CLEAN DEVELOPMENT MECHANISM
PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-CPA-DD)
Version 01

CONTENTS

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NOTE:

(i) This form is for the submission of CPAs that apply a large scale methodology using provisions of the proposed PoA.

(ii) The coordinating/managing entity shall prepare a CDM Programme Activity Design Document (CDM-CPA-DD)\(^1\)\(^2\) that is specified to the proposed PoA by using the provisions stated in the PoA DD. At the time of requesting registration the PoA DD must be accompanied by a CDM-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the PoA must submit a completed CDM-CPA-DD.

\(^1\) The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

\(^2\) At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).
A.1. Title of the CPA:

CPAXX: [Name of the Hydro Project] Hydropower Project
Version: XX
Date: DD/MM/YYYY

To be included under the PoA: Vietnam Renewable Energy Development Program (REDP)

A.2. Description of the CPA:

The present CPA is to be implemented as part of the CDM PoA: Vietnam Renewable Energy Development Program (REDP). It aims at avoiding CO2 emissions from [CPA planned project activities] in Vietnam.

[Brief description of the CPA]

The main objective of the project is to generate power from clean renewable hydropower in Vietnam and to contribute to the sustainability of power generation of the National Power Grid of Vietnam (the “National Power Grid”).

Summary of technology employed

[Technical Description of the CPA]

The technical data of the turbine/generator units are listed in Table X below.

Table X: Technical data of turbines and generators

<table>
<thead>
<tr>
<th>Main Technical Data</th>
<th>Value (per unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Turbines</strong></td>
<td></td>
</tr>
<tr>
<td>Units</td>
<td></td>
</tr>
<tr>
<td>Runner diameter</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td></td>
</tr>
<tr>
<td>Rated speed</td>
<td></td>
</tr>
<tr>
<td>Rated efficiency</td>
<td></td>
</tr>
<tr>
<td><strong>Generators</strong></td>
<td></td>
</tr>
<tr>
<td>Units</td>
<td></td>
</tr>
<tr>
<td>Rated speed</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td></td>
</tr>
<tr>
<td>Power factor (cosφ)</td>
<td></td>
</tr>
</tbody>
</table>

Contribution to sustainable development

The project activity contributes to sustainable development in the following ways:

- Reduction of the dependence on exhaustible fossil fuels for power generation;
Reduction of air pollution by displacing coal-fired power plants with clean, renewable power;
Reduction of the adverse health impacts from air pollution;
Reduction of the emissions of greenhouse gases to combat global climate change;
Promotion of local economic development through employment creation during construction and operation; and
Improvement of water regulation and maintenance of local area’s biodiversity.

This project is consistent with the energy development policies of the Vietnamese government and conforms to the sustainable development criteria outlined by the Designated National Authority (“DNA”) of Viet Nam.

A.3. Entity/individual responsible for CPA:
[Implemener’s name] is responsible for the CPA implementation

A.4. Technical description of the CPA:

A.4.1. Identification of the CPA:

> CPAXX – [Name of the Hydro Project]

A.4.1.1. Host Party:

>>> Socialist Republic of Vietnam (“Vietnam”)

A.4.1.2. Geographic reference of other means of identification allowing the unique identification of the CPA (maximum one page):

[Name of the Hydro Project] is located in [location of the CPA]

The geographical reference of the [Name of the Hydro Project] Project’s Power house is: [GPS Coordinates]

Figure X. Location of the [Name of the Hydro Project] project in Vietnam

Category(ies) of project activity:
Sectoral scope/ Category:
Energy industries (renewable sources)
Grid-connected electricity generation from renewable sources

A.4.2. Duration of the CPA:

A.4.2.1. Starting date of the CPA:

[CPA starting date DD/MM/YYYY], when the [implementation/construction or real action] is expected to begin
A.4.2.2. Expected operational lifetime of the CPA:

[CPA operational lifetime]

A.4.3. Choice of the crediting period and related information:

Renewable crediting period.

A.4.3.1. Starting date of the crediting period:

[DD/MM/YYYY], when the project is expected to be operational, or the date of inclusion of this CPA in the registered PoA, whichever is later.

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

7 years and renewable. [Please note that the duration of crediting period of any CPA shall be limited to the end date of the PoA regardless of when the CPA was added.]

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

Table X: Estimated emission reductions from the CPA during the first crediting period considering expected CPA inclusion date

<table>
<thead>
<tr>
<th>Years</th>
<th>Annual estimation of emission reductions (tonnes of CO₂e)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total estimated reductions over the first crediting period(tonnes of CO₂e)

Total number of crediting years in the first period

Annual average over the first crediting period of estimated reductions (tonnes of CO₂e)

A.4.5. Public funding of the CPA:

[Public funding information for this CPA]
A.4.6. Confirmation that CPA is neither registered as an individual CDM project activity nor is part of another Registered PoA:

[Name of the Hydro Project] project is not among CDM hydropower project activities of Vietnam which has been submitted for validation and global consultation, thus this CPA is neither registered as an individual CDM project activity nor is part of any other registered PoA in Vietnam.

SECTION B. Eligibility of CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which CPA is added:

Vietnam Renewable Energy Development Program (REDP).

B.2. Justification of the why the CPA is eligible to be included in the Registered PoA:

A CPA under the PoA is required to fulfill the eligibility criteria outlined in the below table for inclusion in the PoA. The developed eligibility criteria are consistent with the “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities”, Version 02.1, EB 70.

[Name of the Hydro Project] Project is eligible to be included to the Renewable Energy Development Program PoA because it meets all established eligibility criteria as demonstrated in the below table.

Table X: Conformity of the CPA with the eligibility criteria for inclusion in the PoA

<table>
<thead>
<tr>
<th>#</th>
<th>Eligibility criteria as per requirements of the standard</th>
<th>Evidence needed in the CPA</th>
<th>Eligibility criterion applied?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Geographical boundary of the CPA</td>
<td>Map of CPA and/or description of location indicating project within Vietnam boundary.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Each Project should be located within the geographical boundary of the PoA, i.e. in Vietnam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>Avoidance of double counting of emission reductions</td>
<td>Geographic information (GPS coordinates).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Each CPA-DD shall be uniquely identified and defined in an unambiguous manner.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The coordinating entity will ensure that all CPAs under its PoA are neither registered as an individual CDM project activity nor included in another</td>
<td>Demonstration should be provided in the PDD.</td>
<td></td>
</tr>
</tbody>
</table>
registered PoA, and that the CPA is subscribed to the PoA.

Each CPA must be approved by the coordinating entity.

Evidences could include agreement, letters, communications between CME and CPA implementer with statement of approval for participation in the programme.

c Specifications of technology/measure implemented by the CPA

The project activity shall involve the construction and operation of a new hydropower project. No capacity addition or retrofit will be accepted.

The maximum capacity of the project or the renewable energy component (in cases where it is a combination of renewable and non-renewable) is 30 MW.

In the case that the project activity involves the construction of a new reservoir, the power density shall be larger than 4 W/m².

Reservoir surface and installed capacity or power density shall be documented from topological study or feasibility study, etc.

d Check the start date of the CPA through documentary evidence

The start date of the CPA is in line with CDM glossary.

Evidences should include date of real actions such as loan contract, contract for construction, equipment procurement, equipment supply, etc.

e Compliance with applicability and other requirements of the methodology applied by CPAs

Each CPA is in compliance with applicability and other requirements of the ACM0002 baseline and monitoring methodology.

