



# **VALIDATION REPORT**

**Vietnam Carbon Assets Ltd.**

**Nam Pong Hydropower Project**

**REPORT NO.: 11011116**

**REPORT DATE: 11/12/2011**

**China Environmental United Certification Center Co., Ltd (CEC)**

No.1 Yuhuinan Road, Chaoyang District, Beijing, China, 100029

[www.mepcec.com](http://www.mepcec.com)



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<b>Project Title:</b>	<b>Country:</b>		
Nam Pong Hydropower Project	Vietnam		
<b>Methodology and Version</b>	<b>Sectoral Scope:</b>		
ACM0002 version 12.2.0	1		
<b>PDD for GSP</b>	<b>Final PDD</b>		
Date of Finalization: 15/04/2011 Version: 1.0	Date of Finalization: 29/11/2011 Version: 1.5		
<b>GHG Reducing Measure/Technology</b>	<b>ER Estimate:</b>		
Renewable Power Generation from Hydro Sources	492,471 tCO <sub>2</sub> e during the first crediting period		
<p><b>Summary:</b></p> <p>China Environmental United Certification Center Co., Ltd (CEC) has performed the validation of the Nam Pong Hydropower Project of Vietnam Carbon Assets Ltd. on the basis of all applicable CDM requirements. The CDM requirements include the CDM modalities and procedures and subsequent decisions by the CMP and documents released by the CDM Executive Board and available on the UNFCCC CDM website.</p> <p>The validation scope is defined as an independent and objective review of the Project design document, the Project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the Project design and the baseline and monitoring plan; ii) follow-up interviews with Project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from contract review to validation report &amp; opinion, was conducted using CEC internal procedures.</p> <p>The first output of the validation process is a list of Clarification and Corrective Actions Requests (CLs and CARs), presented in Appendix A. Taking into account this output, the Project participant took corrections and revised its Project design document.</p> <p>In summary, it is CEC's opinion that the Nam Pong Hydropower Project, as described in the PDD version 1.5 dated 29/11/2011, meets all relevant UNFCCC requirements for the CDM and all relevant Host Parties criteria, correctly applies the baseline and monitoring methodology ACM0002 version 12.2.0, and also meets the stated validation criteria. CEC thus requests the registration of the Project as a CDM Project activity.</p>			
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TANG Dingding Chair of Board			



## Abbreviations

ACM	Approved Consolidated Methodology
BM	Build Margin
BDR	Basic Design Report
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEC	China Environmental United Certification Center Co., Ltd
CER	Certified Emission Reductions
CH <sub>4</sub>	Methane
CL	Clarification Request
CM	Combined Margin
CO <sub>2</sub> eq	Carbon Dioxide Equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EIA	Environmental Impact Assessment
EF	Emission Factor
ERPA	Emission Reduction Purchase Agreement
GHG	Green House Gas(es)
GSP	Global Stakeholders Consultation Process
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LoA	Letter of Approval
MoV	Means of Verification
MP	Monitoring Plan
N/A	Not Applicable
NGO	Non Government Organization
ODA	Official Development Assistance
PDD	Project Design Document
PDR	Preliminary Project Engineering Report
OM	Operational Margin
PP	Project Participant
PPA	Power Purchase Agreement
TDR	Technical Design Report
UNFCCC	United Nations Framework Convention for Climate Change
VVM	Validation & Verification Manual



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# **1 INTRODUCTION**

Vietnam Carbon Assets Ltd. (the Project Participant) has commissioned and contracted CEC to validate the CDM Project “Nam Pong Hydropower Project” (Hereafter called “the Project”) located on Nam Pong stream, Chau Hanh and Chau Phong communes, Quy Chau district, Nghe An province, Vietnam.

This report summarizes the findings of the validation of this project, performed based on all applicable CDM requirements.

## **1.1 Objective**

The purpose of validation is to ensure a thorough, independent assessment of proposed CDM project activities submitted for registration as proposed CDM project activity against the applicable CDM requirements. Validation is part of the CDM project cycle and will finally result in a conclusion by CEC whether a project activity is valid and should be submitted for registration of a proposed project activity rests at the CDM Executive Board and the Parties involved.

The project activity discussed by this validation report has been submitted under the project title: Nam Pong Hydropower Project.

## **1.2 Scope**

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against all applicable CDM requirements.

The validation is not meant to provide any consultation towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

# **2 VALIDATION METHODS**

The overall validation, from Contract Review to Validation Report& Opinion, was conducted using CEC internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, in accordance with Version 01.2 of the Clean Development Mechanism Validation and Verification Manual (VVM) issued in EB55 Meeting on 30/07/2010/5.1/.The protocol shows in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements that a CDM project is expected to meet.
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the results of the validation.



The validation protocol consists of two tables. The different columns in these tables are described in below. The findings are the essential part of this validation report and the completed validation protocol is enclosed in Appendix A to this report.

**Table 1: Requirements checklist**

Checklist Question	Reference	Means of Verification(MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in several sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Give reference to documents where the answer to the checklist question or item is found.	Explain how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I), N/A means not applicable.	The section is used to elaborate and discuss the checklist question and /or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided(OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question.(See below).Clarification Request(CL) is used when the validation team has identified a need for further clarification. Forward action request (FAR) is used for a need for review during the first verification.

**Table 2: Resolution of Corrective Action and Clarification Requests**

Report clarifications and corrective action requests	Ref. to checklist question in table 1	Summary of project participant response	Validation conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in several sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	The responses given by the project participants during the communications with the validation team should be summarized in this section.	This section should summarize the validation team's responses and final conclusions. The conclusions should also be reflected in Table 1,"Final conclusion"

## 2.1 Validation Team

According to the designation requirements on the validation team in the CDM accreditation standards of Executive Board, and following requirements from the technical scopes and professional characters in the sectoral scopes, CEC designated a validation team.



It is required that the validation team collectively has the required competencies in the technical, methodological and sectoral aspects of specific CDM project activities.

The validation team consists of the following members, the detailed personal information see Appendix B

**Table 3: List of validation Team**

<b>Name</b>	<b>Role</b>	<b>Qualification</b>	<b>Specific Scope</b>	<b>If participating in on-site visit</b>
XU Linghua	Team Leader	Auditor	√	√
WANG Yanping	Team Member	Auditor	√	√
ZHANG Jiajia	Team Member	Auditor trainee	-	√
HUANG Wenjing	Team Member	Technical Expert	√	√

## **2.2 Document Review**

The Project Design Document (PDD) ver.1.0/1.1/ dated 15/04/2011 and additional background documents related to the project design and baseline were submitted by the PP.

Once CEC receives the PDD version 1.0 dated 15/04/2011, it was made publicly available on the internet on the UNFCCC CDM web pages for starting a 30 days global stakeholder consultation process (GSP). The PDD version 1.5 dated 29/11/2011 will form the basis for the final evaluation as presented by this report. The information of the PDD version is presented on Page 1.

To address the validation team's corrective action and clarification requests, the PP revised the PDD/1.2/ and resubmitted it on 11/10/2011 and the validation findings presented in this report related to the project are described in the PDD version 1.5 dated 29/11/2011/1.2/.

## **2.3 Follow-up Interviews**

The validation team performed on-site interviews with the relevant stakeholders and cross-checked information provided by interviewed personnel to ensure that no relevant information has been omitted from the validation. Representatives of the PP, the consultant and local stakeholders were interviewed on 21/06/2011~ 23/06/2011 (See Reference). The main topics of the interview are summarized in Table 4.



**Table 4: Interview topics and organization**

<b>Date: 21/06/2011~23/06/2011</b>	
<b>Interview topics</b>	<b>Interview Organization</b>
<ul style="list-style-type: none"> <li>✓ Project background information and CDM consideration.</li> <li>✓ Project technology, operation, maintenance and monitoring capability.</li> <li>✓ Project monitoring and management plan.</li> <li>✓ Stakeholder consultation process.</li> <li>✓ Project approval status (incl. EIA approval, CDM project approval status)</li> <li>✓ Hydropower development in the area</li> <li>✓ Government policies related to hydropower projects</li> </ul>	ZaHung Joint Stock Company (the PO)
<ul style="list-style-type: none"> <li>✓ Project background in details</li> <li>✓ Stakeholder comments</li> <li>✓ Social and environmental impact of the project</li> </ul>	Local Stakeholders
<ul style="list-style-type: none"> <li>✓ Applicability of selected methodology.</li> <li>✓ Baseline determination</li> <li>✓ Emission reductions calculation.</li> <li>✓ Emission reduction monitoring plan.</li> </ul>	Energy and Environment Consultancy Joint Stock Company (the Consultant)

## 2.4 Resolution of CARs / CLs /FARs

During the validation of a project activity, CEC identifies issues that need to be further elaborated upon, researched or added to in order to confirm that the project activity meets the CDM requirements and can achieve credible emission reductions, CEC shall ensure that these issues are correctly identified, discussed and concluded in the validation report.

