Component project activity design document form
(Version 09.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title of the CPA	CPA2_Nam Tha 4 Hydropower Project
Scale of the CPA	☒ Large-scale ☐ Small-scale
Version number of the CPA-DD	08
Completion date of the CPA-DD	03/02/2020
Title and UNFCCC reference number of the registered CDM PoA	Vietnam Renewable Energy Development Program (REDP) 6810
Title and reference number of the corresponding generic CPA	CPA2_Nam Tha 4 Hydropower Project
Coordinating/managing entity	Ministry of Industry and Trade of Vietnam (MOIT)
Host Party	Viet Nam
Applied methodologies and standardized baselines	ACM0002 Version 13.0.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", EB 67
Sectoral scopes	Sectoral scope 1: Energy industries (renewable - / non-renewable sources)
Estimated amount of annual average GHG emission reductions	28,~~804~~311 tCO_2e

SECTION A. Description of component project activity (CPA)

A.1. Purpose and general description of CPA

>>

The present CPA is to be implemented as part of the CDM PoA: Vietnam Renewable Energy Development Program (REDP). It aims at avoiding CO_2 emissions from Nam Tha 4 Hydropower Project in Vietnam.

Nam Tha 4 Hydropower is a run-off-river hydropower plant with an installed capacity of 17 MW connecting to Vietnam national electricity grid.

Description and purpose of the CDM programme activity

The CDM programme activity of Nam Tha 4 hydropower project is part of the Program of Activities (PoA) supporting the Renewable Energy Development Program (REDP) in Vietnam. The PoA will be coordinated and managed by the Project Management Board for Rural Energy and Renewable Energy (PMB-RERE) under the Energy Department of the Ministry of Industry and Trade (MOIT). The CPA implemented as part of the PoA, proposes to reduce the GHG emissions from fossil fuels used for power generation.

The CDM programme activity, Nam Tha 4 Hydropower Project (the "project" or the "proposed CPA"), involves the construction and operation of a new run-off-river hydroelectric power project on the Nam Tha stream, which is a grade-1 branch of the Ngoi Nhu (Nhu stream), which is again a grade-2 branch of the Red river, located in Nam Tha commune, Van Ban district, Lao Cai province, Vietnam. The developer of the project is Phuc Khanh Investment Construction and Energy Development JS Company (the "project owner").

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"). The project will install two turbine / generator units, with an installed capacity of 8.5 MW for each unit for a total installed capacity of 17 MW.

- **Scenario existing prior to the start of the implementation project:**
  The scenario prior to the start of the implementation of the project consists of the non-utilization of the Nam Tha stream at the given site, and the continued expansion of the National Power Grid with a combination of fossil-fuel fired and renewable energy resources.

- **Baseline scenario:**
  According to the approved CDM methodology ACM0002, the baseline scenario for the CPA is the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

- **Project scenario**
  In the project scenario, the proposed project activity will provide clean, renewable power which will displace an equivalent amount of power otherwise to be generated by existing power plants and future additions to the National Power Grid.

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.

Implementation schedule:[1]

No.	Milestone (date/month/year)	Description
1	06/12/2010	Construction of the horizontal pressure tunnel and the vertical well (underground construction work)
2	20/12/2011	Construction of the pressure tank
3	25/01/2012	Construction of the powerhouse
4	15/02/2012	Supply of package equipment and technical services, including turbines and generators (divided in 4 packages)
5	10/03/2012	Construction of head work items (dam, water intake, spillway)
6	12/07/2012	Construction of office building
7	01/07/2013[2]	Start of commercial generation for both generating units

On 19/07/2018, Nam Tha 4 CPA was hit by violent floods, which had badly destroyed the plant, making it non-operational as of 19/07/2018. The following damages were caused to the plant:[3]

No.	Project item affected	Scope of damage
1	Powerhouse	o The entire powerhouse and 35kV substation were completely submerged o The entire machine tools for general uses and repair works and spare equipment of Nam Tha 4 plant kept in the stock were swept away o The entire office area of Nam Tha 4 plant was swept away (including all properties and 6 motorbikes) o Tailrace and powerhouse front ground were blocked up with woods, rubbish, rock and soil. o The entire power access road and road dikes were swept away.
2	Diversion system	o Steel diversion canal was completely broken and swept away: approximately 100m, supporting abutments exposed to subsidence
3	Service road	o About 30m of negative-side slope was exposed to landslide, which caused cracks to the road at 3-4m depth. o About 47m of road base was severely eroded, with 120m3 of positive-side slope were exposed to landslide.
4	Dam and reservoir area	o Heavy sedimentation was caused to the entire bed with a lot of huge peddles. o Sand release gate was blocked up.

[1] The implementation milestones are based on the date of signing relevant construction and/or supply contracts.

[2] Date expected by both project owner and grid company in the signed Power Purchase Agreement.

[3] Refer to 2018 revised Feasibility Study, General Description, page 3

The turbine-generator units, speed governor, magnetic stimulators, turbine valve gates and other auxiliary equipment contained inside the powerhouse were severely damaged based on evaluations made by the insurance company.[4] Recommendations were made to the CPA implementer to replace all these equipment with new ones. Therefore the CPA implementer had to reconstruct the powerhouse and install new equipment.

Timeline of reconstruction:[5]

No.	Milestone (date/month/year)	Description
1	12/2018	Revised feasibility study documents completed for reconstruction of Nam Tha 4 plant
2	01/01/2019	Site clearance and preparation in order to start re-construction and/or upgradation
3	01/07/2019	Start of re-construction and/or upgradation works
4	12/01/2020	Non-load commissioning is completed for 1st and 2nd generating units
5	15/01/2020	Loaded commissioning is completed for 1st and 2nd generating units

A.2. Location of CPA

>>

Nam Tha 4 Hydropower Project is located on Nam Tha Stream, Nam Tha communes, Van Ban district, about 30km away from Van Ban township, Lao Cai province.

The geographical references of Nam Tha 4 Hydropower Project's main construction works are located within the following geographical coordinate range:[6]

- Dam location: Longitude: 104.331˚ E; Latitude: 21.887˚ N
- Powerhouse location: Longitude: 104.341˚ E; Latitude: 21.885˚ N

[4] Evaluation report by insurance company dated 24/10/2018

[5] Refer to page 43 of revised FSR, General Description

[6] The geographical coordinates are taken from the approval to include Nam Tha 4 HPP into the province hydropower plan by Lao Cai provincial people's committee on 10/05/2010

Figure 1. Location (arrow) of the main construction works of the project activity by GPS

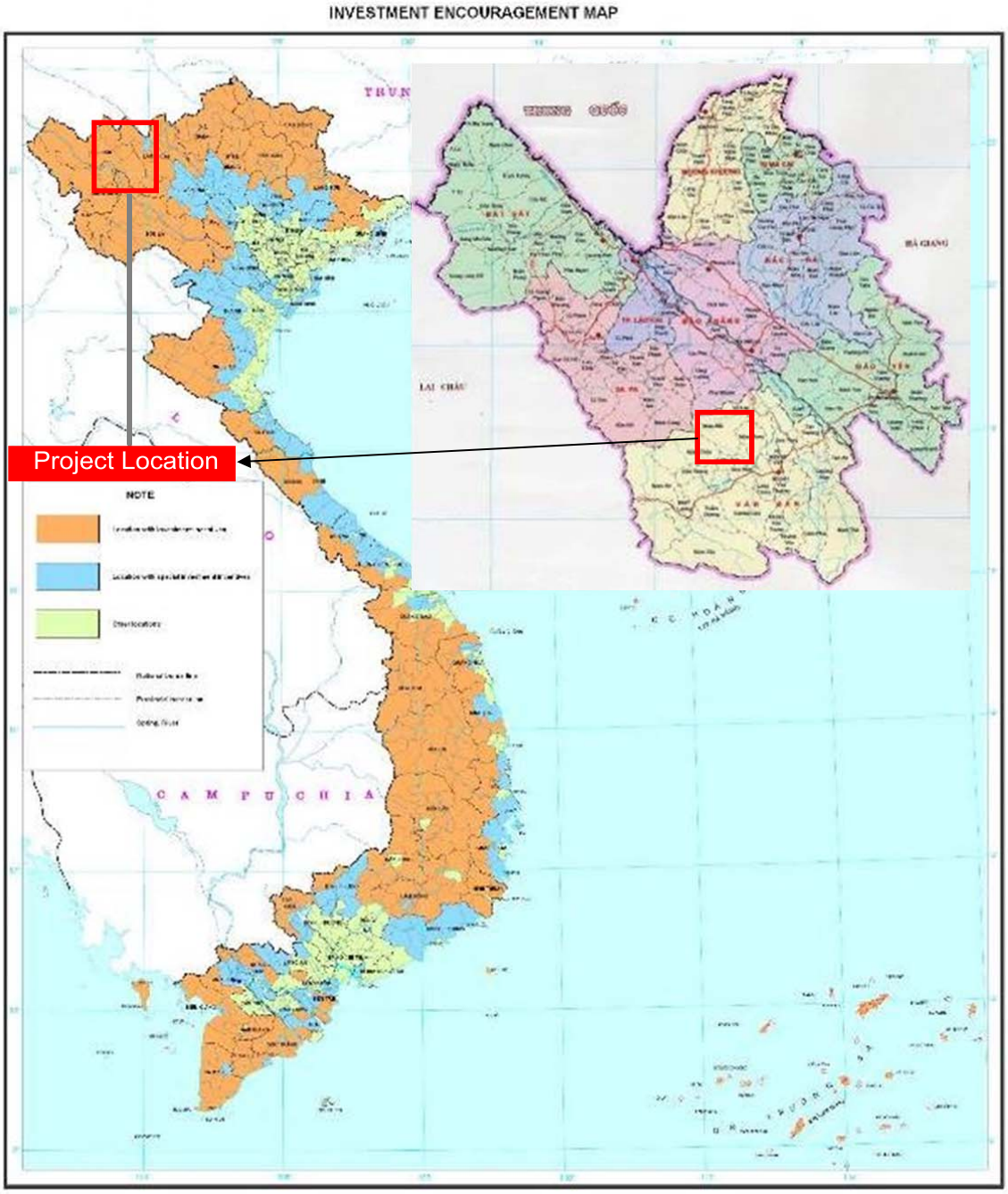


Figure 2. Location of the project in Vietnam

A.3. Technologies/measures

>>

The CPA involves the construction and operation of a new hydropower plant facility with a maximum water head of 218 meters. The project design consists of a main dam section (including gravity dam and spillway dam) a subordinate dam section, water intake, diversion canal, pressure tank, pressure pipe, a powerhouse, a tailrace and a switching station. Below is summary of project main parameters:[7]

Description	Unit	Value	
		Main dam section	Subordinate dam section
Reservoir			
Normal water level in the reservoir	M	816	847
Dead water level in the reservoir	M	814.5	847
Reservoir surface area at normal water level	km^2	0.01	
Full capacity of the reservoir	10^6m^3	64	0
Dead capacity of the reservoir	10^6m^3	46	0
Gravity dam			
Length of whole dam	M	26.45	35.07
Maximum dam height	M	16.1	4.8
Spillway dam			
Weird elevation	M	816	847
Number of spillway sections	Section	1	1
Maximum height	M	14.5	4.8
Energy			
Maximum water head	M	218	
Annual operating hours	Hour	3,464	
Annual gross electricity generation	10^6 kWh	58.9	
Net annual electricity generation	10^6 kWh	58.017[8]	

The reservoir shall have a surface area[9] of 0.01km^2 or 10,000m^2 at full capacity and a total water volume[10] of 64,000,000m^3. The project will install 2 horizontal axis turbine/generator units with a capacity of 8.5 MW per unit. The technical data of the turbine/generator units are listed in Table 1~~Table 1~~ below.

[7] 2018 Revised FSR, General Description, Technical Specifications Sheet

[8] Calculated at 1.5% transmission loss and internal use

[9] The surface area of the reservoir at normal water level was derived from the Revised FSR, Volume 10, Chapter 2, page 2-2.

[10] The average capacity of the reservoir at normal water level was determined at 64,000 m^3 according to the Revised FSR, Volume 10, Chapter 2, page 2-1

Table 1: Technical data of turbines and generators[11]

Main Technical Data		Value (per unit)
Turbines	Units	02
	Type	Francis turbine, horizontal axis
	Rated speed	1,000 rpm
	Rated capacity	8,734 kW
Generators	Units	02
	Rated speed	1,000 rpm
	Frequency	50 Hz
	Capacity	8,500 kW (or 10,000 kVA)
	Rated voltage	6.3 kV
	Power factor (cosφ)	0.85
	Plant load factor	39.55%

Total annual power generation is considered at 58,900 MWh[12], and 58,017 MWh[13] of that will be supplied to the grid. Power generated by the project will be transmitted to the National Power Grid through the 35 kV double-circuit overhead lines.

A.4. Coordinating/managing entity

>>

Ms. Pham Huong Giang (who is also a project participant)
General Directorate of Energy, Ministry of Industry and Trade (MOIT)
Tel: 844- 22202431; Email: giangph@moit.gov.vn

A.5. Parties and CPA implementers

~~Name of Party~~**Parties involved** ~~(host) indicates host Party~~	~~Private and/or public entity(ies) CPA implementer(s) (as applicable)~~**CPA implementers**	**Indicate if the Party involved wishes to be considered as CPA implementer (Yes/No)**
Socialist Republic of Viet Nam (Host Country)	Ministry of Industry and Trade of Vietnam (MOIT).	No

[11] Nameplates of generating units and equipment purchase contract dated 18/10/2018.

[12] Annual gross generation is based on the 2018 revised Feasibility Study, General Description, page 59.

[13] The net electricity generation was calculated by subtracting annual gross generation to 1.5% transmission loss, based on the Initial FSR, Volume 7, Chapter 5, Economic & Financial Analysis, page 5-2.

Socialist Republic of Viet Nam (Host Country)	Phuc Khanh Investment Construction and Energy Development JS Company (CPA implementer)	Yes
Sweden (Annex 1 Country)	International Bank for Reconstruction and Development (IBRD) as trustee of the Carbon Partnership facility (CPF)	No
Sweden (Annex 1 Country)[14]	Government of Sweden - Swedish Energy Agency	No
Spain (Annex 1 Country)[15]	Kingdom of Spain - Ministry of the Agriculture, Food and Environment & Ministry of Economy and Competitiveness	No
Norway (Annex 1 Country)[16]	Norwegian Ministry of Climate and Environment	No

A.6. Public funding of CPA

>>

No public funds from Annex I countries is involved in this project.

A.7. History of CPA

>>

Nam Tha 4 Hydropower 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. It is also not a de-registered project activity.

This CPA is not a CPA that has been excluded from a registered CDM PoA as a result of erroneous inclusion of CPAs. There is no other hydropower plant that is a registered CDM project activity or a CPA under a registered CDM PoA whose crediting period has or has not expired exists in the same geographical location as this CPA. This is evidenced by the coordinates of Nam Tha 4 CPA in Section A.2.

