitivity analysis (only applicable to Option II and III)

Sub-step 2a: Determine appropriate analysis method

It has to be determined whether to apply simple cost analysis (Option I), investment comparison analysis (Option II) or benchmark analysis (Option III).

All activities under the proposed CPAs will generate financial and economic benefits other than CER revenues, so the simple cost analysis (Option I) is not applicable. Following the paragraph 19 of the latest version (at the time of drafting of the PoA) of the "Guidelines on the assessment of investment analysis" (Version 05)[11] "*if the alternative to the project activity is the supply of electricity from a grid, this is not considered an investment and a benchmark approach is considered appropriate*" the benchmark analysis (Option III) shall be used.

Sub-step 2b: Apply benchmark analysis (Option III)

For the benchmark analysis, depend on specific financial circumstances of each CPA, the CPA implementer would select one of two options is equity IRR or Project IRR as the financial indicator compared with appropriate benchmark to determine the financial viability of the CPA.

☐ **Option 1: Equity IRR**

The equity IRR after tax shall be used to determine the project financial viability. An appropriate benchmark shall be determined at the time when a CPA is being added to the PoA and according to the requirements of the methodological tool "Tool for the demonstration and assessment of additionality" version 06.1.0, EB 69 and "Guidelines on the assessment of investment analysis", version 05.0.0, EB 62.

[11] http://cdm.unfccc.int/Reference/Guidclarif/reg/index.html

Benchmark selection:

Following the "Guidelines on the Assessment of Investment Analysis (Annex 5 of EB 62)" expected returns on equity are appropriate benchmark for an equity IRR. The guidance also argues that:
"*In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on parameters that are standard in the market."* And "*Requited/expected returns on equity are appropriate benchmark for an equity IRR".*

We refer to the appendix of the "Guidelines of the Assessment of Investment Analysis" (EB 62, Annex 5) and apply the default costs of equity of group 1 (including energy industries) of Viet Nam which is 12.75%. This cost of equity is expressed in real terms and therefore needs to be adjusted to represent the nominal terms as does the financial indicator. This is done by adjusting for the inflation at the time of the investment decision.

Without the availability of sufficient inflation targets/forecast as published by the Bank of Viet Nam we apply the 5 year average inflation forecast figures as published by the IMF or the sources in Viet Nam available has been considered as the reliable sources for the benchmark calculation.
The benchmark is calculated within the following equation basically created by Irving Fisher[12]:

$$(1 + r_n) = (1 + r_r) \times (1 + i)$$

where:

r_n is the nominal rate
r_r is the real rate
i is the rate of inflation

The benchmark will thus be determined based on the following indicators in Table II.B.5.2:

Table II.B.5.2 – calculation of ROE

Rate	Value	Possible source
Real value Return on Equity (r_r)	%	Default value for expected return on equity as per "Guidelines of the Assessment of Investment Analysis" (EB 62, Annex 5)
Inflation (i)	%	Public data (International Monetary Fund World Economic Outlook - IMF or the World Bank) or the sources in Viet Nam available at the time to include CPA for the next five years after the start of the CPA shall be used.
Nominal value Return on Equity (r_n)	%	calculated

☐ **Option 2: Project IRR is the financial indicator**

Considering the fact- the CPA is in the private sector, financed by a mix of debt and equity and that the project IRR is one of the recommended financial indicator, the project IRR has been selected as the indicator to gauge the financial viability of the proposed project. Based on the tool, *due to the impact of loan interest on income tax calculations it is recommended that when a project IRR is calculated to demonstrate additionality a pre-tax benchmark be applied. In cases where a post-tax benchmark is applied…actual interest payable is taken into account in the calculation of income tax*. Hence, the CPA

[12] http://everything.explained.at/Fisher_equation/ and
http://www.financeformulas.net/Real_Rate_of_Return.html

implementer selected the project IRR as a financial indicator that compared with benchmark of the project activity for demonstration additionality of a typical CPA.

Benchmark selection:

As mentioned above, for the benchmark analysis, the project IRR shall be used to determine the project financial viability. An appropriate benchmark shall be determined at the time when a CPA is being added to the PoA and according to the requirements of the methodological tool "Tool for the demonstration and assessment of additionality" version 06.1.0, EB 69 and "Guidelines on the assessment of investment analysis", version 05.0.0, EB62.

As per the Guidance on the Assessment of Investment Analysis[13] version 05 Annex 5 of EB62, the benchmark for project IRR can be derived from: *'Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR'*, and *"In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on parameters that are standard in the market".* Hence, there are two options for benchmark selection in the way to demonstrate the investment analysis of CPAs through the project IRR as the financial indicator as below. The CPA implementer can select one of them based on the data source available at the time of inclusion of CPA.

☐ Option 2.1: The local commercial lending rates selected as the benchmark.

The selected benchmark is local commercial lending rate at the time on which investment decision was made. The commercial rate of interest in Viet Nam is based on the State Bank of Vietnam's base interest rate. The project IRR of the CPA will be calculated and compared to the local commercial lending rates as the benchmark, which offered by the local commercial Vietnamese banks at time point making decision to implement projects by the Board of Directors.

Hence, the selected benchmark for the project activity is selected as the most conservative value.

☐ Option 2.2: The WACC selected as the benchmark.

Providing that the CPA is financed by equity and loan sources, the appropriate benchmark is WACC which represents the weighted average of the costs of various sources of financing in the financing structure. This benchmark represents the minimal required financial IRR of the project to be economically attractive. The WACC benchmark is indicated in paragraph 12, Guidance on Assessment of Investment Analysis, Annex 5, EB 62, "Local lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR". Thus the project participant applies WACC equation to estimate the required return on capital as a benchmark for this project IRR.

The WACC equation is the cost of each capital component multiplied by its proportional weight and then summing[14]:

$$WACC = \frac{E}{V} * Re + \frac{D}{V} * Rd * (1 - Tc)$$

Where:

[13] The guidance on the assessment of Investment Analysis, version 05, Annex 5, EB 62
[14] http://www.investopedia.com/terms/w/wacc.asp#ixzz1qVBk62x8

Parameter	Value	Possible sources
Re = cost of equity	%	One of the following sources can be used: (a) selecting the default values provided in CDM Guidelines specified at CPA level, or (b) by calculating the cost of equity using best financial practices, based on data sources at the time to include CPA. (c) The approved FSR if any
Rd = cost of debt	%	One of the following sources can be used: (a) the cost of financing in the capital markets (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on documented evidence from financial institutions with regard to the cost of debt financing of comparable projects. (b) the commercial lending rate in the host country. (c) The offer letter from the bank where the CPA implementer might borrow loan from. (d) The FSR if any.
E/V = percentage of financing that is equity	%	One of the following sources can be used: (a) CDM Guidelines Default Value (b) Project Financing Structure (if available at time of investment decision) (c) The approved FSR if any
D/V = percentage of financing that is debt	%	One of the following sources can be used: (a) CDM Guidelines Default Value (b) Project Financing Structure (if available at time of investment decision) (c) The approved FSR if any
Tc = corporate tax rate	%	One of the following sources can be used: 1. Approved FSR 2. Applicable Income tax Law 3. Investment License (if any)