Corrective Action Requests (CARs) are issued, where:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM requirements have not been met;
- There is a risk that emission reductions cannot be monitored or calculated.

The validation team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward action request (FAR) are raised to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

To guarantee the transparency of the validation process, the concerns raised and responses





that have been given are documented in more detail in the validation protocol in Appendix A.

The PDD version 1.5/1.2/ dated 29/11/2011 that was submitted on 30/11/2011 presented herewith serves as the basis for the final assessment.

**Table 5: Main Changes in the Content of the PDDs**

<b>Subject and Section in the PDD</b>	<b>Main Changes in the Revised PDD</b>
Section A General Description of Project Activity	PDD version and revision history
Section B Application of a Baseline and Monitoring Methodology	Supplement the content of Define alternatives to the project activity Supplement Table 1: Key assumption for investment analysis Add parameter O&M in sensitivity analysis Revised input parameters of IRR calculation and IRR calculation result
Section C Duration of the Project Activity /Crediting Period	N/A
Section D Environmental Impacts	N/A
Section E Stakeholders' Comments	N/A

## **2.5 Internal Quality Control**

As final step of a validation, the validation report and the validation protocol have to be reviewed by the technical reviewers, then verified by the CDM Supervisor and finally approved by Chairman of Board according to the regulations on technical review of CEC; the technical reviewers have to be independent from the validation team.

After confirmation of the PP, the validation opinion and relevant documents are submitted to the EB through the UNFCCC web-platform.

## **3 VALIDATION SUMMARY**

The findings from the desk review of the original project design documents and the findings from interviews during the on-site visit are described in the Validation Protocol Appendix A.

The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in 7 Corrective Action Requests and 11 Clarification Requests.

### **3.1 Participants and Approval**

The project participants are ZaHung Joint Stock Company/4.2/ and Energy and Environment Consultancy Joint Stock Company (of the host party Vietnam) and Vietnam Carbon Assets



Limited (of the Annex I party Switzerland)/1.1//1.2/. The host party Vietnam and Annex I Party Switzerland meet the requirements to participate in the CDM. Both have ratified the Kyoto Protocol and established a DNA as per the participating requirements for CDM under the Kyoto Protocol.

The DNA of Vietnam has issued the LoA/1.3/ on 28/09/2011 (ref.48/2011/DMHCC-BCD) authorizing ZaHung Joint Stock Company and Energy and Environment Consultancy Joint Stock Company as project participants (of the host party Vietnam). The LoA was received from the project participants and its authenticity was confirmed by crosschecking against the list of approved projects published by the Vietnam DNA. The DNA of Annex 1 Country has also issued a LoA/1.4/ on 27/09/2011 (ref.G514-3487) authorizing Vietnam Carbon Assets Ltd. as a project participant (of the Annex I party Switzerland).

The host Party Vietnam and the participating Annex I Party, i.e. Switzerland both meet the requirements to participate in the CDM. Vietnam is a non Annex I party to the Kyoto Protocol. Vietnam has established a DNA (Ministry of Natural Resources and Environment, MONRE) as per the participating requirements for CDM under the Kyoto Protocol. Switzerland has ratified the Kyoto Protocol on 09/07/2003. The host Party Vietnam and the participating Annex I Party Switzerland both meet the requirements to participate in the CDM.

Non-Annex 1 Country: <http://maindb.unfccc.int/public/country.pl?country=VN>

And Annex 1 Country: <http://maindb.unfccc.int/public/country.pl?country=CH>

Both LoAs indicate that the participation in the “Nam Pong Hydropower Project” Project is voluntary. The Vietnamese LoA also confirms that the proposed CDM project activity contributes to the sustainable development of Vietnam (host country).

The Vietnam LoA has further been cross-checked with the CDM official website ([http://www.noccop.org.vn/Data/profile/Airvariable\\_Projects\\_77438Danh%20sach%20PDD%20-%20TA.pdf](http://www.noccop.org.vn/Data/profile/Airvariable_Projects_77438Danh%20sach%20PDD%20-%20TA.pdf)), which confirms the approval of the proposed project.

The LoA of the DNA of Switzerland was issued on 27/09/2011/1.4/, confirming that it authorizes Vietnam Carbon Assets Limited as a project proponent in the proposed project (<http://www.bafu.admin.ch/emissionshandel/05556/05558/index.html?lang=en>). The approval is not conditional, and the participation is voluntary.

The LoA of the DNA of Vietnam and LoA of Annex 1 Party Switzerland were provided by the project participant. CEC confirmed its authenticity by cross-checking the Announcement of newly approved projects issued by DNA of Vietnam/1.5/ and relative documents provided. The information of Project Participants and project title in these documents is consistent with the PDD.

Both LoAs do not refer to any specific version of the PDD or validation report. Both LoAs are valid for Nam Pong Hydropower Project. Both LoAs confirm the title of the proposed project is “Nam Pong Hydropower Project”. And the related documents including PDD and MOC/1.5/ are consistent with the LoAs.

CAR01 was raised as the LoA from the Annex I party was not provided and the name of the



PO from host party in the investment license and Version 1.0 was found to be inconsistent with that in the LoA. The LoA the Annex I party was submitted before the finalization of the validation report. And PP clarified that the LoA from the DNA of Viet Nam was issued for Nam Pong Hydropower Project (Nam Pong HPP) with Project Owner is Ha Do Joint Stock Company (Ha Do JSC). However, the Nghe An Provincial People's Committee (Nghe An PPC) approved the transfer of the right to invest in the Nam Pong HPP from the Ha Do JSC to the ZaHung Joint Stock Company (ZaHung JSC) on 18 December 2008. DNA Vietnam has issued an official letter to endorse that ZaHung JSC is Project Participant of Nam Pong HPP; and the new LoA was submitted before the finalization of the validation report. The name of the PO has been revised in the new LoA and confirmed to be consistent with that in the investment licence and PDD and MoC. This CAR was closed. For detailed resolution please see Table 2 in Appendix A.

The validation team concluded that the participants and approvals are fully complying with the requirements of the CDM. According to Annex 2 of the PDD, the proposed project does not receive any public funding. The validation did not reveal any information that indicates that official development assistant (ODA) from Annex I Parties is involved in the proposed project.

According to Para.49, 50 and 125 of VVM 01.2/5.1/, CEC confirms that

- (a) The letters of Approval have been received with clearly referencing the letter itself and any supporting documentation.
- (b) The letters are received from the PPs.
- (c) The letters of Approval are authenticity.
- (d) The letters are in accordance with Paragraphs 45-48 of VVM version 01.2.

### **3.2 Project Design Document**

The PDD is compliant with relevant form/5.10/ and guidance as provided by UNFCCC.

The most recent version of the PDD form was used.

The validation team considers that the guidelines for the completion of the PDD in their most recent version have been followed. Relevant information has been provided by the participants in the corresponding PDD sections. Completeness was assessed by employing the validation protocol checklist included in Appendix A of this report.

### **3.3 Project Description**

The following description of the project as per PDD/1.1//1.2/ could be verified during the on-site visit.

The project is located on Nam Pong stream in Chau Hanh and Chau Phong communes, Quy Chau district, Nghe An province, Viet Nam. The project's purpose is to generate hydroelectricity from Nam Pong stream, a clean and renewable source, to supply the national grid. The geographic coordinates allowing the unique identification of this project activity are east longitude of 105°02'10" and Northern latitude of 19°31'15". The project's installed capacity



and estimated annual gross power generation is 30 MW and 123.29 GWh, respectively. The estimated annual net electricity generated is 122.057 GWh, which is determined by subtracting 1% of loss load and internal consumption from the estimated annual gross power generation. This is in accordance with the Technical Design Report/2.1/. The selection of 1% loss load and internal consumption has also been checked to be appropriate through crosschecking with other registered hydropower projects in Vietnam /4.1/ and further confirmed by the third party consultant, Power Engineering Consulting Joint Stock Company/4.3/, contracted by the project owner to conduct the detailed technical design for the project /2.1/. The net electricity generated will be supplied to the national grid via a newly constructed transmission line from the plant to a transformer station.