[14] Though this project participant was there during PoA registration, it was not mentioned in CPA DD before

[15] Project participant detail updated in UNFCCC project page only on 19/03/2015

[16] Project participant detail updated in UNFCCC project page only on 19/03/2015

A.8. Debundling

>>
Not applicable

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines

>>
Name of approved baseline and monitoring methodology:

ACM0002 Version 13.0.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", EB 67.
http://cdm.unfccc.int/UserManagement/FileStorage/DYPFI935XBG274NWH6O8CM1KEZR0VU

The following related tools are applied for this CPA:
Version 2.2.1 of the "Tool to calculate the emission factor for an electricity system", which was approved by the Executive Board in its 63rd meeting.
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.2.1.pdf

Version 06.1.0 of the "Tool for the demonstration and assessment of additionality", which was approved by the Executive Board in its 69th meeting.
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.1.0.pdf

Version 03.0.1 of the "Combined tool to identify the baseline scenario and demonstrate additionality."
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v3.0.1.pdf

This proposed project is a grid-connected renewable power generation that is eligible to apply Version 13.0.0 of ACM0002. The fulfillment of relevant applicability conditions of ACM0002, version 13.0.0 are demonstrated in below table.

Comparison of project characteristics and eligibility criteria of ACM0002 methodology

Applicability conditions of ACM0002	Characteristics of the project activity	Applicability criteria met?
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-off-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*	The project activity is to install a new run-off-river hydropower plant. This is evidenced by the feasibility study[17] and related	Yes

[17] Initial FSR, Volume 10, General Description, Chapter 1, General Information

plant/unit;	construction contract[18] and also revised set of 2018 feasibility study documents and construction contracts.[19]	
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/m^2; 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/m^2.*	If the project involves construction of a new reservoir, the power density will be greater than 4 W/m^2. The power density of the project activity is 1,700 W/m^2 which is much larger than 4 W/m^2. Installed capacity is provided in the 2018 revised feasibility study. Reservoir surface[20] The project activity does not involve retrofit, replacement or capacity additions of any power plant/unit as evidenced by the feasibility study and construction contract[21] and also revised set of 2018	Yes

[18] Civil construction contract for the horizontal tunnel and vertical well (underground work) signed with the Chinese contractor.

[19] Refer to 2018 revised FSR and related construction contracts for reconstruction of plant

[20] The installed capacity is taken from the 2018 revised Feasibility Study, General Description, Technical Specifications Sheet. The surface area of the reservoir at normal water level remains unchanged and was derived from Revised FSR, Volume 10, Chapter 2, page 2-2

[21] The installed capacity is taken from the Initial FSR, Volume 10, General Description, Chapter 1, General Information. The surface area of the reservoir at normal water level was derived from the Revised FSR, Volume 10, Chapter 2, page 2-2

	feasibility study documents and construction contracts.[22]	
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/m^2	It is a renewable energy project with no fuel-switch nor biomass involved. The power density of the new reservoirs is larger than 4 W/m^2[23]	Yes

B.2. Project boundary, sources and greenhouse gases (GHGs)

>>

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.

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 project activity.	CO_2	Yes	Main emission source.
		CH_4	No	Minor emission source.
		N_2O	No	Minor emission source.
Project scenario	For hydro power plants, emissions of CH_4 from the reservoir.	CO_2	No	Minor emission source.
		CH_4	No	Main emission source. Negligible as power density is > 10 W/m^2.

[22] Refer to 2018 revised FSR and related construction contracts for reconstruction of plant

[23] Initial FSR, Volume 10, General Description, Chapter 1, General Information and also 2018 revised Feasibility Study, General Description

		N_2O	No	Minor emission source

Figure 3 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.

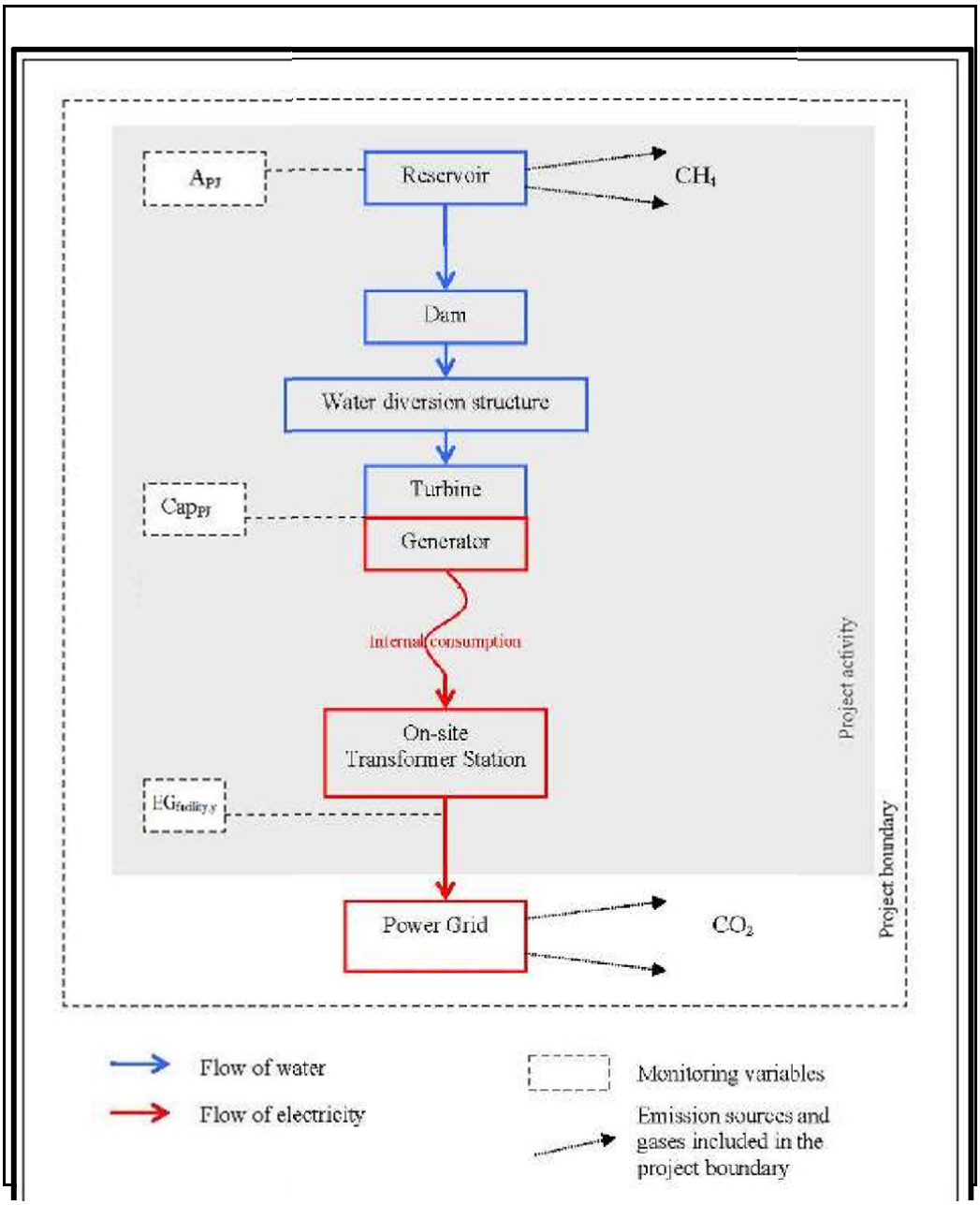


Figure 3. Flow diagram of the CPA and related emissions

B.3. Establishment and description of baseline scenario

>>

According to the approved CDM methodology ACM0002, the baseline scenario for the CPA is the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

B.4. Estimation of emission reductions

B.4.1. Explanation of methodological choices

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

Baseline emissions
The baseline emissions (BE_y) are the product of the baseline emissions factor (EF_y) calculated below, times the electricity supplied by the project activity to the national grid (EG_y), as per the formulae given below:

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

Where:

BE_y	tCO_2/yr	Baseline emissions in year *y*
$EG_{PJ,y}$	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)
$EF_{Grid,CM,y}$	tCO_2/MWh	Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the "*Tool to calculate the emission factor for an electricity system*", version 2.2.1.

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

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

where:

$EG_{PJ,y}$	=	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr)
$EG_{facility,y}$	=	Quantity of 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 ex-ante baseline emission factor set out in the PoA-DD, the baseline emissions of the CPA are calculated as shown below:

$$BE_y = EG_{facility,y} \times EF_{grid,CM,y} = 45{,}852 \times 0.5874 = 26{,}932\ tCO_2$$

After adjustment of installed capacity and annual gross generation:

~~$BE_y = EG_{facility,y} \times EF_{grid,CM,y} = 58{,}017 \times 0.5874 = 34{,}078\ tCO_2$~~

$BE_y = EG_{facility,y} \times EF_{grid,CM,y} = 55{,}022 \times 0.5874 = 32{,}319\ tCO_2$

Where:

55,022 is the MWh of net electricity determined based on increased capacity by 20% of capacity specified in originally included CPA-DD in accordance with Paragraph 241(a)(i)(a) of the CDM Project Standard for PoA version 2. Please refer to emission reductions (ER) spreadsheet, tab Emission reductions for detailed calculations.

The baseline emission factor is ($EF_{grid,CM,y}$) is calculated ex-ante 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." In the case of Vietnam electricity generation mix, the only low-cost/must-run generation resource is the hydro power generation.

The Simple OM is applicable to this project activity since it involves hydropower which has low marginal generation costs. And as Table 10 shows below, Low-Cost/Must-run power resources constitute less than 50% of the total grid generation on average over five recent years. Therefore, as per the tool, simple OM can be used in the calculation of the OM emission factor.

Table 10: Electricity generation of the National Power Grid of Viet Nam, period 2007-2011[24]

Year	2007	2008	2009	2010	2011	Period 2007-2011
Hydropower (MWh)	22,385,232	25,933,762	29,033,871	24,241,216	35,185,329	136,779,410
Total power (MWh)	66,348,589	74,689,636	81,369,303	91,224,603	100,851,857	414,483,988
Low-cost/Must-run Ratio	33.74%	34.72%	35.68%	26.57%	34.89%	33.00%

In accordance with the "Tool to calculate the emission factor for an electricity system", the OM is calculated according to the "*ex-ante* option": a three-year generation-weighted average, based on the most recent data available at the time of submission of the CPA-DD to the DOE for validation, without the requirement to monitor and recalculate the emissions factor during the crediting period.

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

According to the simple OM method, the OM emission factor is calculated as the generation-weighted average tCO_2 emissions per unit of net electricity generation (tCO_2/MWh) of all generating power plants serving the system, excluding the low-cost/must-run power plants/units.

[24] Data is extracted from the annex 1 of 2011 EF calculation report for the national electricity grid system published by Vietnam DNA

We calculate the OM emission factor according to option B of the simple OM method because: (i) The data required for option A (net quantity electricity ($EG_{m,y}$) and a CO_2 emission factor of each power unit ($EF_{EL,m,y}$)) is not available. The 2011 EF report by Vietnam DNA only published 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; (ii) Only renewable power generation is considered as low-cost/must-run in Viet Nam and its quantity is known and included in the 2011 EF report; and (iii) The off-grid power plants are not included in the calculation (As per choice of step 2).

Option B – Calculation based on total fuel consumption and electricity generation of the system

Under this option, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_{i} (FC_{i,y} \times NCV_{i,y} \times EF_{CO_2,i,y})}{EG_y}$$

Where:

$EF_{grid,OMsimple,y}$	=	Simple operating margin CO_2 emission factor in year *y* (tCO_2/MWh)
$FC_{i,y}$	=	Amount of fossil fuel type *i* consumed in the project electricity system 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)
$EF_{CO_2,i,y}$	=	CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)
EG_y	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year *y* (MWh)
i	=	All fossil fuel types combusted in power sources in the project electricity system in year *y*
y	=	The relevant year as per the data vintage chosen in Step 3

The carbon emission factors *(*$EF_{CO_2,i,y}$) and net calorific value ($NCV_{i,y}$) are default values at the lower limit of the uncertainty at 95% confidence interval as provided in Table 1.4, page 1.23 and 1.24, Chapter 1 of Volume 2 (Energy) of the *2006 IPCC Guidelines for National Greenhouse Gas Inventories.*

The net electricity generated and supplied to the national power grid (EG_y) and amount of fuel consumption of each fuel type ($FC_{i,y}$) in the project electricity system were obtained from the 2011 EF report published by Vietnam DNA on 28/05/2013.

The simple OM is derived as in the below table.

Year	**Total Emissions**	**Total Generation**	**Simple OM value**

	(tCO2)	(MWh)	(tCO2 / MWh)
2009	28,382,922	52,303,503	**0.5598**
2010	36,057,342	66,933,115	
2011	39,038,319	65,620,049	

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 *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) The set of five power units that have been built most recently, or
(b) 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 (2011):

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

In accordance with the 2011 EF report published by Vietnam DNA, the total domestic electricity generation of Vietnam National Power Grid in 2011 was 100,851,857.00 MWh, the 20% of domestic electricity generation of Vietnam National Power Grid in 2011 is 20,170,371.40 MWh. The most recently commissioned 17 power plants (20,929,236.83MWh) in the grid contributed 20.75% of the total electricity generation.

The build margin is calculated as the generation–weighted average emission factor (tCO_2/MWh) of a sample of power plants as follows:

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

Where:

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

$EF_{grid,BM,y}$ is calculated ***ex–ante*** as described in Option 1 of the "Tool to calculate the emission factor for an electricity system" version 2.2.1.

The CO_2 emission factor of each power unit *m* ($EF_{EL,m,y}$) is determined as per the guidance in Step 4 (a) for the simple OM, option A1, using electricity generation data for 2011 which is the most recent historical year for which is available at the time of the CPA inclusion.

$$EF_{EL,m,y} = \frac{\sum_{i} FC_{i,m,y} \cdot NCV_{i,y} \cdot EF_{CO2,i,y}}{\sum EG_{m,y}}$$

Where:

$EF_{EL,m,y}$	=	CO_2 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
$EF_{CO2,i,y}$	=	CO_2 emission factor of fossil fuel type i in year y
$EG_{m,y}$	=	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 data from the 2011 EF report published data by the Vietnam DNA, the build margin emission factor is:

Total Generation	20,929,236.83	MWh
Total Emissions	12,871,467	tCO2
$EF_{grid,BM,y}$	0.6150	tCO2/MWh

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:

$EF_{grid,BM,y}$	tCO_2/MWh	Emission factor of the build margin.
$EF_{grid,OM,y}$	tCO_2/MWh	Emission factor of the operating margin.
w_{OM}	%	Weighting of the operating margin emission factor. (Default of 50%)
w_{BM}	%	Weighting of the build margin emission factor. (Default of 50%)

$$EF_{grid,CM,y} = 0.5 \times 0.5598 + 0.5 \times 0.6150$$

$EF_{grid,CM,y}$ =	**0.5874**	**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 Appendix 3.