The compliance should be demonstrated against the applicability conditions of the methodology as outlined in Section E.2. of the PoA-DD
### f CPAs meet the requirements pertaining to the demonstration of additionality

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRR of the CPA is below the benchmark rate applicable to the CPA in the Guidelines on the Assessment of Investment Analysis.</td>
<td>The financial analysis sheet and all assumptions justified through relevant evidences by the CPA implementer. The values for key parameters used in the calculation of the FIRR can be sourced from documents such as feasibility studies, detailed project reports, bank appraisal documents, loan sanction documents, etc.</td>
</tr>
<tr>
<td>CPA has access to loan from participating banks under REDP, and participating banks have a refinance agreement with WB-REDP/MOF.</td>
<td>Loan agreement between the CPA and local banks and list of participating banks in WB-REDP/MOF refinancing scheme.</td>
</tr>
<tr>
<td>Local stakeholder consultations and environmental impact analysis</td>
<td>The relevant documents should include inter alia Initial Environmental Evaluation, water rights, land right, power purchase agreement, etc. The project safeguard documents must be publicly disclosed.</td>
</tr>
</tbody>
</table>

### g Local stakeholder consultations and environmental impact analysis

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>The CPA must have secured all required environmental clearances as outlined in Section C.</td>
<td>The relevant documents should include inter alia Initial Environmental Evaluation, water rights, land right, power purchase agreement, etc.</td>
</tr>
<tr>
<td>The CPA must comply with Dam Safety Framework, Resettlement Policy Framework and Ethnic Minority Planning Framework or similar instruments.</td>
<td>The project safeguard documents must be publicly disclosed.</td>
</tr>
<tr>
<td>The project must have Evidences could include the</td>
<td></td>
</tr>
</tbody>
</table>
undertaken a stakeholder consultation as outlined in Section D.

| Participating developers and bank attended the training and capacity building programs conducted by MOIT. | Participants list or confirmation by MOIT. |

**Participating developers and bank attended the training and capacity building programs conducted by MOIT.**

| A letter from Annex I parties should affirm that funding, if any, does not result in a diversion of ODA. | Participant from Annex I country LoA could be used. This evidence could be used for the inclusion of further CPAs |

**Affirmation of non diversion of official development assistance (ODA)**

**Target group**

- The project must be connected to the national distribution grid of Vietnam, which predominantly supplied by both fossil fuel based and non fossil fuel based generating units.

- Agreement/letter of intent between the project developer and the national utility or transmission and/or distribution entity.

Criteria j, k and l of the “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities” are not applicable as sampling is not applied and the project is not a small-scale project neither a micro-scale project.

This proposed project is a grid-connected renewable power generation that is eligible to apply Version 13.0.0 of ACM0002. The fulfilment of relevant applicability conditions of ACM0002, version 13.0.0 are demonstrated in below **Comparison of project characteristics and eligibility criteria of ACM0002 methodology** table.

<table>
<thead>
<tr>
<th>Applicability conditions of ACM0002</th>
<th>Characteristics of the project activity</th>
<th>Applicability criteria met?</th>
</tr>
</thead>
<tbody>
<tr>
<td>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;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comparison of project characteristics and eligibility criteria of ACM0002 methodology**

<table>
<thead>
<tr>
<th>Applicability conditions of ACM0002</th>
<th>Characteristics of the project activity</th>
<th>Applicability criteria met?</th>
</tr>
</thead>
<tbody>
<tr>
<td>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;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 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 definitions given in the Project Emissions section, is greater than 4 W/m²; or
- The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per definitions given in the Project Emissions section, is greater than 4 W/m².

The methodology is not applicable to the following:

- Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;
- Biomass fired power plants;
- Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m².

<table>
<thead>
<tr>
<th>B.3. Assessment and demonstration of additionality of the CPA, as per eligibility criteria listed in the Registered PoA:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The additionality of the project activity is demonstrated using the key criteria defined in Section E.5.2 of the PoA-DD, following the applicable tools:</td>
</tr>
<tr>
<td>- “Combined tool to identify the baseline scenario and demonstrate additionality”, version 03.0.1, EB 60</td>
</tr>
<tr>
<td>- “Tool for the demonstration and assessment of additionality”, version 06.1.0, EB69.</td>
</tr>
</tbody>
</table>

Accordingly, investment analysis and checklist for additionality will be carried out at CPA level for assessment and demonstration of additionality. The analysis aims at demonstration of the FIRR of the CPA below the benchmark established in the PoA-DD and the participation of CPA in to the program has addressed some of the barriers faced by this kind of projects in Vietnam.

The steps for demonstration of additionality are as per the description in the PoA-DD and “Tool for the demonstration and assessment of additionality”, version 06.1.0. The benchmark analysis is performed using Step 2 of the “Tool for the demonstration and assessment of additionality”. This includes applying benchmark analysis (sub step 2b), calculation and comparison of financial indicators (sub step 2c) and sensitivity analysis (sub step 2d).

**STEP 1 – Identification of alternatives to the project activity consistent with current laws and regulations**
Sub-step 1a. Define alternatives to the project activity:

The following alternatives to the project activity will be considered:

Alternative 1: The proposed project activity undertaken without being registered as a CDM project activity

The construction and operation of a hydropower project with the total installed capacity below or equal to 30 MW, without being registered as a CDM project activity.

Alternative 2: Adding a new fossil fuel-fired power plant with equivalent power output

The construction and operation of a new fossil fuel power plant with equivalent power output means that the installed capacity of the fossil fuel plant shall be smaller than the proposed capacity of the hydropower project since any fossil power plant has a longer operational hour than those of a hydropower plant.

Alternative 3: Adding a new renewable energy power plant other than hydropower plant

The construction and operation of another renewable power plant (e.g. solar, wind, biomass).

Alternative 4: Continuation of the current situation

In this case, the project activity will not be constructed and the power will be solely supplied from the Vietnam national grid.

Alternative 2 cannot be the baseline scenario because there is not any fossil fired power plant with the equivalent power output is constructed/under construction and or planned in Vietnam. See Chapter VII of the Master Plan on Power Development for period of 2006-2015 with perspective to 2025 (the Sixth Master Plan) approved by the Prime Minister in July 2007.

According to the Master Plan of Electricity Expansion for period of 2006-2015 with perspective to 2025 - EVN (Master Plan VI) approved by the Prime Minister in July 2007 (Chapter VII) (the latest publicly information source listed all operated and planned power plants in Vietnam), there is no fossil fuel power plant with the equivalent or lower power output is constructed/under construction and/or planned in Vietnam. It shows that the investment and operation of such thermal power plants with the capacity equal and below 15.6 MW is not realistic in Vietnam.

Furthermore, within the scope of the Renewable Development Program (REDP), only renewable energy projects will be considered to receive the loan under the lending scheme. The construction of fossil fuel power plants thus will not be a plausible investment option as the project participant has no plan for investing in a fossil fuel power plant.

Alternative 3 cannot be the baseline scenario because the project location does not provide sufficient renewable resources except for the water resource.

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

3 See Chapter VII of the Master Plan on Power Development for period of 2006-2015 with perspective to 2025 (the Sixth Master Plan) approved by the Prime Minister in July 2007.
All alternatives mentioned above are technically feasible and comply with Vietnamese current laws and regulations. However, Alternative 2 and 3 are not realistic and credible alternatives as explained above.

Hence, only Alternatives 1 and 4 are further considered as realistic and credible alternatives.