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

The calculation of the IRR of a typical CPA shall be presented in excel format and will be submitted along with the CPA DD. All assumptions of critical parameters have to be substantiated with reliable sources or evidence where available. The following table presents the key parameters and alternatives for appropriate sources:

Table II.B.5.4 General Key parameters applied in IRR calculation for the CPA

Parameter	Data	Possible Sources
Investment decision	DD/MM/YYYY	Minutes of Board of Directors (BOD) meeting or BOD's decision on CDM development of the CPA.
Installed capacity	MW	This may include one of the following: (a) Board Minutes (b) Approved FSR (c) Investment license

Total investment	VND (billion) or USD (million)	This may include one of the following: (a) Board Minutes (budget) (b) Approved FSR (c) Quotation (d) EPC Contract
Annual O&M cost	VND (billion) or USD (million)	This may include one of the following: (a) Approved FSR (b) Quotation (c) Service Agreement
Annual net electricity exported to the grid	MWh	This may include one of the following: (a) Board Minutes (b) Approved FSR (c) Investment license
Electricity tariff	VND/kWh	This may include one of the following: (a) National tariff regulations (b) Approved FSR (c) PPA signed with Grid company (if available at the time to include CPA)
Income Tax	%	One of the following sources can be used: (a) Approved FSR (b) Applicable Income tax Law (c) Investment License (if its mentioned)
Project lifetime	years	This may include one of the following: (a) Equipment Contracts (b) Approved FSR (c) Declaration by Equipment Supplier/Consultant
Fair value	%	This may include one of the following: (a) Equipment Contracts (b) Approved FSR (c) Local regulations or prevailing practice value
Other costs (if any)	VND (billion) or USD (million)	This may include one of the following: (a) Approved FSR (b) Service Agreement/Proposal/Invoice, etc.
Key parameters might be added more for equity IRR calculation		
Percentage of Debt Financing	%	One of the following sources can be used: (a) CDM Guidelines Default Value (b) Project Financing Structure (if available at time of investment decision) (c) estimated in approved FSR
Percentage of Equity Financing	%	One of the following sources can be used: (a) CDM Guidelines Default Value (b) Project Financing Structure (if available at time of investment decision) (c) estimated in approved FSR

Interest rate	%	One of the following sources can be used: (a) the cost of financing in the capital markets (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on documented evidence from financial institutions with regard to the cost of debt financing of comparable projects. (b) The commercial lending rate in the host country. (c) The offer letter from the bank where the CPA implementer might borrow loan from. (d) The FSR if any.
Repayment period	Years (or months)	One of the following sources can be used: (a) The offer letter from the bank where the CPA implementer might borrow loan from. (b) The FSR if any.
Moratorium	Years (months)	One of the following sources can be used: (a) The offer letter from the bank where the CPA implementer might borrow loan from. (b) The FSR if any.

For each of the parameters indicated in Table II.B.5.4, values as per best available sources available at the time of the investment decisions shall be presented to the DOE together with a cash flow model that calculates the Equity (Project) IRR of the CPA.

Comparison of the financial indicator against the benchmark

The results of the calculation of the IRR compared to the benchmark and the CPA implemented with CER revenues will be presented as:

Table II.B.5.5 Result of investment analysis

IRR of typical CPA without CER	%
Benchmark	%

As a result of the benchmark analysis it will be clearly demonstrated that the proposed CPA (project) is not financially attractive. Through comparison of the IRR to the benchmark, it can be clearly seen that CER revenues help the CPA to reach an acceptable return on investment.

Sub-step 2d: Sensitivity analysis

The essential parameters for the profitability of a wind farm power project are the total investment and the electricity price and output. Other parameters such as O&M costs have only a minor impact, but are also considered. The assessed variation is +/-10% in line with Annex 5 of EB 62.

For a typical CPA even the most favourable variations, e.g. +10% electricity price or -10% investment and O&M cost, will not help the project to reach the required benchmark. It is hence further substantiated that the CPA is not financially attractive without access to CER revenues.

Step 3: Barrier analysis

The barrier analysis is optional, and will therefore be applied only in cases where the project participants believe that the *Investment analysis (Step 2)* does not, by itself, give a strong argument in favour of additionally for the activities under the CPA. Two options are possible:

Skip Step 3	The barrier analysis is not applied, proceed to Step 4 (Common practice analysis)
Apply Step 3	Apply barrier analysis

If Step 3 is applied, determine whether the proposed project activity faces barriers that:

(a) Prevent the implementation of this type of proposed project activity; and

(b) Do not prevent the implementation of at least one of the alternatives, if the project is not first of its kind according to the definition provided in paragraph 40(c)(i).

For barriers other than barriers due to project being "first of its kind" as defined in paragraph 40(c)(i),the identified barriers are only sufficient grounds for demonstration of additionality if they would prevent potential project proponents from carrying out the proposed activity undertaken without being registered as a CPA under this PoA.

Typical barriers include: investment barriers, technological barriers, and barriers due to prevailing practice.

The latest version (at the time of drafting the CPA-DD) of "Guidelines for objective demonstration and assessment of barriers"[15] shall be used to demonstrate applicable barriers to the CPA.

Outcome of Sub-step 3a - 3b (for each activity), if:

Both sub-steps 3a and 3b are satisfied	Proceed to Step 4 (Common practice analysis)
Sub-steps 3a and/or 3b is not satisfied	Additionally has not been demonstrated

Step 4: Common practice analysis

The common practice analysis is conducted in accordance with "Tool for the demonstration and assessment of additionality", version 06.1.0 which takes an approach as indicated below.
Sub-steps to be followed to identify similar activities and discuss on the applicable:
Sub-step 4a: Analyze other activities similar to the proposed activity, and
Sub-step 4b: Discuss any similar Options that are occurring are not applicable in the analysis.

However since the CPAs under this PoA fall in the type of "Switch of technology with or without change of energy source, including the use of renewable energies" which listed in the para 6 of the tool, the following Steps shall be applied to analyze the common practices for the project according to paragraph 47 of the Tool:

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

Step 2. In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started

[15] Version 01.0 at the time of webhosting the PoA-DD, http://cdm.unfccc.int/Reference/Guidclarif/index.html#meth

commercial operation before the start date of the project. Note their number Nall. Registered CDM project activities and project activities undergoing validation shall not be included in this step.

The applicable geographical area for the proposed project is the whole country (Viet Nam), the plants which deliver the same capacity, within the applicable output range calculated above, as the proposed project activity and have started commercial operation before the start date of the project can be listed and compared to the proposed CPA.

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}.

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.

The proposed project activity is a common practice within a sector in the applicable geographical area if the factor F is greater than 0.2 and $N_{all}-N_{diff}$ is greater than 3.

Outcome of Step 4: In cases the factor F is less than 0.2 and $N_{all}-N_{diff}$ is less than 3, the CPAs are not common practice in Viet Nam that is the applicable geographical area of the PoA. On the other hand, they are additional.