B.4.2. Data and parameters fixed ex ante

(Copy this table for each data and parameter.)

Data / Parameter	**EF_{Res}**
Data unit	$kgCO_2e/MWh$
Description	Default emission factor for emissions from reservoirs
Source of data	Decision by EB23
Value(s) applied	0
Choice of data or Measurement methods and procedures	The CPA consists of a new hydropower project (greenfield) with no reservoirs existing.
Purpose of data	For calculating project emission from the reservoir
Additional comment	-

Data / Parameter	Cap_{BL}
Data unit	W
Description	Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero
Source of data	Operations Manual of REDP
Value(s) applied	0
Choice of data or Measurement methods and procedures	The PoA consists of new hydropower projects (greenfield projects) only.
Purpose of data	For calculating the power density
Additional comment	-

Data / Parameter	A_{BL}
Data unit	m^2
Description	Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero
Source of data	Operations Manual of REDP
Value(s) applied	0
Choice of data or Measurement methods and procedures	The PoA consists of new hydropower projects (greenfield) with no reservoirs existing before the CPAs.
Purpose of data	For calculating the power density
Additional comment	-

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2/MWh
Description	Combined margin CO_2 emission factor of grid connected power generation in year y calculated using the version 2.2.1 of the "Tool to calculate the emission factor for an electricity system"
Source of data	Department of Meteorology, Hydrology and Climate Change (DNA of Vietnam).
Value(s) applied	0.5874
Choice of data or Measurement methods and procedures	The CM emission factor is recalculated using the data extracted from the 2011 grid EF report published by Vietnam DNA. The calculation was made in accordance with version 2.2.1 of the "Tool to calculate the emission factor for an electricity system". Link to the 2011 EF report published by Vietnam DNA: http://www.noccop.org.vn/Data/vbpq/Airvariable_ldoc_61vnBC%20cuoi%20cung%202011.pdf
Purpose of data	For calculating the baseline emission
Additional 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 $EF_{grid,OM,y}$ and the $EF_{grid,BM,y}$ are calculated *ex-ante*, the $EF_{grid,CM,y}$ will be fixed during the first crediting period.

Data / Parameter	EG_y
Data unit	MWh
Description	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year *y* (MWh)
Source of data	Department of Meteorology, Hydrology and Climate Change (DNA Vietnam)
Value(s) applied	See Appendix 3 for 2009, 2010 and 2011 data
Choice of data or Measurement methods and procedures	Electricity generation data are used for OM and BM calculations
Purpose of data	For calculating the baseline emission
Additional comment	-

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	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(s) applied	See Appendix 3
Choice of data or Measurement methods and procedures	No data for the fuels used in Vietnam is available hence IPCC defaults are used.
Purpose of data	For calculating the emission factor
Additional comment	-

Data / Parameter	$FC_{i,m,y}$
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	Department of Meteorology, Hydrology and Climate Change (DNA Vietnam)
Value(s) applied	See Appendix 3 for 2009, 2010 and 2011 data
Choice of data or Measurement methods and procedures	Fuel consumption data are used for OM and BM calculations
Purpose of data	For calculating the emission factor
Additional comment	-

Data / Parameter	$EF_{CO2,i,y}$
Data unit	tCO_2/TJ
Description	CO_2 emission factor of fossil fuel type i in year y
Source of data	2006 IPCC Guidelines on National GHG Inventories
Value(s) applied	See Appendix 3
Choice of data or Measurement methods and procedures	IPCC default values at the lower limit of the uncertainty at 95% confidence interval as provided in table 1.4 of Chapter1 of Vol.2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Purpose of data	For calculating the emission factor
Additional comment	-

B.4.3. Ex ante calculation of emission reductions

>>

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:

Parameter	Unit	Description
PD	W/m^2	Power density of the project activity
Cap_{PJ}	W	Installed capacity of the hydro power plant after the implementation of the project activity
Cap_{BL}	W	Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero.
A_{PJ}	m^2	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.
A_{BL}	m^2	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.

Installed capacity is 17 MW or 17,000,000 W. The power density is calculated as follows.

$PD = (Cap_{PJ} – Cap_{BL}) / (A_{PJ} – A_{BL})$ = (17,000,000 – 0) / (10,000 – 0) = 1,700 W/m^2

The power density of the project is 1,700 W/m^2, which is much greater than 10 W/m^2. 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:

$ER_y = BE_y – PE_y – LE_y$

Where:

ER_y	tCO_2e/yr	Emission reductions in year *y*
BE_y	tCO_2e/yr	Baseline emissions in year *y*
PE_y	tCO_2e/yr	Project emissions in year *y*
LE_y	tCO_2e/yr	Leakage emissions in year *y*

The annual emission reductions are calculated with the following formula:

$ER_y = BE_y – PE_y – LE_y = 26,932 – 0 – 0 = 26,932\ tCO_2$

After adjustment of installed capacity and annual gross generation:

$ER_y = BE_y – PE_y – LE_y =$ ~~34,078~~32,319[25] $– 0 – 0 =$ ~~34,078~~32,319 tCO_2

B.4.4. Summary of ex ante estimates of emission reductions

Year	Baseline emissions (t CO_2e)	Project emissions (t CO_2e)	Leakage (t CO_2e)	Emission reductions (t CO_2e)

[25] Baseline emission is determined based on increased capacity by 20% of capacity specified in originally included CPA-DD

2014 (2 months)	4,489	0	0	4,489
2015	26,932	0	0	26,932
2016	26,932	0	0	26,932
2017	26,932	0	0	26,932
2018	26,932	0	0	26,932
2019	26,932	0	0	26,932
2020	~~34,078~~32,095[26]	0	0	~~34,078~~32,095
2021 (10 months)	~~28,389~~26,933	0	0	~~28,389~~26,933
Total	**~~201,625~~198,176**	**0**	**0**	**~~201,625~~198,176**
Total number of crediting years	7			
Annual average over the crediting period	**28,~~804~~311**	**0**	**0**	**28,~~804~~311**

[26] Baseline emission ~~increases due to adjustment of~~is determined with 0.5 month based on original capacity and 11.5 months based on new installed capacity ~~and annual gross generation~~

B.5. Monitoring plan

B.5.1. Data and parameters to be monitored

(Copy this table for each data and parameter.)

Data / Parameter	$EG_{facility,y}$
Data unit	**MWh**
Description	Quantity of net electricity generation supplied by the CPA to the grid in year *y.*
Source of data	Measured from applicable meter(s) and calculated from export and import power
Value(s) applied	45,852[27] 58,017[28]
Measurement methods and procedures	The data are directly measured by bidirectional electronic power meters installed at Nam Tha 4 plant and 110 kV Nam Tha substation. There will be 05 bidirectional power meters as follows: 1. 01 main meter and 01 back-up meter at Nam Tha 4 plant 2. 01 main meter and 02 back-up meters at 110 kV Nam Tha substation. These meters 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 single cable line. The electricity will be continuously measured by the power meters and hourly recorded. Proportion of data to be monitored: 100% Data will be recorded electronically and kept during the crediting period and two years after. Accuracy level: in accordance with the local Circular No. 27/2009/TT-BCT, dated 2009-09-25 issued by the Ministry of Industry and Trade of Vietnam.
Monitoring frequency	Continuous measurement and monthly recording.
QA/QC procedures	The measurement/monitoring equipment should adopt the colligated automation system complying with national standard and technology. These equipment and systems should be calibrated once a year, in accordance with the signed power purchases agreement.[29] If the main meter is failed, the value recorded by the backup power

[27] Ex-ante net electricity supplied to the grid by the CPA, after deducting internal use only.

[28] Ex-ante net electricity supplied to grid by CAP, after adjustment of installed capacity and deducting internal use. Two values of ex-ante net electricity are provided here to make ex-ante baseline emission calculation transparent.

[29] Based on page 30, Annex 3 of the Power Purchase Agreement signed in 05/2013.

	meters will be used generation calculation. If both main and backup power meters are also erroneous, the data used for generation calculation will be conducted according to the details agreed in the Power Purchase Agreement.
Purpose of data	For calculating baseline emission of the CPA.
Additional comment	The monitored value of this parameter will be calculated from the power export and import. The power export and import will be based on the data from the applicable meter(s). 58,017 MWh is the ex-ante net electricity supply to grid by the CPA after adjustment of installed capacity. However, the exported electricity will be capped at 55,022MWh for CER claim which is determined based on the increased capacity by 20% of capacity specified in originally included CPA-DD in accordance with Paragraph 241(a)(i)(a) of the CDM Project Standard for PoA version 2.

Data / Parameter	**Cap_{PJ}**
Data unit	W
Description	Installed capacity of the hydro power plant after the implementation of the project activity.
Source of data	Nameplate of the generating equipment
Value(s) applied	11,500,000 17,000,000[30]
Measurement methods and procedures	Verified at the project site.
Monitoring frequency	Monitored yearly.
QA/QC procedures	Photos to be taken showing the status of generators and the nameplates with specifications of generators. Cross check with the Maintenance Logbook for any modification or replacement.
Purpose of data	For calculating PD, from which determine EF_{Res} and PE_y
Additional comment	-

[30] Installed capacity after re-construction of powerhouse in the aftermath of floods

Data / Parameter	A_{PJ}
Data unit	m^2
Description	Area of reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full
Source of data	Measurement report by a third party consultant.
Value(s) applied	10,000
Measurement methods and procedures	The measurement method will be applied by the third party consultant in accordance with the local industry practices.
Monitoring frequency	Monitored yearly.
QA/QC procedures	The third party consultant will have sufficient qualification and licensing to conduct the measurement. The actual water level will also be measured on-site for the operational purpose and records. The uncertainty level of the data is low.
Purpose of data	For calculating PD, from which determine EF_{Res} and PE_y
Additional comment	-

B.5.2. Sampling plan

>>
Not applicable

B.5.3. Other elements of 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.

MONITORING OF NET ELECTRICITY SUPPLIED BY THE PROJECT TO THE GRID AND RELATED PARAMETERS

Nam Tha 4 Hydropower Project is expected to connect to the National Power Grid through 110kV Nam Tha – Khe Lech substation located by the hydropower plant. The grid connection diagram indicates the principles for positioning of metering instruments and flow of electricity export to and import from the national power grid that will be used in the monitoring of emission reductions.

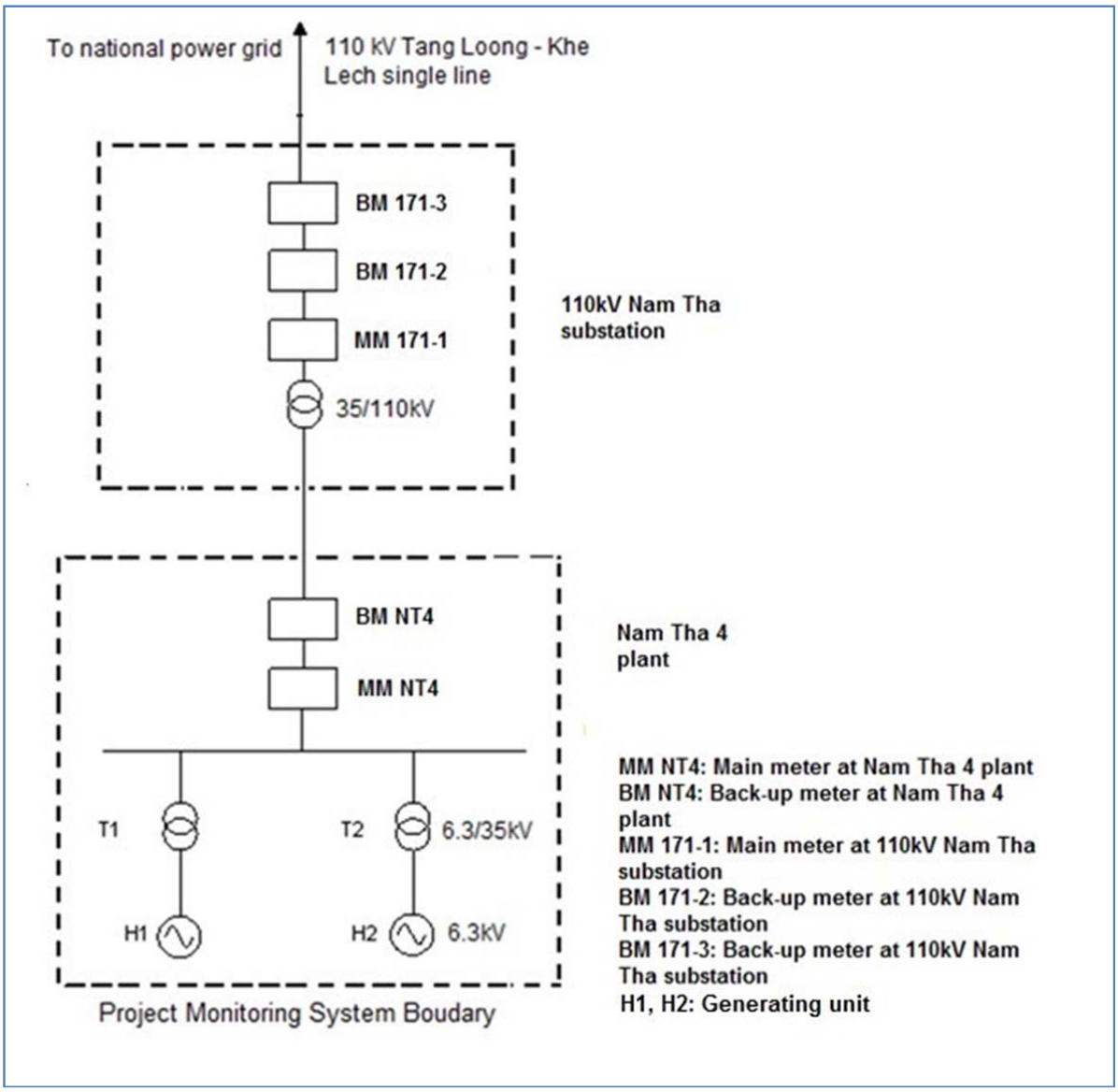


Figure 8. Expected grid connection diagram

The Project Entity will monitor the parameters in accordance to the following principles:

- **Power supplied to the grid by the component project activity:**
  As indicated in Figure 8, the project is connected by a single cable line, which will deliver power generated by the project to the national power grid. The power supplied to the grid is metered as below:
  - Project entity: The power supplied to the grid is metered by the project entity by 05 power meters, including 01 main and 01 back-up meters at Nam Tha 4 plant; and

01 main and 02 back-up meters at 110 kV Nam Tha substation. The meters will be bidirectional standard electricity meters in accordance with national regulations (that meet the accuracy level of 0.2 for main meters and 0.5 for back-up meters in compliance with local regulation or equivalent to IEC 62053-22)[31].