**STEP 2 – Investment Analysis**

**Sub-step 2a: Determine appropriate analysis method**

The proposed project activity generates financial and economic benefits other than CER revenues, so the simple cost analysis (Option I) is not applicable. As there are no other credible and realistic baseline scenario alternatives other than electricity supply from the grid, Option II is also not applicable. Thus, the benchmark analysis (Option III) is chosen to demonstrate additionality.

**Step 2b: Applying benchmark analysis**

For this CPA, it has been selected the [Select Project IRR or Equity IRR] as the most suitable economic indicator or FIRR.

If Project IRR is selected, select local commercial lending rates or weighted average costs of capital (WACC) as a project IRR benchmark, and follow the guidelines below:

- If local commercial lending rates are selected as benchmark for the project IRR, the benchmark should be derived from the average long-term lending rates available from the beginning of calculated year up to the date of decision making. All data can be sourced from relevant documents of the financial sector such as weekly reports published by the State Bank of Vietnam on its official website (http://www.sbv.gov.vn/wps/portal/en), reports from International Financial Institutions, reports from commercial banks in Vietnam, etc.

- If WACC is selected as benchmark for the project IRR, include the following formula and follow the guidelines below to justify the values used:

  \[ WACC = (Re \times E) + (Rd \times D) \times (1 - Tc) \]

  Where:

  - Re: Return on equity
  - Rd: Debt interest rate
  - E: Average industry equity ratio
  - D: Average industry debt ratio
  - Tc: Average Corporate tax rate

Determine the average industry equity (E) and debt (D) ratios:

The average industry debt ratio (D) is determined based on common practice in the Vietnamese hydropower industry and can be sourced from relevant regulations or guidance or other public sources. Also, it can be used the default value of 50/50 from the Guidance # 18 of the Guidelines on assessment of Investment Analysis (EB 62 Annex 5). The average industry debt ratio will be revised and updated, as necessary, in later CPAs included in the PoA. The average equity ratio (E) is defined as \( E = 1 - D \).
Determine the Return on Equity (Re):

The “Guidelines on the Assessment of Investment Analysis” Version 05, EB62, Annex 5 provides default values for the approximate expected return on equity for different project groups and host countries.

Determine the Debt interest rate (Rd):

The debt interest rate is determined as the interest rate for a long-term loan prevailing at the time of making the investment decision for the CPA in question, as published by sources such as State Bank of Viet Nam, relevant documents of the financial sector, loan sanction documents, etc.

Determine average corporate tax rate (Tc):

In terms of corporate tax, there are legal documents in Viet Nam prescribing general provisions on the implementation of corporate tax. The investment certificate of each particular project, on the other hand, may also specify tax requirements imposed on the project. Therefore, the CPAs will apply the provision on tax in the investment certificate in the case that investment decision is made during the validity period of such certificate and that there is no legal documents on enterprise tax published and taking effect after the date of issuance of the investment certificate. Other references could include feasibility study report.

[If Equity IRR is selected, include the rationale for the value chosen, either from local publicly available information or using the default values as specified for Vietnam in the Appendix A of the Guidelines on investment analysis as available at the time of decision making/inclusion process.

The eligible CPAs (sectoral scope 01 – energy industries) under this PoA fall under Group 1 projects. As per the Guidelines, the suggested default value of the return on equity for Group 1 projects available at the inclusion of this CPA in Vietnam is XX%. This value will be used along with the interest rate applied to the loan part of the investment of each CPA and the debt-equity ratio to establish the required minimum FIRR for a project to be considered financially viable]

[For the avoidance of doubt the FIRR benchmark selected is a post-tax indicator.]

**Step 2c: Calculation and comparison of financial indicators**

[Describe financial analysis undertaken, including description of the benchmark when used, financial indicator, time period for the analysis, all values of financial parameters: costs and revenues, and as footnotes, their sources. The values for the key parameters above and other project specific parameters used in the calculation of the FIRR can be sourced from documents such as feasibility studies, detailed project reports, bank appraisal documents, loan sanction documents, etc.]

**Table X: Parameters for FIRR calculation**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
<th>Source</th>
<th>Date</th>
</tr>
</thead>
</table>

CDM PROGRAMME ACTIVITY DESIGN DOCUMENT FORM (CDM-CPA-DD) - Version 01

NAME /TITLE OF THE PoA: VIETNAM RENEWABLE ENERGY DEVELOPMENT PROGRAM (REDP)
I. Project technical details

Installed capacity  MW
Project expected lifespan  years

II. Investment costs

III. Costs arising during operation

Annual O&M Cost
Resources tax
Taxable tariff  VND/kWh
Enterprise’s revenue tax
- For the first [XXX] years
- For the next [XXX] years
- ...
- For the remaining years

IV. Project revenue

Electricity Sales (per year)  MWh
Electricity tariff  VND/kWh

V. Financing structure

Debt interest Rate  %
Equity ratio  %

Comparison of the FIRR of the CPA with the benchmark FIRR

The comparison of the FIRR of the CPA, [Name of the Hydro Project] Hydropower Project with the benchmark FIRR [XX] is presented in Table.

Table X: Results of financial analysis

<table>
<thead>
<tr>
<th>[Name of the Hydro Project]</th>
<th>Financial Internal Rate of Return (IRR)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without CDM revenues</td>
</tr>
<tr>
<td></td>
<td>Benchmark</td>
</tr>
</tbody>
</table>

The results indicate that the FIRR of [Name of the Hydro Project] hydropower project is below the [XX]% benchmark without CDM revenues, thus the proposed project is not financially attractive and is therefore is eligible for inclusion in REDP PoA. This analysis also shows that additionality is robust over a wide range of potential benchmark values.

Sensitivity Analysis:

The sensitivity analysis is carried out in connection with four main risks to the project:

- Capital cost
- Energy generation
• Tariff
• Operation and Maintenance cost

In the sensitivity analysis, three above parameters is considered in the critical assumptions. The results of the sensitivity analysis for the FIRR are shown in Table X below, while Figure X provide a graphic depiction.

Table X: Impact of variations in assumptions on the IRR without CDM revenues

<table>
<thead>
<tr>
<th>No</th>
<th>Parameter</th>
<th>Variation</th>
<th>Project IRR</th>
<th>Likelihoods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Investment cost</td>
<td>+10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Benchmark crossing variation rate]</td>
<td>[Benchmark rate]</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Energy generation</td>
<td>-10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Benchmark crossing variation rate]</td>
<td>[Benchmark rate]</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Electricity Tariff</td>
<td>-10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Benchmark crossing variation rate]</td>
<td>[Benchmark rate]</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>O&amp;M Costs</td>
<td>+10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Benchmark crossing variation rate]</td>
<td>[Benchmark rate]</td>
<td></td>
</tr>
</tbody>
</table>

Figure X: Sensitivity of FIRR to investment cost

Figure X: Sensitivity of FIRR to Annual Generation

Figure X: Sensitivity of FIRR to Tariff

Figure X: Sensitivity of FIRR to O&M Costs
Outcome of Step 2: The proposed CDM project activity is unlikely to be financially attractive.

STEP 3 – Barrier Analysis

The additionality is demonstrated through investment analysis. Hence, the barrier analysis is not required.

STEP 4 – Common practice analysis

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

Government Decree No 45/2001/ND-CP on power generation and consumption, which was issued on 02 August 2001 created a legal basis to allow other entities to invest in and generate electricity rather than only state-owned entities as previously regulated. Before that time, all power plants have been invested from the state budget sources and operated by state owned companies.

Hence, any hydropower projects that have started the construction activities before August 2001 are not subject to this analysis. Besides, all hydropower projects that have started construction activities after the start date of CPA ([Include start date of the CPA DD/MM/YYYY]) are not included in the analysis.