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

B.6.1. Explanation of methodological choices

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ACM0002 will be used to establish the baseline and calculate GHG emission reductions. This methodology also refers to the "*Tool to calculate the emission factor for an electricity system*" for calculations of CM emission factor. The applicability of ACM0002 has already been demonstrated in Section E.2.

Project emissions

For most renewable power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y} \quad \textbf{(1)}$$

Where:

PE_y	=	Project emissions in year *y* (tCO_2e/yr)
$PE_{FF,y}$	=	Project emissions from fossil fuel consumption in year *y* (tCO_2/yr)
$PE_{GP,y}$	=	Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year *y* (tCO_2e/yr)
$PE_{HP,y}$	=	Project emissions from water reservoirs of hydro power plants in year *y* (tCO_2e/yr)

Since the CPA uses wind energy to generate electricity, which does not involve combustion of fossil fuels. Hence, the project emissions are equal to zero:

$$PE_y = 0 \quad \text{(B.6-1)}$$

Baseline emissions

Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the CPA. The ACM0002 methodology assumes that electricity delivered to the grid by the wind farm would have otherwise been generated by the operation of grid-connected

power plants and by the addition of new generation sources. The baseline emissions are calculated as follows:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y} \quad \text{(E.6-2)}$$

Where:

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

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

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y (tCO_2/MWh)

The combined margin CO_2 emission factor for grid connected power generation ($EF_{grid,CM,y}$) will be calculated according to the procedures prescribed in the "Tool to calculate the emission factor for an electricity system" version 02.2.1 or the latest version of the tool at the time of inclusion of new CPA.
CPAs of the PoA shall calculate the combined margin emission factor for the grid which the CPAs is connected to at the time of inclusion and that emission factor shall be fixed ex-ante for the CPA. Information about the calculation of the emission factor will be presented in the Appendix 4 of the PoA-DD and also in the each CPA-DD at the time of inclusion.

In accordance with the Tool to calculate the emission factor for an electricity system, the emissions factor $EF_{grid,CM,y}$ can be calculated using either an ex ante option at the validation stage or ex post for the year in which the project activity displaces electricity. The ex-ante option is chosen and the combined margin published by the DNA of Viet Nam will be used to calculate emission reductions throughout the first crediting period..

A description of the data used to calculate the combined margin is provided in Appendix 4 and the step-wise approach used by the DNA of Viet Nam to calculate the emissions factor of the electricity system is described as follows:

STEP 1. Identify the relevant electricity systems

Determination of project electricity system

Although Viet Nam DNA has not published a delineation of the project electricity system and connected electricity but as indicated in National electricity master plan VII approved by the prime minister on 21 July 2011 at decision 1208/QD-TTg, Viet Nam has only one electricity system operated by Vietnam Electricity (EVN) that all power plants are physically connected through transmission and distribution lines to project activity, and there are no differences in electricity price in regions of Viet Nam. There is only one electricity dispatch system in Viet Nam, i.e. the National Dispatching Load Centre (NDLC) under EVN. Therefore, the project electric power system is identified as the Viet Nam National Electricity Grid. Otherwise also the national grid can be applied by default as per Tool.

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

This step offers two options to calculate the operating margin and build margin emisison factors and project participants may choose between the following two options:

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.

Option I is selected for calculation of the emission factor: Only grid power plants are included in the calculation.

STEP 3. Select a method to determine the operating margin (OM).

The "Tool to calculate the emission factor for an electricity system" offers four methods to calculate the OM emission factor ($EF_{grid,OM,y}$):

1 Simple OM, or

2 Simple adjusted OM, or

3 Dispatch Data Analysis OM, or

4 Average OM.

Of these procedures, Option (a) (Simple OM) is applied. This is because low-cost / must run resources constitute on average less than 50% of total grid generation of the five most recent years.

The "Tool to calculate the emission factor for an electricity system" offers the choice between two data vintages to calculate the Simple OM emission factor ($EF_{grid,OMsimple,y}$):

- *Ex-ante* option: A 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period; or
- *Ex-post* option: The year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

The simple OM emission factor is *ex-ante* calculated using the most update data issued by Viet Nam DNA.

This calculated OM emission factor remains unchanged during the crediting periods.

As power plants registered as CDM project activities are only hydropower projects[16], they are excluded from calculating simple OM.

Data relevant to above calculation has been placed in appendix 4 of this PoA-DD and each CPA-DD at time of inclusion.

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. It may be calculated:

- **Option A:**Based on the net electricity generation and a CO_2 emisison 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.

Option A has been selected as the required data is available for Viet Nam. 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:

$$EF_{grid,OMsimple,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

$EF_{grid,OMsimple,y}$	Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$	Net electricity generated and delivered to the grid by power plant/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	All power plants/units serving the grid in year *y* except low-cost/must-run

[16]UNFCCC website

	power plants/units
Y	The relevant year as per the data vintage chosen in Step 3

Under Option A, $EF_{EL, m,y}$ is determined using one of the following 3 sub-options:

- Option A1: if data on fuel consumption and electricity generation is available for relevant power units.
- Option A2: if only data on electricity generation and the fuel types is available.
- Option A3: to be used if only data on electricity generation is available.

Determination of $EF_{EL,m,y}$

Under Option A1, the emission factor for each power unit ($EF_{EL,m,y}$) is determined as follows:

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_{m,y}}$$

Where:

$EF_{EL,m,y}$	CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)
$FC_{i,m,y}$	Amount of fossil fuel type *i* consumed by power unit *m* in year *y* (Mass or volume unit)
$NCV_{i,y}$	Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ/mass or volume unit)
$EF_{CO2,i,y}$	CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)
$EG_{m,y}$	Net electricity generated and delivered to the grid by power plant/unit *m* in year *y* (MWh)
i	All fossil fuel types combusted in power unit *m* in year *y*
m	All power plants/units serving the grid in year *y* except low-cost/must-run power plants/units
y	The relevant year as per the data vintage chosen in Step 3

Data relevant to above calculation has been placed in appendix 4 of this PoA-DD and each CPA-DD at time of inclusion.

STEP 5.Calculate the Build margin (BM) emission factor.

The Emission Factor Tool allows project participants to choose between two options to calculate the build margin emission factors. **Option 1 is selected**: "*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*".

According to the Emission Factor Tool, the sample group of power units m used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage 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.

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

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.

The calculation of the BM emission factor for the first crediting period is done once (*ex-ante*) and will *not* be updated during the first crediting period.

Data relevant to above calculation has been placed in appendix 4 of this PoA-DD and each CPA-DD at time of inclusion.

STEP 6.Calculate the combined margin baseline (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; or

(b) Simplified CM.

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:

$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$	=	Operating margin CO_2 emission factor in year y (tCO_2/MWh)

W_{OM}	=	Weighting of operating margin emissions factor (%)
W_{BM}	=	Weighting of build margin emissions factor (%)

The Emission Factor Tool provides the following default weights for Wind power generation project activities: Operating Margin, W_{OM} = 0.75; Build Margin, W_{BM} = 0.25 for the first crediting period and subsequent crediting periods. The Combined Margin Baseline Emission Factor will be fixed throughout the crediting period.

Data relevant to above calculation has been placed in appendix 4 of this PoA-DD and each CPA-DD at time of inclusion.