- o Grid company: The grid company, EVN, will meter the power supply also by the same sets of meter systems which are sealed by EVN. The calibration will be carried out according to the internal calibration requirements of the grid company itself.
- o Calibration: Calibrations are carried out by the grid company or by a certified company appointed by the grid company following the procedures and cycles as stipulated in the Decision No. 25/2007/QD-BKHCN dated 05 October 2007 by the Ministry of Science and Technology or any specific regulations applicable. If there are any substantial discrepancies between the readings of the metering instruments throughout the year, both instruments will be recalibrated.

- **Power imported from the grid to the component project activity:**

  - o Project entity: The power imported from the grid is metered by the project entity by 05 meters, including 01 main and 01 back-up meters at Nam Tha 4 plant, and 01 main and 02 back-up meters at 110 kV Nam Tha 4 substation. The meters will be bidirectional standard electricity meters in accordance with national regulations (that meet the accuracy level of 0.2 for main meters and 0.5 for back-up meters in compliance with local regulation or equivalent to IEC 62053-22)[32].
  - o Grid company: The grid company, EVN, will meter the power import also by the same sets of meter systems which are sealed by EVN. The calibration will be carried out according to the internal calibration requirements of the grid company itself.
  - o Calibration: Calibrations are carried out by the grid company or by a certified company appointed by the grid company following the procedures and cycles as stipulated in the Decision No. 25/2007/QD-BKHCN dated 05 October 2007 by the Ministry of Science and Technology or any specific regulations applicable. If there are any substantial discrepancies between the readings of the metering instruments throughout the year, both instruments will be recalibrated.

- **Determination of net power supply:**

  The net electricity supplied by the project (in MWh) will be calculated from the readings of meters for import and export and 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.

[31] Circular No. 27/2009/TT-BCT dated 25 September 2009 by the Ministry of Industry and Trade
[32] Circular No. 27/2009/TT-BCT dated 25 September 2009 by the Ministry of Industry and Trade

- **Installed capacity of the hydropower plant (Ca_{PJ}):**
  In addition to the above, the installed capacity of the hydropower plant will be monitored annually. Photos showing the date of checking, the status of generators and the nameplates with specifications of generators shall be taken and along with information from supplier should be enclosed with the Annual Monitoring Report for submission to the PoA coordinating entity.

- **Surface area of the reservoir (A_{PJ}):**
  The level of the water reservoir will be measured and the surface area of the reservoir is calculated annually by a third party measurement consultant, to check whether the actual reservoir does not deviate substantially for the design.

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.

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

The data recorded from the back-up system will be used in case of the failure of the main system:

1. The main metering system is to measure the total electricity export and import.
2. The backup systems are also installed and operated for measuring the total electricity export and import in redundancy with the main system. Its recorded data will be served in case of any failure of the main system.

Furthermore, the project entity will document all efforts made to restore normal monitoring procedures.

Emergencies

In case of emergencies, the project entity will not claim emission reductions due to the project activity for the duration of the emergency. The project entity will follow the below procedures for declaring the emergency period to be over:

1. The project entity will ensure that all requirements for monitoring of emission reductions have been re-established.

2. The monitoring officer and the head of operations of the hydropower station will both sign a statement declaring the emergency situation to have ended and normal operations to have resumed.

OPERATIONAL AND MANAGEMENT STRUCTURE FOR MONITORING

The monitoring of the emission reductions will be carried out according to the scheme shown in Figure 6. Within the project entity, a monitoring officer is appointed to undertake the day-to-day supervision responsibility. The measurement of the electrical energy supplied to the grid and reporting of daily operations will be carried out by the plant operation staff.

The monitoring officer will be responsible for checking the measurements, collection of sales receipts, collection of billing receipts of the power supplied by the grid to the hydropower 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 hydropower 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 4. Finally, the monitoring reports will be reviewed by a CDM Advisor, who will be engaged by the coordinating entity to assure that all monitoring requirements are met.

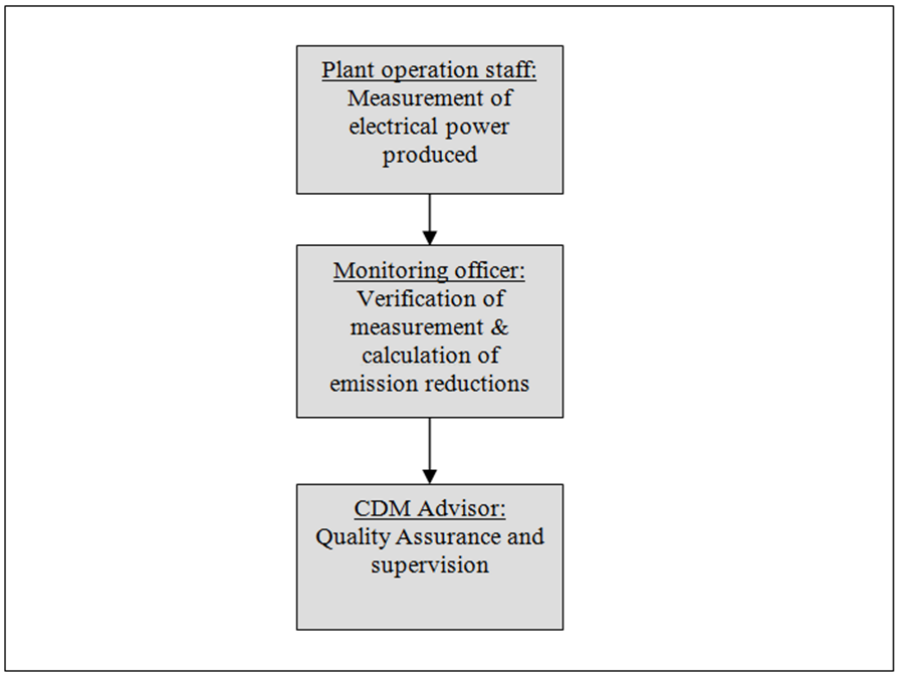


Figure 7. Management structure for monitoring emission reductions

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).

SECTION C. Start date, crediting period type and duration

C.1. Start date of CPA

>>
06/12/2010, which was the date that the contract on the construction of the horizontal pressure tunnel and vertical pressure well (underground work) was signed between Phuc Khanh Investment Construction and Energy Development JS Company and a Chinese contractor.

C.2. Expected operational lifetime of CPA

>>
30 years 00 months

C.3. Crediting period of CPA

C.3.1. Type of crediting period

>>
Renewable crediting period
This is the first renewable crediting period.

C.3.2. Start date of crediting period

>>
26/11/2014 or the date of inclusion of this CPA in the registered POA, whichever is later.

C.3.3. Duration of crediting period

>>
7 years and 00 months

SECTION D. Environmental impacts

D.1. Analysis of environmental impacts

>>
Environmental Protection Commitment (EPC) report was carried out in 2008 by the project entity. Furthermore, an Environmental Management Plan (EMP) was also developed in 2010 as required by the REDP. A summary of the main environmental impacts is provided below.

Summary of main Environmental Impact Assessment

1. Land acquisition.

Permanent land acquisition area shall be 0.65 ha for the reservoir and 18.02 ha for project construction items. Temporarily occupied land area shall be 4.5 ha for the disposals and temporary material handling processes.

2. Landslide, erosion and sedimentation.

This will cause sedimentation on different parts of Nam Tha stream, thereby affecting the quality of surface water and aquatic life.

3. Impacts on quality of surface water.

This shall be mainly resulted from the rainwater run-offs that sweep away constructional material waste and domestic waste from the workers working at the site. The polluted rainwater shall increase the water turbidity in nearby water bodies and hence affecting the marine life.

4. Impacts on air quality.

During the project's construction, some air pollution will occur due to dust resulting from construction and skimming tools. There will also be exhaust gases from transport vehicles and machines during construction and exhaust gases from transportation activities during operation, which have insignificant an impact on the air quality.

The other impact on the air quality will come from the storage of water in the reservoir. The changes in buffering surface type will cause the humidity pattern of the lake area and surroundings to change. The increased humidity reserves can create favorable conditions for cloud and frost forming in the area.

5. Noise impacts.

This may be resulted from the operation of constructional machinery and equipment during construction phase of the hydropower plant. In addition, transport vehicles and mine explosions may also be a significant source of noise impacts which directly influence workers' health at the site.

6. Impacts on soil.

Water from the turbines containing little suspended sediment may cause sand erosion through abnormal changes. Large erosion may affect the reservoir's capacity.

7. Impacts on the river flow in the downstream region, marine life and reservoir side subsidence and/or landslide during operation phase.

Summary of Mitigation Measures

During the construction phase, the project owner has to sign a contract with contractors who provide material/equipment for the construction activities. Therefore, the mitigation measures relating to noise and air pollution caused by the transport of material/equipment shall be mandated in the bid documents as prerequisites for the bidders.

Phuc Khanh Investment Construction and Energy Development JS Company will assign a specific person to be responsible for environmental management of Nam Tha 4 Hydropower Project. This environmental management person shall preside and ensure proper coordination among the relevant stakeholders in order to:

- ✓ Monitor the implementation of mitigation measures in accordance with the EMP.
- ✓ Environmental quality monitoring and implementation of preventive measures relating environmental issues in accordance with the Environmental Protection Commitment (EPC) report.
- ✓ Supervise and take necessary measures to address adverse environmental impacts.
- ✓ Prepare a report the process of environmental management work and submit it to the district Department of Natural Resources and Environment and to the management of Phuc Khanh Investment Construction and Energy Development JS Company, and Lao Cai BIDV branch.
- ✓ Participate in MOIT PMB's training courses on environmental management practices.

The EPC report and EMP did not report any trans-boundary impacts since the project is completely located within Vietnam land territory.

D.2. Environmental impact assessment

>>

According to the Decree No. 21/2008/ND-CP, Nam Tha 4 Hydropower Project is required to conduct the Environmental Protection Commitment (EPC) report.

The EPC report was developed and completed by a third party consultant. The EPC of Nam Tha 4 project was approved by Van Ban District Peoples' Committee on 01-10-2008 via the letter No. 586/XN-UBND. In addition, the project has also complied with the Environment Safeguards Framework, which was approved for REDP. In accordance with the ESF, an Environment Management Plan for the project was prepared so as to meet the requirements of Vietnam's regulation on environment issues, which was given no objection by the WB and endorsed by MOIT.

Below is the list of environment regulations that the project complied with:

Related Law and Regulations of Vietnam:

- Environment protection Law of the Socialist Republic of Vietnam No. 52/2005/QH11 dated 29/11/2005, which come into effect since 01/07/2006
- Decree No. 80/2006/ND-CP dated 09/09/2006 by the Government on detail regulations and guidelines for the implementation of the Environment protection Law

- Decree No. 117/2009/ND-CP dated December 31, 2009 of the Government on the handling of law violations in the domain of environmental protection

- Circular No. 05/2008/TT-BTNMT dated 08/12/2008 by the Ministry of Natural Resources and Environment on guidelines for strategic environment assessment, environmental impact assessment and environment protection commitment.

- Decree No. 21/2008/ND-CP dated 28/02/2008 by the Government on amendment to Decree No. 80/2006/ND-CP dated 09/09/2006 by the Government which provides detail regulations and guidelines for the implementation of the Environment protection Law.

- Vietnam's current standards related to environment issues.

World Bank safeguards policies:

Safeguard
OP/BP 4.01 Environmental Assessment (January 1999)
OP/BP 4.04 Natural Habitats (June 2001)
OP/BP 4.10 Indigenous Peoples (July 2005)
OP/BP 4.11 Physical Cultural Resources (July 2006)
OP/BP 4.12 Involuntary Resettlement (December 2001)
OP/BP 4.37 Safety of Dams (October 2001)
OP/BP 7.50 International Waterways (June 2001)
World Bank Policy on Disclosure of Information (January 2002)

SECTION E. Local stakeholder consultation

E.1. Modalities for local stakeholder consultation

>>

The following the procedures on stakeholder consultations required by the local regulation (Circular No. 05/2008/TT-BTNMT, dated 08/12/008 by the Ministry of Natural Resources and Environment), the comments of the commune's stakeholders were collected. These comments were received by the project entity during a meeting with the commune's officials and local residents, which occurred on 10 June 2010 in Nam Tha commune, Van Ban district, Lao Cai province. The proposed project is solely located in Nam Tha commune, Van Ban district, Lao Cai province. The officials of the People's Committee of Nam Tha commune and all households affected by the construction of the project were invited to the stakeholder consultation meeting. The following commune officials and local representatives participated in such stakeholder consultation meeting:

Commune officials:

1. Mr. Dang Phuc Huong – Vice Chairman of Nam Tha Commune People's Committee.
2. Mr. Trieu Huu Chau – Deputy Secretary of Nam Tha Commune Party Committee.
3. Mr. Trang Sua Nhia – Leader of Khe Pan village.

Representatives of Phuc Khanh Investment Construction and Energy Development JS Company:

1. Mr. Hoang Van Tam – Director of Phuc Khanh Investment Construction and Energy Development JS Company

2. Mr. Mai Cong Long – Head of the Projects Management Unit, Phuc Khanh Investment Construction and Energy Development JS Company
3. Mr. Tran Van Ha – Vice Manager of Nam Tha 6 Hydropower Plant (another plant), Phuc Khanh Investment Construction and Energy Development JS Company

Local residents:[33]

1. Mr. Trang Sua Nhia – Khe Pan village
2. Cang Giong Sam – Khe Pan village
3. Lo Lu To – Khe Pan village
4. Thao Cho Vao – Khe Pan village
5. Sung Xoay Vang – Khe Pan village
6. Trang Bo Xan – Khe Pan village
7. Lo Nhe Pao – Khe Pan village
8. Trang Sinh Vang – Khe Pan village
9. Sung Nay Sung – Khe Pan village

E.2. Summary of comments received

>>

All the comments received have been taken into consideration by the project owner and documented in the minute of stakeholder consultation meeting. A summary of the comments received are as follows:

1. Comments by Mr Dang Phuc Huong, vice chairman of Nam Tha commune people's committee:

✓ The project is located far from the residential area, thus the construction of the project activity will not require resettlement, will not change and displace traditional customs of the local residents;

✓ The project activity will contribute to improving local roads, which is beneficial to the local residents;

✓ The project activity will improve the life of local residents by supplying power for their production and living needs, hence, leading to improved life quality;

✓ The 3-years now operation Nam Tha 6 HPP has proven that it does not affect or the health or change the life of the local residents;

✓ The project owner is requested to conduct some afforestation for those forest areas are temporarily displaced during the construction phase

[33] Just to name a few, the full list of attendance was included in the stakeholder consultation meeting records and attached attendance list conducted on 10/06/2010

2. Comments by affected households:

✓ Though it is said that the project is located far from residential areas and does not affect the life of local residents, the project owner will still have to address some potential indirect impacts;

✓ The acquisition of the forest will be in accordance with the government procedure where appropriate and valid compensation price frame shall be applied;

✓ The temporarily acquired forest area shall be rehabilitated appropriately and handed over to Nam Tha commune people's committee for management;

✓ Appropriate measures will be taken in order to reduce noise from the transport of material and equipment to the project sites;

✓ Dust prevention measures will also be taken properly;

Maximization of the chance for the local residents to work in the plant;

E.3. Consideration of comments received

>>

All the participants agreed to support the construction of Nam Tha 4 hydropower plant. The local authorities committed to working closely with the project owner to ensure proper management in terms of forest management, and other administrative measures will be taken to ensure the minimum adverse impacts on the environment, and socioeconomic situation in the region. The project owner committed to strictly apply measures provided in the EMP in order to minimize the impacts on the local environment and life of residents. The project owner will send a specific representative working on issues or comments by the local residents during the construction and operation phases of the project activity.