To classify the projects listed against the criteria: similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, the most relevant regulations which regulate the legal entities, the investment management procedures, and the technical designs and construction standards for hydropower projects in different scales (Prime's Minister Decision No 176/2004/QD-TTg, Decision of Ministry of Industry - No 3454/QD-BCN, Viet Nam Construction Code - TCXDVN 285:2002).

According to the Prime's Minister Decision No 176/2004/QD-TTg which defines the legal entities against the project scales, private entities are not encouraged to invest in hydropower projects with capacity above 100 MW. Furthermore, according to the Decision of Ministry of Industry - No 3454/QD-BCN dated 18 October 2005 on defining the jurisdictions to approve the Master Plans and management hierarchy for small hydropower projects, hydropower projects having installed capacity within the range from 1 to 30 MW are categorized as small projects.

To serve the purpose of this analysis and in order to categorize hydropower projects in correspondence with the existing regulations mentioned above, hydropower projects are categorized into groups as follows:

Table X: Groups of hydropower projects serving for common practice analysis

<table>
<thead>
<tr>
<th>Group</th>
<th>Installed capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≥ 300 MW</td>
</tr>
<tr>
<td>B</td>
<td>≥ 100 MW and &lt; 300 MW</td>
</tr>
<tr>
<td>C</td>
<td>≥ 50 MW and &lt; 100 MW</td>
</tr>
<tr>
<td>D</td>
<td>≥ 30 MW and &lt; 50 MW</td>
</tr>
<tr>
<td>E</td>
<td>≥ 5 MW and &lt; 30 MW</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 5 MW</td>
</tr>
</tbody>
</table>

The PoA include CPA with installed capacity up to 30 MW. According to Table X, a typical CPA can then falls into Groups E or F of small hydropower projects in Vietnam.

The common practice analysis is carried out as per paragraph 47 of the “Tool for demonstration and assessment of additionality”, Version 06.1.0. Accordingly, the following stepwise approach is used:

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

The installed capacity of the CPA is XX MW, hence the applicable capacity range is +/-50% MW.

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

The selected geographical area is Vietnam. The following table presents a list of XX power plants with installed capacity up to 50 MW that are implemented in Vietnam after 2001 and before [start date of the CPA DD/MM/YYYY].

Table X: Power projects implemented after 2001 and before [start date of the CPA DD/MM/YYYY] (capacity up to 50 MW)

<table>
<thead>
<tr>
<th>#</th>
<th>Name of power plant</th>
<th>Capacity (MW)</th>
<th>Technology</th>
<th>Commissioning date</th>
<th>CDM (Yes/No)</th>
<th>Investor</th>
<th>Ownership (Private/Public?)</th>
<th>Investment before removal of interest rate cap (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above list, only power plants with installed capacity between +/-50% MW and non-CDM projects are considered in the analysis. This yields to XX power plants, hence Nall = XX

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 Ndiff.

All Nall power plants (out of which XX hydro plants) identified in Step 2 are analyzed as follows:

- XX power plants are thermal, hence they are excluded because they use different that the technology applied in the project activity
- XX power plants use public capital or mix of private and public capital, so they are excluded from the common practice analysis as compared to the project that uses exclusively private capital.
- XX hydro power plants were developed in a different investment environment benefiting from a low interest rate. The investment climate has changed at the date of investment decision of the CPA. Further details on the investment environment are discussed in below Sub-step 4b.

Based on the above analysis, Ndiff is XX.
Step 4: Calculate factor $F = 1 - \frac{N_{\text{diff}}}{N_{\text{all}}}$ 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 both the following conditions are fulfilled: (a) the factor $F$ is greater than 0.2 and (b) $N_{\text{all}} - N_{\text{diff}}$ is greater than 3.

[Include results of the common practice analysis: factor $F$ and $N_{\text{all}} - N_{\text{diff}}$; compared with the mentioned boundaries]

From the analysis, it is clearly demonstrated that the project is not a common practice.

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

As per the “Tool for demonstration and assessment of additionality”, “if similar activities are identified above, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed project activity is financially/economically unattractive or subject to barriers. This can be done by comparing the proposed project activity to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that rendered it financially/economically attractive (e.g., subsidies or other financial flows) and which the proposed project activity cannot use or did not face the barriers to which the proposed project activity is subject. Essential distinctions may include a serious change in circumstances under which the proposed CDM project activity will be implemented when compared to circumstances under which similar projects were carried out. For example, new barriers may have arisen, or promotional policies may have ended, leading to a situation in which the proposed CDM project activity would not be implemented without the incentive provided by the CDM. The change must be fundamental and verifiable”.

The existence of the XX hydropower plants does not contradict the result of the benchmark analysis stating that the proposed project is financially unattractive” as demonstrated above.

The common feature of all these private developed projects between 2001 and November 2009 is that they all benefit for a different investment environment. At that period, Vietnam’s Civil Code stipulates that financial institutions cannot charge lending rates exceeding 1.5 times the base (prime) rate set by the State Bank of Vietnam (SBV). During much of 2009 (until Nov 2009), therefore, the maximum lending rate was capped at 10.5 percent (7 times 1.5). After that period, the SBV allowed loan rates to be negotiated between the lender and the borrower. As a result, in some cases, loan rates are said to have risen from a subsidized 6 percent to a negotiated 16–18 percent, before declining to 14 - 15 percent4.

This is a serious, fundamental and verifiable change in circumstances under which the proposed CPAs will be implemented when compared to circumstances under which similar projects were carried out.

Therefore, it can be concluded all small size hydropower projects implemented before the start date of the PoA were developed in a more favorable investment environment where lending was cheaper. This is not

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the case in the PoA with high interest rate that results from the liberalization of lending rates. The proposed PoA and CPAs are promoted in an investment environment which is challenging and more difficult as the financial cost has increased due to higher interest rate from commercial banks.

Additionality checklist

The following items are checked if participation in the program has addressed some of the barriers faced by these kind of projects in Vietnam:

<table>
<thead>
<tr>
<th>Key Criteria</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRR of the CPA in the absence of the CDM incentive is below the benchmark rate</td>
<td></td>
</tr>
<tr>
<td>CPA has access to loan from participating banks under REDP, and participating banks have a refinance agreement with WB-REDP/MOF</td>
<td></td>
</tr>
<tr>
<td>Participating developers and bank attended the training and capacity development programs conducted by MOIT</td>
<td></td>
</tr>
</tbody>
</table>

Time line of the CPA

The table below summarizes the milestones in the investment process of [Name of the Hydro Project] hydropower project, in connection with the REDP.

<table>
<thead>
<tr>
<th>Date</th>
<th>Activities</th>
<th>Remarks</th>
</tr>
</thead>
</table>

B.4. Description of the sources and gases included in the project boundary and proof that the CPA is located within the geographical boundary of the registered PoA.

The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected.

