



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

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NOTE:

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

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

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


SECTION A. General description of CDM programme activity (CPA).
A.1. Title of the CPA:

Title: Thoong Cot 2 Hydropower Project

Version: 4.0

Date: 20 August 2012

A.2. Description of the CPA:

The CPA involves the construction of the Thoong Cot 2 Hydropower plant, which is located on Quay Son River in Chi Vien commune, Trung Khanh district, Cao Bang province of Viet Nam. The CPA's installed capacity and estimated annual gross power generation is 3.5 MW and 14,710 MWh³, respectively.

The project's purpose is to supply renewable electricity to the national grid via the Power Purchase Agreement (PPA) signed with the Electricity Corporation of Viet Nam (EVN). The net electricity generated from this project - annual estimated volume is 14,415 MWh - will be supplied to the national grid.

The CPA will generate renewable power, which will displace part of the electricity otherwise supplied by fossil fuel fired 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", version 02.2.1.

Thus, GHG emission reductions are achieved via this CPA.

The project's contributions to the sustainable development of the local area as well as the host country are as follows:

General contributions towards national sustainable development:

- In recent years, Viet Nam, especially the North of Viet Nam, has suffered a critical electricity shortage as a consequence from rapidly increasing demand and insufficient supply, thereby imposing negative impacts on economic growth as well as on daily lives of people. This CPA will be a contribution towards closing the supply and demand gap. By exporting electricity directly to the National grid, it will help to reduce electricity losses across the national grid and to lessen the risks of cascading national grid collapse due to overload.
- Reducing reliance on exhaustible fossil fuel based power sources and also reducing the import of fuels for the purpose of power generation.
- Modern and highly efficient turbines and generators are being used in the project and the power transmission will be at high voltage to ensure low losses. The CPA will contribute to accelerate the deployment of renewable energy technologies in Viet Nam.

Contributions towards local sustainable development:

- a) Economic well-being

³ General Description Volume - Feasibility Study Report of Thoong Cot 2 project

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- Once implemented, this CPA will increase the industrial share in the economic structure of Cao Bang province – a poor mountainous province in Viet Nam. This CPA will pay annual tax to the local budget.
 - By supplying a stable and high electric output, this CPA will facilitate the industrialization process of the province and lever the performance of traditional trade villages as well as tourism industry and services inside the province.
- b) Social well-being
- This CPA will contribute directly to improve the low-quality infrastructure systems of Chi Vien commune, where only minority ethnics settle. The commune is categorized as a mountainous commune with thin population, less developed and autarky agricultural economy. The project will upgrade the road that then will be integrated into the traffic system of the commune.
 - The communication system and clean water treatment serving for workers of the project during both construction and operation phases will be shared with local people. Besides, new jobs will be created during construction and operation phases. The CPA could result in the employment of the local people for the construction and operation of the hydropower plant later on.

This demonstrates that the CPA will contribute positively towards sustainable development and satisfies the sustainable development criteria for CDM projects set by the DNA of Viet Nam.

A.3. Entity/individual responsible for <u>CPA</u>:

Eternal Light Company Limited (English transaction name of Truong Minh Company Limited) is the responsible project implementer of the CPA.

A.4. Technical description of the <u>CPA</u>:
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The CPA involves the construction of a weir, canal intakes, tunnels, penstocks, power house with 3 units and discharge channels in order to convert potential flowing energy from Quay Son river into clean electrical energy, which will be supplied to the national grid at the connection point. At the connection point, the power meter systems will be installed. They are digital and bi-directional type to measure the export and import of electricity by Thoong Cot 2 Hydropower plant.



Figure 1 shows the layout of the project plant.

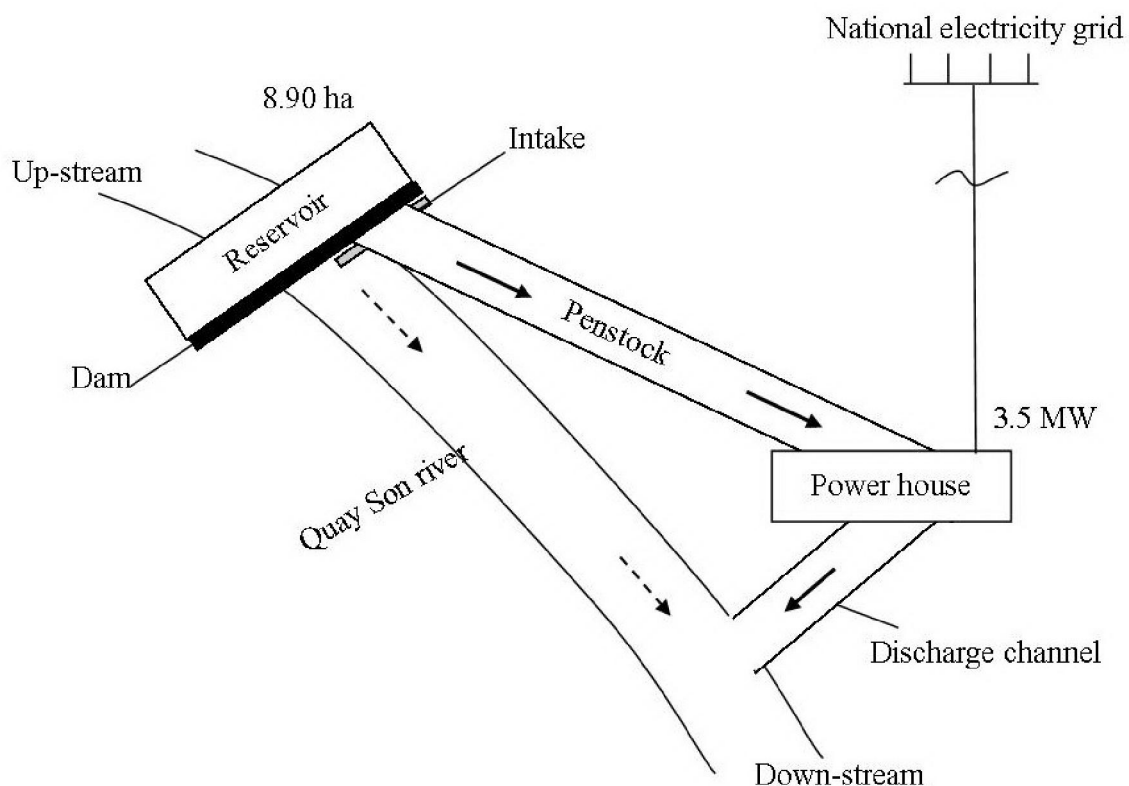


Figure 1: Project lay-out

The main equipment of the CPA is shown in Table below.

Table 1. Main equipment used in the proposed project activity

Main parameters	Units	Values
<i>1. Turbine</i>		
• Type		ZDK305-LH-128 with vertical axis
• Diameter of runner	m	1.28
• Rated net head	m	14.78
• Number of turbine	set	3
• Turbine discharge	m ³ /s	9.52

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• Capacity	MW	1.277
• Speed	rpm	528
• Annual utilisation hours	hour	4010 ⁴
• Efficiency	%	93.5
• Expected lifetime ⁵	hour	150,000
<i>2. Generator</i>		
• Number	set	3
• Type		SF1200-14/2150
• Rated voltage	kV	6.3
• Rated capacity	MW	1.2 (1500kVA)
• Efficiency at load =100%, Cosφ = 0.8	%	94.5
• Expected lifetime ⁶	year	30
<i>3. Transformer</i>		
• Number	set	1
• Type		3 phases
• Rated capacity	MVA	1.6
• Primary voltage	kV	6.3
• Secondary voltage	kV	38.5
• Expected lifetime ⁷	year	30
<i>4. Annual river flow</i>	m ³ /s	29.35

Eternal Light Company Limited has selected the equipment supplier via tender and entered an Engineering, Procurement and Construction (EPC) contract with Bac Thanh Cong Investment Joint Stock Company for the package of investigation, technical design, material and synchronous equipment supply, construction and installation of Thoong Cot 2 hydropower plant⁸. The main equipment utilized in this project will be imported. All the turbines and alternators must use environmentally safe and sound technology and meet the criteria of the tender document.