SECTION F. Eligibility for inclusion

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.

Nam Tha 4 Hydropower 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 2: Conformity of the CPA with the eligibility criteria for inclusion in the PoA

	Eligibility criteria as per requirements of the standard	Evidence needed in the CPA	Eligibility criterion applied?
a	**Geographical boundary of the CPA**		
	Each Project should be located within the geographical boundary of the PoA, i.e. in Vietnam.	Map of CPA and/or description of location indicating project within	Yes – The CPA is located in Lao Cai province, Vietnam see

	Eligibility criteria as per requirements of the standard	Evidence needed in the CPA	Eligibility criterion applied?
		Vietnam boundary.	Section A.2
b	**Avoidance of double counting of emission reductions**		
	Each CPA-DD shall be uniquely identified and defined in an unambiguous manner.	Geographic information (GPS coordinates).	Yes – The geographical reference of Nam Tha 4 Hydropower Project is within the range: Dam location: Longitude: 104.331; Latitude: 21.887 Powerhouse location: Longitude: 104.341; Latitude: 21.885[34]
	The coordinating entity will ensure that all CPAs under its PoA are neither registered as an individual CDM project activity nor included in another registered PoA, and that the CPA is subscribed to the PoA.	Demonstration should be provided in the PDD.	Yes – The CPA has never been registered or submitted for registration under the CDM. see Section A.7
	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.	Yes – the project was approved by the MOIT which is the coordinating entity. This is evidenced by the internal MOIT letter approving the refinancing for this CPA in the PoA, dated 08/12/2011.[35]
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	Evidences should include any of the following: Technical specification/Manufacturer data/nameplate	Yes – the project activity involves the construction of a new hydropower plant. This

[34] The geographical coordinates are taken from the approval for the hydropower plan issued by Lao Cai provincial people's committee on 10/05/2010.

[35] Letter by the MOIT approving the refinancing for the the project activity under the REDP.

	Eligibility criteria as per requirements of the standard	Evidence needed in the CPA	Eligibility criterion applied?
	accepted.	data/procurement contract/feasibility study, etc.	is evidenced by the feasibility study [36]and construction contract[37] and also 2018 revised feasibility study documents and construction contracts, proving that the project was built from green field.
	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.	Evidences should include any of the following: Technical specification/Manufacturer data/nameplate data/procurement contract/feasibility study, etc.	Yes, - the capacity of the project is 17 MW. This is evidenced by the 2018 revised feasibility study.[38]
	In the case that the project activity involves the construction of a new reservoir, the power density shall be larger than 4 W/m^2.	Reservoir surface and installed capacity or power density shall be documented from topological study or feasibility study, etc.	Yes – the power density of the project activity is 1,700 W/m^2 which is much larger than 4 W/m^2. Installed capacity is provided in the 2018 revised feasibility study. Reservoir surface[39]
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	Yes – Contract on the civil construction for the horizontal pressure tunnel and vertical pressure well

[36] Initial FSR, Volume 10, General Description, Chapter 1, General Information.

[37] Civil construction contract for the horizontal tunnel and vertical well (underground work) signed with the Chinese contractor

[38] 2018 Revised FSR, General Description, Technical Specifications Sheet.

[39] The installed capacity is taken from 2018 revised Feasibility Study, General Description, Technical Specifications Sheet. The surface area of the reservoir at normal water level was derived from the Revised FSR, Volume 10, Chapter 2, page 2-2.

	Eligibility criteria as per requirements of the standard	Evidence needed in the CPA	Eligibility criterion applied?
		supply, etc.	(underground work), dated 06/12/2010.[40] The start date of CPA is 06/12/2010 whilst the date of publication of the PoA for global public consultation is 30/12/2009.
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. "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 13.0.0*.	The compliance should be demonstrated against the applicability conditions of the methodology as outlined in Section E.2. of the PoA-DD	Yes – the CPA meets all applicability conditions of ACM0002 baseline and monitoring methodology (version 13.0.0) as demonstrated in the below table.
f	**CPAs meet the requirements pertaining to the demonstration of additionality**		
	FIRR of the CPA is below the benchmark rate applicable to the CPA as per the Guidelines on the Assessment of Investment Analysis. The financial analysis should be provided and all assumptions are justified through relevant evidences by the CPA implementer. The analysis will be done following the "Tool for the demonstration and assessment of additionality"	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. The Equity rate and the debt interest rate, involved in the calculation of the benchmark rate, can be sourced from	Yes – additionality is demonstrated through benchmark analysis. The equity IRR (9.09%) is well below the standard benchmark for Vietnam for this type of projects (12.75%). The project is not a common practice. The financial analysis sheet is available and all assumptions are justified. Details in section D.5.

[40] Based on the civil construction of the pressure tunnel and vertical well concluded in 2010.

	Eligibility criteria as per requirements of the standard	Evidence needed in the CPA	Eligibility criterion applied?
		documents such as Annex I of the Guidelines on the Assessment of Investment Analysis, relevant documents of the financial sector, loan sanction documents, etc.	
	CPA has access to loan from participating banks under REDP, and participating banks have a refinance agreement with WB-REDP/MOF.	Loan agreement between the CPA and local banks and list of participating banks in WB-REDP/MOF refinancing scheme.	Yes - the CPA accessed loan from the BIDV, a participant bank. The WB and BIDV Lao Cai issued the appraisal reports in 10/2011 and 10/2010 respectively for the refinancing for the project activity on[41]. BIDV has a refinance agreement with WB-REDP/MOF, dated 08/12/2011.[42]
g	**Local stakeholder consultations and environmental impact analysis**		
	The CPA must have secured all required environmental clearances as outlined in Section C.	The relevant documents should include inter alia Initial Environmental Evaluation, water rights, land right, power purchase agreement, etc.	Yes – Secured relevant environmental clearances outlined in section C of the PoA. The EPC of Nam Tha 4 project was approved by Van Ban District Peoples' Committee on 01/10/2008. [43] All other permits are available.
	The CPA must comply with Dam Safety Framework, Resettlement Policy Framework and Ethnic Minority Planning Framework or similar instruments.	The project safeguard documents must be publicly disclosed.	Yes – Complies with the requirements. On 15/11/2010 Phuc Khanh Investment Construction and Energy

[41] Appraisal reports by WB and BIDV Lao Cai, dated 10/2011 and 10/2010 respectively.

[42] Loan contract was signed on 8 December 2011 between BIDV Lao Cai and the project owner.

[43] Based on the approval for the EPC issued on 01/10/2008.

	Eligibility criteria as per requirements of the standard	Evidence needed in the CPA	Eligibility criterion applied?
			Development JS Company disclosed the Resettlement Plan (RP) and Ethnic Plan (EP) of Nam Tha 4 project to stakeholders. The project has an environmental management plan which has granted no objection by the WB and endorsed by MOIT and was also published on 25/11/2010.[44]
	The project must have undertaken a stakeholder consultation as outlined in Section D.	Evidences could include the following : meetings minutes, press release, list of participants and records of participants comments and project developers responses, pictures, etc.	Yes - Stakeholder consultations have been undertaken by the CPA. This is evidenced by the stakeholder meeting minutes dated 10/06/2010.[45]
	Participating developers and bank attended the training and capacity building programs conducted by MOIT.	Participants list or confirmation by MOIT.	Yes, the developer and the bank attended the training and capacity building programs conducted by MOIT. This has been evidenced by providing the attendance log sheet of the training sessions.
h	**Affirmation of non-diversion of official development assistance (ODA)**		
	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	Yes - LoA for Swedish clearly states that non ODA is involved in the project.

[44] Based on the letters to disclose the RP and EP on 15/11/2010 and the EMP on 25/11/2010 respectively.

[45] Based on the minute of stakeholder consultation meeting organized on 10/06/2010.

	Eligibility criteria as per requirements of the standard	Evidence needed in the CPA	Eligibility criterion applied?
		CPAs	
i	**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.	Yes – the project will be connected to the national grid through 110kV transmission line to the national power grid. The national utility had issued the approval for grid connection and arrangements for the project activity on 17/04/2009 and a modified grid connection arrangement on 14/05/2013.[46]

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 activity neither a micro-scale project.

Demonstration of project additionality:

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:

Version 06.1.0 of the "Tool for the demonstration and assessment of additionality", which was approved by the Executive Board in its 69th meeting.
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v6.1.0.pdf
Version 03.0.1 of the "Combined tool to identify the baseline scenario and demonstrate additionality."
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v3.0.1.pdf

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

[46] Based on the approval for the grid connection dated 17/04/2009 and the approval for modified grid connection dated 14/05/2013.

program has addressed some of the barriers faced by these kinds 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.[47]

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

[47] 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.

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 30 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:

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 Equity IRR as the most suitable economic indicator or FIRR.

Following paragraph 15 of the “Guidelines on the Assessment of Investment Analysis” Version 05, EB62, Annex 5, it has been selected as a benchmark the default value of the return on equity provided in Appendix A of the Guidelines. For Energy Industries (Group 1) projects in Vietnam, this value is 12.75%

Step 2c: Calculation and comparison of financial indicators

The parameters used in the FIRR calculations are presented in Table below.

Table 3: Parameters for FIRR calculation

Table 3.1: Initial parameters used for FIRR calculation:[48]

	Item	Unit	Value	Source	Date (dd/mm/yy)
I	**Project technical details**				
	Installed capacity	MW	11.5	Volume 1, Summary Report	06/2008
	Project expected lifespan	years	30	Volume 7, Chapter 5 - Economic & Financial Analysis, page 5-5	12/2009
	Annual gross generation	MWh	46,550	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009
	Plant load factor	%	46.21%	Calculated	
II	**Initial investment costs**		**221,268**		
	Construction cost	mil. VND	109,996	Volume 1, Summary Report, page 1-15 to 1-16	06/2008
	Equipment cost	mil. VND	67,847	Volume 1, Summary Report, page 1-15 to 1-16	06/2008
	Project management cost	mil. VND	2,587	Volume 1, Summary Report, page 1-15 to 1-16	06/2008
	Consultancy cost	mil. VND	9,250	Volume 1, Summary Report, page 1-15 to 1-16	06/2008
	Other cost	mil. VND	7,156	Volume 1, Summary Report, page 1-15 to 1-16	06/2008
	Contingency	mil. VND	19,747	Volume 1, Summary Report, page 1-15 to 1-16	06/2008
	Resettlement, compensation	mil. VND	4,685	Volume 1, Summary Report, page 1-15 to 1-16	06/2008
III	**Costs arising during operation and Taxes**				
	Annual O&M Cost		1.5% of Investment costs	Volume 7 - Economic & Financial Analysis, page 5-5	12/2009
	Annual insurance		1% of Investment costs	Decision 28/2007/QD/BTC	04/2007
	Resources tax		2% of revenue calculated	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009

[48] The investment costs are derived from the Initial FSR in 2008 and the financial references are derived from the Updated Initial FSR in 12/2009, which was at the same timing of investment decision.

	Item	Unit	Value	Source	Date (dd/mm/yy)
			using the taxable tariff		
	Taxable tariff	VND/kWh	940	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009
	Depreciation for Equipment	year	10	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009
	Depreciation for others	year	20	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009
	Residual value of fixed asset	mil. VND	0	Fixed asset are fully depreciated after 20 years	
	Enterprise's revenue tax			Decree 124/2008/ND-CP	12/2008
	For the first 4 years		0%	Decree 124/2008/ND-CP	12/2008
	For the next 9 years		5%	Decree 124/2008/ND-CP	12/2008
	For the next 2 years		10%	Decree 124/2008/ND-CP	12/2008
	For the remaining years		25%	Decree 124/2008/ND-CP	12/2008
IV	**Project revenue**				
	Electricity Sales (per year)	MWh	45,852	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009
	Electricity tariff	VND/kWh	750.66	Volume 7 - Economic & Financial Analysis, page 5-8	12/2009
V	**Financing structure**				
	Debt interest Rate	%	15	IMF country report 2010 describes the prevalent interest rates at end of 2009 and early 2010 which is at similar time of the investment decision[49]	IMF report: 10/2010 Board decision: 02/12/2009
	Equity ratio	%	50	Guideline # 18 on the assessment of Investment Analysis (EB 62 Annex 5)	

The powerhouse with all equipment inside and some sections of diversion canal were damaged by floods and have been replaced with new ones and reconstructed. The residual value of project

[49] IMF country report published in 09/2010 but described the prevalent interest rate in Vietnam at end of 2009 and early 2010.

assets are estimated to add up with additional investments costs to conduct investment analysis as follows.

Table 3.2: Residual value of equipment and construction works from initial investment for re-investment:

Item	Unit	Value	Source	Date
Scrap value of equipment	mil. VND	3,392	Cut-off value for residual value at 5% https://help.sap.com/doc/saphelp_afs64/6.4/ru-RU/4f/71dded448011d189f00000e81ddfac/content.htm?no_cache=true	International allowable practice
Fair value of construction works	mil. VND	82,475	Volume 7 - Economic & Financial Analysis, page 5-6 (Straight-line depreciation for 20 years); Project has been operational for approximately 5 years	2018
Total	mil. VND	85,867	Calculated	

Table 3.3: New parameters used for FIRR calculation:

	Unit	Unit	Value	Source	Date	Note
I	**Project technical details**					
	Installed capacity	MW	17	2018 Revised General Description, page 31	2018	Changed due to reconstruction
	Project expected lifespan	years	25[50]	2018 Revised General Description, page 57	2018	
	Annual gross generation	MWh	58,900	2018 Revised General Description, page 59	2018	Changed due to reconstruction
	Plant load factor	%	39.55	Calculated	2018	Changed due to reconstruction
II	**Additional investment costs**	mil. VND	**180,660**	Calculated	2018	Changed due to reconstruction
	Construction cost	mil. VND	77,418	2018 Revised FSR, Total Investment, page 9	2018	Changed due to reconstruction
	Equipment cost	mil. VND	82,048	2018 Revised FSR, Total Investment, page 9	2018	Changed due to reconstruction

[50] The total expected operational lifetime of CPA is still 30 years. 2018 revised FSR estimates 25 years because the plant is already in operation for approximately 5 years prior to re-construction.