Calculation of $EG_{PJ,y}$

The method for calculation of $EG_{PJ,y}$ is for Greenfield plants as following:

Greenfield wind farm plants:

Since the CPAs are the installation of new grid-connected renewable power plant at a site where no renewable power plant was operated prior to the implementation of the CPA, $EG_{PJ,y}$ is calculated as follows:

$$EG_{PJ,y} = EG_{\text{facility,y}} \quad \text{(E.6-3)}$$

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 CPA in year *y* (MWh/yr)
$EG_{\text{facility,y}}$	=	Quantity of net electricity generation supplied by the wind farm(s) to the grid in year *y* (MWh/yr)

Leakage (LE_y)

No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected. Therefore, $LE_y = 0$.

Emission reductions (ER_y)

Emission reductions are calculated as follows:

$ER_y = BE_y - PE_y$ **Equation (11) of ACM0002 Version 13.0.0**

Where

ER_y = Emission reductions in year *y* (t CO_2)
BE_y = Baseline emissions in year *y* (t CO_2)
PE_y = Project emissions in year *y* (t CO_2)

B.6.2. Data and parameters that are to be reported ex-ante

Data / Parameter	$EF_{grid,CM,y}$
Unit	tCO_2e/MWh
Description	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"
Source of data	As stipulated by Vietnamese DNA.
Value(s) applied	To be specified for each CPA
Choice of data or Measurement methods and procedures	The data is used to estimate the baseline emission.
Purpose of data	Calculation of baseline emissions
Additional comment	To be specified for each CPA

B.6.3. Ex-ante calculations of emission reductions

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The emissions reductions are calculated in accordance with the approved consolidated baseline methodology ACM0002 along with the "Tool to calculate the emission factor for an electricity system" as follows:

Project emissions (PE_y)

For most renewable power generation project activities, incl. wind power, applies $PE_y = 0$. The total emission reductions of the CPA are calculated on the basis of the equations and parameters presented and explained in Section II.B.6.1 of this document.

Therefore, $PE_y = 0$.

Baseline emissions (BE_y)

Baseline emissions include only CO2 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:

$BEy = EG_{PJ,y} * EF_{grid,CM,y}$ (1)

Where:

BE_y = Baseline emissions in year y (tCO2e/yr)

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

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

Combined margin CO_2 emission factor for grid connected power generation calculated ex ante is fixed for all CPAs of the PoA.

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for (a) greenfield plants, (b) retrofits and replacements, and (c) capacity additions. For the typical CPA methodology (a) is used.

(a) Greenfield renewable energy power plants

Since the typical CPA 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, $EG_{PJ,y}$ is calculated as follows:

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

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).

Leakage (LE_y)

According to ACM0002 version 13.0.0, no leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, and transport). These emissions sources are neglected.

Therefore, $LE_y = 0$.

Emission reductions (ER_y)

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where

ER_y = Emission reductions in year *y* (t CO_2/year)

BE_y = Baseline emissions in year *y* (t CO_2/year)

PE_y = Project emissions in year *y* (t CO_2/year)

B.7. Application of the monitoring methodology and description of the monitoring plan
B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data	Measured by electricity meters installed in each CPA site.
Value(s) applied	To be defined with respect to each CPA.
Measurement methods and procedures	The following parameters shall be measured: (i) The quantity of electricity supplied by the project plant/unit to the grid; and (ii) The quantity of electricity delivered to the project plant/unit from the grid The net supply of power to the grid by the proposed project activity is calculated as the difference between the quantity of electricity supplied by the project to the grid and the quantity of electricity delivered to the project from the grid which is measured through standard electricity metering instruments. The measurement of electricity will be in accordance with the PPA. The metering instruments will be calibrated annually.
Monitoring frequency	The net amount of power supplied to the grid by the project will be continuously measured and at least recorded monthly.
QA/QC procedures	This data will be directly used for calculation of emission reductions and will be cross-checked with records for sold electricity.
Purpose of data	Calculation of baseline emissions
Additional comment	To be defined with respect to each CPA.

Data / Parameter	$\mathbf{EF}_{grid,CM,y}$
Unit	tCO_2e/MWh
Description	Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"
Source of data	As stipulated by Vietnamese DNA.
Value(s) applied	To be specified for each CPA
Measurement methods and procedures	The data is used to estimate the baseline emission.
Monitoring frequency	Every 07 year renewable crediting period since the start date of crediting period.
QA/QC procedures	To be specified for each CPA
Purpose of data	Calculation of baseline emissions
Additional comment	To be specified for each CPA

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

The monitoring plan of a CPA is devised as per approved consolidated baseline and monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources". The following monitoring procedures shall be applied:

The proposed CPA is connected to the Grid through one or more on-site transformer stations. The CPA is connected to local substations through power lines and might in the future also connect to the grid through other main power lines. The project may furthermore be connected to a back-up power line to provide emergency power in case the project is not operational. An indicative grid connection diagram is provided in figure II.B.7.2.1. The solid lines indicate connection lines that are currently intended with the dotted lines indicating potential future additions.

The grid connection diagram indicates the principles for positioning of metering instruments that will be used in the monitoring of emission reductions. A separate detailed grid connection diagram will be prepared which is updated on the basis of the actual implementation of the project's grid connection and which will serve as the basis for periodic verification.