The professional technicians and engineers will train the hydropower plant staff on the monitoring procedures, operation regulation, maintenance procedures and other required knowledge regarding the hydropower plant before the start of operation of the project. Furthermore, there will be regular training courses regarding monitoring and operation for plant staffs during operation period. So the modern technology would be transferred to the host country.

A.4.1. Identification of the <u>CPA</u>:

⁴ General Description Volume - Feasibility Study report of Thoong Cot 2 project

⁵ Determined pursuant to Version 1 of "Tool to determine the remaining lifetime of equipment"

⁶ Determined pursuant to Version 1 of "Tool to determine the remaining lifetime of equipment"

⁷ Determined pursuant to Version 1 of "Tool to determine the remaining lifetime of equipment"

⁸ EPC Contract No. 01/2010/HD-EPC dated 5 July 2010



Viet Nam Small Hydro PoA-CPA001.Thoong Cot 2

A.4.1.1. Host Party:

Viet Nam

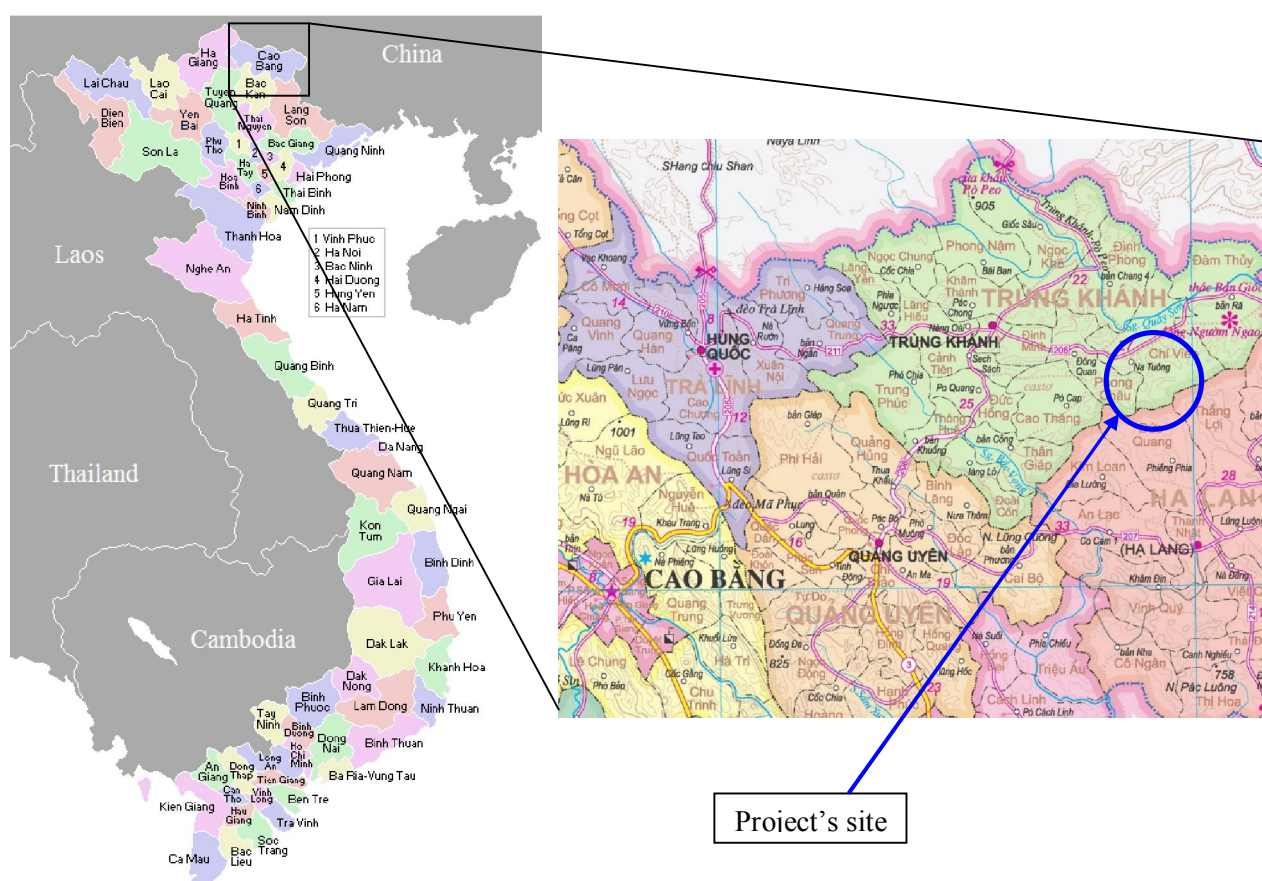
A.4.1.2. Geographic reference of other means of identification allowing the unique identification of the CPA (maximum one page):

The Thoong Cot 2 Hydropower project is located on Quay Son River in Chi Vien commune, Trung Khanh district, Cao Bang province. The geographic coordination of the power house⁹:

Northern latitude: 22°40'07''

Eastern longitude: 106°02'47''

The site of the project is shown in the figure below.



Project's site

⁹ General Description Volume - Feasibility Study report of Thoong Cot 2 project



Figure 2: Project site on the map

A.4.2. Duration of the CPA:**A.4.2.1. Starting date of the CPA:**

05/07/2010 (date of signing the EPC Contract)

This is the earliest contract signed by the project owner to commit for the project's expenditures. This is in accordance with the "CDM Glossary of Terms/version 05", which define the starting date of project as "the earliest date at which either the implementation or construction or real action of a project activity begins".

A.4.2.2. Expected operational lifetime of the CPA:

36 years 0 months

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

Renewable crediting period

A.4.3.1. Starting date of the crediting period:

The later of 01/01/2013 or date of inclusion of the CPA in the PoA

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

7 years

A.4.4. Estimated amount of emission reductions over the chosen crediting period:**Table 2: Estimated amount of emission reductions over the chosen crediting period**

Years	Annual estimation of emission reductions in tonnes of tCO ₂ e
2013	8,012
2014	8,012
2015	8,012
2016	8,012
2017	8,012
2018	8,012
2019	8,012
Total emission reductions (tonnes of CO ₂ e)	56,084
Total number of crediting years	7



Annual average over the crediting period of estimated reductions (tonnes of CO ₂ e)	8,012
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A.4.5. Public funding of the CPA:

There are no public and/or ODA funds involved in this CPA.

A.4.6. Confirmation that CPA is neither registered as an individual CDM project activity nor is part of another Registered PoA:

By using the precise geographical coordinates of the CPA provided in section A.4.1.2 and comparing it with the database of registered CDM¹⁰ project activities and registered PoAs it has been established that the CPA is neither registered as an individual CDM project activity nor is part of another registered PoA.

SECTION B. Eligibility of CPA and Estimation of emissions reductions**B.1. Title and reference of the Registered PoA to which CPA is added:**

Sustainable Small Hydropower Programme of Activities (PoA) in Viet Nam

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

As summarized in the table below, the CPA fulfils the eligibility criteria of the Sustainable Small Hydropower Programme of Activities in Viet Nam (later referred to as “Viet Nam Small Hydro PoA”):

Table 3: Eligibility requirements

Eligibility requirements (Section A.4.2.2 PoA-DD)		Characteristics of the CPA	Applicability criterion met?
i.	Comprise one or more newly developed grid-connected hydro power plants located within the geographical boundary of Viet Nam.	The CPA is a newly developed grid-connected hydropower plant located in Chi Vien commune, Trung Khanh district, Cao Bang province, Viet Nam ¹¹ .	Yes
ii.	Have a maximum installed capacity below or equal to 30 MW to be qualified as a small hydropower plant under Vietnamese regulations.	The CPA capacity is 3.5 MW ¹² which is below the limit capacity of 30 MW.	Yes
iii.	Be uniquely identified project which is neither registered as a CDM project activity	The CPA is neither registered as a CDM project activity nor	Yes

¹⁰ <http://cdm.unfccc.int/Projects/registered.html>. Accessed on 10 December 2010.