	Project management cost	mil. VND	730	2018 Revised FSR, Total Investment, page 9	2018	Changed due to reconstruction
	Consultancy cost	mil. VND	2,456	2018 Revised FSR, Total Investment, page 9	2018	Changed due to reconstruction
	Other cost	mil. VND	2,679	2018 Revised FSR, Total Investment, page 9	2018	Changed due to reconstruction
	Contingency	mil. VND	15,206	2018 Revised FSR, Total Investment, page 9	2018	Changed due to reconstruction
	Appraisal, verification, audit	mil. VND	121	2018 Revised FSR, Total Investment, page 9	2018	Changed due to reconstruction
	Total investment costs	mil. VND	**266,527**[51]	Calculated		
III	**Costs arising during operation and Taxes**					
	Annual O&M Cost		1.5% of Investment costs	Volume 7 - Economic & Financial Analysis, page 5-5	12/2009	
	Annual insurance		1% of Investment costs	Decision 28/2007/QD/BTC	04/2007	
	Resources tax		2% of revenue calculated using the taxable tariff	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009	
	Taxable tariff	VND/kWh	940	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009	
	Depreciation for Equipment	year	10	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009	
	Depreciation for others	year	20	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009	
	Enterprise's revenue tax			Decree 124/2008/ND-CP	12/2008	
	For the first 4 years		0%	Decree 124/2008/ND-CP	12/2008	

[51] 85,867 million VND + 180,660 million VND = 266,527 million VND. Initial investment costs and Additional investment costs are exclusive of local VAT at 10%

	For the next 9 years		5%	Decree 124/2008/ND-CP	12/2008	
	For the next 2 years		10%	Decree 124/2008/ND-CP	12/2008	
	For the remaining years		25%	Decree 124/2008/ND-CP	12/2008	
IV	**Project revenue**					
	Electricity Sales (per year)	MWh	58,017	Volume 7 - Economic & Financial Analysis, page 5-6	12/2009	Changed due to reconstruction
	Electricity tariff	VND/kWh	750.66	Volume 7 - Economic & Financial Analysis, page 5-8	12/2009	
V	**Financing structure**					
	Debt interest Rate	%	15.0%	IMF country report 2010 describes the prevalent interest rates at end of 2009 and early 2010 which is at similar time of the investment decision	IMF report: 10/2010 Board decision : 02/12/2009	
	Equity ratio	%	50%	Guideline # 18 on the assessment of Investment Analysis (EB 62 Annex 5)		

Comparison of the FIRR of the CPA with the benchmark FIRR

The comparison of the FIRR of the CPA, Nam Tha 4 Hydropower Project with the benchmark FIRR of 12.75% is presented in Table below.

Table 4: Results of financial analysis

Nam Tha 4 Hydropower Project		
Financial Internal Rate of Return (IRR) over a 25 year period	Without CDM revenues	9.09%
Benchmark		12.75%

The results indicate that the FIRR of Nam Tha 4 Hydropower Project is below the 12.75% 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, four above parameters is considered in the critical assumptions. The results of the sensitivity analysis for the FIRR are shown in Table below, while Figure 4, 5, 6 and 7 provide a graphic depiction.

Table 5: Impact of variations in assumptions on the IRR without CDM revenues

No	Parameter	Variation	Project IRR	Likelihoods
1	Investment cost	+10%	7.16%	Below benchmark
		- 10%	11.42%	Below benchmark
		-14.87%	12.75%	The probability of a 14.87% decrease in the investment cost is not likely to happen because the statistic CPI of housing materials construction has been increased for the last few years. Especially for 2008 the general CPI has already increased more than 20%.
2	Energy generation	-10%	7.00%	Below benchmark
		10%	11.16%	Below benchmark
		17.62%	12.75%	The probability of a 17.62% increase in annual energy generation is very unlikely. This is because the potential hydrology has been surveyed in long term basis. The current estimate by Construction Works and High Tech Consultancy Joint Stock Company, a qualified and licensed consultant, is the most likelihood and an increase of 17.62% is not possible.
3	Electricity Tariff	-10%	6.94%	Below benchmark
		10%	11.22%	Below benchmark
		17.18%	12.75%	As mentioned in Decision 18/2008/QD-BCN, as the fuel price to be used to calculate variable cost for ACT will be limited by a ceiling rate of 110% of the average fuel prices in the previous year (Appendix 2). It is expected that the electricity tariff will not exceed 10% of the previous tariff. Thus, a variable of 17.18% in the tariff is unlikely happened.
4	O&M Costs	+10%	8.89%	Below benchmark
		-10%	9.28%	Below benchmark

		N.A.%	12.75%	Even if the O&M costs were to be set at zero, the FIRR would have a value of 11.04%, which is still below the benchmark.

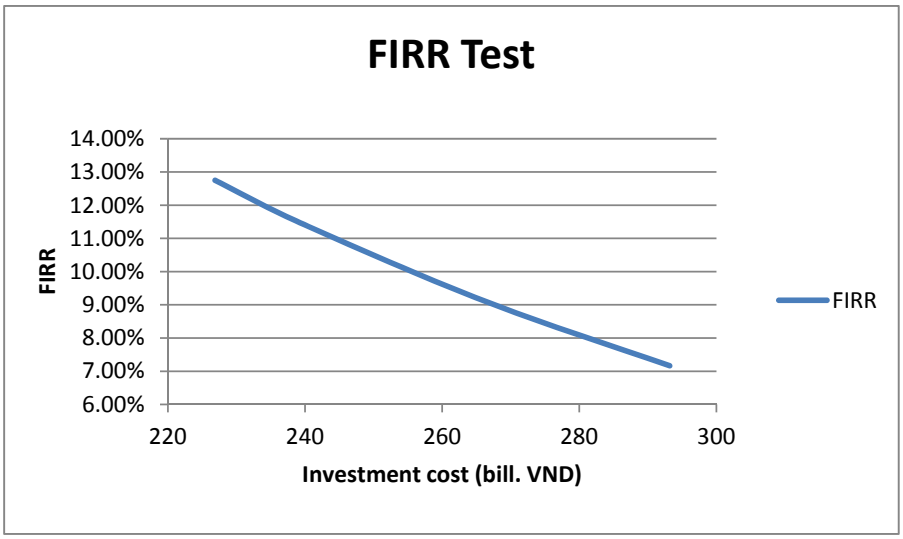


Figure 4: Sensitivity of FIRR to investment cost

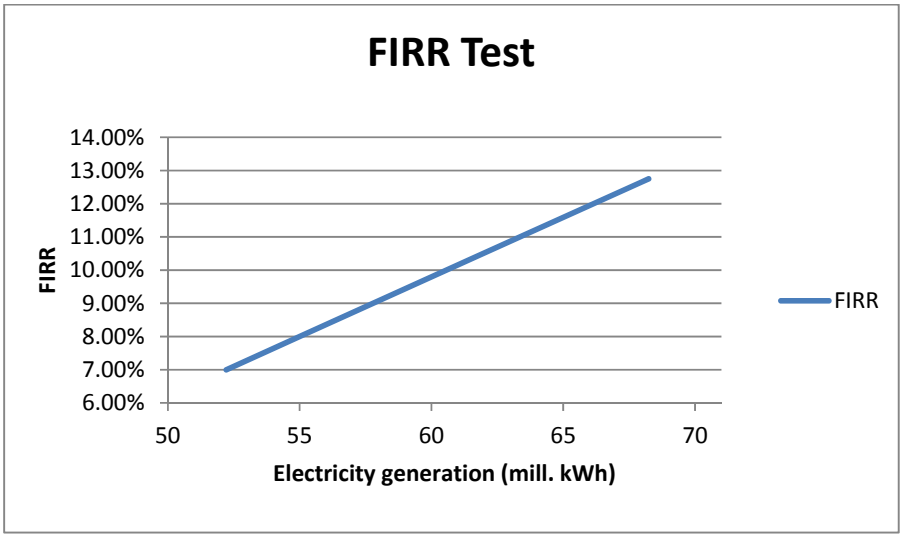


Figure 5: Sensitivity of FIRR to Annual Generation

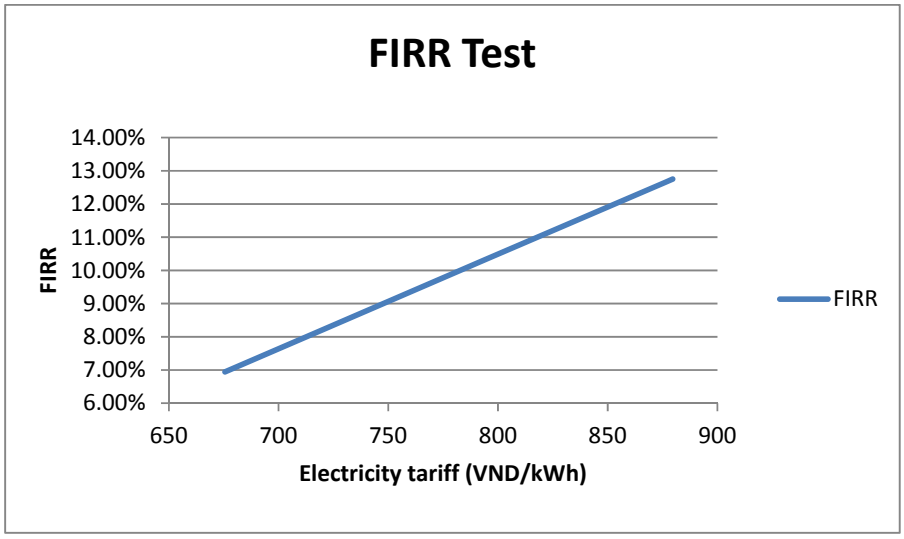


Figure 6: Sensitivity of FIRR to Tariff

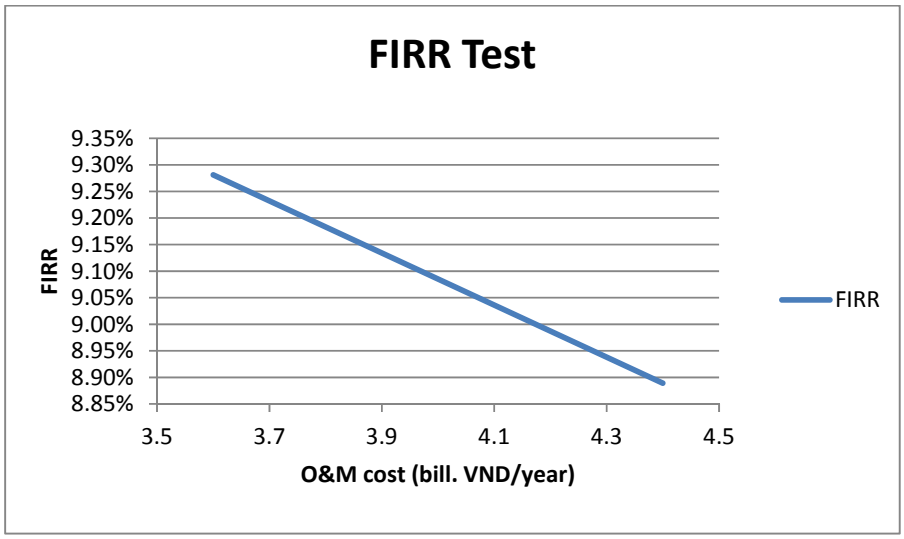


Figure 7: Sensitivity of FIRR to O&M Costs

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 (06/12/2010) 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/QĐ-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/QĐ-BCN dated 18 October 2005 on defining the jurisdictions to approve the Master Plans and management hierarchy for small scale hydropower projects, hydropower projects having installed capacity within the range from 1 to 30 MW are categorized as small scale 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 6: Groups of hydropower projects serving for common practice analysis

Group	Installed capacity
A	≥ 300 MW
B	≥ 100 MW and < 300 MW
C	≥ 50 MW and < 100 MW
D	≥ 30 MW and < 50 MW
E	≥ 5 MW and < 30 MW
F	< 5MW

Source: Vietnam Construction Code – TXDVN 285:2002 (File 19)
Ministry of Industry No. 3454/QD-BCN, 2005 (File 39)

The PoA include CPA with installed capacity up to 30 MW. According to Table 6, a typical CPA can then falls into Groups E or F of small scale 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 17 MW, hence the applicable capacity range is 8.5 MW - 25.5 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 82 power plants with installed capacity up to 50 MW that are implemented in Vietnam after 2001 and before 06/12/2010.

Table 7: Power projects implemented after 2001 and before 06/12/2010 (capacity up to 50 MW)

#	Name of power plant	Capacity (MW)	Technology	Commissioning date	CDM (Yes/No)	Investor	Ownership (Private/ Public?)	Investment before removal of interest rate cap (Yes/No)
1	Cấm Sơn Tai SHP	4.5	Hydro	Feb-07	No	Cam Son Hydropower JSC	Private	Yes
2	Đrây H'Linh 2 SHP	16	Hydro	Feb-07	No	No.3 Electricity-Hydro Power JSC	Private	Yes
3	Nà Lơi SHP	9	Hydro	May-07	No	Na Loi Hydro Power JSC under No.7 Song Da Group	Private + state capital	Yes
4	Thác Trắng SHP	6	Hydro	Jun-07	No	No.11 Song Da Company	Private + state capital	Yes
5	Ry Ninh II SHP	8.1	Hydro	Jun-07	No	Ry Ninh II HydroPower JSC	Private	Yes
6	Khe Diên SHP	9	Hydro	Jun-07	No	Song Ba Power Investment and Development Company	Private	Yes
7	EaKrông Rou SHP	28	Hydro	Jun-07	No		Public	Yes
8	Suối sập 2 SHP	14.4	Hydro	Jul-07	Yes	Truong Thanh Construction Company	Private	Yes
9	Nậm Tha 6 SHP	6	Hydro	Jul-07	Yes	Phuc Khanh JSC	private	Yes