The greenhouse gases and emission sources included in or excluded from the project boundary are shown in Table below.
Table X: Inclusion of gases and sources in the calculation of the emission reductions

<table>
<thead>
<tr>
<th>Source</th>
<th>Gas</th>
<th>Included?</th>
<th>Justification / Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>CO$_2$ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.</td>
<td>CO$_2$</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CH$_4$</td>
<td>No</td>
<td>Minor emission source.</td>
</tr>
<tr>
<td></td>
<td>N$_2$O</td>
<td>No</td>
<td>Minor emission source.</td>
</tr>
<tr>
<td>Project activity</td>
<td>For hydro power plants, emissions of CH$_4$ from the reservoir.</td>
<td>CO$_2$</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>CH$_4$</td>
<td>No</td>
<td>Main emission source. Negligible as as power density is &gt; 10 W/m$^2$.</td>
</tr>
<tr>
<td></td>
<td>N$_2$O</td>
<td>No</td>
<td>Minor emission source.</td>
</tr>
</tbody>
</table>

Figure below provides a flow diagram of the CPA and related emissions that potentially need to be taken into account. Leakage associated with the project does not have to be taken into account as the project employs new turbines / generators and does not involve the transfer of equipment from another activity. The ACM0002 methodology also does not require the consideration of technology.
Figure X. Flow diagram of the CPA and related emissions

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:
<table>
<thead>
<tr>
<th>Data / Parameter</th>
<th>Description</th>
<th>Source of data</th>
<th>Value applied</th>
<th>Justification of the choice of data or description of measurement methods and procedures actually applied</th>
<th>Any comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>CapBL</td>
<td>Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero</td>
<td>Operations Manual of REDP</td>
<td>0</td>
<td>The PoA consists of new hydropower projects (Greenfield projects) only.</td>
<td></td>
</tr>
<tr>
<td>ABL</td>
<td>Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m²). For new reservoirs, this value is zero</td>
<td>Operations Manual of REDP</td>
<td>0</td>
<td>The PoA consists of new hydropower projects (Greenfield) with no reservoirs existing before the CPAs.</td>
<td></td>
</tr>
<tr>
<td>EFRes</td>
<td>Default emission factor for emissions from reservoirs</td>
<td>Decision by EB23</td>
<td>[XX]</td>
<td>The PoA consists of new hydropower projects (Greenfield) with no new reservoirs or increase in existing reservoirs. If the CPA consists of any new reservoir or increase in existing reservoirs and if the power density of the reservoir is greater than 4 W/m² and less than or equal to 10 W/m², a suitable value (90 kgCO₂e/MWh) as per the Decision by EB23 will be used, otherwise 0 kgCO₂e/MWh will be used.</td>
<td>The PoA consists of hydro power projects with capacity up to 30 MW, and with the power density greater than 4 W/m² if the construction of a new reservoir is required.</td>
</tr>
</tbody>
</table>
### Data / Parameter: \( EF_{\text{grid,CM,y}} \)

**Data unit:** tCO₂/MWh  
**Description:** Combined margin CO₂ emission factor of 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 used:** Department of Meteorology, Hydrology and Climate Change (DNA Vietnam)  
**Value applied:** [XX]  
**Justification of the choice of data or description of measurement methods and procedures actually applied:** CM emission factor is published by Vietnam DNA. The most recent publication was in [XX] using [XX] data. The calculation was made as per the “Tool to calculate the emission factor for an electricity system”  
**Any comment:** As per the “Tool to calculate the emission factor for an electricity system” Calculated as a weighted sum of the operating margin and the build margin. Given that both the \( EF_{\text{grid,OM,y}} \) and the \( EF_{\text{grid,BM,y}} \) are calculated \textit{ex-ante}, the \( EF_{\text{grid,CM,y}} \) will be fixed during the first crediting period.

### Data / Parameter: \( EG_{m,y}, EG_y, EG_{k,y} \) or \( EG_{n,h} \)

**Data unit:** MWh  
**Description:** Net electricity generated by power plant/unit m, k or n (or in the project electricity system in case of \( EG_y \)) in year y or hour h  
**Source of data used:** Department of Meteorology, Hydrology and Climate Change (DNA Vietnam)  
**Value applied:** See Annex 3 for [XX] data  
**Justification of the choice of data or description of measurement methods and procedures actually applied:** Electricity generation data are used for OM and BM calculations.

### Data / Parameter: \( NCV_{i,y} \)

**Data unit:** TJ/10⁻³ tonnes or TJ/Gg  
**Description:** Net calorific value (energy content) of fossil fuel type \( i \) in year y  
**Source of data used:** IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories  
**Value applied:** See Annex 3  
**Justification of the choice of data or description of measurement methods and procedures actually applied:** No data for the fuels used in Vietnam is available hence IPCC defaults are used.
**Data / Parameter:** $F_{C_i,m,y}$

- **Data unit:** mass (tones) or volume unit (m$^3$)
- **Description:** Amount of fossil fuel type $i$ consumed by power plant / unit $m$ in year $y$
- **Source of data used:** Department of Meteorology, Hydrology and Climate Change (DNA Vietnam)
- **Value applied:** See Annex 3 for [XX] data
- **Justification of the choice of data or description of measurement methods and procedures actually applied:** Fuel consumption data are used for OM and BM calculations
- **Any comment:**

**Data / Parameter:** $E_{F_{CO2,i,y}}$

- **Data unit:** tCO$_2$/TJ
- **Description:** CO$_2$ emission factor of fossil fuel type $i$ in year $y$
- **Source of data used:** 2006 IPCC Guidelines on National GHG Inventories
- **Value applied:** See Annex 3
- **Justification of the choice of data or description of measurement methods and procedures actually applied:** IPCC default values at the lower limit of the uncertainty at 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol.2 (Energy)
- **Any comment:**

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**B.5.2. Ex-ante calculation of emission reductions:**

The ex-ante calculation of the emission reductions follows methodology ACM0002 (version 13.0.0)

**Baseline emissions**

The baseline emissions ($B_{E,y}$) are the product of the baseline emissions factor ($E_{F,y}$) calculated below, times the electricity supplied by the project activity to the national grid ($E_{G,y}$), as per the formulae given below:

$$B_{E,y} = E_{G_{P,y}} \cdot E_{F_{grid,CM,y}}$$

Where:
- $B_{E,y}$: tCO$_2$/yr Baseline emissions in year $y$
- $E_{G_{P,y}}$: MWh Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year $y$ (MWh/yr)
- $E_{F_{grid,CM,y}}$: tCO$_2$/MWh Combined margin CO$_2$ emission factor for grid connected power generation in year $y$ calculated using the latest version of the “Tool to calculate the emission factor for an electricity system”.

The quantity of net electricity generation by CPA in year $y$ is determined as
where:

\[ EG_{PJ,y} = EG_{facility,y} \]

- \( EG_{PJ,y} \) = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year \( y \) (MWh/yr)
- \( EG_{facility,y} \) = Quantity of electricity generation supplied by the project plant/unit to the grid in year \( y \) (MWh/yr). It shall be determined as a difference between (i) quantity of electricity supplied by the project plant/unit to the grid and ii) quantity of electricity delivered to the project plant/unit from the grid.

Based on the baseline emission factor set out in the PoA-DD, the baseline emissions of the CPA are calculated as shown below:

\[ [XX] \]

The baseline emission factor is \( (EF_{grid,CM,y}) \) is calculated as the combined margin, consisting of the combination of operating margin \( (EF_{grid,OM,y}) \) and build margin \( (EF_{grid,BM,y}) \) factors calculated using version 2.2.1 of the “Tool to calculate the emission factor for an electricity system” as follows.

**BASELINE METHODOLOGY PROCEDURE**

Project participants shall apply the following six steps:

**STEP 1. Identify the relevant electricity systems.**

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

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

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

**STEP 5. Calculate the build margin (BM) emission factor.**

**STEP 6. Calculate the combined margin (CM) emissions factor.**

**STEP 1. Identify the relevant electric power system**

The electricity generated by the project activity will be delivered to the Vietnamese national grid, the only grid existing in the country.