¹¹ General Description Volume - Feasibility Study report of Thoong Cot 2 project

¹² General Description Volume - Feasibility Study report of Thoong Cot 2 project

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	nor included in another registered PoA to avoid double counting of emission reductions.	included in another registered PoA to avoid double counting of emission reductions ¹³ .	
iv.	Use newly built equipment to generate electricity from hydro power.	The CPA uses new imported equipment.	Yes
v.	Have start date not prior to 23 December 2009 which is the date when the PoA first published for global stakeholder consultation (in accordance to EB 55, Annex 38, paragraph 7d) or in the case of the CPA having start date before 23 December 2009, have start date between 22 June 2007 and 23 December 2009 and be included in the list that have been provided to UNFCCC for this PoA (in accordance to EB 47 Meeting Report, paragraph 72)	The start date of the CPA is 05 July 2010 which is after the start date of PoA.	Yes
vi.	Be in line with requirements in the approved consolidated baseline and methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” version 12.3.0	The CPA is in line with version 12.3.0 of ACM0002 requirements for hydro projects	Yes
	○ not include any activities that consist of capacity additions, retrofits or replacements	The CPA does not include any activities that consist of capacity additions, retrofits or replacements. ¹⁴	Yes
	○ be a hydro power plant/unit either with a run-of-river reservoir or accumulation reservoir. In case the CPA utilizing new single or multiple reservoir, the power density of each reservoir must be greater than 4 W/m ² with or without the volume increased	The CPA is a hydropower plant with a new single reservoir with power density of 39.3 W/m ²¹⁵	Yes
	○ Not 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	The CPA does not 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 ²¹⁶	Yes
vii.	Have a cooperation agreement with the CME	The CPA owner has a	Yes

¹³ Check against the database of the CME.¹⁴ General Description Volume - Feasibility Study report of Thoong Cot 2 project¹⁵ Calculated from installed capacity and reservoir's area¹⁶ General Description Volume - Feasibility Study report of Thoong Cot 2 project

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	to participate in the PoA. The Agreement shall clearly state that CPA owner cedes its rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC or any voluntary scheme to the CME of the present PoA.	cooperation agreement with the CME to participate in the PoA and cedes its rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC or any voluntary scheme to the CME ¹⁷ .	
viii	Additionality of GHG emission reductions is demonstrated in accordance to the “Tool for the demonstration and assessment of additionality”, version 6.0.0.	The CPA is resulted in additionality of GHG emission reductions which is demonstrated in accordance to the “Tool for the demonstration and assessment of additionality”, version 6.0.0. (Please refer to section B.3 below)	Yes
ix	Undertake stakeholder consultations and environmental impact analysis as per requirements of the CDM modalities and procedures as well as the relevant laws and regulations of Viet Nam.	The CPA undertakes stakeholder consultations and environmental impact analysis as per requirements of the CDM modalities and procedures as well as the relevant laws and regulations of Viet Nam. Please refer to Section D. ¹⁸	Yes
x	Not result into the diversion of official development assistance or public funding.	The CPA does not result into the diversion of official development assistance or public funding.	Yes

B.3. Assessment and demonstration of additionality of the CPA, as per eligibility criteria listed in the Registered PoA:

Pursuant to the PoA-DD for the Viet Nam Small Hydro PoA the “Tool for the demonstration and assessment of additionality” - version 06.0.0 is applied.

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

¹⁷ Emission Reduction Purchase Agreement between CPA owner and the CME

¹⁸ Feasibility Study Approval, Environmental Impact Assessment Report Approval, Investment Licence of Thoong Cot 2 project



Pursuant to the PoA-DD the CPA will consider the following two alternatives in the assessment of additionality:

- Alternative 1: the proposed CPA is undertaken without the CDM
- Alternative 2: continuation of the current situation. In this case, the proposed CPA will not be constructed and the power it would produce will be solely supplied from the Viet Nam national grid.

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

The “continuation of the current situation” alternative does not face any barrier from the current law and regulation in Viet Nam because it is the “do-nothing” alternative. The project owner of the Thoong Cot 2 Hydropower plant has no obligation to build or invest in the power plant to supply electricity for the local area. Hence this alternative is consistent with mandatory laws and regulations.

Step 2: Investment analysis

Sub-step 2a: Determine appropriate analysis method

The appropriate analysis method for conducting the investment analysis is the benchmark analysis (Option III).

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

Pursuant to the PoA-DD, either local commercial lending rate or WACC approach can be used for the CPA.

- In case of using local commercial lending rates as a benchmark for the project IRR, the benchmark should be derived from the average long-term lending rates available from the beginning of calculated year up to the date of decision making. All data is sourced from weekly reports published by the State Bank of Viet Nam on its official website (<http://www.sbv.gov.vn/wps/portal/en>).
- In case of using WACC approach, the project participant should apply the WACC equation to estimate the *required return on capital* as a benchmark for the project IRR as follows:

$$WACC = E * R_e + D * R_d * (1 - T_c) \quad (1)$$

Where:

R_e : cost of equity

R_d : cost of debt

E : Average industry equity ratio

D : Average industry debt ratio

T_c : Average enterprise tax rate

This CPA opts for using local commercial interest rate approach to the investment analysis. The average long-term lending rates available from the beginning of calculated year up to the date of decision making as published in the weekly reports of the State Bank of Viet Nam is 13.66%.

Determine average Enterprise Tax rate

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According to the latest legal document at the date of investment decision (Decree No.124/2008/ND-CP dated 11 December 2008 of the Government) the Company will enjoy tax exemption for the first 4 years and 50% reduction of payable tax amount for 9 subsequent years. The incentive rate of 10% is applied till 15 years and for the remaining lifetime of the project, enterprise revenue tax is 25%. Therefore the average enterprise tax during the lifetime of the project is 16.39%.

The post-tax value of the lending rate is calculated as follows:

Lending rate (pre-tax value)*(1- tax rate)= 13.66*(1-16.39%)=11.42%

So the benchmark is 11.42% at the date of making the investment decision¹⁹.

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

Project IRR is estimated using the standard spreadsheet referred to in the PoA-DD and based on the following input parameters:

Table 4: Parameters for calculation of Project IRR²⁰

No	Parameter	Unit	Value
1	Investment decision date ²¹	DD/MM/YY	29/06/2010
2	Construction start date	Year	2010
3	Date project starts operating	Year	2012
4	Installed capacity ²²	MW	3.5
5	Total investment cost ²³	thousand VND	94,918,483
6	Total annual O&M cost ²⁴	%	1.5
7	Period of financial assessment (Life time) ²⁵	Year	36
8	Fair value ²⁶	Billion VND	0
9	Annual net electricity generation ²⁷	MWh	14,415
10	Electricity price ²⁸	VND/kWh	783.32

¹⁹ Calculation of benchmark is indicated in the Excel sheet

²⁰ All data used for the IRR calculation are based on information which were available at the investment decision date

²¹ Investment decision by management board

²² General Description Volume -Feasibility Study Report

²³ Total investment cost volume in FSR

²⁴ According to Decision No. 2014/QĐ – BCN issued by the Ministry of Industry, the OM Cost for project with capacity lower than 30 MW is from 1% to 2% of the total investment cost. The applied O&M cost for this CPA is the weighted average rate adjusted for the CPA's installed capacity.

²⁵ Lifetime for financial analysis was based on the lifetime of equipment according to Version 1 of "Tool to determine the remaining lifetime of equipment"

²⁶ Because the project IRR calculations has reflected "the period of expected operation of the underlying project activity (technical lifetime)", after the project lifetime, the fair value is not need to be considered. It is consistent with "Guidance on Assessment of Investment Analysis" (version 05), Annex 5, EB 62 that states only "if a shorter period is chosen - include the fair value of the project activity assets at the end of the assessment period".

²⁷ Electricity Generation subtract the internal use and loss load

²⁸ Electricity price is calculated based on Decision No.73/QĐ-DTDL dated 30 December 2009 on avoided cost tariff application in 2010 and information from General Description Volume in FSR.