#	Name of power plant	Capacity (MW)	Technology	Commissioning date	CDM (Yes/No)	Investor	Ownership (Private/ Public?)	Investment before removal of interest rate cap (Yes/No)
10	Ngòi Xan 1 SHP	10.5	Hydro	Sep-07	Yes	Nam Tien JSC	private	Yes
11	Iagrai 1 SHP	7.5	Hydro	Sep-07	No	Gia Lai Quoc Cuong JSC	Private	Yes
12	Sông Pha SHP	7.5	Hydro	Sep-07	No	Đa Nhim- Hàm Thuận- Đa Mi Hydro Power JSC	Public	Yes
13	Nà Lòa SHP	6	Hydro	Oct-07	No	Cao Bang Metallurgy and HydropPower JSC	Private	Yes
14	Đăkrơsa SHP	7.5	Hydro	Nov-07	No	Đăkrơsa Hydropower JSC	Private	Yes
15	Krông Hin Tai SHP	5	Hydro	Jan-08	No	Krông Hin Tai HydroPower JSC	Private	Yes
16	Định Bình Tai SHP	6.6	Hydro	Jan-08	No	Unknown	Unknown	Yes
17	Ngòi Đường SHP	5	Hydro	Mar-08	Y	Lao Cai HydroPower JSC	Private	Yes
18	Đăk Pi Hao 2 SHP	9	Hydro	Mar-08	No	Gia Lai Electricity Company	Public	Yes
19	Krong Kmar SHP	12	Hydro	May-08	No	Song Da Investment and Development Company (Song Da IDC)	Private + state capital	Yes
20	Đak Ru SHP	7.5	Hydro	Jun-08	No	N&S Co., LTD	Private	Yes
21	Khe Diên SHP	9	Hydro	Jun-08	No	Song Ba Power Investment and Development Company	Private	Yes
22	So lo 1 SHP	5.2	Hydro	Jul-08	Yes	Mai Chau JSC, private Vitol S.A	private	Yes
23	Cốc Đàm SHP	7.5	Hydro	Jul-08	Yes	Hoang Son JSC	private	Yes
24	Iagrai 3 SHP	7.5	Hydro	Jul-08	Yes	Song Da 4 JSC under Song Da Group	Private + state capital	Yes
25	Ngòi Xan 2 SHP	8.1	Hydro	Aug-08	No	Nam Tien Trading and Construction JSC	Private	Yes
26	Đrây H'Linh 3 SHP	6	Hydro	Feb-09	No	Lilama 45-3	Private + state capital	Yes
27	ĐakPône 2 SHP	3.6	Hydro	Feb-09	Yes	No.3 Electricity Company (PC3-INVEST)	Private + state capital	Yes
28	Ayun Hạ SHP	3	Hydro	Mar-09	No	Ayun Hạ Hydro Power JSC	Unknown	Yes
29	Nậm Hô SHP	7.5	Hydro	May-09	No	Unknown	Unknown	Yes
30	An Điềm SHP	5.4	Hydro	May-09	Yes	Song Vang JSC	private	Yes
31	Ry Ninh SHP	3.6	Hydro	May-09	No	Ry Ninh HydroPower SHP	Private	Yes
32	Sông Ông	8.1	Hydro	May-09	No	Sông Ông HydroPower JSC	Private	Yes
33	Nậm Tục 2	3	Hydro	Jun-09	No	Nậm Tục	Private	Yes

#	Name of power plant	Capacity (MW)	Technology	Commissioning date	CDM (Yes/No)	Investor	Ownership (Private/ Public?)	Investment before removal of interest rate cap (Yes/No)
	SHP					HydroPower JSC		
34	Bình Điền SHP	44	Hydro	Jun-09	No	Bình Điện Hydropower JSC	Private + state capital	Yes
35	Ta Niet	3.6	Hydro	2009	Yes	Ta Niet JSC, private RCEE	private	Yes
36	Pac Khuoi	8	Hydro	2007	Yes	Cao Bang JSC (BOO)	Private	Yes
37	Dasiat	13.5	Hydro	2008	Yes	Northern hydropower JSC	Public	Yes
38	Khe Soong	3.6	Hydro	2009	Yes	An Sinh JSC, private	private	Yes
39	Suoi Tan	5.5	Hydro	2009	Yes	Suoi Tan JSC	private	Yes
40	So Lo	8.7	Hydro	2009	Yes	Mai Chau JSC	private	Yes
41	Muong Sang	2.4	Hydro	2009	Yes	Mường Sang JSC	private	Yes
42	Phu mau	5.6	Hydro	2006-2008	Yes	Tan An Ltd, private	private	Yes
43	Nam Pung	8.1	Hydro	2009	Yes	Nam Pung JSC	private	Yes
44	Ha Nang	11	Hydro	2009	Yes	Thien Tan JSC	private	Yes
45	Za Hung	30	Hydro	2009	Yes	Dat Phuong JSC	private	Yes
46	Nam Mo 3	10	Hydro	2009	Yes	Northern investment and development Company	private	Yes
47	Ho Nui Coc	1.5	Hydro	2009	Yes	Nui Coc JSC	private	Yes
48	Nam Toong	30	Hydro	2009	Yes	Northern electricity development JSC No3	private	Yes
49	An Diem 2	15	Hydro	2009	Yes	Song Vang JSC	private	Yes
50	Fertilizer and chemical HaBac (coal fire power plant)	36	Thermal	2002	No	Ha Bac JSC	Private	Yes
51	Fertilizer Phu My (natural gas power plant)	23	Thermal	2003	No	Phu My JSC	Private + state capital	Yes
52	Diesel Amata (FO fire)	13	Thermal	2001	No	Unknown	Private	Yes
53	Diesel Ca Mau (DO fire)	20.1	Thermal	1975-2005	No	Unknown	Private + state capital	Yes
54	Bảo Lộc SHP	24.5	Hydro	Dec-09	No	Bao Loc HydroPower JSC	Private	No
55	Nậm Ngần SHP	13.5	Hydro	Jul-09	Yes	Nậm Mu JSC	private	Yes
56	Đăk Rung SHP	8	Hydro	Aug-09	Yes	Viet Nguyen JSC	private	Yes
57	Tà Làng SHP	4.5	Hydro	Aug-09	No	BaK Can Material Construction and Production JSC	Private	Yes
58	Za Hung SHP	30	Hydro	Oct-09	No	Za Hung Joint Venture	Public	Yes
59	Nậm Pia SHP	15	Hydro	Oct-09	Yes	Lam Son Ltd	private	Yes
60	Nậm Chiến 2	32	Hydro	Dec-09	Yes	Tay Bac JSC	private	No

#	Name of power plant	Capacity (MW)	Technology	Commissioning date	CDM (Yes/No)	Investor	Ownership (Private/ Public?)	Investment before removal of interest rate cap (Yes/No)
	SHP							
61	Nậm Đông III SHP	15.6	Hydro	Jan-10	No	No.3 The North Electricity Investment and Development Company	Public	No
62	Trà Linh 3 SHP	7.2	Hydro	Feb-10	Yes	699 Construction JSC	private	No
63	Nậm Chim 1 SHP	16	Hydro	Mar-10	Yes	Song Lam Construction and Investment JSC	Unknown	No
64	Nam Khot	14	Hydro	2010	Yes	Nam Khot JSC	private	No
65	Ha Rao Quan	6.4	Hydro	2010	Yes	Song Cau JSC	private	No
66	Muong Kim	13.5	Hydro	2010	Yes	Hanoi Electricity equipment JSC	private	No
67	H'Mun	16.2	Hydro	2010	Yes	Gia Lai JSC	private	No
68	Ea Drang 2	6.4	Hydro	2010	Yes	Dal Lak power company	public	No
69	La Hieng 2	18	Hydro	2010	Yes	Phu Yen JSC	private	No
70	Dak Ne	8.1	Hydro	2010	Yes	Trung Dong JSC	private	No
71	Dak Glun	18	Hydro	2010	Yes	Sai Gon machine JSC	private	No
72	Nam Khoa 3	18	Hydro	2010	Yes	Linh Linh JSC	private	No
73	Dak Srong 2	24	Hydro	2010	Yes	Hoang Anh Gia Lai JSC	private	No
74	Pa khoang	2.4	Hydro	2010	Yes	Duc Thanh JSC	private	No
75	Suoi sap 3	14	Hydro	2010	Yes	Bac Minh JSC	private	No
76	Nam Pung	8.1	Hydro	2009	Yes	Nam Pung JSC	private	No
77	Nam Ly 1	5.1	Hydro	2010	Yes	SOMECO Ha Giang JSC	private	No
78	Dak Mi 4c	18	Hydro	2010	Yes	IDICO JSC	private	No
79	Seo Chong Ho	21.7	Hydro	2010	Yes	Viet-Trung JSC	private	No
80	Song Nhiem 3	10	Hydro	2010	Yes	LICOGI JSC	private	No
81	Song Mien 5	16.5	Hydro	2010	Yes	Song Mien 5 JSC	private	No
82	Suoi Lum 1	20	Hydro	2010	Yes	Nam Lum JSC	private	No

Source: Electricity Regulatory Authority of Vietnam (ERAV), MOIT - DNA Vietnam, etc.

From the above list, only power plants with installed capacity between 8.5 – 25.5 MW and non-CDM projects are considered in the analysis which are presented in the below table.

Table 08: Power projects implemented after 2001 and before 06/12/2010 and not registered as CDM project activities

#	Name of power plant	Capacity (MW)	Technology	Commissioning date	CDM (Yes/No)	Investor	Ownership (Private/ Public?)	Investment before removal of interest rate cap (Yes/No)
1	Đrây H'Linh 2 SHP	16	Hydro	7-Feb	No	No.3 Electricity-Hydro Power JSC	Private	Yes

#	Name of power plant	Capacity (MW)	Technology	Commissioning date	CDM (Yes/No)	Investor	Ownership (Private/ Public?)	Investment before removal of interest rate cap (Yes/No)
2	Nà Lơi SHP	9	Hydro	7-May	No	Na Loi Hydro Power JSC under No.7 Song Da Group	Private + state capital	Yes
3	Khe Diên SHP	9	Hydro	7-Jun	No	Song Ba Power Investment and Development Company	Private	Yes
4	Đăk Pi Hao 2 SHP	9	Hydro	8-Mar	No	Gia Lai Electricity Company	Public	Yes
5	Krong Kmar SHP	12	Hydro	8-May	No	Song Da Investment and Development Company (Song Da IDC)	Private + state capital	Yes
6	Khe Diên SHP	9	Hydro	8-Jun	No	Song Ba Power Investment and Development Company	Private	Yes
7	Fertilizer Phu My (natural gas power plant)	23	Thermal	2003	No	Phu My JSC	Private + state capital	Yes
8	Diesel Amata (FO fire)	13	Thermal	2001	No	Unknown	Private	Yes
9	Diesel Ca Mau (DO fire)	20.1	Thermal	1975-2005	No	Unknown	Private + state capital	Yes
10	Bảo Lộc SHP	24.5	Hydro	9-Dec	No	Bao Loc HydroPower JSC	Private	No
11	Nậm Đông III SHP	15.6	Hydro	10-Jan	No	No.3 The North Electricity Investment and Development Company	Public	No

Source: Electricity Regulatory Authority of Vietnam (ERAV), MOIT - DNA Vietnam, etc.

The above short-listed table yields to 11 power plants, hence N_{all} = 11.

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}.

All 11 power plants (out of which 8 are hydro plants) identified in Step 2 are analyzed as follows:

- 03 power plant are thermal, hence they are excluded because they use technology that is different from the one applied in the project activity
- 04 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.
- 03 hydro power plants with known information about ownership 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, N_{diff} is 10.

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 both the following conditions are fulfilled: (a) the factor F is greater than 0.2 and (b) Nall-Ndiff is greater than 3.

$F = 1 – N_{diff}/N_{all} = 1 – 10/11 = 0.1 < 0.2$
$N_{all} – N_{diff} = 11 – 10 = 1 < 3$

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".

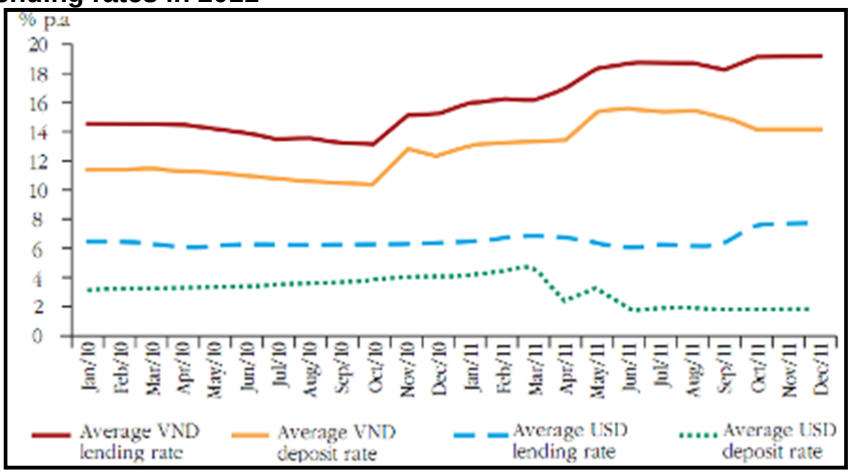
The existence of the 8 hydropower plants does not contradict the result of the benchmark analysis stating that the proposed project is financially unattractive" as demonstrated above.

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 percent[52].

[52] International Monetary Fund. 2010. Vietnam: 2010 Article IV Consultation—Staff Report and Public Information Notice. Page 6, footnote 4.

As shown is the Step 2, investment analysis, the actual loan agreement between Phuc Khanh Investment Construction and Energy Development JS Company (Nam Tha 4 CPA implementer) and BIDV (local bank) provides the financing arrangements of the CPA. The project is financed with 20% equity and 80% debt at an annual starting interest rate of even 17.5% which is much high compared to projects implemented before the liberalization of the lending rates. This fact is supported by the Annual Report 2011 by the State Bank of Vietnam. The period after the investment decision date saw a sharp increase in the commercial annual lending rate, which was at 15.27% as of end-2010 and at 18.5% as of end-June 2011 and continued to increase progressively until the end of 2011.[53]

Deposit and lending rates in 2011



Source: Annual Report 2011, State Bank of Vietnam

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 CPA (06/12/2010) were developed in a more favorable investment environment where lending was cheaper. This is not 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.

[53] Annual Report 2011, State Bank of Vietnam, page 32: http://www.sbv.gov.vn/portal/ShowProperty?nodeId=/UCMServer/CNTHWEBAP01162395542//idcPrimaryFile&revision=latestreleased

Additionality checklist

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

Key Criteria	Yes/No
FIRR of the CPA in the absence of the CDM incentive is below the benchmark rate	Yes, see Step 2 discussed above.
CPA has access to loan from participating banks under REDP, and participating banks have a refinance agreement with WB-REDP/MOF	Yes, the CPA accessed loan from the participant bank and the participating bank has a refinance agreement with WB-REDP/MOF
Participating developers and bank attended the training and capacity development programs conducted by MOIT	Yes, the developer and the bank attended the training and capacity building programs conducted by MOIT.

Time line of the CPA

The table below summarizes the milestones in the investment process of Nam Tha 4 Hydropower Project, in connection with the REDP.

Table 9: Details of the timeline of CPA design and implementation

Date	Activities	Remarks
16 January 2007	MOU on power purchase from 06 projects, including the project activity between EVN and Phuc Khanh company	
22 January 2008	MOIT issued the Generation License for the project owner	
02 June 2008	Lao Cai provincial people's committee issued letter on the appraisal of the Initial Feasibility Study Report (FSR) for the project activity	**Initial FSR completed**
01 October 2008	Van Ban district people's committee issued the approval for Environmental Protection Commitment (EPC) report	
31 December 2008	Lao Cai provincial people's committee issue the investment license for the project activity	**Initial FSR approval**
16 June 2009	Signing the Financing Agreement with the Government of Vietnam on REDP	
November 2009	Removal of the lending rate cap by SBV, allowing loan rates to be negotiated between the lender and the borrower.	