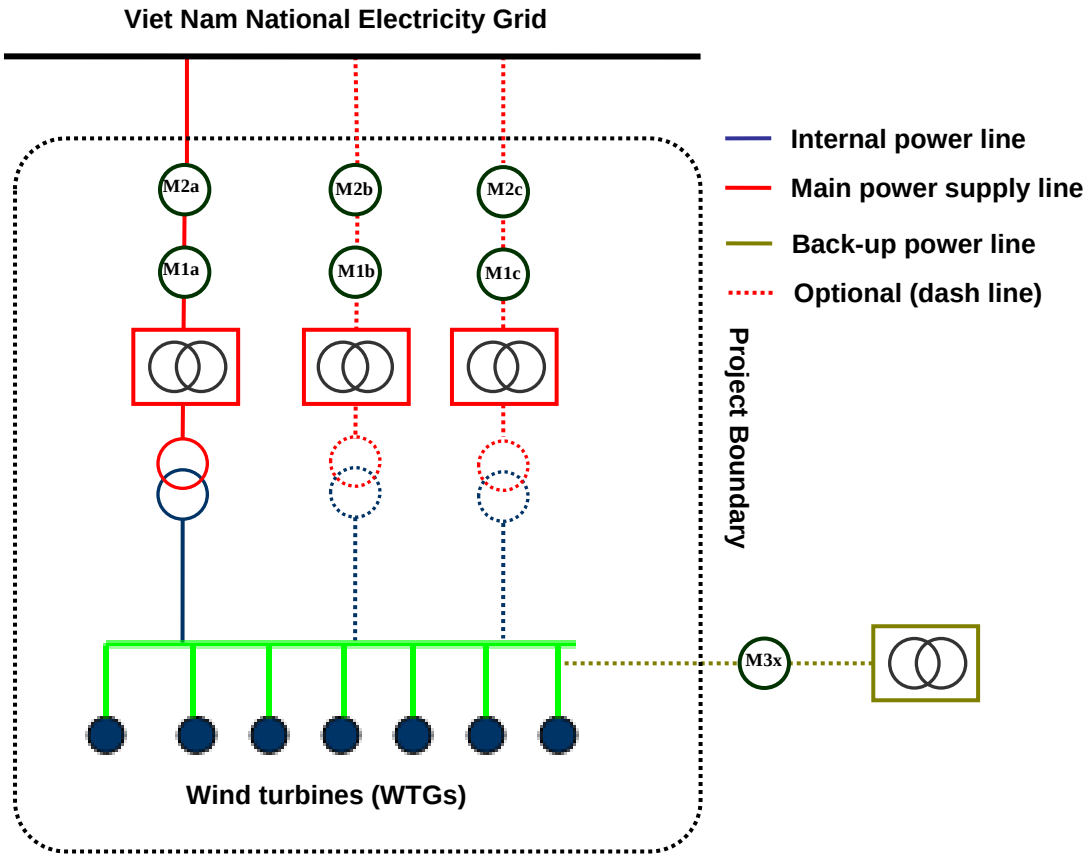

Figure II.B.7.2.1 Indicative grid connection diagram

The CPA implementer will meter electric power according to the following principles:
The CPA implementer is responsible for operation and maintenance of all the meters installed in the plant (the grid company will calibrate the electricity meter before installation and protect the same with integrate seal).

- **Power supplied to the grid through main power line(s):** As indicated in Figure **II.B.7.2.1**, the CPA might be connected by one or more main power lines (indicated in red) which will deliver power generated by the project to the grid. Net power supplied to the grid is metered as below:
    - The power supplied to the grid is metered by the primary and backup meters at a point after power has been transformed to the transmission voltage. Therefore, no further transformer losses will occur before the project is connected to the grid. The power supply of the project to the grid will be metered with standard electricity meters in accordance with national regulations. The meter should record the net supply as the main power supply lines can transfer power in both directions. The metering instruments may record either a net figure of power delivered to the grid or two readings (bidirectional meters), i.e. power delivered to the grid and power received from the grid. The electricity recorded by the primary meter will be used for the purpose of billing and emission reduction verification as long as the error of the primary meter is still in the range of permission.
    - The CPA implementer and the grid company read and check the primary meter (M1x) for commercial electricity generation by the CPA, and records the data from two meters (primary and backup) in the end of every month; the meter readings with signatures will be kept by each side.
    - Based on the monthly record, the CPA implementer will provide a power sales invoice for the electricity of the CPA exported to the grid. A copy of this power sales invoice is stored by the CPA implementer. In addition, the CPA implementer provides DOE for verification the copies of the power sales invoices for the imported electricity that the CPA implementer has wind farm power plants imported from the grid on an annual or monthly basis (depending on agreement between state utility (EVN) and CPA implementer.
    - The CPA implementer monitors and stores the records of the primary meter and backup meter's data readings for verification by the DOE.

    - Calibration: Calibrations are carried out by the grid company or by a certified third party. If there are any substantial discrepancies between the readings of the metering instruments throughout the year, both instruments will be recalibrated.

- **Power received through back-up power lines:** As indicated in Figure II.B.7.2.1 the CPA may be connected by a back-up emergency power line (indicated in brown) which delivers power from the grid to the project in case of emergencies or when the turbines of the proposed CPA are not in operation. Net power received from the grid is metered as below:
    - Grid company:

      The grid company will meter the power supplied to the project with its own metering equipment (M3x) in accordance with national regulations. Accordingly, the grid company will provide the electricity invoices for the imported electricity that the CPA implementer would has purchased from the Grid every month or every year (depending on the power consumption amount), and one hard copy of the electricity invoice is stored by the CPA implementer.
    - Calibration:
      Calibrations are carried out by the grid company or by a certified company.

Determination of net electricity supply to the grid by CPA:

The CPA implementer will collect the power sales invoices for power imported and exported to the grid (or the net power sales receipt) as evidences. The net supply (i.e. total electricity export minus total electricity import to the project) will be used in the calculations. All records of power delivered to the

grid, sales receipts and the results of calibration will be collated in a central place by the CPA implementer.

An overview of detailed information on minimum accuracy requirements of the metering instruments, measuring intervals, recording form, calibration and available documentation is provided in table **II.B.7.2.1** below.

Based on the imported and exported electricity records monthly, the project participant will calculate the net electricity generation by the CPA ($EG_{facility,y}$ in section B.6.1.) as following:

$EG_{facility,y} = EG_{export,y} – EG_{import,y}$

With:

- $EG_{export,y}$: total electricity exported to the Grid by the CPA in year y through the main power line(s) (in MWh) metered by the grid company (evidenced by monthly sales receipts) and cross-checked against the readings of metering instruments of the CPA Implementer.
- $EG_{import,y}$: total electricity imported from the Grid to the CPA in year y through possible back-up power line(s) measured by the meter (M3x) and/or by the primary meter (M1x) in case there is power imported from the grid via the main power line(s) (evidenced by monthly billing receipts).

Table II.B.7.2.1 Details of metering instruments

Meter	Operated by	Electronic measurement	Manual logging	Recording	Calibration	Accuracy	Documentation
M1 x	CPA implementer (primary meter)	Continuous	Daily (optional) [17]	Monthly or less	Annually	0.5 (as IEC 62053-22) and 2.0 (as IEC 62053-23) [18] or more accurate	Print out of electronic record and optional paper log. Data will consist of two readings, i.e. power delivered to the grid and power received from the grid or combined as net supply.
M2 x	CPA implementer (backup meter)	Continuous	-	Monthly or less	Annually	0.5 (as IEC 62053-22) and 2.0 (as IEC 62053-23) [19] or more accurate	Monthly sales receipts (for power delivered to grid) and billing invoices (for power received from the grid), or alternatively a single receipt which shows net power received.
M3 x	Grid company	Continuous	-	Monthly or less	Annually	regulated by Grid company	Monthly billing invoices (for power received from the grid).

[17] The CPA Implementer intends to log the readings of meters M1x and M2x manually in daily logs, but these logs will not form a formal requirement during verification. The ACM0002 methodology requires continuous electronic measurement and these manual log records will only be maintained for back-up purposes. The CPA Implementer may deviate from this procedure during actual operation of the project.

[18] Based on the Circular 32/2010/TT-BCT by Ministry of Industrial and Trade dated 30th July 2010 or the latest relevant regulations available at the time of CPA's inclusion.

[19] Based on the Circular 32/2010/TT-BCT by Ministry of Industrial and Trade dated 30th July 2010 or the latest relevant regulations available at the time of CPA's inclusion.

Reporting, archiving and preparation for periodic verification

The CPA implementer will in principle report the monitoring data annually but may deviate to report at intervals corresponding to agreed verification periods and will ensure that these intervals are in accordance with CDM requirements. The CPA implementer will ensure that all required documentation is made available to the verifier. Data record will be archived for a period of 2 years after the crediting period to which the records pertain.