11	Enterprise revenue tax ²⁹		
	• For the first 4 years		0
	• For the next 9 years	%	5
	• For next 2 years		10
	• For the remaining years		25
12	Project IRR	%	8.62

This table shows that the project IRR of the CPA was lower than the value of the commercial lending rate benchmark at the date of the investment decision.

Sub-step 2d: Sensitivity analysis

The results of the sensitivity analysis conducted pursuant to the PoA-DD are reported in the table below:

²⁹ Government Decision No 124/2008/ND-CP on implementation of enterprise tax law issued on 11 December 2008, Chapter 2: Article 10 Item 1 and Chapter 4: Article 16 - Item 2



Table 5: Framework for reporting results of sensitivity analysis

	IRR	Variation that hits the benchmark	Likelihood of hitting the benchmark
Annual amount of electricity exported to the national grid +10%	9.78%	+24.49%	The probability of a 24.49% increase in annual export to the national grid is very unlikely. This is because the potential hydrology of the stream has been surveyed by the third party based on a long term record data of the government. It is concluded that the hydrological condition is not possible to sustain a 24.49 % annual increase compared with the current estimation for the entire crediting period. This option shall be discarded.
Feed in price set by EVN +10%	9.81%	+23.83%	The probability of a 23.83% increase in feed in tariff annually is very unlikely because the power purchaser (EVN) has to increase the selling electricity price accordingly and both increases in the purchasing or selling prices must get the approval by the government. If it would happen, this rate would cause an economic and social crisis that would definitely not allowed by the government. So this option shall be discarded.
O&M cost -10%	According to EB 51, Annex 58, paragraph 17: "only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenue should be subjected to reasonable variation", The O&M cost constitutes only 1.5% of the total investment cost of this proposed project. Therefore, it's not considered in this analysis.		
Total investment cost -10%	9.76%	-21.69 %	The probability of a 21.69 % decrease in the total investment cost is not likely to happen because the average consumer prices (reflecting the inflation rate) in 2008, 2009 and 2010 ³⁰ have an annual increase of 23.1%,

³⁰<http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?sy=2008&ey=2015&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=20&pr1.y=14&c=582&s=PCPIPCH&grp=0&a=%23cs1>



			6.7% and 12% respectively. So this option shall be discarded.
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The sensitivity analysis shows that the project IRR is lower than the benchmark in all cases. **In conclusion, the proposed CPA is unlikely to be financially attractive.**

Step 3: Barrier analysis

Not applied.

Step 4: Common practice analysis

For the purpose of common practice analysis, hydropower projects in the whole Viet Nam are taken into account. Therefore, the entire host country is chosen as the applicable geographical area.

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

According to the para 47 of the “Tool for the demonstration and assessment of additionality”, version 06.0.0, EB 65, the project activity falls in the type of “Switch of technology with or without change of energy source, including the use of renewable energies” which listed in the para 6 of the tool. Therefore, the following Steps wise approached according to the Additional Tool shall be applied to analyze the common practices for the proposed project.

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

The proposed project activity has the installed capacity of 3.5 MW.

So applicable output range as +/-50% of the capacity of the proposed project activity is calculated as from 1.75 MW to 5.25 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 Step1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all} . Registered CDM project activities and projects activities undergoing validation shall not be included in this step.

The entire host country was chosen as the applicable geographical area.

The comprehensive list of all plants that deliver the same capacity within the applicable output range of 1.75MW to 5.25MW which have started commercial operation before the start date of the proposed project and not developed as CDM project is presented in table below.



Table 6. List of relevant hydropower plant for common practice analysis

No.	Name	Capacity MW	Construction starting date	Commissioning date	Developed as CDM project
1.	Ayun Ha	3		2001	
2.	Sao Va	3		2004	Yes ³¹
3.	Ia Meur 3	1.8		2005	
4.	La La	3		2008	Yes ³²
5.	Song Muc	2		2008	Yes ³³
6.	Dak Drung 1	6		2009	Yes ³⁴
7.	Ia Hrung	4.5		2009	Yes ³⁵
8.	Ta Niet Hydro Power Project	3.6	2006	2009	Yes ³⁶
9.	Muong Sang Hydropower Project	2.4	2007	2009	Yes ³⁷
10.	Pa Khoang Hydropower Project	2.4	2007	2010	Yes ³⁸
11.	Talat Hydro Power Project	3	2008	2011	Yes ³⁹
12.	Nam Gie Hydro Power Project	4	2008	2011	Yes ⁴⁰
13.	Dakgret Hydro Power Project	3.6	2008	2011	Yes ⁴¹
14.	Daklay Hydro Power Project	3.2	2008	2011	Yes ⁴²

Hydropower plants which belong to output range of 1.75MW to 5.25MW but were developed without CDM are Ayun Ha and Ia Meur 3.

So, one gets $N_{all}=2$.

³¹ <http://cdm.unfccc.int/Projects/DB/CEC1309759086.62/view>

³² <http://cdm.unfccc.int/Projects/DB/RWTUV1301377895.16/view>

³³ <http://cdm.unfccc.int/Projects/DB/TECO1148475244.75/view>

³⁴ <http://cdm.unfccc.int/Projects/DB/DNV-CUK1269595584.23/view>

³⁵ There is some delay in construction and the project is under validation stage for being registered as CDM project.
<http://cdm.unfccc.int/Projects/Validation/DB/ALJUF4A11BAJU688W9ALUQG1TWWX7B/view.html>

³⁶ <http://cdm.unfccc.int/Projects/DB/DNV-CUK1249543116.9/view>

³⁷ <http://cdm.unfccc.int/Projects/DB/KEMCO1232029207.02/view>

³⁸ <http://cdm.unfccc.int/Projects/DB/KEMCO1269222068.05/view>

³⁹ <http://cdm.unfccc.int/Projects/DB/RWTUV1292949913.35/view>

⁴⁰ Ibit at 31

⁴¹ Ibit at 31

⁴² Ibit at 31

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

Step 3: Identify plants that apply technologies different than the technology applied in the proposed project activity:

The existence of these hydropower plants does not contradict the result of the benchmark analysis stating that the proposed project is financially unattractive, because of the following reasons: Projects Ayun Ha (No. 1) and Ia Meur 3 (No. 3) were all invested and constructed by Gia Lai Electricity Joint Stock Company. It was a state-own company established by the People's Committee of Gia Lai Kon Tum province in 1989⁴³ and has just been privatized in September 2010⁴⁴. Its establishment was to meet urgent energy demand for the country's development in the innovative period of Viet Nam which began in 1986. Therefore, at the time of investment, those three projects enjoyed finance from the state budget and did not take place in *in a comparable investment environment* to the proposed project activity.

In term of construction, this company has substantial experiences⁴⁵ in designing, investing, constructing and operating hydropower plants and the project owner of these projects is different with the proposed project who is a private entity that does not have such important role and rich experience.

Moreover, compared to the 2000-2005 period when energy demand was very urgent to meet the "hot" development growth rates of Viet Nam but the price of labour, construction materials, machine is quite cheap and stable, in recent years, Viet Nam has been suffered with high inflation with a sharply increase in prices of construction materials. As a result, the government has promulgated the tightening monetary policy to reduce the annual growth rate in order to control inflation. It therefore gets more difficult to arrange sufficient loan for a non attractive investment project. As demonstrated in Section B5, this project is not an attractive alternative. Without the additional revenue from CDM, it will be non attractive investment project.

Therefore N_{diff} is ascertained to be 2.

Step 4: Calculate factor $F = 1 - N_{diff}/N_{all} = 1 - 2/2 = 0$ that is lesser than 0.2 (for common practice, it should be more than 0.2)

$N_{all} - N_{diff} = 0$ that is smaller than 3 (for common practice, it should be more than 3)

It can be concluded from the above analysis that no similar projects facing the same barriers as the proposed project have been developed without the aid of CDM.

Prior consideration of the CDM:

The major milestones in developing the investment project and CDM application are summarized in the below table.