CL01 was raised as the electricity generation in Approval of Basic Design Report and Investment License is different with it applied in PDD, and asked PP to clarify the method that the estimated net electricity supplied to the national grid is calculated and provide the evidences. To response CL01, PP clarified that the BDR is designed at basic studying level. The purposed of BDR is applied for investment license which will be issued by the national authority. The electricity generation in the Approval of Basic Design Report and Investment License was calculated at the basic level to assess the potential electricity generation. The Technical Design Report (TDR) is designed at a studying level with detailed, standardized parameters that are based on the BDR, the TDR is at high accurate and the applied value in the PDD is most updated data. The net electricity supplied to the national grid is calculated by the gross power generation subtracts 1% for parasitic and loss load. Through check the relevant documents provided by PP, the validation team considered it was reasonable and conservative. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

CL02 was raised to ask PP to clarify the approval procedure of the Technical Design Report and provide the relevant evidences. PP detailedly clarified the requests of law and regulation on the preparing and issuing of the TDR and provided the relevant evidences. According to the requests of Government Decree No.12/2009/ND-CP on "Management of investment projects on the construction of works", the approval procedure of the Technical Design Report is complied with the requests of the relevant national law and regulation. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

CL03 was raised to add the construction and commission status of the proposed project in PDD. To this question, PP clarified it and supplemented the relevant description in revised PDD. Through cross-checked it with the information obtained from on-site visiting, the validation team considered it was valid. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

The main structures of the project include a dam, intake, tunnel, pressurized well, penstock, a power house, and a discharge canal. The project involves construction of a reservoir with an area of 0.32 km<sup>2</sup> and a power density of 93.75 W/m<sup>2</sup>, accordingly. As the power density of this project is greater than 10 W/m<sup>2</sup>, the GHG emission from reservoir is not included in the project emission. Thus, GHG emission reductions can be achieved via this proposed project activity. Total expected CO<sub>2</sub> emission reduction is 492,471 tCO<sub>2</sub> over the first crediting period of 7 years.

**Table 6: Technical specifications of turbines/generators**

Main parameters	Units	Values
<i>1. Turbine</i>		
• Type		Francis – Vertical
• Number of turbine	set	2
• Turbine discharge	m <sup>3</sup> /s	10.75
• Rated capacity	MW	15.56
• Speed	rpm	750
<i>2. Generator</i>		
• Number	set	2
• Type		Synchro – 3 phases- vertical
• Rated voltage	kV	10.5
• Rated capacity	MW	15.0
<i>3. Transformer</i>		
• Number	set	2
• Type		3 phases, 2 windings
• Rated capacity	MVA	20
• Voltage	kV	115±2×2.5%/10.5
<i>4. Annual river flow</i>	m <sup>3</sup> /s	12.15
<i>5. Load factor</i>	%	46.91

The parameters of turbines and generators in the PDD are consistent with the TDR and TDR Assessment Report. The construction of the project is as per the TDR. Based on the document review and on site visit, CEC confirmed that the description of the proposed project activity as contained in the PDD is accurate and outlines the nature and technical aspects of the project activity.

The technology of project activity transfers from China, it does not involve any technology transfer from the Annex 1 country. The technology applied is environmentally safe. The project is considered to contribute to sustainable development in the host country (Vietnam), by utilizing renewable water resources available in the project region, eliminating the environmental pollution caused by operation of fossil fuel-fired power plants and to achieve various social, economic and environmental benefits, such as the employment of the local people during the construction and operation period.

According to Para.57 of VVM, the validation team is able to confirm that the project description, as per the PDD, is sufficiently accurate and complete and therefore comply with CDM requirements.

### 3.4 Baseline and Monitoring Methodology

#### 3.4.1 Applicability of the Selected Methodology to the Project Activity

The project uses Version 12.2.0 of ACM0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”/5.2/.

The assessment of the relevant information contained in the PDD against each applicability condition is described below:

**Table 7: Comparison of project’s characteristics and eligibility criteria of Version 12.2.0 of ACM0002**

Applicability conditions in Version 12.2.0 of ACM0002	Characteristics of the project activity	if met	DOE’s opinion
This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (green field plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The project activity consists in the installation of a new grid connected renewable power plants at a site where no renewable power plant was operated prior to the implementation of the project activity (green field plant).	Yes	The project activity is to install a new power plant with two turbines of 15.56 MW capacities each. This has been verified during the site visit as well as from the TDR of the project.
The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run of river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	The project activity involves the installation of a new hydropower plant.	Yes	The project activity is to install two turbines of 15.56 MW each. This has been verified during the site visit as well as from the TDR of the project.
In the case of the capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 11 to calculate the parameter $EG_{PJ,y}$ ): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	The project activity is to install a new hydro power plant.	Not applicable	The project activity is to install a new hydro power plant. This has been verified during the site visit.







<p>density lower than 4 W/m<sup>2</sup>, is lower than 15MW;</p> <ul style="list-style-type: none"> <li>● Total installed capacity of the power units, which are driven using water from reservoirs with power density lower than 4 W/m<sup>2</sup>, is less than 10% of the total installed capacity of the project activity from multiple reservoirs.</li> </ul>			
<p>This methodology is not applicable to</p> <ul style="list-style-type: none"> <li>● 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 the fossil fuels at the site.</li> <li>● Biomass fired power plants.</li> <li>● Hydropower plants that result in new single or multiple reservoir or in the increase in an existing reservoir where the power density of the power plant is less than 4 W/m<sup>2</sup>.</li> </ul>	<p>It is a renewable energy project with no fuel-switch involved.</p> <p>The project activity is to install a new hydro power plant.</p> <p>The project activity results in a new reservoir, with a power density of 93.75 W/m<sup>2</sup>, which is greater than 4 W/m<sup>2</sup>.</p>	<p>Yes</p> <p>Yes</p> <p>Yes</p>	<ul style="list-style-type: none"> <li>● During site visit, the validation team has confirmed that the project activity does not involve any switching of fossil fuels.</li> <li>● And it is not a biomass fired power plant, because a new reservoir is being constructed.</li> <li>● The validation team has confirmed during site that a new reservoir has been built for the hydro project.</li> </ul> <p>The calculation of power density and the data used for the calculation have been verified by the validation team and are found to be acceptable as per the methodology indicated.</p>

Complying with VVM, the validation team confirmed that, by checking the requirements of the applied methodology ACM0002 (Version 12.2.0) and by means of onsite assessment, the selected methodology is applicable to the proposed project activity and has been correctly quoted and applied, the version of the applied methodology is valid. The choice of methodology is justified and has been clearly demonstrated in the PDD that the project activity meets each of the applicability conditions of the applied methodology. The project emission and leakage is also correctly identified and calculated in Section B.6 of the PDD in accordance with the applied methodology.

Complying with VVM, by onsite assessment and interview with the project owner, the validation team confirms that as a result of the implementation of the proposed CDM project activity, there are no greenhouse gas emissions occurring within the proposed project boundary, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.





### 3.4.2 Project Boundary

The project boundary was assessed in the context of physical site visit, interviews and based on the secondary evidences received on the design of the project.

ACM0002 v12.2.0 states “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 to”.

The spatial extent of the project boundary includes the project power plant and all power plants connected physically to Vietnam National Grid. The most relevant documentation assessed in order to confirm the project boundary is following: “Research and Determine the Emission Factor of Viet Nam National Grid” issued by Ministry of Resources and Environment Department of Meteorology Hydrology and Climate Change on 26/03/2010/3.1/, which is the latest available document for the PP at the time of submitting the project for validation.

The project participant has considered CO<sub>2</sub> as the main green house gas from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. Other GHG has been considered as the minor emission sources and not included as an emission source.

Under project emission CH<sub>4</sub> has been considered as the main emission source, however since the power density of the project activity is greater than 10W/m<sup>2</sup>, as per ACM0002 v12.2.0, CH<sub>4</sub> emission are neglected. The calculation of power density has been checked by the validation team and found to be appropriate.

Complying with VVM, the validation team confirmed that the identification of project boundary is in compliance with the applied methodology and the identified boundary, the selected sources and gases as documented in the PDD are justified for the project activity. There are no emission sources that will be affected by the project activity and are not addressed by the selected approved methodology.