Date	Activities	Remarks
02 December 2009[54]	**Resolution by the Shareholders General Assembly of Phuc Khanh company to mobilize capital for investing in the project activity, which was signed by all shareholders**	**Investment decision date**
30 December 2009	**Submission of PoA/CPA documents for validation and global stakeholder comment**	**GSP date, Starting date of PoA**
10 June 2010	Stakeholder consultation meeting was organized in Nam Tha commune, Van Ban district, Lao Cai province	
27 July 2010	Lao Cai provincial people's committee issue the approval for land acquisition for the project activity	
October 2010[55]	Revised FSR documentation was completed and handed over to the project owner	**Revised FSR**
October 2010	BIDV Lao Cai Technical Due Diligence Report prepared by Mr. Tran Trung Dung, BIDV Lou Cai and signed by the Vice Director of BIDV Lou Cai.	
06 December 2010[56]	**Civil construction contract for the horizontal tunnel and vertical pressure well (underground work) between Phuc Khanh company and a Chinese contractor**	**Start date of CPA**
09 November 2010	Submission of refinancing application to MOIT by BIDV	
15 November 2010	Publication of the Resettlement Plan and Ethnic Minority Plan by the project owner	
25 November 2010	Publication of the Environmental Management Plan by the project owner	
01 December 2010	REDP hydro simulation model with consideration of environmental flow requirement	
10 December 2010	AU Refinancing Application Package Review	

[54] The Resolution by the Shareholder General Assembly was made after the province issued the investment license for the project activity and based on the financial inputs of the Initial FSR in 2008, which was approved by local authorities

[55] The Revised FSR encompasses only changes in technical parameters for purpose of maximizing the hydropower potential of the river

[56] The Start Date of the CPA was based on the signing the civil construction contract for the horizontal tunnel and vertical pressure well

Date	Activities	Remarks
	Checklist. Signed by the AU Manager Mr Chu Ba Thi and the AU Safeguards Specialist Ms. Pham Huong Giang	
10 December 2010	Request for approval for refinancing by MOIT submitted to the WB	
11 December 2010	World Bank approval for the refinancing for the project activity by Ms. Pham Nguyet Anh	
03 October 2011	Technical Due Diligence Report prepared by Mr. Ho Sy Du, concluding that the project is technically sound	
08 December 2011	Loan Agreement was signed between BIDV Phuc Khanh Investment Construction and Energy Development JS Company	
May 2013	Signing of power purchase agreement with the national grid utility company for the sale of electricity to the grid	

It can be seen from the above timeline that CDM consideration was made due to the difficulty to approach a financing source which assures the financial viability of the project (in terms of loan amount and interest rate)[57], and the process started before the investment decision was made.

Considering the situation that only with CDM revenues the project can be implemented, the CPA is additional.

[57] The Resolution by the Shareholders of Phuc Khanh Investment Construction and Energy Development JS Company to invest in the project activity despite the increase in interest rates at time of investment decision made.

Appendix 1. Contact information of CPA implementers

Organization name	Phuc Khanh Investment Construction and Energy Development JS Company (CPA implementer)
Country	Viet Nam
Address	No. 001, Nguyen Hue street, Pho Moi ward, Lao Cai city, Lao Cai province
Telephone	+84 20.221.0784
Fax	+84 20.3828.900
E-mail	Phuckhanhco@yahoo.com
Website	
Contact person	Mr. Hoang Van Tam, Chairman of the board

Appendix 2. Affirmation regarding public funding

The CPA does not receive any public funding.

Appendix 3. Further background information on ex ante calculation of emission reductions

Vietnam's DNA issued the Official Dispatch No. 513/KTTVBDKH on 28/05/2013, providing the national grid emission factor for 2011 with related data on OM and BM for data vintage 2009, 2010, and 2011.

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

IPCC DEFAULT CO_2 EMISSION FACTORS FOR COMBUSTION

Fuel type	NET CALORIFIC VALUE (NCV) (TJ/Gg)			Source of data
	Default value	95% confidence interval		
		Lower	Upper	
Coal (Anthracite)	26.70	21.60	32.20	2006 IPCC Guidelines on National GHG Inventories, Volume 2: Energy, Chapter 1, Table 1.2, Page 1.18
Other Bituminous Coal	25.80	19.90	30.50	
Tail Gas	-	-	-	
Gas/Diesel Oil	43.00	41.40	43.30	
Residual Fuel Oil	40.40	39.80	41.70	
Natural Gas	48.00	46.50	50.40	

Fuel type	Effective CO_2 emission factor (kg/TJ)			Source of data
	Default value	95% confidence interval		
		Lower	Upper	
Coal (Anthracite)	98,300	94,600	101,000	2006 IPCC Guidelines on National GHG Inventories, Volume 2: Energy, Chapter 1, Table 1.4, Page 1.23, 1.24
Other Bituminous Coal	94,600	89,500	99,700	
Tail Gas	-	-	-	
Gas/Diesel Oil	74,100	72,600	74,800	
Residual Fuel Oil	77,400	75,500	78,800	
Natural Gas	56,100	54,300	58,300	

ELECTRICITY GENERATED FROM LOW-COST/MUST-RUN SOURCES:

Low-cost/Must-run Ratio (2007-2011)

Year	2007	2008	2009	2010	2011	Total for period 2007-2011
Hydropower (MWh)	22,385,232	25,933,762	29,033,871	24,241,216	35,185,329	136,779,410
Total power (MWh)	66,348,589	74,689,636	81,369,303	91,224,603	100,851,857	414,483,988

Year	2007	2008	2009	2010	2011	Period 2007-2011
Low-cost/Must-run Ratio	33.74%	34.72%	35.68%	26.57%	34.89%	33.00%

DATA USED FOR CALCULATION OM EMISSION FACTOR

For 2009:

Group plants	Fuel consumption	Net electricity supplied to national power grid	Type of fuel	Net calorific value (NCV)	Effective CO2 emission factor	Amount of CO2 emission
	Coal, Oil : kton Gas: 10^3 m^3	MWh		TJ/Gg	kg/TJ	t CO_2
Coal power plant	6,927.29	9,841,579	Coal (Anthracite)	21.60	94,600	14,154,947
Gas Turbine		36,714,493				0
Gas Turbine powered by gas	*7,251.87*	*25,471,686*	Natural Gas	46.50	54,300	12,817,426
Gas Turbine powered by oil	*21.83*	*71,304*	Gas/Diesel Oil	41.40	72,600	65,613
Tail gas	*0*	*11,171,503*	Tail Gas	-		0
Oil thermal power plant	444.99	1,635,351	Residual Fuel Oil	39.80	75,500	1,337,150
Diesel using FO	0.18	0	Residual Fuel Oil	39.80	75,500	541
Diesel using DO	2.41	10,000	Gas/Diesel Oil	41.40	72,600	7,244
Imported		4,102,080				
Total	**14,648.57**	**52,303,503**				**28,382,922**

For 2010:

Group plants	Fuel consumption	Net electricity supplied to national power grid	Type of fuel	Net calorific value (NCV)	Effective CO2 emission factor	Amount of CO2 emission
	Coal, Oil : kton Gas: 10^3 m^3	MWh		TJ/Gg	kg/TJ	t CO_2
Coal power plant	9,075.79	14,624,274	Coal (Anthracite)	21.60	94,600	18,545,106
Gas Turbine		44,051,812				0
Gas Turbine powered by gas	*8,664.36*	*31,073,369*	Natural Gas	46.50	54,300	15,313,953
Gas Turbine powered by oil	*63.43*	*209,306*	Gas/Diesel Oil	41.40	72,600	190,648
Tail gas	*0*	*12,769,136*	Tail Gas	-		0
Oil thermal power plant	664.97	2,648,763	Residual Fuel Oil	39.80	75,500	1,998,168
Diesel using FO	0.99	0	Residual Fuel Oil	39.80	75,500	2,975
Diesel using DO	2.16	9,036	Gas/Diesel Oil	41.40	72,600	6,492
Imported		5,599,230				
Total	**18,471.70**	**66,933,115**				**36,057,342**

For 2011:

Group plants	Fuel consumption	Net electricity supplied to national power grid	Type of fuel	Net calorific value (NCV)	Effective CO2 emission factor	Amount of CO2 emission
	Coal, Oil : kton Gas: 10^3 m^3	MWh		TJ/Gg	kg/TJ	t CO_2
Coal power plant	11,836.03	18,057,709	Coal (Anthracite)	21.60	94,600	24,185,270
Gas Turbine		41,157,471				0
Gas Turbine powered by gas	*7,644.37*	*28,793,277*	Natural Gas	46.50	54,300	13,511,156
Gas Turbine powered by oil	*96.79*	*403,092*	Gas/Diesel Oil	41.40	72,600	290,916
Tail gas	*0*	*11,961,103*	Tail Gas	-		0
Oil thermal power plant	332.7	1,338,219	Residual Fuel Oil	39.80	75,500	999,730
Diesel using FO	0.38	0	Residual Fuel Oil	39.80	75,500	1,142
Diesel using DO	16.67	63,650	Gas/Diesel Oil	41.40	72,600	50,104
Imported		5,003,000				
Total	**19,926.94**	**65,620,049**				**39,038,319**

DATA FOR CALCULATION OF BM EMISSION FACTOR FOR YEAR 2011

Name of power plant	Operation year (dd/mm/yy)	Net electricity supplied to national power grid (MWh)	Type of fuel	Amount of consumed fuel	Net calorific value	Emission factor of fuel	Amount of emission
				Coal, DO, FO: kton; Gas: 10^6 m^3	TJ/Gg	kg/TJ	t CO_2
Se San 4A	11/2011	150,055.21	Hydropower				
Dong Nai 3	2011	254,398.10	Hydropower				
An Khe	2011	521,474.48	Hydropower				
Son Dong	2011	1,115,687.39	Coal (Anthracite)	806.96	21.60	94,600	1,648,910
Nhon Trach 2	2011	1,764,978.90	Natural Gas	385.55	46.50	54,300	681,446
Formosa 2	22/08/2011	187,662.50	Other Bituminous Coal	194.79	19.9	89,500	346,931
Cam Pha	15/05/2011	3,445,956.19	Coal (Anthracite)	2,390.60	21.60	94,600	4,884,856
Srepok 3	09/2010	1,097,445.28	Hydropower				
Son La	12/2010	4,945,860.51	Hydropower				
Cua Dat	2010	451,024.10	Hydropower				
Hai Phong	2010	2,158,000.00	Coal (Anthracite)	1,029.35	21.60	94,600	2,103,333
Quang Ninh	2010	1,854,096.20	Coal (Anthracite)	923.29	21.60	94,600	1,886,614
Buon Tua Srah	12/2009	339,183.29	Hydropower				
Song Ba Ha	11/2009	791,915.30	Hydropower				
Se San 4	2010	1,644.65					
Pleikrong	04/2010	494,000.00	Hydropower				
Uong Bi Expansion (7)	09/2009	1,355,854.73	Coal (Anthracite)	645.69	21.60	94,600	1,319,377
Total		**20,929,236.83**					**12,871,467**

Combined Emission Factor:

Simplified Combined Margin Emission Factor for 2011

Build Margin CO_2 Emission Factor in year 2011	BM	tCO_2/MWh	0.6150
Average Operating Margin CO_2 Emission Factor (2009, 2010, 2011)	OM	tCO_2/MWh	0.5598
Simplified Combined Margin CO_2 Emission Factor in year 2011	**CM**	**tCO_2/MWh**	**0.5874**

Appendix 4. Further background information on monitoring plan

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.

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 down-line technical staff in collecting data and checking operational status of technological equipment as set out in the monitoring plan.

Appendix 5. Summary report of comments received from local stakeholders

Not applicable.

Appendix 6. Summary of post-registration changes

2nd monitoring period:

No.	Section	Description	Change
1	A.6	Parties	Swedish Energy Agency was there as project participant during PoA registration. But it was not mentioned in CPA DD before. Participants from Spain and Norway were added to UNFCCC project page only on 19/03/2015. Hence, these parties were listed in CPA DD now. Footnotes are added for the same
2	D.7.1.	Data and parameters to be monitored	For parameter $EG_{facility,y}$ Revision of number of power meters. There will be 05 bidirectional power meters: 1. 01 main meter and 01 back-up meter at Nam Tha 4 plant 2. 01 main meter and 02 back-up meters at 110 kV Nam Tha substation
3	D.7.2.	Description of the monitoring plan	• Revision of number of power meters as above for "Power imported from the grid to the component project activity" and "Power supplied to the grid by the component project activity" • Revision of figure 8: Grid connection diagram as per the actual metering system.

As a result of above two corrections, Nam Tha 4 CPA DD is revised to incorporate the changes. The revised CPA DD version 05 dated 09/05/2016 was approved during the verification process.

Design change:[58]

Due to serious floods that heavily hit Nam Tha 4 CPA on mid-night and early morning of 19/07/2018, the plant was badly destroyed and became non-operational as of 19/07/2018. As a result, the CPA implementer had to re-construct the plant with some adjusted technical specifications that require a request for approval of design change.

[58] Submitted separately from request for issuance(s)

Changes from initial design include:

- Installed capacity has changed from 11.5 MW to 17 MW
- Annual gross generation has changed from 46,550 MWh to 58,900 MWh

These changes have been incorporated in the revised CPA-DD version 08, dated 03/02/2020.

Document information

Version	*Date*	*Description*
09.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for programmes of activities" (CDM-EB93-A07-STAN); • Make editorial improvements.
08.1	20 October 2017	Editorial revision to remove appendix "Applicability of methodologies and standardized baselines" from the main part of the form which had been mistakenly kept in the previous version.
08.0	28 June 2017	Revision to: • Remove appendix "Applicability of methodologies and standardized baselines" as the appendix is not relevant at the CPA level; • Make editorial improvement.
07.0	7 June 2017	Revision to: • Improve consistency with the "CDM project standard for programmes of activities" and with the PDD and PoA-DD forms; • Make editorial improvement.
06.0	24 May 2017	Revision to: • Ensure consistency with the "Standard: CDM project standard for programme of activities" (CDM-EB93-A07-STAN) (version 01.0); • Incorporate the "Component project activity design document form for small-scale component project activities" (CDM-SSC-CPA-DD-FORM); • Make editorial improvement.
05.0	15 April 2016	Revision to ensure consistency with the "Standard: Applicability of sectoral scopes" (CDM-EB88-A04-STAN) (version 01.0).
04.0	9 March 2015	Revision to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.
03.0	25 June 2014	Revisions to:

Version	Date	Description
		• Include the Attachment: Instructions for filling out the component project activity design document form for CDM component project activities (these instructions supersede the "Guidelines for completing the component project activity design document form" (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a CPA implementer and/or responsible person/ entity for completing the CDM-CPA-DD-FORM in A.13. and Appendix 1; • Add general instructions on post-registration changes in paragraph 4 and 5 of general instructions and Appendix 6; • Change the reference number from F-CDM-CPA-DD to CDM-CPA-DD-FORM; • Make editorial improvement.
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the component project activity design document form" (EB 66, Annex 16).
01.0	27 July 2007	EB 33, Annex 42 Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: component project activity, project design document