⁴³ <http://www.geccom.vn/about.php?id=7>

⁴⁴ http://www.ticcom.com.vn/GT_CTDienGL.htm

⁴⁵ <http://www.geccom.vn/services.php?id=2>

**Table 7: Major milestones in developing the investment project and CDM application**

Development of the hydropower project	Activities taken to secure CDM status	Time	Implication on CDM
Issuing the Feasibility Study Report		Oct 2006	
Issuing the investment licence by the People Committee of Cao Bang province		13 Dec 2006	
<i>No action in the period 2007 - 2009 due to lack of finance</i>			
	Start date of the PoA	23-Dec-2009	
Finalising the Feasibility Study Report		Jan 2010	
	CDM negotiation with PoA Coordinating/Managing Entity	08-Jan-2010	<i>CDM early consideration</i>
	The minute of the meeting on economic- social and environment impacts and developing the proposed project as the CDM project with stakeholders	12-Mar-2010	<i>CDM early consideration</i>
Issuing the Decision on implementing the investment project with the CDM application by the Management Board		29 - Jun-2010	Date of making investment decision
Signing the EPC contract		05-Jul-2010	<i>Starting date of project activity</i>
	Issuing the LOA for Sustainable Small Hydropower Programme of Activities by DNA Viet Nam	14-Jul-2010	
	Including this project into the PoA	21-Sept-2010	

In conclusion, the proposed CPA is additional.

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

The GHG emission sources included in or excluded from the project boundary are as follows:

**Table 8: GHG Sources included to within project boundary**

	Source	Gas	Included?	Justification/Explanation
Baseline	CO ₂ emission from electricity generation in fossil fuel fired power plants that is displaced due to the project activity	CO ₂	Yes	Main emission source.
		CH ₄	No	Minor emission source.
		N ₂ O	No	Minor emission source.
Project Activity	For hydro power plants, emissions of CH ₄ from the Reservoir	CO ₂	No	Minor emission source.
		CH ₄	No	Main emission source. However, as the power density of the CPA is greater than 10 W/m ² CH ₄ emissions are neglected according to ACM0002 version 12.3.0.
		N ₂ O	No	Minor emission source.

The Thoong Cot 2 Hydropower plant is located within the boundaries of Viet Nam as specified in A.4.1.2.

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

The approved consolidated baseline methodology ACM0002 Version 12.3.0 is used to calculate the emission reductions.

I. Project emissions (PE_y)

According to the ACM0002 Version 12.3.0, the project emission for the Hydropower project is calculated using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

PE_y	Project emissions in year y (tCO ₂ e)
$PE_{FF,y}$	Project emissions from fossil fuel consumption in year y (tCO ₂)
$PE_{GP,y}$	Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO ₂ e)
$PE_{HP,y}$	Project emissions from reservoirs of hydro power plants in year y (tCO ₂ e)

The proposed project is a hydro power plant that neither uses fossil fuel nor operates geothermal power plants (i.e. $PE_{FF,y} = 0$; $PE_{GP,y} = 0$); therefore, the above equation can be shortened as follows:

$$PE_y = PE_{HP,y}$$

**Emission from water reservoir ($PE_{HP,y}$)**

For hydropower project activity that results in new reservoirs and/or the increase of existing reservoirs, the power density (PD) of the project activity shall be calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

PD	Power density of the project activity (W/m^2).
Cap_{PJ}	Installed capacity of the hydro power plant after the implementation of the CPA(W).
Cap_{BL}	Installed capacity of the hydro power plant before the implementation of the CPA (W). For new hydro power plants, this value is zero.
A_{PJ}	Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the CPA, when the reservoir is full (m^2).
A_{BL}	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the CPA, when the reservoir is full (m^2). For new reservoirs, this value is zero.

(a) If the PD is greater than $4 W/m^2$ and less than or equal to $10 W/m^2$:

$$PE_{HP,y} = \frac{EF_{Res} \times TEG_y}{1000}$$

Where:

$PE_{HP,y}$	Project emission from reservoir of hydro power plants in year y (tCO_2e)
EF_{Res}	Default emission factor for emissions from reservoirs of hydropower plants ($kgCO_2e/MWh$). ⁴⁶
TEG_y	Total electricity produced by the CPA, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (MWh).

(b) If PD is greater than $10 W/m^2$, then:

$$PE_{HP,y} = 0$$

II. Baseline emissions (BE_y)

Baseline emissions include only CO_2 emissions from electricity generation from fossil fuel fired power plants that are displaced due to the project activity, calculated as follows:

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

Where:

BE_y	Baseline emissions in year y (tCO_2).
--------	---

⁴⁶ Default value was $90 Kg CO_2e /MWh$ as per EB23.

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$EG_{PJ,y}$	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CPA in year y (MWh).
$EF_{grid,CM,y}$	Combined margin CO ₂ emission factor for grid connected power generation in year y use the applied value from PoA-DD (tCO ₂ /MWh).

Calculation of EG_{PJ}

Because the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

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

Where:

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

Therefore, the baseline emissions are calculated as follows:

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

III. Leakage (LE_y)

According to ACM0002_ version 12.3.0, No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected.

IV. Emission reductions (ER_y)

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

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

In summary, the following data and parameters are available at the date of validation of the CPA:

Data / Parameter:	EF_{Res}
Data unit:	kgCO ₂ e/MWh
Description:	Default emission factor for emissions from reservoirs of hydro power plants
Source of data:	Decision by EB23
Value to be applied:	90 kgCO ₂ e/MWh
Any comment:	Applicable to CPAs with a power density (PD) greater than 4 W/m ² and less

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	than or equal to 10 W/m ² .
--	--

Data / Parameter:	Cap_{BL}
Data unit:	MW
Description:	Installed capacity of hydropower plant before the implementation of the project activity.
Source of data used:	This is a green-field project. This value does not exist prior to the implementation of the project activity
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied :	The project activity constructs a new hydropower plant, so <i>Cap_{BL}</i> is considered by zero according to the applied methodology.
Any comment:	For calculating the power density (PD)

Data / Parameter:	A_{BL}
Data unit:	m ²
Description:	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 reservoirs, this value is zero.
Source of data used:	This is a green-field project. This value does not exist prior to the implementation of the project activity
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied :	The project activity builds a new single reservoir, so <i>A_{BL}</i> is considered by zero according to the applied methodology.
Any comment:	For calculating the power density (PD)

Data / Parameter:	EF_{grid,OM,y}
Data unit:	tCO ₂ /MWh
Description:	Operating 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 02.2.1
Source of data used:	Data published by DNA Viet Nam
Value applied:	0.6240

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Justification of the choice of data or description of measurement methods and procedures actually applied:	As per version 02.2.1 of “Tool to calculate the emission factor for an electricity system”
Any comment:	For calculation of $EF_{grid,CM,y}$

Data / Parameter:	$EF_{grid,BM,y}$
Data unit:	tCO ₂ /MWh
Description:	Build 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 02.2.1
Source of data used:	Data published by DNA Viet Nam
Value applied:	0.4875
Justification of the choice of data or description of measurement methods and procedures actually applied:	As per version 02.2.1 of “Tool to calculate the emission factor for an electricity system”
Any comment:	For calculation of $EF_{grid,CM,y}$

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	tCO ₂ /MWh
Description:	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the “Tool to calculate the emission factor for an electricity system”, version 02.2.1
Source of data used:	Data published by DNA Viet Nam
Value applied:	0.5558
Justification of the choice of data or description of measurement methods and procedures actually applied:	As per version 02.2.1 of “Tool to calculate the emission factor for an electricity system”
Any comment:	Fixed for crediting period.

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



Emission reductions generated by the CPA are calculated ex-ante on the basis of the equations and parameters presented and explained in the section E.6.1 of the PoA-DD and B.5.1 of this document.

Starting date of a 7 year crediting period is 01/07/2012 or date of inclusion of the CPA in the PoA, whichever is later.