### 3.4.3 Baseline Identification

As the project is the installation of the new grid-connected renewable power plant that delivers the generated electricity to the National Grid (operated and monopolized by the *Vietnam Electricity (EVN*, previously known as *Electricity Corporation of Viet Nam*), to which all power plants in Vietnam are physically connected to.

The baseline scenario has been determined in accordance with the applied methodology as the electricity delivered to the Vietnam national electricity grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources. The baseline scenario is determined properly as:

“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” version 2.2.1 dated 29/09/2011/5.3/( hereafter called “Tool-Grid EF”)



According to the “Vietnam-Grid EF”, the delineation of the Grid boundary of the project is the Vietnam National Grid. Furthermore, the baseline of the Project determined in the PDD, i.e. “the delivery of equivalent amount of annual power output from the Vietnam national grid to which the proposed project is also connected.” is transparent and deemed to be reasonable.

The information presented in the PDD has been validated by a first document review of all the data, further confirmation based on the on-site visit and a final step by cross-checking the information with similar relevant projects and/or technologies. The sources referenced in the PDD have been quoted correctly.

The following alternatives to the project activity are identified in the PDD as per the requirement of ACM0002 and “The tool for demonstration and assessment of additionality”/6.4/. The non-feasible alternatives have been excluded reasonably.

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

The construction and operation of Nam Pong Hydropower project with the total installed capacity of 30 MW, without being registered as a CDM project activity. This is not feasible because of lack of financial attraction based on the investment analysis in Section B.5 of the PDD.

This alternative is the project activity itself without any CDM revenue. Thus this is considered for further analysis in the section of investment analysis.

Alternative 3: “Add a new fossil fuel-fired power plant with equivalent power output”

The construction and operation of a new fossil fuel power plant. This is not in compliance with the relevant laws and plan of Vietnam:

- The Electricity Law, the investment in electricity generation must be in line with the potential power generation projects listed in the latest Master plan/4.5/.
- 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 2007/4.6/ which is the latest publicly information source listed all operated and planned power plants in Vietnam.
- In the point of view for electricity development by Ministry of Industry and Trade, the common capacity of thermal power unit within next 10 years is 300 MW and in the future the higher capacity (600 MW and higher) will be chosen for the economic scale reason/4.7/.

PP claimed that the alternative 3 has been ruled out stating that 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, there is not any fossil fired power plant with the equivalent and lower power output is constructed/under construction and/or planned in Vietnam/4.5//4.6/.

The PP has also referred the point of view for electricity development by Ministry of Industry and Trade, Electricity Law, the investment in electricity generation must be in line with the potential power generation projects listed in the latest Master plan. In the point of view for



electricity development by Ministry of Industry and Trade, the common capacity of thermal power unit within next 10 years is 300 MW and in the future the higher capacity (600 MW and higher) will be chosen for the economic scale reason/4.7/. This is also accessible at the website:

<http://www.tapchicongnghiep.vn/News/channel/1/News/89/3751/Chitiet.html>

It has also referred its Investment License No.271110000013 issued by People's Committee of Nghe An Province on 21 November 2007 for Ha Do Joint Stock Company (Ha Do JSC) and the Modificative Investment License No.271110000013/GCNĐC/01 issued by People's Committee of Nghe An Province on 15 May 2009 for ZaHung Joint Stock Company (ZaHung JSC)/4.8/ that the project developer has only experience and right to invest and do business in hydro power project. PP claims that they have no know-how and experience to construct a fossil fuel power plant.

Alternative 4: "Adding a new renewable energy power plant other than hydropower plant"

In order to state that alternative 4 cannot be a baseline scenario as the project location is not suitable for any other renewable energy power plant with the same electricity output except the water resource; PP has referred Chapter IV of the Master Plan approved by the Prime Minister, which supports PP's claim.

It has also referred its Investment License that the project developer has only experience and right to invest and do business in hydropower project. PP claims that they have no know-how and experience to construct Solar, Wind or Biomass power plants and thus is not a plausible investment option. And the potential renewable power sources in Nghe An include Hydropower and wind power, but wind power plants will be built along the coast line or in the islands. The project location does not provide sufficient renewable resources except for the water resource/4.6/.

Thus with this explanation project proponent has shown that the alternative 4 is also not a possible alternatives to the proposed CDM project activity.

Alternative 2: "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 is the scenario where there will be no construction of the hydro power project and the additional power will be supplied from the Vietnam national grid in existing and new grid-connected power plants. This alternative is a realistic and credible alternative to the project activity as PP have a choice to invest or not, in the project at all if the CDM revenues are not materialized, which would mean the power would be generated in grid and emissions would occur associated with the power plants connected to grid (electricity system). Moreover, this alternative does not prohibited due to any financial non-viability like as Alternative 1.

Therefore, the baseline scenario is concluded to be Alternative 2: "Continuation of the current situation", which is common practice and has no barriers. The information is cross-checked based on verifiable and credible sources. The validation team has determined that no reasonable alternative has been excluded.



CAR02 was raised to ask PP to supplement the alternatives of the proposed project in according to the applied methodology ACM0002 ver.12.2.0. PP supplemented the relevant description and the supportive document in support of full out/considering the alternative scenarios had been provided. This CAR was closed. For detailed resolution please see Table 2 in Appendix A.

Based on the validated assumptions, the validation team considers that the identified baseline scenario is reasonable.

The validation team confirms that all relevant CDM requirements, including relevant and/or sectoral policies and circumstances, have been identified correctly taken into account the definition of the baseline scenario.

Complying with VVM, by validating the assumptions, calculations and rationales used, as described in the PDD, and cross checking with official approvals, the validation team is able to confirm that the baseline scenario identified is reasonable, and that:

- (a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- (c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- (d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- (e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

#### 3.4.4 Algorithms and/or Formula Used to Determine Emission Reductions

The calculations of project emissions, baseline emissions and leakage and emission reductions have been checked by the validation team. The calculations were carried out based on the calculation Excel spreadsheets/4.9/. The parameters and equations presented in the PDD and further documentation have been compared with the information and requirements presented in applied methodology and respective tools.

##### ● **Baseline Emission**

The calculation of the baseline emissions followed the procedures described in the Methodology: ACM0002 version12.2.0.

The six steps of “Tool to calculate the emission factor for an electricity system” (ver.02.2.1) were applied to determine the operating margin ( $EF_{OM}$ ), build margin ( $EF_{BM}$ ) and combined margin emission factor ( $EF_{CM}$ ).

Step 1: Identify the relevant electricity system. The power to be generated from the Project will



be delivered to the national power grid, which is operated and monopolized by the EVN. There are electricity imports to the national electricity grid from China, thus the China Power Grid is the connected electricity system and the emission factor for the imported electricity is zero tons CO<sub>2</sub> per MWh by default. The ex-ante calculation method with fixed emission factors (for OM and BM) is selected/4.1/.

Step 2: Choose whether to include off-grid power plants in the project electricity system (optional). Because only the data of grid connected power plants is available, so Option I (Only grid power plants are included in the calculation) will be chosen for calculating the grid emission factor.

Step 3: Select a method to determine the operating margin (OM). The simple OM is used.

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

Option A: Calculation based on average efficiency and electricity generation of each plant is used. The data and calculation is checked to be in accordance with the Official Letter published by the Viet Nam DNA.  $EF_{grid, OM}$  is 0.6465 tCO<sub>2</sub>e/MWh.

Step 5: Calculate the build margin (BM) emission factor.  $EF_{grid, BM}$  is 0.5064 tCO<sub>2</sub>e/MWh.

Step 6: Calculate the combined margin (CM) emission factor. The weight of  $EF_{OM}$  and  $EF_{BM}$  is 0.5 and 0.5, respectively by default in the first crediting period, and  $W_{OM}=0.25$  and  $W_{BM}=0.75$  in the second and third crediting period.

The PDD also refers to the EF of the national electricity grid in the Emission Factor of Viet Nam Grid issued by the Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment dated 26/03/2010//, which is verified to be the most updated version before the investment decision was made. The  $EG_{grid, OM}$  is 0.6465 tCO<sub>2</sub>e/MWh, the  $EF_{grid, BM}$  is 0.5064 tCO<sub>2</sub>e/MWh.