PROCEDURES IN CASE OF DAMAGED METERING EQUIPMENT / EMERGENCIES

Damages to metering equipment:

In case metering equipment is damaged and no reliable readings can be recorded the CPA Implementer will estimate net supply by the proposed project activity according to the following procedure:

1. **In case primary metering equipment is damaged only:**
   The metering data measured by the backup meter will be used as record of net power supplied to the grid for the days for which no record could be recorded.
2. **In case both metering equipment operated by CPA implementer and grid company are damaged:**
   The CPA Implementer and the grid company will jointly calculate a conservative estimate of power supplied to the grid. A statement will be prepared indicating:
   ► the background to the damage to metering equipment
   ► the assumptions used to estimate net supply to the grid for the days for which no record could be recorded
   ► the estimation of power supplied to the grid
   The statement will be signed by both a representative of the project entity as well as a representative of the grid company.

The CPA implementer will furthermore document all efforts taken to restore normal monitoring procedures.

Emergency situations

If any instrument that is used in the monitoring process fails, a CPA shall remedy the situation as soon as possible and if necessary shall replace the instrument. In case of breakdown of any of the wind turbines the electricity generation will go down, and amount of electricity supplied to the grid by the wind farm will be reduced. All accidents that may occur at the wind farm shall be recorded by the CPA Implementer. Information on major accidents shall be included in the monitoring report.

OPERATIONAL AND MANAGEMENT STRUCTURE FOR MONITORING

The monitoring of the emission reductions will be carried out according to the scheme shown in figure II. B.7.2.2. The project entity will engage its CDM advisor, Blue World Carbon (CME) to assure that all monitoring requirements are met. Within the project entity a monitoring officer is appointed who will carry the day-to-day supervision responsibility. The first step is the measurement of the electrical energy supplied to the grid and reporting of daily operations, which will be carried out by the plant operation staff.

The monitoring officer who will be responsible for verification of the measurement, collection of sales receipts, collection of billing receipts of the power supplied by the grid to the wind farm power plant and the calculation of the emissions reductions. The monitoring officer will prepare operational reports of the project activity, recording the daily operation of the wind farm power station including operating periods, power delivered to the grid, equipment defects, etc. The selection procedure, tasks and responsibilities of the monitoring officer are described in detail in Appendix 5 of individual CPAs. Finally, the monitoring reports will be reviewed by CME.

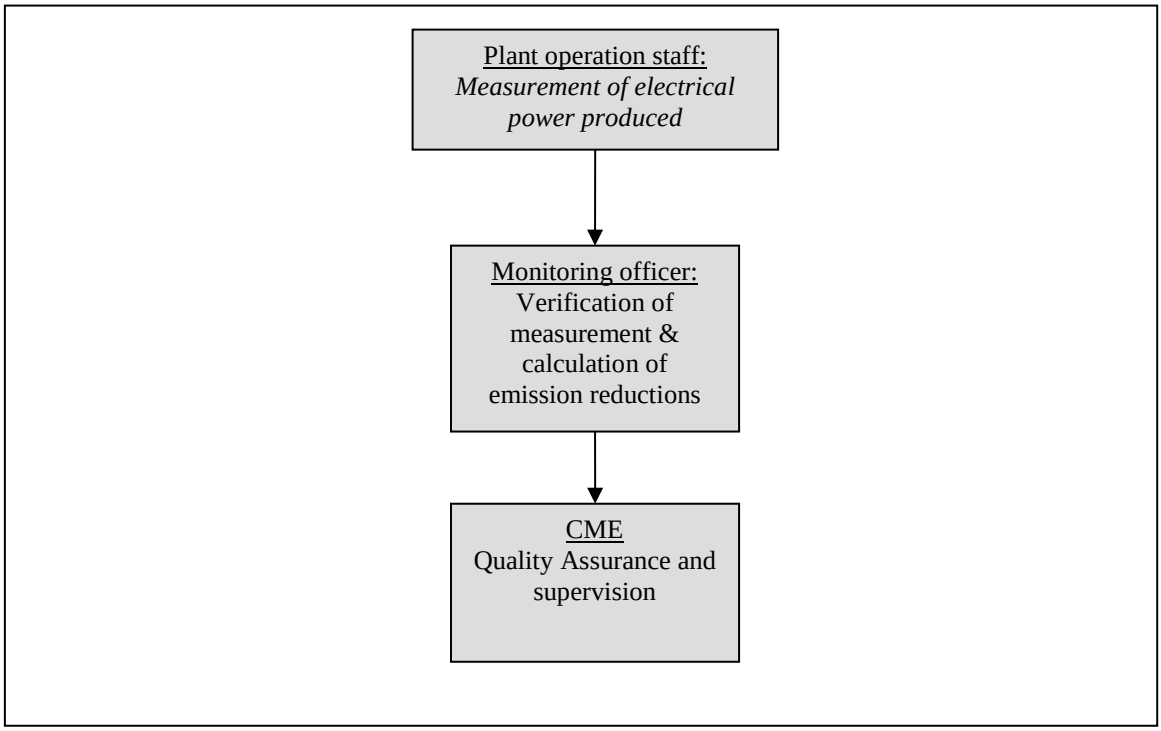

Figure II.B.7.2.2 Management structure in order to monitor emission reductions

- - - - -

Appendix 1: Contact information on entity/individual responsible for the PoA

Organization	Blue World Vietnam Co., Ltd.
Street/P.O. Box	204/28 National Road No.13, Ward 26
Building	-
City	Ho Chi Minh City
State/Region	Binh Thanh District
Postcode	-
Country	Viet Nam
Telephone	+65 63389411
Fax	+65 63389411
E-mail	joost.van.acht@blueworldcarbon.com
Website	-
Contact person	Joost Willem van Acht
Title	Managing Director
Salutation	Mr
Last name	van Acht
Middle name	-
First name	Joost Willem
Department	-
Mobile	-
Direct fax	+65 63389411
Direct tel.	+65 63389411
Personal e-mail	joost.van.acht@blueworldcarbon.com

Organization	Blue World Carbon SEA Pte Ltd
Street/P.O. Box	19 China Street, #03-02 Far East Square
Building	
City	Singapore
State/Region	
Postcode	049561
Country	Singapore
Telephone	+65 63389411
Fax	+65 63389411
E-mail	joost.van.acht@blueworldcarbon.com
Website	-
Contact person	Joost Willem van Acht
Title	Managing Director
Salutation	Mr
Last name	van Acht
Middle name	-
First name	Joost Willem
Department	
Mobile	
Direct fax	+65 63389411
Direct tel.	+65 63389411
Personal e-mail	joost.van.acht@blueworldcarbon.com

Appendix 2: Affirmation regarding public funding

The PoA does not receive any public funding from Parties included in Annex I of the UNFCCC.

Appendix 3: Application of methodology(ies)

No further information is necessary as all generic CPA types comply with the applicability conditions of the methodology.