I. Project emissions (PE_y)

The proposed project activity involves the construction of the power plant with the parameters detailed in table below

Table 9: Installed capacity and respective reservoir area of CPA

Parameter	Unit	Symbol	Value
Installed capacity	W	Cap_{PJ}	3,500,000
Reservoir area	m ²	A_{PJ}	89,000

The power density (PD) is derived as:

$$PD = \frac{Cap_{PJ}}{A_{PJ}} = \frac{3,500,000}{89,000} = 39.3 \text{ W/m}^2$$

It is greater than 10 W/m², thus the project emission is zero: $PE_y = 0$

Because the power density of this proposed project is higher than 10 W/m², the monitoring of total electricity generation TEG_y was excluded from the monitoring section.

II. Baseline emissions (BE_y)

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated as follows:

$$BE_y = EG_{\text{facility},y} \times EF_{\text{grid},CM,y}$$

Where: $EG_{\text{facility},y}$ – Electricity supplied by the Thoong Cot 2 Hydropower plant to the grid

$$EG_{\text{facility},y} = 14,415 \text{ MWh}$$

$$EF_{\text{grid},CM,y} = 0.5558 \text{ tCO}_2/\text{MWh}$$

therefore:

$$BE_y = 14,415 \times 0.5558 = 8,012 \text{ tCO}_2$$

III. Leakage (LE_y)

According to ACM0002_ version 12.3.0, No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected.

IV. Emission reductions (ER_y)

Emission reductions are calculated as follows:



$$ER_y = BE_y - PE_y$$

$$= 8,012 \text{ (tCO}_2\text{e)}$$

B.5.3. Summary of the ex-ante estimation of emission reductions:**Table 10: Ex-ante estimation of emission reductions**

Year	Estimation of project activity emissions (tonnes of CO ₂ e)	Estimation of baseline emissions (tonnes of CO ₂ e)	Estimation of leakage (tonnes of CO ₂ e)	Estimation of overall emission reductions (tonnes of CO ₂ e)
2013	0	8,012	0	8,012
2014	0	8,012	0	8,012
2015	0	8,012	0	8,012
2016	0	8,012	0	8,012
2017	0	8,012	0	8,012
2018	0	8,012	0	8,012
2019	0	8,012	0	8,012
Total estimated emissions and emission reductions in tonnes of CO ₂ e	0	56,084	0	56,084

B.6. Application of the monitoring methodology and description of the monitoring plan:**B.6.1. Description of the monitoring plan:**

The monitoring plan for the CPA is consistent with methodology ACM0002 version 12.3.0 and the requirements laid out in the PoA-DD.

Pursuant to the PoA-DD, the following parameters are monitored for this CPA:

Data / Parameter:	EG_{y, export}
Data unit:	MWh
Description:	Electricity supplied by the proposed CPA to the national grid,
Source of data to be used:	Direct measurement at the project connection point
Value of data applied for the purpose of calculating expected emission reductions in section B.6	14,415
Description of measurement methods and procedures to be	Two-way power meters will be installed at the grid-connected point to measure the amount of electricity supplied and consumed by the proposed project. The readings of electricity meter will be hourly measured and monthly recorded.



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applied:	The recorded data will be confirmed by the joint balance sheet which will be signed by the representatives of EVN and the project owner. Electronic data will be archived within the crediting period and 2 years after the end of the crediting period.
Monitoring frequency	Continuous measurement and monthly recording
QA/QC procedures to be applied:	The uncertainty level of this data is low. The measurement/ monitoring equipment should be complied with national standard and technology. These equipment and systems should be calibrated and checked every 2 year.
Any comment:	For $EG_{\text{facility},y} = EG_{y,\text{export}} - EG_{y,\text{import}}$

Data / Parameter:	$EG_{y,\text{import}}$
Data unit:	MWh
Description:	Electricity supplied by the national grid to the proposed CPA
Source of data to be used:	Direct measurement at the project connection point
Value of data applied for the purpose of calculating expected emission reductions in section B.6	0
Description of measurement methods and procedures to be applied:	Two-way power meters will be installed at the grid-connected point to measure the amount of electricity supplied and consumed by the proposed project by the reverse direction. The readings of electricity meter will be hourly measured and monthly recorded. The recorded data will be confirmed by the joint balance sheet which will be signed by the representatives of EVN and the project owner. Electronic data will be archived within the crediting period and 2 years after the end of the crediting period.
Monitoring frequency	Continuous measurement and monthly recording
QA/QC procedures to be applied:	The uncertainty level of this data is low. The measurement/ monitoring equipment should be complied with national standard and technology. These equipment and systems should be calibrated and checked every 2 year.
Any comment:	For $EG_{\text{facility},y} = EG_{y,\text{export}} - EG_{y,\text{import}}$

Data / Parameter:	$EG_{\text{facility},y}$
Data unit:	MWh
Description:	Net electricity supplied to the national grid by the proposed project
Source of data to be used:	Calculating from $EG_{y,\text{import}}$ and $EG_{y,\text{export}}$
Value of data applied for the purpose of calculating expected emission reductions in section B.6	14,415
Description of measurement methods	Calculating by subtracting $EG_{y,\text{import}}$ from $EG_{y,\text{export}}$. Double checking by the joint balance sheet issued by EVN and project owner to ensure the consistency.

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and procedures to be applied:	Data will be archived within the crediting period and 2 years after the end of the crediting period.
Monitoring frequency	Continuous measurement and monthly recording
QA/QC procedures to be applied:	The uncertainty level of this data is low. The measurement/ monitoring equipment should be complied with national standard and technology. These equipment and systems should be calibrated and checked every 2 year.
Any comment:	For CERs calculation

Data / Parameter:	A_{PJ}
Data unit:	m^2
Description:	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.
Source of data to be used:	Feasibility Study
Value of data applied for the purpose of calculating expected emission reductions in section B.6	89,000
Description of measurement methods and procedures to be applied:	Measured from topographical surveys, satellite pictures and maps yearly
Monitoring frequency	Yearly
QA/QC procedures to be applied:	The uncertainty level of this data is low.
Any comment:	For the calculation of PD

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 to be used:	Project site
Value of data applied for the purpose of calculating expected emission reductions in section B.6	3,500,000
Description of measurement methods and procedures to be applied:	Determine the installed capacity by taking photographs of the nameplates. And the value in nameplate will be included in the monitoring report.
Monitoring frequency	Yearly
QA/QC procedures to be applied:	The capacity of this project will not be changed. The monitoring of Cap_{PJ} will be taken yearly and will be confirmed by the Verifier



Any comment:	For the calculation of PD
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The surface area of the reservoir will be monitored annually. The monitoring of the reservoir area will be measured by a third party when the project becomes operational. This evidence will be used for calculating the project emission.

In addition, since the baseline emission factor of Viet Nam National Grid ($EF_{grid,CM,y}$) is fixed ex-ante (detail in Section B.5), therefore the main data to be monitored is $EG_{facility,y}$. $EG_{facility,y}$ will be calculated according to the below formula:

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

The electricity generated from the project activity will be sold to the EVN for the complete project lifetime under a long-term PPA with EVN.

The electricity generated from the project activity before entering into the grid at the grid interconnection point will be measured by a digital kilowatt hour (kWh) meter. The metering system includes the main system and a back-up system. The back-up system will be used in case of a failure of the main meter.

Data from the operating meters will be measured hourly. Additionally, monthly manual readings will be taken from the operating meters.

Monthly, EVN staff and staff of the operation division of the power plant will cross-check manual meter readings with the electronically recorded data and prepare and sign a joint balance sheet which indicates the amount of power fed into the grid within that month.

This joint balance sheet is also the basis of payment by the EVN to the project proponent. Hence, the monitoring plan is well integrated into the standard EVN procedures.

For further details see Annex 4.

SECTION C. Environmental analysis

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

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

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

1. Environment Impacts

1.1. Impact on land

The proposed project will occupy 10.27 ha⁴⁷ of land for arrangement of project structures, which mainly consists of uncultivated bush land and river land.

⁴⁷ Contract of land for rent dated 30 June 2010



No historical culture and archaeological places exist in the project site.