The calculation of emission factor of Vietnam national electricity grid for the year 2008 was also published in the official Letter to CDM project developers - Emission factor of Vietnam national grid (Ref. No.: 151/KTTVBDKH) by the Ministry of Natural Resources and Environment (DNA of Vietnam) on 26/03/2010/4.1/ based on the Tool to calculate emission factor for electricity system. This is the latest official sources available at the time of commencement of the validation and it has also been confirmed that CDM project developers in Vietnam have been requested by the DNA Vietnam to use the approved EF for development or CDM project documents. The calculation result for the OM, BM and CM presented in the PDD were checked and confirmed to be consistent with this official document.

The value for the Combined Margin Emission Factor( $EF_{CM}$ ) was determined using the weighted average of the  $EF_{OM}$  and  $EF_{BM}$  using the default values for the factors as described in the "Tool to calculate the emission factor for an electricity system" (Version 02.2.1)( $\omega_{OM}=0.5$  and  $\omega_{BM}=0.5$  for hydropower projects).

Therefore the combined baseline emission factor is determined ex-ante and will remain fixed during the first crediting period, via  $EF_{grid, CM, y}=0.6465 \times 0.5 + 0.5064 \times 0.5 = 0.5764 \text{ tCO}_2/\text{MWh}$ .

The assumptions and data used to determine the emission reductions are listed in the PDD



and all the sources have been checked and confirmed.

Based on the information reviewed, it can be confirmed that the sources used are correctly quoted and interpreted in the PDD.

The baseline methodology has been correctly applied following the requirements. The detailed information on the parameters checked used in the equations can be seen in Appendix A.

In summary, the calculation of the baseline emissions can be considered to be correctly done.

### ● **Project Emissions**

According to ACM0002, Version 12.2.0, for hydropower project activities that result in new reservoirs, project proponents shall account for CH<sub>4</sub> and CO<sub>2</sub> emissions from the reservoir. But if power density of the project activity is greater than 10 W/m<sup>2</sup>, then project emission is zero.

The project involves construction of a reservoir with an area of 0.32 km<sup>2</sup> and a power density of 93.75 W/m<sup>2</sup>/1.1//1.2/, accordingly. As the power density of this project is greater than 10 W/m<sup>2</sup>, so the project emission is zero.

CAR 06 was raised to ask PP to provide the accurate value of the power density and construction period. PP revised it in revised PDD. This CAR was closed out. For detailed resolution please see Table 2 in Appendix A.

Based on document review and on-site visit, the project emission can be considered to be correct.

Detailed information on the audit on project emission can be found in the Appendix A.

### ● **Leakage**

As per the methodology, the project does not need to consider leakage.

### ● **Emission Reductions**

The annual emission reductions equal to the annual baseline emissions. In summary, the calculation of the baseline emissions and the emission reductions, respectively, can be considered as correct.

Emission reductions are calculated using the following equation:

$$ER_y = BE_y - PE_y - LE_y$$

According to the estimated annual electricity delivered to the grid is 122,057MWh, as the estimated crediting period begins from 01/07/2013, so the estimated annual average emission reductions of the project is 70,353tCO<sub>2</sub>e during the first crediting period represents a reasonable estimation using the assumptions given by the project. All these have been verified by on-site visit.

The calculations of project emissions, baseline emissions, leakage emissions and emission reductions have been checked by the validation team. The calculations were carried in accordance with the requirement of the applied methodology, correct equations and parameters have been used accordingly. No mistakes have been observed after the validation



team has recalculated the baseline emission input provided. The parameters and equations presented in the PDD have been checked with the information and requirements presented in applied methodology and respective tools to be correct. Therefore, the GHG emission reduction calculation is assessed to be conservative and appropriate.

The validation team can hereby confirm that the emission reductions are appropriately worked out complying with relevant methodology and tools, and parameters and data for the calculations are sourced from proper data sources.

According to Para.92 and 93 of VVM, CEC hereby confirms that:

- (a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources.
- (b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD.
- (c) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity.
- (d) The baseline methodology has been applied correctly to calculated project emissions, baseline emissions, and leakage and emission reductions
- (e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

### 3.5 Additionality of a Project Activity

The validation team assessed the additionality of the project activity with the following steps as below. The additionality was demonstrated according to “Tool for the demonstration and assessment of additionality (Version 06.0.0)/6.4/”. The PP has identified the realistic and credible alternative which is in compliance with mandatory legislation and regulations taking into account the enforcement in the country.

The additionality issue has also been discussed during the site visit. The data, rationales, assumptions and justifications and documentation provided have been checked using local knowledge and sectoral expertise, this has been cross checked with various documents provided by the project proponent during the validation.

#### 3.5.1 Prior Consideration of the Clean Development Mechanism

The project is a newly built project constructed before the start of the validation. The correlative timeline was given in section B.5 of the PDD. The validation team confirmed against related evidences that the events and dates are correct.

**Table 8: the timeline of key events of Nam Pong Hydropower Project**

Date	Key Events
2007.6	Finalizing the Basic Design Report by the technical consultant.
2007.9.5	Achieving the Minutes of a meeting to consult public opinions (local people and local authorities)
2007. 11	Finalizing the EIA of Nam Pong Hydropower Project
2007.8.16	Approving Basic Design Report of Nam Pong Hydropower Project





2007.9.5	Consulting public opinions
2007.12.13	Approving EIA report of Nam Pong Nam Pong Hydropower Project
2008.7.31	Official letter submitting by Ha Do JSC to Nghe An Provincial People's Committee (PPC) and DNA requests to verify and support for the CDM project
2008.8.21	Official letter submitting by the Nghe An PPC to the DNA requests to verify and support for the CDM project
2008.12.18	Approving the transfer of the right to invest in the hydropower project from the Ha Do JSC to the ZaHung JSC issued by Nghe An PPC
2009.5.15	Issuing adjustment investment licence by Nghe An PPC for ZaHung JSC
2009.8.10	Signing CDM consultancy contract
2009.8.14	Notifying the CDM project to the Executive Board and the DNA
2010.6	Finalizing the Technical Design Report
2010.7.17	Issuing the Investment Decision on implementing the investment project and CDM project by the Management Board of ZaHung JSC
2011.1.14	Signing the first main construction contract for dam, tunnel and power house (Starting date of the project activity)

- Project Starting date

As defined in the CDM glossary, the starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins. In light of above definition, the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity.

According to the relevant documents and on-site visit, up until the day of on-site visit, only the construction contract was signed/4.10/. So, the date of construction contract is the earliest date at which the PP committed to expenditures related to the implementation of the project activity. Thus, the starting date of the Nam Pong Hydropower Project is defined on 14/01/2011.

The validation team confirms that the start date of the project is 14/01/2011, which is the earliest date at which the implementation or construction or real action of the project activity began which is in line with the CDM glossary.

- Prior consideration of CDM and real and continuing actions to secure CDM status

Based on Para102 in VVM (v1.2) and EB62 Annex13 "Guidelines on the demonstration and assessment of prior consideration of the CDM", the starting date of the proposed project activity is after 2 August 2008. The validation team checked the date PP sent the prior consideration of the CDM form to EB and confirmed it is within six months of the start date.

For the project, the documents such as BDR and its approval, the EIA and its approval, board decision to apply for CDM, consulting contract, construction contract, prior consideration of the CDM form and EB's reply have been checked by the validation team/4.11//4.12/ and been confirmed that the date of 17/07/2010 of the board decision/4.13/ to apply for CDM is earlier than the starting date of 14/01/2011 of the project. When the board made the decision, CDM revenue is the key factor. The interval between the major events is less than one year. Thus, the validation team confirms that the PP has prior, really and continuously considered CDM.

CAR07 was raised to ask PP to supplement the Major milestones table. In revised PDD, PP supplemented it. This CAR was closed out. For detailed resolution please see Table 2 in Appendix A.