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

The Emission factor for the Viet Nam National Electricity Grid is taken from Vietnamese DNA published Grid Emission Factors Report on 05/03/2012[20], which is made publicly available on Vietnamese DNA website. The emission factor is based on combined margin approach, following the step by step calculation in "Tool to calculate the emission factor for an electricity system", version 02.2.1:

STEP 1. Identify the relevant electricity systems

Determination of project electricity system

Although Viet Nam DNA has not published a delineation of the project electricity system and connected electricity but as indicated in National electricity master plan VII approved by the prime minister on 21 July 2011 at decision 1208/QD-TTg, Viet Nam has only one electricity system operated by Vietnam Electricity (EVN) that all power plants are physically connected through transmission and distribution lines to project activity, and there are no differences in electricity price in regions of Viet Nam. There is only one electricity dispatch system in Viet Nam, i.e. the National Dispatching Load Centre (NDLC) under EVN. Therefore, the project electric power system is identified as the Viet Nam National Electricity Grid. Otherwise also the national grid can be applied by default as per Tool.

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

This step offers two options to calculate the operating margin and build margin emisison factors and project participants may choose between the following two options:

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.

Option I is selected for calculation of the emission factor: Only grid power plants are included in the calculation.

STEP 3. Select a method to determine the operating margin (OM).

The "Tool to calculate the emission factor for an electricity system" offers four methods to calculate the OM emission factor ($EF_{grid,OM,y}$):

5 Simple OM, or

6 Simple adjusted OM, or

7 Dispatch Data Analysis OM, or

8 Average OM.

Of these procedures, Option (a) (Simple OM) is applied. This is because low-cost / must run resources constitute on average less than 50% of total grid generation of the five most recent years.

The Document No.109/KTTVBDKH dated 05/03/2012 issued by Viet Nam DNA (baseline data for OM and BM calculation) shows that all hydropower plants are excluded in calculation of simple OM. Thus, hydropower plants in Viet Nam are defined as low cost/must run resources. Accordingly, the rate of low cost/must run resources from 2006 to 2010 is determined as per table B.1.

[20] Grid Emisison Factor Study Report issued by Viet Nam DNA in 5thMarch 2012: http://www.noccop.org.vn/Data/vbpq/Airvariable_ldoc_59vnBao%20cao%20EF%202010.pdf

Table 1. Rate of low cost/must-run sources based on electricity generation[21]

Year	2006	2007	2008	2009	2010	Average
Hydro Power (MWh)	19,508,244	22,385,232	25,933,762	29,033,871	24,241,216	121,102,325
Total power generation (MWh)	57,160,493	66,348,589	74,689,636	81,369,303	91,224,603	370,792,624
Rate of low cost/ must-run (%)	34.13%	33.74%	34.72%	35.68%	26.57%	32.66%

The "Tool to calculate the emission factor for an electricity system" offers the choice between two data vintages to calculate the Simple OM emission factor ($EF_{grid,OMsimple,y}$):

- *Ex-ante* option: A 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, without requirement to monitor and recalculate the emissions factor during the crediting period; or
- *Ex-post* option: The year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

The simple OM emission factor is *ex-ante* calculated using the data from 2008, 2009 and 2010, which available in the Grid Emission Factor Study Report issued by Viet Nam DNA in March 2012.

This calculated OM emission factor remains unchanged during the crediting periods.

As power plants registered as CDM project activities are only hydropower projects[22], they are excluded from calculating simple OM.

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. It may be calculated:

- **Option A:** Based on the net electricity generation and a CO_2 emisison 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.

Option A has been selected as the required data is available for Viet Nam. 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:

$$EF_{grid,OMsimple,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

$EF_{grid,OMsimple,y}$ Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)

[21] Grid Emisison Factor Study Report issued by Viet Nam DNA in 5th March 2012 (http://www.noccop.org.vn/Data/vbpq/Airvariable_ldoc_59vnBao%20cao%20EF%202010.pdf)

[22] UNFCCC website

$EG_{m,y}$	Net electricity generated and delivered to the grid by power plant/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	All power plants/units serving the grid in year *y* except low-cost/must-run power plants/units
Y	The relevant year as per the data vintage chosen in Step 3

Under Option A, $EF_{EL, m,y}$ is determined using one of the following 3 sub-options:

- Option A1: if data on fuel consumption and electricity generation is available for relevant power units.
- Option A2: if only data on electricity generation and the fuel types is available.
- Option A3: to be used if only data on electricity generation is available.

Option A1 is the most appropriate one because data on fuel consumption and electricity generation is available in the Grid Emission Factor Study Report issued by Viet Nam DNA on 05/03/2012.

Determination of $EF_{EL,m,y}$

Under Option A1, the emission factor for each power unit ($EF_{EL,m,y}$) is determined as follows:

$$EF_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_{m,y}}$$

Where:

$EF_{EL,m,y}$	CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)
$FC_{i,m,y}$	Amount of fossil fuel type *i* consumed by power unit *m* in year *y* (Mass or volume unit)
$NCV_{i,y}$	Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ/mass or volume unit)
$EF_{CO2,i,y}$	CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)
$EG_{m,y}$	Net electricity generated and delivered to the grid by power plant/unit *m* in year *y (*MWh)
i	All fossil fuel types combusted in power unit *m* in year *y*
m	All power plants/units serving the grid in year *y* except low-cost/must-run power plants/units
y	The relevant year as per the data vintage chosen in Step 3

Based on data vintage for 2008-2010 the $EF_{grid,OM,y}$ has been calculated as below.

Table 2. Output generation of power plants (2008-2010)

Group of Power plants	**2008**	**2009**	**2010**
Hydropower	25,933,761.92	29,033,870.91	24,241,216.47
Coal-based thermal plant	10,055,394.03	1. 9,841,578.80	14,624,274.14

Gas turbine	33,857,134.85	36,714,493.20	44,051,811.72
Oil-based thermal plant	1,481,880.17	1,635,350.57	2,648,763.23
Diesel firing FO	90,465.01	-	-
Diesel firing DO	15,000.00	10,000.00	9,035.70
Bagasse-based thermal plant	36,000.00	31,930.00	50,272.00
Import electricity	3,220,000.00	4,102,080.00	5,599,230.00
Total domestic generation	71,469,635.98	77,267,223.48	85,625,373.26
Total domestic + import generation	74,689,635.98	81,369,303.48	91,224,603.26

Table 3. Fuel consumption, emissions and power generation in 3 most recently years (2008, 2009, 2010)

Power plant groups	**Fuel consumption (Coal, oil: kton; Gas: mm^3)**	**Output generation supplied to Grid (MWh)**	**Emissions (tCO_2)**
Year 2008			
Coal-based thermal plant	6,483.99	10,055,394.03	13,378,811.40
Gas turbine	6,893.46	33,857,134.85	14,716,799.17
Gas turbine using gas	6,839.11	22,396,231.24	14,535,266.34
Gas turbine using oil	54.35	183,087.52	181,532.83
Waste heat recovery	-	11,277,816.09	-
Oil-based thermal plant	534.59	1,481,880.17	1,784,825.09
Diesel firing FO	22.48	90,465.01	71,384.99
Diesel firing DO	3.73	15,000.00	11,878.75
Import		3,220,000.00	
Total	**13,938.25**	**48,719,874.06**	**29,963,699.40**
Year 2009			
Coal-based thermal plant	6,927.29	9,841,578.80	14,380,035.80
Gas turbine	7,273.70	36,714,493.20	15,970,688.95
Gas turbine using gas	7,251.87	25,471,686.34	15,897,778.22
Gas turbine using oil	21.83	71,303.56	72,910.73
Waste heat recovery		11,171,503.30	
Oil-based thermal plant	444.99	1,635,350.57	1,471,505.07
Diesel firing FO	0.18		604.88
Diesel firing DO	2.41	10,000.00	8,058.07
Import		4,102,080.00	