1.2. Impact on water flow

The project will create a reservoir with a total area of 8.9 ha. So in the reservoir filling period, the river flow will be reduced. When completed, the reservoir will be used for the purpose of generating electricity. So the main impact on water quality is the disposal of septic wastewater discharging from the work camps and waste oil from the truck and vehicle during the construction phase.

1.3. Impacts on ecological system

The Thoong Cot 2 hydropower project does not cross-out any natural conservation areas, national forests or specialized forest.

The reservoir will adjust local climate to be more moderate. This fine weather not only has positive impacts on local people health but also has favourable impacts on surrounding flora system.

During the construction period, the project's activities such as material exploitation, material transportation, mine explosion as well as the concentration of workers will have certain negative impacts on local environments, namely local air and noise pollutions.

However, these impacts are temporary and will be terminated after completing the construction phase.

2. Socio-economic impacts

2.1. Negative impacts

Negative impacts are mainly impacts on occupied land. Most occupied land is uncultivated bush land and least agricultural. The occupied land will be compensated adequately under the government law.

2.2. Positive impacts

As presented in Section A.2

3. Mitigation measures to reduce negative impacts

3.1. Construction phase

- *Waste collection and treatment*
 - Implement regular collection and treatment of solid and liquid wastes, including the construction of a dumping area.
 - Improve awareness on the environmental protection for workers and local people.
- *Local pollution*
 - Dust removal measures will be taken such as spraying water along the roads.
 - All means/vehicles for transport of construction materials must be covered in order to minimize dust dispersion.
 - All transport equipment/vehicles and machines must have operational certifications issued by the Directorate for Standards and Quality.
- *On socio-economic impacts:*
 - Implement the compensation plan for the affected local people according to the government law.

3.2. Operational phase

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Preventive measures and reaction towards environment problems: Installing monitoring equipment to monitor absorption and distortion of water rising and water quality released from the plant and proposing suitable preventive measures if required.

4. Conclusion

The main negative impacts on environment happen during the construction phase. However, all these impacts will be mitigated by implementing mitigation measures and then will be terminated after finishing the construction. Preventive and mitigation measures are planned to be conducted during the operation period to reduce and prevent any negative impacts.

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

Pursuant to the Environment Law year 2005 of Viet Nam, the project owner has to submit the Environment Impact Assessments and got the approval for the CPA. The Environment Impact Assessment has been approved by People's Committee of Cao Bang Province in December of 2006 in the Decision No. 183/QD-HDTD.

Furthermore, based on the impact assessments of the proposed CPA, the EIA report proposes that the mitigation measures shall be conducted during the construction and operation phases in order to minimize the negative impacts and ensure the long-term benefits from this project.

The surface water license is to be obtained from the Ministry of Natural Resources & Environment before operation as this is mandatory for this type of project in Viet Nam.

SECTION D. Stakeholders' comments

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

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

The following local stakeholder have been invited:

- The People Committee of Cao Bang province: which is the highest local authority.
- Commune's People Council: The members of Commune People Council are elected by residents in commune. So the Council opinions officially represent for opinions of the local people.
- Commune's People Committee (CPC): CPC is the lowest administration level in Viet Nam administrative hierarchy. Chairman of CPC is elected by the Commune People Council, so she/he well represents the commune's interest.
- Commune's communist party committee secretary: this is one of the key bodies in making development strategies at the communal level.
- Village's representative: head of village, secretary of young union, head of farmers' association, head of women's association. Such associations are NGOs and represent the interests of different groups.


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

The project owner has submitted the FS and EIA report to the People Committee of Cao Bang province. Then the People Committee has authorised for the project owner to develop this investment project via issuance of the investment license and approved the EIA report. After that, the People Committee has granted investment approval for the project activity by issued investment license (No 11121000005/GCNDC1/11/1) on 13 December 2006.

Besides, the local people of Chi Vien commune were involved in the consultation process. At first, the stakeholders were informed about the project by public radio and notices at the Communal People Committee's office. And then, they were invited to the official meetings with the project owner for giving their comments.

Given that all local people living in Chi Vien commune are ethnic minorities, then the communication with local people was made via local representatives.

On 12 March 2010, the meetings at Chi Vien commune between the project owner and the following representatives of the local people took place in order to inform the project activity:

- Commune's People Council.
- Commune's People Committee (CPC).
- Commune's communist party committee secretary.
- Village's representatives.

D.3. Summary of the comments received:

All organizations agreed that the project will certainly contribute to sustainable development and environment protection in the province and Viet Nam and especially this project will increase local budget and reduce poverty in the project's region.

Comments and feedbacks from local people and local authority are summarized as follows:

- The proposed hydropower project is a clean industrial project and will contribute to socio-economic development of the project's area;
- The good impacts are expected to include infrastructure improvement such as road, electricity access, and clean water system. Besides, the increase of awareness and market access also implies the positive impacts on spiritual and material lives of local people;
- The project will contribute to conservation of forest and environmental protection;
- Support the local area with upgraded infrastructure and employed local workers.
- Conduct measures to protect the environment according to the government law.
- Compensate for the affected people.

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

The comments of the above mentioned organisations are carefully reviewed. All of them are positive comments without any main concerns or any objections.



To address the requests from local people, the project's owner committed to:

- use local human resources for appropriate jobs in the construction and operation phases;
- seriously apply and implement mitigation activities as stated in the EIA report in order to minimise negative impacts on local environment.
- comply with existing regulation on compensations and agreements with the households to implement a fair and reasonable plan. The project owner has negotiated and reached an agreement with each affected households. The payment to each household is made under the supervision of the local government.

**Annex 1****CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE CPA**

Organization:	Eternal Light Company Limited
Street/P.O.Box:	No 6, Vu Ngoc Phan Street, Lang Ha Ward, Dong Da District, Ha Noi
Building:	
City:	
State/Region:	Ha Noi
Postfix/ZIP:	
Country:	Viet Nam
Telephone:	+84-04-62662722
FAX:	+84-04-62662723
E-Mail:	duycole@yahoo.com
URL:	
Represented by:	Trieu Quoc Viet
Title:	Director
Salutation:	Mr.
Last Name:	Trieu
Middle Name:	Quoc
First Name:	Viet
Department:	
Mobile:	
Direct FAX:	+84-04-62662722
Direct tel:	+84-04-62662723
Personal E-Mail:	duycole@yahoo.com



Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There are no public and/or ODA funds involved in this CPA.



Annex 3

BASELINE INFORMATION

No further information provided.

**Annex 4****MONITORING INFORMATION**

The monitoring information of the Thoong Cot 2 Hydropower plant can be seen in details as follows:

A. Description of technical equipment

The metering system including main system and a back-up system will be installed at the grid connecting point. They are digital meters bi-directly with the accuracy of main meter at least 0.5sas required by regulations⁴⁸. The meter type used is an electronic 3 phase and details on the technical equipment can be found in the hard copy document “Technical explanation for metering system” as developed by the project proponent and approved by EVN.