CL04 was raised to ask PP to provide the evidences to show that the Host Party DNA had been informed the prior consideration of CDM by PP. The evidences to show that the Host Party DNA had been informed the prior consideration of CDM by PP was provided. The validation checked the evidence ([http://www.noccop.org.vn/modules.php?name=Airvariable\\_Projects&file=index&opcase=view\\_procat&pro\\_cate\\_id=77&menuid=96](http://www.noccop.org.vn/modules.php?name=Airvariable_Projects&file=index&opcase=view_procat&pro_cate_id=77&menuid=96)) and confirmed it is valid. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

CL07 was raised as the date of verification report of the TDR is Jan 2010, but the date of Finalizing the TDR is Jun 2010, it seems not to be reasonable. PP provided the relevant evidences and clarified that the draft TDR was finished in 11/2009 and the verification report aimed at the draft report. Based on this validation result, the first party who was contracted to prepare the TDR had revised the TDR and issued the final TDR version. So the date of verification report of the TDR was earlier than the date of Finalizing the TDR. Through cross-checked the relevant process documents of the verification report provided by PP. Through reviewed the relevant evidences, the validation team considered it was valid. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

All documents were provided by the project participants, and the information was cross-checked with local stakeholders during the on-site interviews. Thus, it was confirmed by CEC that CDM was prior, real and continuously considered by project participants.

The validation team hereby confirmed that PP considered seriously the incentives from CDM in the context of the project before taking its real actions and verified the start date of the project activity identified in the PDD is appropriate and the CDM status has been kept by continuing actions.

### 3.5.2 Identification of Alternatives

See 3.4.3 Baseline identification in this report.

### 3.5.3 Investment Analysis

Considering the baseline scenario as above identified, the Benchmark Analysis was applied in the investment analysis as per the Sub-step 2b of Step 2 of "Tool for the demonstration and assessment of additionality (Version 06.0.0)".

#### 3.5.3.1 Benchmark Analysis

Since the Project only generates financial and economic benefits through the sales of electricity other than CDM related income, benchmark analysis is applied for conducting the investment analysis in the PDD. The project IRR before tax (hereafter IRR) was calculated to be IRR value without CERs revenue. It was therefore concluded that the Project without CERs revenue was not financially attractive, and are validated with the steps described below:

Application of benchmark analysis was justified appropriately as below:

A) Tool for demonstration and assessment of additionality provides three options for the methods of investment analysis.

Option I: Simple cost analysis



The PP has stated that the proposed project activity generates financial and economic benefits other than CER revenues, thus Option 1 has been ruled out to carry out the investment analysis.

#### Option II: Investment comparison analysis

This option has also ruled out as there are no other credible and realistic baseline scenario alternatives other than electricity supply from the grid as shown in the section 3.4.3 of this report.

#### Option III: Benchmark analysis

Therefore, the PP has carried out this option to prove additionality of the proposed project activity and was found to be appropriate.

#### B) Apply benchmark analysis

The PP has used Project IRR to demonstrate the additionality of the project. As indicated in Guidelines on the assessment of investment analysis - version 05, Annex 05, EB62/5.8/, *“Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR”*, the project participant applies the average long-term local commercial lending rates available at the time of making the investment decision as the benchmark.

The validation team reviewed the PDD, and judged that the selection of benchmark analysis for investment analysis was appropriate and fully complied with the relevant tool “Tool for the demonstration and assessment of additionality” (version 06.0.0) and CDM VVM (version 01.2).

CAR03 was raised as the latest version of Guidelines on the assessment of investment analysis should be used. The latest version of Guidelines on the assessment of investment analysis has been applied in the revised PDD. This CAR was closed. For detailed resolution please see Table 2 in Appendix A.

According to the above mentioned Regulation, the benchmark of Nam Pong project is derived from the average long-term commercial lending rates available from the beginning of 2010 up to the date of making the investment decision and equal 13.6%/2.1//4.14/. The benchmark IRR is specified as the project IRR before tax at 13.6% that can be applied to the investment analysis for the scale of the project activity. The benchmark IRR of 13.6% applied in the PDD is in accordance with the TDR, national regulation and also the Guidance on the Assessment of Investment Analysis. CEC confirmed the PDD appropriately applied this benchmark value.

#### 3.5.3.2 Evaluation of IRR Calculation

With the result of benchmark analysis, the PDD concluded that the project activity would not be implemented without CDM application, as the project IRR without CERs revenue is 9.96%, which is lower than the benchmark 13.6%.

The parameters used in the financial calculations have been validated based on an assessment of the sources presented in the PDD. The main source of inputs to the investment model which led to the investment decision is the Technical Design Report/2.1/, dated 06/2010.



DOE can also confirm that values in the PDD are fully consistent with this report. The following table lists the issues mentioned in “Guidelines on the assessment of Investment Analysis” Version 05, Annex 05, EB62.

The Technical Design Report is the base of the project owner prior decision taking on 17/07/2010. Its data were confirmed at a meeting/4.13/. At this meeting the management Board made a summarized version of the TDR dated 06/2010 in which all data were confirmed.

**Table 9: validation of input values of the proposed project finance**

parameters	Valued applied in PDD	Data source validated	Validation opinion
Installed capacity (MW)	30	TDR	The source applied value is TDR/2.1/. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on “Management of investment projects on the construction of works”/ Article 18. This can be verified from the Investment Decision on implementing the project by the Management Board of the ZaHung Joint Stock Company on 17/07/2010. During site visit, the validation team has confirmed the same.
Operating hours (h) PLF	4110 46.91%	TDR	The source of operating hours is TDR/2.1/. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. The operational hours results from the ratio of the annual power generation and the installed capacity. For the proposed project activity, the power generation is calculated in the FSR based on the 47 years hydrological data (1960-2007) by an independent qualified third party. This can be verified from the Investment Decision on implementing the project by the Management Board of the ZaHung Joint Stock Company on 17/07/2010. During site visit, the validation team has confirmed the same. PLF of the proposed project has been validated as below: $PLF = 4110 / 8760 * 100\% = 46.91\%$ . Therefore, it has been concluded that the PLF considered by the PP lies within the acceptable range (from 35.11% (ref.2372) to 58.79% (ref.3942)) and validated as appropriate.
Annual electricity generation (GWh)	123.29	TDR	The source of Annual electricity generation is TDR/2.1/. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1



			<p>that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on “Management of investment projects on the construction of works”/ Article 18.</p> <p>This can be verified from the Investment Decision on implementing the project by the Management Board of the ZaHung Joint Stock Company on 17/07/2010. During site visit, the validation team has confirmed the same.</p>
Parasitic and loss load (%)	1%	TDR	<p>The source of parasitic and loss load is TDR/2.1/. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on “Management of investment projects on the construction of works”/ Article 18.</p> <p>This can be verified from the Investment Decision on implementing the project by the Management Board of the ZaHung Joint Stock Company on 17/07/2010. During site visit, the validation team has confirmed the same from.</p> <p>The parasitic and loss load of the proposed project has been cross-checked with the registered CDM project of Viet Nam, the range is from 1% to 3.2%, it has been concluded that the parasitic and loss load considered by the PP lies within the acceptable range and validated as appropriate.</p>
Annual net electricity supplied to the grid (GWh)	122.057	TDR	<p>The applied value is also cross-checked with TDR/2.1/. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on “Management of investment projects on the construction of works”/ Article 18.</p> <p>This can be calculated by:  Annual electricity generation*(1- parasitic and loss load) =123.29*(1-1%)=122.057. It is considered correction.</p>
Total Investment ( Billion VND)	695.571	TDR	<p>In TDR, it is stated that the total investment cost is 695.571 Billion VND, including: construction cost 322.161 Billion VND, equipment cost 164.695 Billion VND, management cost 21.828 Billion VND, construction consultancy cost 30.268 Billion VND, other cost 62.114 Billion VND, contingency cost 54.705 Billion VND,</p>



			<p>compensation cost 7.8 Billion VND, transmission line cost 32 Billion VND.</p> <p>The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on "Management of investment projects on the construction of works"/ Article 18.</p> <p>The TDR is the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the TDR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed.</p> <p>The investment cost per kW for the proposed project is 23 billion VND/MW, within the range of 11(ref.2372) to 25(ref.3667) billion VND/MW for local registered projects. Thus the total investment for the proposed projects is within normal range.</p> <p>The project has not signed construction and equipment contracts up to and during the course of validation and the large majority of investment cost will be disbursed in the remaining years for constructing the project. This was confirmed with the project owner.</p> <p>Based on the information obtained and analysis made above, the validation team assess that the total investment cost applied in the investment analysis of the proposed project credible and reasonable.</p>
Electricity price (without VAT)( VND/kWh)	720.35	TDR	<p>The hydropower plant had not received any Power Purchase Agreement (PPA) from the National Utilities company, EVN. Therefore, the estimation of the project revenue from the sales of the electricity was in accordance with the TDR.</p> <p>The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on "Management of investment projects on the construction of works"/ Article 18.</p> <p>This is the estimate of average price applied for power generation projects with the capacity equal and below 30MW in the regulation for avoided cost tariff for 2010 issued on 30 December 2009(Decision No.73 QD-DTDL-Promulgation on Avoided Cost Tariff</p>