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

Off-grid power plants are not included in the project electricity system, thus **Option I: Only grid power plants** are included in the calculation.

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

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

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

According to the tool, any of the four methods can be used. The simple OM method (option a), however, can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term averages for hydroelectricity production. The tool defines “low-cost/must run” resources as “power plants with low marginal generation costs or power plants that are dispatched independently of the daily or seasonal load of the grid. They typically include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation.”

For the simple OM, the simple adjusted OM and the average OM, the emissions factor will be calculated using ex ante option. Therefore, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation.

For this PoA, an ex-ante method will be used, therefore Option (c) will not be considered. The relevant method (Option a, b or d) should be established in each CPA depending on available data at the time of the CPA inclusion into the PoA. The CPA-DD should justify and document all selected options.

STEP 4. Calculate the operating margin emission factor according to the selected method ($EF_{grid,OM,y}$)

According to the selected OM method, the OM emission factor is calculated as per steps and equations set up in the the latest version of the “Tool to calculate the emission factor for an electricity system”.

(a) Simple OM

The simple OM emission factor is calculated as the generation-weighted average CO$_2$ emissions per unit net electricity generation ($tCO_2/MWh$) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

The simple OM may be calculated by one of the following two options:

Option A: Based on the net electricity generation and a CO$_2$ emission factor of each power unit; or

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

Option B can only be used if:

(a) The necessary data for Option A is not available; and

(b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and

(c) Off-grid power plants are not included in the calculation (i.e. if Option I has been chosen in Step 2).

(b) Simple adjusted OM

The simple adjusted OM emission factor ($EF_{grid,OM-adj,y}$) is a variation of the simple OM, where the power plants/units (including imports) are separated in low-cost/must-run power sources ($k$) and other power sources ($m$).
(d) Average OM
The average OM emission factor \( (EF_{grid,OM-ave,y}) \) is calculated as the average emission rate of all power plants serving the grid, using the methodological guidance as described under (a) above for the simple OM, but also including the low-cost/must-run power plants in all equations.

Option B should only be used if the necessary data for Option A is not available.
[Description of the selected method and Options for OM calculation. Detailed equations should be provided]

The simple OM is given in the below table.

<table>
<thead>
<tr>
<th></th>
<th>Total Emissions (tCO2)</th>
<th>Total Generation (MWh)</th>
<th>OM Weighted Average (tCO2 / MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Year 1]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Year 2]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[Year 3]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

STEP 5. Calculate the Build Margin emission factor \( (EF_{grid,BM,y}) \)

Vintage of Data
In accordance with the “Tool to calculate the emission factor for an electricity system”, the BM emission factor is calculated according to option 1: For the first crediting period, the BM emission factor is calculated \textit{ex-ante} based on the most recent information available. For the second crediting period, the BM emission factor will be updated based on most recent data available at the time of submission of the request for registration. For the third crediting period, the BM emission factor calculated for the second crediting period will be used.

The sample group of power units \( m \) used to calculate the build margin consists of either:
(a) \textit{The set of five power units that have been built most recently}, or
(b) \textit{The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently}

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 (2008):
(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 \( (SET_{5-units}) \) and determine their annual electricity generation \( (AEG_{SET-5-units}, \text{in MWh}) \);
(b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities \( (AEG_{total}, \text{in MWh}) \). 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) \( (SET_{\geq20\%}) \) and determine their annual electricity generation \( (AEG_{SET_{\geq20\%}}, \text{in MWh}) \);
(c) From \( SET_{5-units} \) and \( SET_{\geq20\%} \) 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\text{sample} to calculate the build margin. Ignore steps (d), (e) and (f).

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{EF}_{\text{grid,BM,y}}$</td>
<td>$\text{tCO}_2/\text{MWh}$</td>
<td>Build margin CO$_2$ emission factor in year $y$</td>
</tr>
<tr>
<td>$\text{EG}_m,y$</td>
<td>$\text{MWh}$</td>
<td>Net quantity of electricity generated and delivered to the grid by power unit $m$ in year $y$</td>
</tr>
</tbody>
</table>
The CO₂ emission factor of each power unit \( m \) (\( FE_{EL,m,y} \)) is determined as per the guidance in Step 4 (a) for the simple OM, option A1, using electricity generation data for [reference year] which is the most recent historical year for which is available at the time of the CPA inclusion.

\[
FE_{EL,m,y} = \frac{\sum_i FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{\sum_i EG_{i,m,y}}
\]

Where:
- \( FE_{EL,m,y} \) = CO₂ emission factor of power unit \( m \) in year \( y \)
- \( FC_{i,m,y} \) = Amount of fuel type \( i \) consumed by power plant/unit \( m \) in year \( y \).
- \( NCV_{i,y} \) = Net calorific value (energy content) of fossil fuel type \( i \) in year \( y \)
- \( EF_{CO2,i,y} \) = CO₂ emission factor of fossil fuel type \( i \) in year \( y \)
- \( EG_{i,m,y} \) = Net electricity generated and delivered to the grid by power plant/unit \( m \) in year \( y \)
- \( m \) = All power plants/units serving the grid in year \( y \) except low-cost/must-run power units.
- \( i \) = All fossil fuel types combusted in power unit \( m \) in year \( y \)
- \( y \) = The relevant year as per the data vintage chosen in Step 3

Using the published data by the Vietnam DNA, the build margin emission factor is:

<table>
<thead>
<tr>
<th>Total Generation</th>
<th>MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Emissions</td>
<td>tCO₂</td>
</tr>
<tr>
<td>( EF_{grid,BM,y} )</td>
<td>tCO₂/MWh</td>
</tr>
</tbody>
</table>

**STEP 6. Calculate the combined margin baseline emission factor \( EF_{grid,CM,y} \)**

The baseline emission factor \( EF_{grid,CM,y} \) is calculated ex-ante as the weighted average of the operating margin and the build margin. Default weights of 50% for the first crediting period are used.

\[
EF_{grid,CM,y} = w_{OM} \times EF_{grid,OM,y} + w_{BM} \times EF_{grid,BM,y}
\]

Where:
- \( EF_{grid,BM,y} \) = tCO₂/MWh  Emission factor of the build margin.
- \( EF_{grid,OM,y} \) = tCO₂/MWh  Emission factor of the operating margin.
- \( w_{OM} \) = %  Weighting of the operating margin emission factor. (Default of 50%)
Weighting of the build margin emission factor. (Default of 50%)

\[ W_{BM} \%

\]

**EF\text{grid,CM,y} = tCO_2/MWh**

Details of the generation data and power units used in the calculation of the grid emission factor for the first crediting period are listed in Annex 3.

**Project emissions**

For the project activity, which involves construction of a new hydropower project with a new accumulated reservoir, project emissions associated with reservoir must be accounted if the power density of the project activity is less than 10 W/m\(^2\).

Power density is calculated as follows:

\[ PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} \]

Where:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD</td>
<td>W/m(^2)</td>
<td>Power density of the project activity</td>
</tr>
<tr>
<td>Cap(_{PJ})</td>
<td>W</td>
<td>Installed capacity of the hydro power plant after the implementation of the project activity</td>
</tr>
<tr>
<td>Cap(_{BL})</td>
<td>W</td>
<td>Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero.</td>
</tr>
<tr>
<td>A(_{PJ})</td>
<td>m(^2)</td>
<td>Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.</td>
</tr>
<tr>
<td>A(_{BL})</td>
<td>m(^2)</td>
<td>Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full. For new hydro power plants, this value is zero.</td>
</tr>
</tbody>
</table>

The power density is calculated as follows.