B. Monitoring organization

The structure of the monitoring group is as follows:

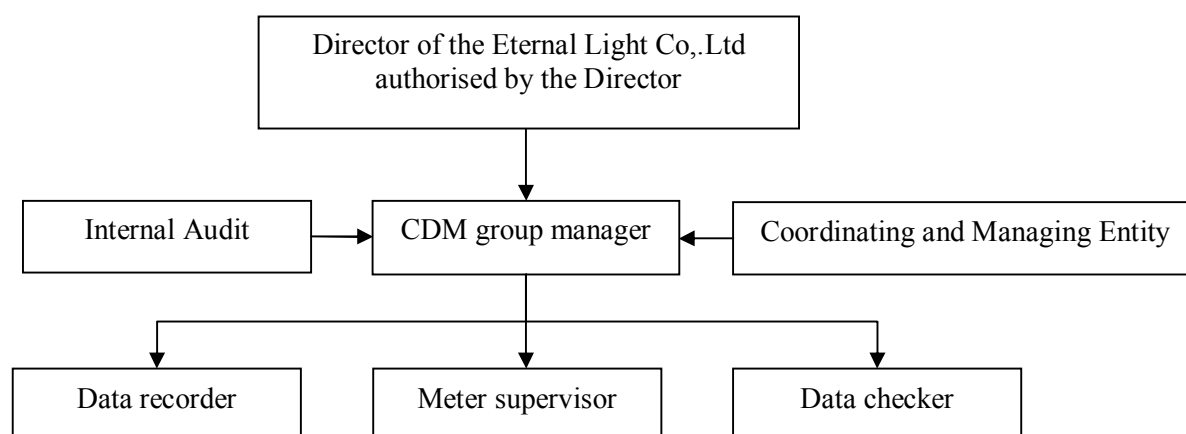


Figure 3: Structure of the monitoring group

The responsibilities of each person involved are elaborated as follows:

Table 11: Group members and their responsibilities

Person	Responsibility
Director of the Eternal Light Co.,Ltd /authorised by the Director	Check and sign the monitoring report annually
CDM group manager	Managing the whole CDM business of Thoong Cot 2 power plant, guiding

⁴⁸ Circular No. 32/2010/TT-BCT of Ministry of Industry and Trade dated 30 July 2010

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	and supervising data recorder after trained by the Coordinating and Managing Entity.
The Coordinating and Managing Entity	Providing CDM group manager training and technical support about CDM monitoring plan.
Internal auditor	Check the monitoring procedures at least once in a year
Data recorder	Collecting and recording data every month.
Meter supervisor	Checking power meter periodically according to relevant regulation.
Data checker	Double checking the collected data measured by power meter.

C. Monitoring procedure

The steps of monitoring the electricity supplied to the grid and the electricity imported from grid and consumed by the proposed project are as follows:

- (1) Persons in charge of data record and meter supervisor from Thoong Cot 2 power plant together with staff from EVN shall read and collect data from main power meters on the first day of every month, the result will be signed by both parties and kept respectively;
- (2) The data from the backup power meter will be hourly recorded by the person in charge of data record of Thoong Cot 2 power plant. This recorded data will be cross checked with the data from main power meter. Data will be filled in the form provided by Vietnam PoA Carbon Management Joint Stock Company.
- (3) Thoong Cot 2 power plant provides electricity sales invoice to EVN, and keeps the copy of invoice;
- (4) Thoong Cot 2 power plant provides the record of main, backup power meters and copy of invoices to the verifier of DOE.

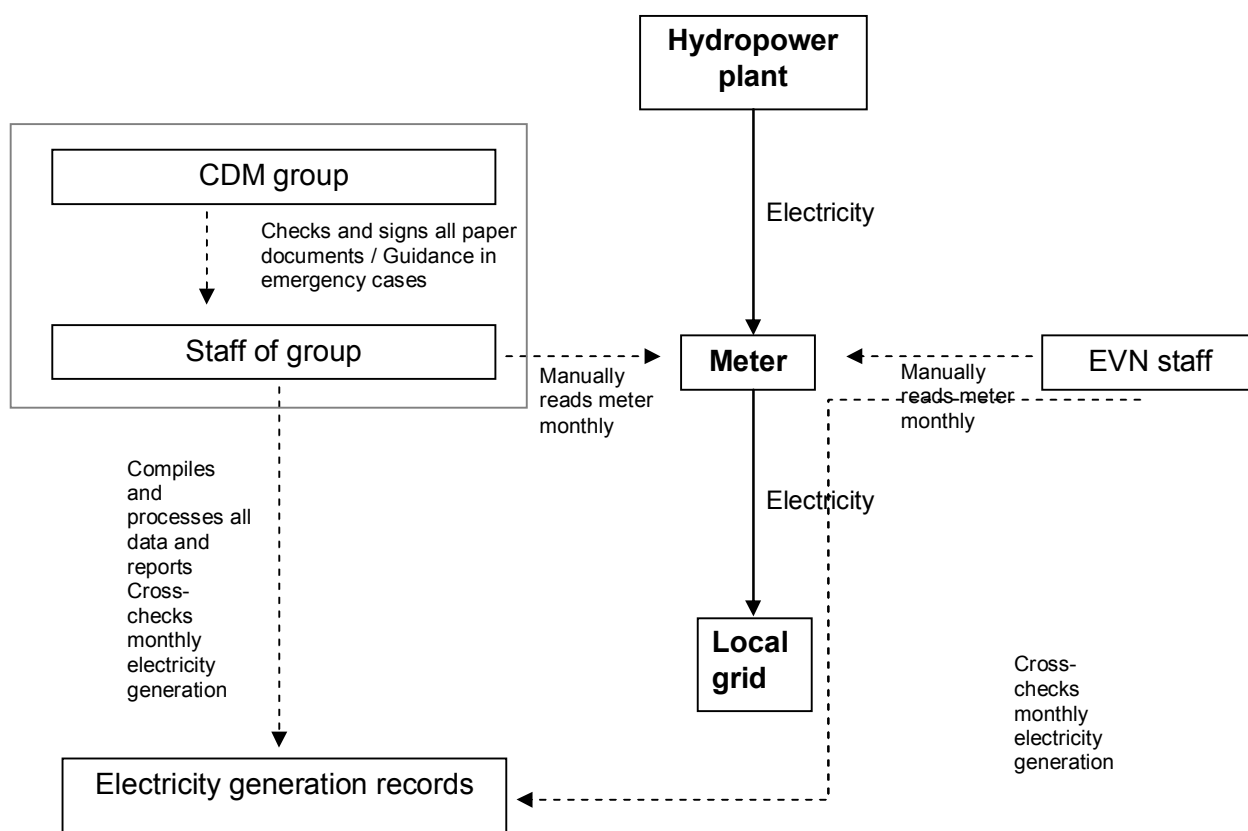


Figure 4: Monitoring process

D. Calibration of metering equipment

The meters will be calibrated and verified pursuant to national standard. According to the Decision No 65/2002/QĐ-BKHCHNT⁴⁹, calibration and verification for 3 phase meters need to be conducted every two year by the third party once during project operation. After every calibration, the meters will be sealed so that no illegal interference is possible.

E. Data recording and archiving procedures

- The CDM group appointed by Thoong Cot 2 power plant shall keep monitored data in electronic archives at the end of every month. Paper documents should be stored in electronic format and copied by CD. Electronic documents should be printed out and kept.
- Thoong Cot 2 power plant shall keep the copy of electricity sales/purchase invoices (the original electricity sales/purchase invoices shall be kept by Finance Department of Eternal Light Co.,Ltd).
- In order to help verifiers obtain documents and information related to the emission reduction of the proposed project, Eternal Light Co.,Ltd shall prepare an index of the data documents and monitoring report.

⁴⁹ Decision No 65/2002/QĐ-BKHCHNT⁴⁹ issued by the Minister of Scientific, Technology and Environment on 19 August 2002 to promulgate "The list of meter equipment must be calibrated and verified and the verification procedures".



- All the data and information in the form of paper documents shall be archived by the CDM group, with at least one copy backup for each datum.
- All the data shall be kept for 2 years after the crediting period.

F. Emergency procedures

In case of any unforeseen event that is not covered under this monitoring plan, staff of the CDM group shall inform the manager and the director. The manager and director are then responsible to ensure that the cause for the unforeseen event is detected, the event is remedied and for the period of time in which the unforeseen event has occurred uncertainty in data gathered is limited as much as possible.

In the case the error of main meter exceeds allowed level; the backup meter will be used to measure output of electricity exporting to grid.

In case of both main and back-up metering systems are in failure, the project owner and the power company (EVN) will jointly calculate a conservative estimate of power supplied to the grid. The assumptions used to estimate net electricity supply to the grid will be signed by both a representative of the project owner as well as a representative of the power company (EVN).

G. Training

Before the start of the crediting period Vietnam PoA Carbon Management Joint Stock Company will in close collaboration with the chief of the operation division of the power plant develop a training manual and training course for the staff of the operation division that will clearly lay out procedures for all activities related to metering, data recording and processing, data archiving and preparation of monitoring reports.