Total	**14.648,57**	**52,303,502.57**	**31,830,892.77**
Year 2010			
Coal-based thermal plant	9,075.79	14,624,274.14	18,824,109.53
Gas turbine	8,727.79	44,051,811.72	19,531,753.05
Gas turbine using gas	8,664.36	31,073,369.39	19,320,632.28
Gas turbine using oil	63.43	209,306.21	211,120.77
Waste heat recovery		12,769,136.12	
Oil-based thermal plant	664.97	2,648,763.23	2,206,222.65
Diesel firing FO	0.99		3,268.82
Diesel firing DO	2.16	9,035.70	9,035.70
Import		5,599,230.00	
Total	**18,471.70**	**66,933,114.79**	**40,572,715.06**

Table 4. Total emission and total electricity generation of the most 3 recent years

	2008	**2009**	**2010**	**Total**
Total electricity (MWh)	48,719,874.06	52,303,502.57	66,933,114.79	167,956,491.42
Total emission (tCO_2)	29,963,699.40	31,830,892.77	40,572,715.06	102,367,307.23

Table 5. Result of OM emission factor in 2010

Year	Total electricity (MWh)	Total CO_2 emission tCO_2	OM_{2010} (tCO_2/MWh)
	A	B	$\sum B/\sum A$
2008	48,719,874.06	29,963,699.40	0.6095[23]
2009	52,303,502.57	31,830,892.77	
2010	66,933,114.79	40,572,715.06	
Total	167,956,491.42	102,367,307.23	

STEP 5.Calculate the Build margin (BM) emission factor.

The Emission Factor Tool allows project participants to choose between two options to calculate the build margin emission factors. **Option 1 is selected**: "*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*

[23]Three years generation weighted average

second crediting period should be used. This option does not require monitoring the emission factor during the crediting period".

According to the Emission Factor Tool, the sample group of power units m used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage 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. Table 6 below shows recently built power plants of the National Power Grid.

Table 6: Overview of most recently-built power units

Plant	**Operation year**	**Fuel consumption** **Coal, oil: kton** **Gas: mm^3**		**Electricity supply to the grid (MWh)**	**Emission (tCO_2)**
5 newly constructed plants					
Srepok 3	2010	Hydropower		632,334.90	
Son La	2010	Hydropower		113,951.84	
Cua Dat	2010	Hydropower		191,861.50	
Hai Phong	2010	Coal	813.42	1,825,288.00	1,713,136.92
Quang Ninh	2009	Coal	573.17	1,291,688.00	1,179,133.25
Total				**4,055,124.24**	**2,892,270.17**
Newly constructed plants constitute 20 % of total electricity output					
Srepok 3	2010	Hydropower		632,334.90	
Son La	2010	Hydropower		113,951.84	
Cua Dat	2010	Hydropower		191,861.50	
Hai Phong	2010	Coal	813.42	1,825,288.00	1,713,136.92
QuangNinh	2009	Coal	573.17	1,291,688.00	1,179,133.25
Pleikrong	2009	Hydropower		228,483.47	
Buon Kuop	2009	Hydropower		1,028,732.36	
Buon Tua Srah	2009	Hydropower		215,749.72	
Hiep Phuoc	2009	Coal	115.52	422,000.02	253,151.16

Uong Bi extension (7)	2009	Coal	856.14	1,896,937.00	1,765,022.67
Can Tho (S1)	2009	DO	226.56	991,680.00	723,401.16
Nhon Trach	2008	DO	1.12	4,518.20	3,773.52
	2008	Gas	731.93	2,520,473.00	1,675,299.94
	2009	Waste heat Recovery		299,593.20	
Tuyen Quang	2008	Hydropower		1,010,177.63	
Dai Ninh	2008	Hydropower		1,102,793.00	
A Vuong	2008	Hydropower		883,990.70	
Ca Mau 1&2	2008	Waste heat Recovery		3,251,096.50	
		Gas	1,556.20	5,934,457.20	3,946,160.03
Total				**23,845,894.24**	**11,259,078.65**

Data source: grid emission factor issued by DNA 05-Mar-2012

So the sample group of power units used to calculate the build margin is $SET_{\geq 20\%}$ and none of the power units in $SET_{\geq 20\%}$ started to supply electricity to the grid more than 10 years ago.

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

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.

Calculation of the BM emission factor is presented in Table 7 below.

Table 7: Build Margin emission factor 2010[24]

Year	Unit	2010
Total electricity delivered to the grid by group of power units	MWh	23,845,894.24
Total emission of group of power units	tCO_2e	11,259,078.65

[24] *Source: Annex of calculation of Emission Factor of Vietnamese Grid enclosed to Document No.109/KTTVBDKH issued by Vietnamese DNA dated 05th March 2012.*

The BM emission factor is calculated as follows:

$$EF_{grid,BM,y} = \frac{11{,}259{,}078.65}{23{,}845{,}894.24}$$

***EF*$_{grid,BM,y}$= 0.4722 tCO$_2$e/MWh**.

The calculation of the BM emission factor for the first crediting period is done once (*ex-ante*) and will *not* be updated during the first crediting period.

STEP 6.Calculate the combined margin baseline (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; or

(b) Simplified CM.

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:

$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$	=	Operating margin CO_2 emission factor in year y (tCO_2/MWh)
W_{OM}	=	Weighting of operating margin emissions factor (%)
W_{BM}	=	Weighting of build margin emissions factor (%)

The Emission Factor Tool provides the following default weights for Wind power generation project activities: Operating Margin, W_{OM} = 0.75; Build Margin, W_{BM} = 0.25 for the first crediting period and subsequent crediting periods. Applying the default weights and the calculated emission factors, we calculate a Combined Margin Baseline Emission Factor of **0.5751** tCO_2e/MWh as indicated in table 8 below.

Table 8 The weighted average CM method (option A) should be used as the preferred option of calculation of the combined margin (CM) emission factor $EF_{grid,CM,y}$

	Default value[25]	**Emission factor (tCO_2/MWh)**
OM	0.75	0.6095
BM	0.25	0.4722
CM (*EF*$_{grid,CM,y}$)		**0.5751**

Please referred to Viet Nam DNA link:
http://www.noccop.org.vn/Data/vbpq/Airvariable_ldoc_59vnBao%20cao%20EF%202010.pdf

[25] Default values applied for hydro power generation project activities for the first crediting period and for subsequent crediting periods as indicated in the *Tool to calculate emission factor for an electricity system*, version 02.2.1.

Appendix 5: Further background information on the monitoring plan

Further background information on the monitoring plan shall be provided on CPA level, for each individual CPA (where applicable).