[Include calculation of the PD]

If the power density (PD) of power plant is greater than 4 W/m\(^2\) and less than or equal to 10 W/m\(^2\), include the following text:

The power density of the project is XX W/m\(^2\), which is greater than 4 W/m\(^2\) and less than or equal to 10 W/m\(^2\). In this case, the Project Emissions are calculated using the following formula:

\[ PE_y = \frac{(EF_{Res} \times TEG_y)}{1000} \]

Where:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE(_y)</td>
<td>tCO(_2)/year</td>
<td>Emissions from reservoir expressed</td>
</tr>
<tr>
<td>EF(_{Res})</td>
<td>kg CO(_2)/MWh</td>
<td>Is the default emission factor for emissions from reservoirs, and the default value as per EB23 is 90 kg CO(_2)/MWh</td>
</tr>
</tbody>
</table>
Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year $y$:

$$TEG_y = \text{MWh}$$

The Project Emissions are:

$$PE_y = XX$$

[If the power density (PD) of power plant is greater than 10 W/m², include the following text:

The power density of the project is XX W/m², which is greater than 10W/m². Therefore, the project will result in no emissions,

$$PE_y = 0$$]

Also, as per the methodology, the use of fossil fuels for the back up or emergency purposes (e.g. diesel generators) can be neglected and hence not included.

**Leakage**

The project will result into no leakage.

$$LE_y = 0$$

**Emission reductions**

Emission reductions are calculated with the following formula:

$$ER_y = BE_y - PE_y - LE_y$$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ER_y$</td>
<td>tCO₂e/yr</td>
<td>Emission reductions in year $y$</td>
</tr>
<tr>
<td>$BE_y$</td>
<td>tCO₂e/yr</td>
<td>Baseline emissions in year $y$</td>
</tr>
<tr>
<td>$PE_y$</td>
<td>tCO₂e/yr</td>
<td>Project emissions in year $y$</td>
</tr>
<tr>
<td>$LE_y$</td>
<td>tCO₂e/yr</td>
<td>Leakage emissions in year $y$</td>
</tr>
</tbody>
</table>

Emission reductions are calculated with the following formula:

$$[XX]$$

**Table X: Summary of the emission reductions calculations**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Symbol</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Installed capacity</td>
<td>N</td>
<td>MW</td>
<td></td>
</tr>
<tr>
<td>2. Annual net electricity generation</td>
<td>$EG_{\text{facility,y}}$</td>
<td>MWh</td>
<td></td>
</tr>
<tr>
<td>3. Baseline carbon emission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline emission factor</td>
<td>$EF_{\text{grid,CM}}$</td>
<td>tCO₂/MWh</td>
<td></td>
</tr>
</tbody>
</table>
Baseline emission per year | BE<sub>y</sub> | tCO<sub>2</sub>
---|---|---
4. Project emission per year | PE<sub>y</sub> | tCO<sub>2</sub>/year
5. Leakage emission per year | LE<sub>y</sub> | tCO<sub>2</sub>/year
6. Emissions reductions per year | ER<sub>y</sub> | tCO<sub>2</sub>/year

### B.5.3. Summary of the ex-ante estimation of emission reductions:

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimation of project activity emissions (tonnes of CO&lt;sub&gt;2&lt;/sub&gt;e)</th>
<th>Estimation of baseline emissions (tonnes of CO&lt;sub&gt;2&lt;/sub&gt;e)</th>
<th>Estimation of leakage (tonnes of CO&lt;sub&gt;2&lt;/sub&gt;e)</th>
<th>Estimation of overall emission reductions (tonnes of CO&lt;sub&gt;2&lt;/sub&gt;e)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>(tonnes of CO&lt;sub&gt;2&lt;/sub&gt;e)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### B.6. Application of the monitoring methodology and description of the monitoring plan:

#### B.6.1. Description of the monitoring plan:

The monitoring plan of the CPA is consistent with methodology ACM0002 (version 13.0.0). Description of the monitoring plan is presented below.

[Describe Monitoring Plan components]

The project entity will collect internal records, sales receipts for power supplied to the grid and billing receipts for power received from the grid as evidence. The net supply (i.e. gross supply minus supply by the grid to the project) will be used for the calculations of emission reductions. In case of discrepancies between the readings of the grid company and the project entity, the readings of the grid company will prevail. The project entity will collect all records of generation, power delivered to the grid, sales receipts and the results of calibration will be collected and stored in a central place.

**Determination of net power supply**

The net electricity supplied by the project through the main power line(s) (in MWh) is continuously metered by the grid company (evidenced by monthly sales receipts), monthly recorded and cross-checked against the readings of metering instruments of the project entity.

**Archiving, reporting, and preparation for periodic verification**
The project entity 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 project entity will ensure that all required documentation is made available to the verifier. Data record will be archived for a period of 2 years subsequent to the crediting period.

Procedures in case of damaged metering equipment / Emergencies:

**Damage to metering equipment**

[XX]

**Emergencies**

[XX]

**Operational and Management Structure for Monitoring**

[XX]

Figure X. Management structure for monitoring emission reductions

**Training**

A detailed Monitoring Manual for CDM will be prepared by the CDM Advisor and delivered to the coordinating entity and the CPA implementing entity before the start of the crediting period. A training course will be designed and conducted so that the monitoring officer and the technical staff are fully familiar with the procedures set out in the Manual and the latest EB guidelines on monitoring for preparation of the monitoring report (CDM-MR).

<table>
<thead>
<tr>
<th><strong>B.6.2. Data and parameters monitored:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameters monitored should be updated according to selected method and options for emission factor determination</td>
</tr>
</tbody>
</table>

The parameters to be monitored are:

<table>
<thead>
<tr>
<th><strong>Data / Parameter:</strong></th>
<th><strong>EG_{facility,y}</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Data unit:</td>
<td>MWh</td>
</tr>
<tr>
<td>Description:</td>
<td>Quantity of net electricity generation supplied by the CPA to the grid in year y.</td>
</tr>
<tr>
<td>Source of data to be used:</td>
<td>Project owner</td>
</tr>
<tr>
<td>Value of data applied for the purpose of calculating expected emission reductions in section B.5</td>
<td>[XX]</td>
</tr>
<tr>
<td>Description of measurement methods</td>
<td>The data are directly measured by two-way electronic power meters</td>
</tr>
</tbody>
</table>
and procedures to be applied:
(revenue meters) installed at specific connecting points as stipulated in the Power Purchasing Agreement (PPA) with [XX]. The revenue meter will measure both the electricity supplied by the power plant to the grid (positive value) and the electricity supplied by the grid to the power plant (negative value) through the main cycle. The value displayed will be the automatic summation of those values.
Proportion of data to be monitored: 100%
Recording frequency: Continuous measurement and monthly recording
Data will be recorded electronically and kept during the crediting period and two years after.
Accuracy levels: As stipulated in the PPA.
It shall be determined as a difference between (i) quantity of electricity supplied by the project plant/unit to the grid and ii) quantity of electricity delivered to the project plant/unit from the grid.

QA/QC procedures to be applied:
Cross-check the measurement results with records for sold electricity (electricity bill provided by [XX]). Meter calibration shall be made in accordance with the PPA with [XX].