			<p>for 2010) by the Ministry of Industry and Trade/4.15/b.</p> <p>The validation team calculated the tariff according to the method requested by Decision No.73 QD-DTDL-Promulgation on Avoided Cost Tariff for 2010, the result is same as the data applied in investment analysis.</p> <p>The tariff rate applied was compared with Government Decision 2014QD/BCN on promulgating temporary Regulations on the Contents of calculation and analysis of economy, investment finance and electricity purchasing price frame of power source project. The price provided in the TDR is considered conservative to the Decision 2014.</p> <p>The validation team was able to verify via the registered CDM project of Viet Nam, the tariff is from 732.96 VND/kWh (ref.3389) to 602 VND/kWh (ref.2978).</p> <p>Based on the information obtained and analysis made above, the validation team assesses the applied electricity price appropriate and conservative.</p>
Total annual O&M cost (1000 VND)	695,571,000*1 %=6,955,710	TDR	<p>The applied value is also cross-checked with TDR/2.1/. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on "Management of investment projects on the construction of works"/ Article 18.</p> <p>This has been verified by Decision No. 2014/QD-BCN issued by the Ministry of Industry on 13 June 2007/4.17/. The decision provides temporary guidelines for conducting the economic, financial and investment analysis and providing the purchasing-selling price frame for power generation projects, the O&amp;M cost per year for power plants which are below/equal 30 MW is 1.0% to 2.0% of total investment cost. PP has considered a cost of 1.0%. So, the validation team considered the O&amp;M cost of the project is conservative.</p>
Construction period (year)	2.5	TDR	<p>The source of Construction period is TDR/2.1/. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on "Management of investment projects on the construction of works"/ Article 18.</p>



			<p>This can be verified from the Investment Decision on implementing the project by the Management Board of the ZaHung Joint Stock Company on 17/07/2010. During site visit, the validation team has confirmed the same.</p> <p>In TDR, the construction period is 30 months. So, PP revised the construction period of GSP PDD from 3 years to 2.5 years.</p>
Expected operational lifetime (year)	40	TDR	<p>The source of operational lifetime is TDR/2.1/, the financial analysis of the proposed project was conducted accordingly.</p> <p>This is consistent with the host country regulation Decision No. 2014/QD-BCN dated 13 June 2007 by Ministry of Industry /40/ requires that the lifetime of hydropower plant less than /equal to 30MW should range from 20 to 40 years.</p> <p>In GSP PDD, the project participant had identified the technical lifetime of hydropower plant based on the Maximal duration of use of the turbines (37years). PP revised it according to the TDR.</p> <p>The validation team considered it was conservative and appropriate.</p>
Depreciation period for construction (year)	20	TDR	<p>The cost of depreciation for the construction applied is consistent with the TDR. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on "Management of investment projects on the construction of works"/ Article 18.</p> <p>This is consistent with the host country regulation Decision 206/2003/QD-BTC issued on 12/12/2003.</p>
Depreciation period for equipment (year)	10	TDR	<p>The cost of depreciation for the equipment applied is consistent with the TDR. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on "Management of investment projects on the construction of works"/ Article 18.</p> <p>This is consistent with the host country regulation Decision 206/2003/QD-BTC issued on 12/12/2003.</p>
Depreciation rate (%)	0	TDR	<p>The local commercial lending rate was applied as the benchmark in the TDR. This is pre-tax benchmark therefore project IRR has been calculated pre-tax accordingly. So the project</p>





			<p>cash flow is not need to considered depreciation and interest.</p> <p>This is also complied with “Guidance on Assessment of Investment Analysis” (version 05), Annex 5, EB 62: “Depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, should be added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV). Taxation should only be included as an expense in the IRR/NPV calculation in cases where the benchmark or other financial indicator is intended for post-tax comparisons” and “...In cases where a post-tax benchmark is applied the DOE shall ensure that actual interest payable is taken into account in the calculation of income tax”,</p> <p>The validation team considered it was rational.</p>
Fair value	0	TDR	<p>The cost of depreciation for the equipment and construction applied is consistent with the TDR and is in accordance with Decision 206/2003/QD-BTC issued on 12/12/2003 which requires a linear depreciation in 20 years for construction and 10 years for equipment. Full value of assets has been completely depreciated thus no fair value need to add back the fair value at the end of the assessment period (fair value is zero), the fair value of zero derived from the FSR is assessed to be appropriate. The validation team considered it was rational.</p>
Resources tax rate (%)	2%	TDR	<p>The value is as per the Circular No 45/2009/TT-BTC issued by Ministry of Finance on 11 March 2009/4.18/, which provides a resource tax rate of 2.0% for hydropower plants the resource tax will be calculated as the net electricity outputs supplied to the national grid *tariff*2%. The validation team confirmed that the resources tax was complied with the request of the regulation. This is found to be appropriate and accepted by the validation team.</p>
Local commercial lending rate	13.6%	Weekly report of the State Bank	<p>This was cross-checked with the report published at the website of the State Bank weekly (<a href="http://www.sbv.gov.vn/en/">www.sbv.gov.vn/en/</a>) /4.14/and confirmed it was correct.</p>
IRR	9.96%	TDR	<p>Calculation of the project IRR was presented in a clear, viewable and unprotected Excel spreadsheet and has been provided to the validation team. The result shows that without CDM income, the project IRR is 9.96% in the revised PDD, lower than the benchmark of 13.6%, the average long-term local commercial lending rates available at the time of making the investment decision.</p> <p>The local commercial lending rate is used as the benchmark, this is a pre-tax benchmark, and project IRR has been calculated pre-tax</p>





			<p>accordingly for pre-tax comparisons. Therefore in accordance with the Guidelines on the Assessment of Investment Analysis, taxation has been excluded in the IRR calculation with the benchmark intended for pre-tax comparisons. The validation team checked the calculation and confirms the exclusion of income tax rational and IRR calculation is correct.</p>
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The validation team verified the financial calculation carried out for the investment analysis, as presented in the attached Excel spreadsheet and is able to confirm that financial calculations are correct.

CDM revenue was involved in the decision making process as evidenced in the *Investment Decision on implementing the CDM investment project by the Board of Management*. It has been confirmed by the validation team during onsite interview with the project owner, that the main barrier identified by the project owner at the date of decision making was the financial barrier and the project owner hence made the decision to implement the project as a CDM project activity.

CAR05 was raised to ask PP to demonstrate the rationality and validity of all of input parameters applied in the investment analysis and provides the relevant evidences. PP revised the improper inputs and clarified the sources and validity of all of actual inputs. Through checked the evidences, the validation team considered the input parameters are valid and verifiable. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

CL06 was raised as the description of Benchmark on Page 13 in PDD is different between the para.2 and para.3 of Sub-step 2b, and the DOE carried out validation activity of ZaHung Hydropower Project in Page 18 of PDD is inconsistent with the provided evidence. PP corrected the parlance on the benchmark in the revised PDD. Through cross-checked the relevant document provided by PP, the validation team considered it was reasonable. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

CL05 was raised as project cash flow was not considered depreciation and residual value in investment analysis. The PP clarified that the benchmark of the project is pre-tax benchmark, therefore project IRR had been calculated pre-tax accordingly. The project cash flow does not need to consider depreciation and interest. This is complied with the relevant request in "Guidance on Assessment of Investment Analysis" (version 05), Annex 5, EB 62. The validation team considered it was rational and valid. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

In order to validate the appropriateness of input values, the data of registered similar projects are checked, the projects with installation capacity between 15 MW and 45 MW were analyzed.