Any comment:
For calculating CERs generated by each CPA

<table>
<thead>
<tr>
<th>Data / Parameter:</th>
<th>TEG&lt;sub&gt;y&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data unit:</td>
<td>MWh/yr</td>
</tr>
<tr>
<td>Description:</td>
<td>Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year &lt;i&gt;y&lt;/i&gt;</td>
</tr>
<tr>
<td>Source of data to be used:</td>
<td>Project owner</td>
</tr>
<tr>
<td>Value of data applied for the purpose of calculating expected emission reductions in section B.5</td>
<td>[XX]</td>
</tr>
</tbody>
</table>

| Description of measurement methods and procedures to be applied: | The PoA consists of new hydropower projects (Greenfield) with no new reservoirs or increase in existing reservoirs and hence this parameter is not required. However, If the CPA results in to any new reservoir or increase in existing reservoirs and if the power density of the reservoir is greater than 4 W/m² and less than or equal to 10 W/m², this parameter will be required to be monitored. The data are directly measured by electronic power meters installed at the busbar after generators. Recording frequency: continuous measurement and monthly recording |
| QA/QC procedures to be applied: | - |
| Any comment: | Applicable only to hydro power project activities with a power density of the project activity (PD) greater than 4 W/m² and less than or equal to 10 W/m². |
### Data / Parameter: $Cap_{PJ}$

<table>
<thead>
<tr>
<th>Data unit:</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Installed capacity of the hydro power plant after the implementation of the project activity.</td>
</tr>
<tr>
<td>Source of data used:</td>
<td>Project owner</td>
</tr>
<tr>
<td>Value of data applied for the purpose of calculating expected emission reductions in section B.5</td>
<td>[XX]</td>
</tr>
<tr>
<td>Description of measurement methods and procedures to be applied:</td>
<td>Determined based on recognized standards. Monitored yearly.</td>
</tr>
<tr>
<td>QA/QC procedures to be applied:</td>
<td>Photos to be taken showing the status of generators and the nameplates with specifications of generators. Cross check with the Asset Registration Book and Maintenance Logbook for any modification or replacement.</td>
</tr>
<tr>
<td>Any comment:</td>
<td>For calculating PD, from which determine $EF_{Res}$ and $PE_y$.</td>
</tr>
</tbody>
</table>

### Data / Parameter: $A_{PJ}$

<table>
<thead>
<tr>
<th>Data unit:</th>
<th>m$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Area of reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full</td>
</tr>
<tr>
<td>Source of data to be used:</td>
<td>Project owner</td>
</tr>
<tr>
<td>Value of data applied for the purpose of calculating expected emission reductions in section B.5</td>
<td>[XX]</td>
</tr>
<tr>
<td>Description of measurement methods and procedures to be applied:</td>
<td>Monitored yearly.</td>
</tr>
<tr>
<td>QA/QC procedures to be applied:</td>
<td>[XX]</td>
</tr>
<tr>
<td>Any comment:</td>
<td>For calculating PD, from which determine $EF_{Res}$ and $PE_y$.</td>
</tr>
</tbody>
</table>
SECTION C. Environmental analysis

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

☐ Please tick if this information is provided at the PoA level. In this case sections C.2. and C.3. need not be completed in this form.

The environment analysis is provided at the CPA level as summarized in sections C.2. and C.3. below.

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

[Summary of the results of the CPA EIA or environmental analysis, as appropriate, will be provided here].

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

[Describe whether in accordance with the Vietnam laws/regulations, an environmental impact assessment is required for the CPA].

SECTION D. Stakeholders’ comments

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

☐ Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form.

The stakeholder comments are provided at the CPA level as summarized in sections D.2., D.3. and D.4. below.

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

According to regulations by the International Cooperation Department of the Ministry of Natural Resources and Environment, which was designated as the Viet Nam DNA at the time of the project’s implementation, the following organizations are the stakeholders of the proposed project whose comments should be taken into account:

- The Provincial People’s Committee;
- The People’s Committee of the district, or the commune affected by the project.

All documents related to the project were sent to these organizations to receive their comments.
Besides their comments, following the CDM procedures on stakeholder consultations, the comments of the commune’s officials were collected. These comments were received by the project entity during a meeting with the commune’s officials, which occurred on [XX].

D.3. Summary of the comments received:

[Summary of the comments received].

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

[Report on any comments received]
Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE CPA

<table>
<thead>
<tr>
<th>Organization:</th>
<th>[Project Implementer information]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street/P.O.Box:</td>
<td></td>
</tr>
<tr>
<td>Building:</td>
<td></td>
</tr>
<tr>
<td>City:</td>
<td></td>
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<tr>
<td>State/Region:</td>
<td></td>
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<td>Postfix/ZIP:</td>
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<td>Represented by:</td>
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<td>First Name:</td>
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<td>Direct FAX:</td>
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<td>Direct tel:</td>
<td></td>
</tr>
<tr>
<td>Personal E-Mail:</td>
<td></td>
</tr>
</tbody>
</table>
Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The CPA does not receive any public funding.
Annex 3

BASELINE INFORMATION

The details of the baseline emission factor calculation are presented in Vietnam Renewable Energy Program (REDP)

Vietnam’s DNA issued the Official Dispatch No. [XX] on [XX] providing the national grid emission factor with related data on OM and BM for data vintage [XX].

Below are tables summarizing data provided by Vietnam’s DNA in the above mentioned Dispatch.
Annex 4

MONITORING INFORMATION

Selection procedure:
The monitoring officer will be appointed by the project entity’s management. The monitoring officer will be selected from among the senior technical or managerial staff.

Tasks and responsibilities:
The monitoring officer will be responsible for carrying out the following tasks:

- **Supervise the project implementation**
  The monitoring officer will supervise the implementation of the project as per the specifications mentioned in the CPA-DD and ensure that the technical specifications are not different from the one mentioned in the included CPA-DD. Any such deviations will be flagged to the C/ME as necessary.

- **Supervise and verify metering and recording**
  The monitoring officer will coordinate with the plant manager to ensure and verify adequate metering and recording of data, including power delivered to the grid. The officer will also pay close attention to correct functioning of the meters, ensure their accuracy through their calibration at regular intervals as required and their maintenance.

- **Collection of additional data, sales / billing receipts**
  The monitoring officer will collect sales receipts for power delivered to the grid, billing receipts for power delivered by the grid to the hydropower station and additional data such as the daily operational reports of the hydropower station. Any major breakdowns or plant shut downs will be recorded along with reasons for the same. The officer will also notify if there are any events/incidents that deviate the project descriptions and/or CDM requirements during each monitoring period mainly with respect to implementation of the monitoring plan prescribed in the CPA-DD.

- **Calculation of emission reductions**
  The monitoring officer will calculate the annual emission reductions on the basis of net power supply to the grid. The monitoring officer will be provided with a calculation template in electronic form by the project’s CDM advisors.

- **Preparation of monitoring report**
  The monitoring officer will annually prepare a monitoring report (as per the standard format suggested by the EB) which will include, among other things, a summary of daily operations, metering values of power supplied to and received from the grid, copies of sales/billing receipts, a report on calibration, calculation of emission reductions and comparison of actual emission reductions with the projected ones in the CPA-DD and the reasons for any significant deviations.

Support:
The monitoring officer will receive the support from the CDM Advisor in his/her responsibilities through the following actions:

- Initial training on CDM, monitoring methodology, monitoring procedures and requirements and archiving;

- Provide the monitoring officer with a calculation template in electronic form for calculation of annual emission reductions;

- Continuous advice to the monitoring officer on a need basis; and
- Review of monitoring report.

The monitoring officer will also receive the support from downline technical staff in collecting data and checking operational status of technological equipment as set out in the monitoring plan.