Comparing the key parameters of the project with the similar registered projects is listed as follows:

**Table 10: Comparing the key parameters of the project with the similar registered projects of Viet Nam**

Ref	Hydropower project	Electricity price without VAT (VND/kWh)	Load factor	Loss load	O&M cost		Total investment cost (Billion VND)	Benchmark		Capacity MW	Annual O&M cost per MW (Billion VND/MW)	Total investment cost per MW (Billion VND/MW)
						Billion VND						
2627	Nam Pia	603	46.67%	1.00%	1.20%	3.660	305.000	WACC	14.30%	15.0	0.24	20
2878	An Diem 2	608	57.28%	1.00%	1.27%	3.960	312.938	WACC	14.60%	15.6	0.25	20
2971	Nam Gion	604	46.49%	1.00%	1.19%	4.700	395.220	WACC	12.47%	20.0	0.24	20
2978	Nam Khoa 3	602	48.06%	2.00%	1.50%	4.907	327.144	Weighted of actual bank interest rates	12.00%	18.0	0.27	18
3051	Yan Tann Sien	603	46.05%	1.00%	1.19%	4.600	386.000	WACC	12.76%	19.5	0.24	20
3667	La Hieng 2	680	43.30%	1.00%	1.20%	3.777	371.905	Weighted of actual bank interest rates	8.09%	15	0.25	25
3745	Su Pan 2	624.47	46.58%	1.50%	0.50%	3.337	667.493	Commercial bank rate	12.38%	34.5	0.10	19
3396	Chau Thon	680.4	47.38%	2.00%	1.00%	3.659	365.857	Commercial bank rate	13.13%	18	0.20	20
3954	Ho Bon	656.04	46.53%	2.00%	1.00%	3.154	315.427	Commercial bank rate	13.70%	18	0.18	18
3532	Song Chung	607	37.13%	1.00%	1.00%	3.748	374.845	WACC	12.53%	19.5	0.19	19
3389	Dak Srong 2	732.96	44.56%	2.00%	1.00%	5.398	539.797	Commercial bank rate	12.38%	24	0.22	22



3442	Nam Chien 2	602.3	46.99%	1.00%	0.50%	3.146	629.159	WACC	13.01%	32	0.10	20
The proposed project		720.35	46.91%	1.00%	1.00%	6.956	695.571	Commercial bank rate	13.6%	30	0.23	23

### 3.5.3.3 Sensitivity Analysis

A sensitivity analysis has been presented in the PDD which demonstrates that the project activity is unlikely to be financially viable under reasonable variations, i.e. fluctuation range of  $\pm 10\%$ , in three selected financial parameters, incl. (i) Annual amount of electricity exported to the national grid; (ii) Investment cost, (iii) electricity price, and (iv) O&M cost. Sensitivity analysis is shown in Nam Pong hydropower Project Financial Assessment. The parameter chosen are correct.

The selection of the sensitivity test parameters focuses mainly on parameters that contribute more than 20% of either total project costs or total project revenue. The selection of the fluctuation range of  $\pm 10\%$  is in accordance with the *Guidelines on the assessment of investment analysis*. All has been verified and the IRR is never higher than 11.04% - lower than the Benchmark of 13.6%.

**Table 11: IRR Base Case and Sensitivity to Parameter Changes Excluding CER Revenues**

Case	IRR
Base case	9.96%
10% lower investment cost	11.03%
10% higher amount of electricity exported to the national grid	11.01%
10% higher income from electricity price	11.04%
10% lower O&M cost	10.05%
Benchmark	13.6%

The likelihood of conditions, such as decrease in construction/operational costs, will only ever go up in a normal economic cycle. Vietnam is experiencing inflation. So drop in costs is unlikely.

During on-site visiting, PP confirmed that the tariff will last unless there has been a call for changes in the electricity tariff from the Government through the Ministry of Industry and Trade. It is therefore difficult to forecast tariff variations in the future. With no justifiable reasons for future changes in tariff, the validation team considered applying a fixed tariff to be appropriate.

In all cases the IRR is clearly lower than the benchmark, i.e. the project in absence of CDM is financially non-feasible.

CL10 was raised as in selected financial parameters of sensitivity analysis; please clarify why the change of annual O&M cost is not considered. According to the request of the validation team, PP has supplemented the relevant analysis in revised PDD. Through checking the analysis and supporting evidences, the validation team considered it was correct. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

The validation team concludes that both of the variation range and relevant assumptions presented stated in the PDD are robust and the fluctuation, within a reasonable range, of the identified parameters, will not influence the conclusion on the investment decision that the proposed project is not financially attractive without CDM.



Complying with VVM, the validation team is able to confirm that the parameters used in the financial calculations for the proposed project have been validated, the suitability of applied benchmark has been assessed, the underlying assumptions are appropriate and the financial calculations of IRR are correct.

#### 3.5.4 Barrier Analysis

The project does not face other barriers besides the low economic returns. Therefore barrier analysis is not applicable in this project.

#### 3.5.5 Common Practice Analysis

##### 1. Geographical scope is the whole of Vietnam and information is available

The chosen geographical scope of the common practice analysis is the whole of Vietnam. This is deemed reasonable since EVN makes no distinction in policy between power plants in the North or South. There are no sub-grids, for example. Therefore, selecting the whole grid of Vietnam as geographical scope is appropriate. The obtaining of information of similar projects is through checking the list of project issued by institute of Energy.

##### 2. Installed Capacity between 5MW and 50MW

PP has chosen for the common practice analysis the Group III  $\geq 5\text{MW}$  and  $\leq 50\text{MW}$  according to Vietnam Construction Code – TXDVN 285:2002/4.19/.

##### 3. Started construction after Aug. 2001

Government Decree No 45/2001/ND-CP on power generation and consumption/4.20/, which was issued on 2 August 2001 and was entered into force 15 days after the issuance date, 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.

##### 4. Not apply CDM support

Are compared power plants commissioned 2001 or later with the proposed project. CDM projects are excluded of the comparison.

It is confirmed that only three hydropower projects need to be discussed in the common practice analysis, named: Nam Mu Hydropower Project, Ea Krong Rou Hydropower Project, Suoi Sap Hydropower Project. Section B.5 of PDD had demonstrated the common practices in the host country on the setbacks faced by IPPs. For Nam Mu Hydropower Project/4.21/, it was invested by a state-owned construction corporation belongs to Ministry of Construction at the beginning. For Ea Krong Rou Hydropower Project/4.22/, part of the company's fund was from state-owned company, it also received 4 million USD of ODA loan from India. For Suoi Sap Hydropower Project/4.23/, the initial main objective was to invest in an irrigation project to provide water for commercial plantation and rice fields in order to alleviate poverty and to develop local agriculture and rural communes. Then the project owner synergized this



objective with construction of a hydropower plant. It also obtained ODA soft-loan from India. Thus the 3 projects have different financial availability compared with the proposed project. The submitted document// confirms what are the main issues faced by privately owned power producers and the success factors in large scale constructions projects in the host country. The analysis was cross-checked against public information// and provided evidences are verified to be correct.

Therefore, it can be concluded the project activity is not a common practice in Viet Nam because most of the hydro power plants of similar capacities were developed by the State owned company or received ODA loan.

From the above analysis, there is no other similar scale hydroelectric that had been implemented by IPPs unless developed with CDM status or be given priorities to access ODA.

Complying with Para.121 of VVM, through above mentioned validation method, the validation team confirms that the common practice analysis has been verified and the proposed project is not common practice.

Based on assessment of CDM serious consideration, comparison of economic attractiveness of the remaining alternatives, sensitivity analysis, common practice analysis, which are demonstrated in above sections, the project can be concluded as additional.

### 3.6 Monitoring Plan

The project activity applies the approved monitoring methodology, ACM0002 version 12.2.0 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources". The selected monitoring methodology is applicable for the proposed project.

#### 3.6.1 Parameters determined ex-ante

The data and parameters have been verified by the validation team to be consistent with the sources, and assessed to be appropriate.

CL08 was raised as the list of parameters presented in Section B6.2 is not considered to be complete and correct. PP supplemented the list of parameters presented in Section B6.2 in PDD. The validation team confirmed it was complete and correct. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

#### 3.6.2 Parameters determined post

The following monitored parameters are presented with regard to the requirement of the applied methodology ACM0002.

**EG<sub>y, export</sub>**: Electricity supplied by the proposed hydropower plant to the national grid;

**EG<sub>y, import</sub>**: Electricity supplied by the national grid to the proposed hydropower plant;

**EG<sub>facility, y</sub>**: Net electricity supplied to the national grid by the proposed hydropower plant. This is determined by the difference of the values of EG<sub>y, export</sub> and EG<sub>y, import</sub>.

The reading of electricity meters will be continuously measured by power meter 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. The meters should be calibrated and checked in accordance with relevant laws of the host country.

**A<sub>PJ</sub>**: Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full. This will be yearly measured by the observation equipment;

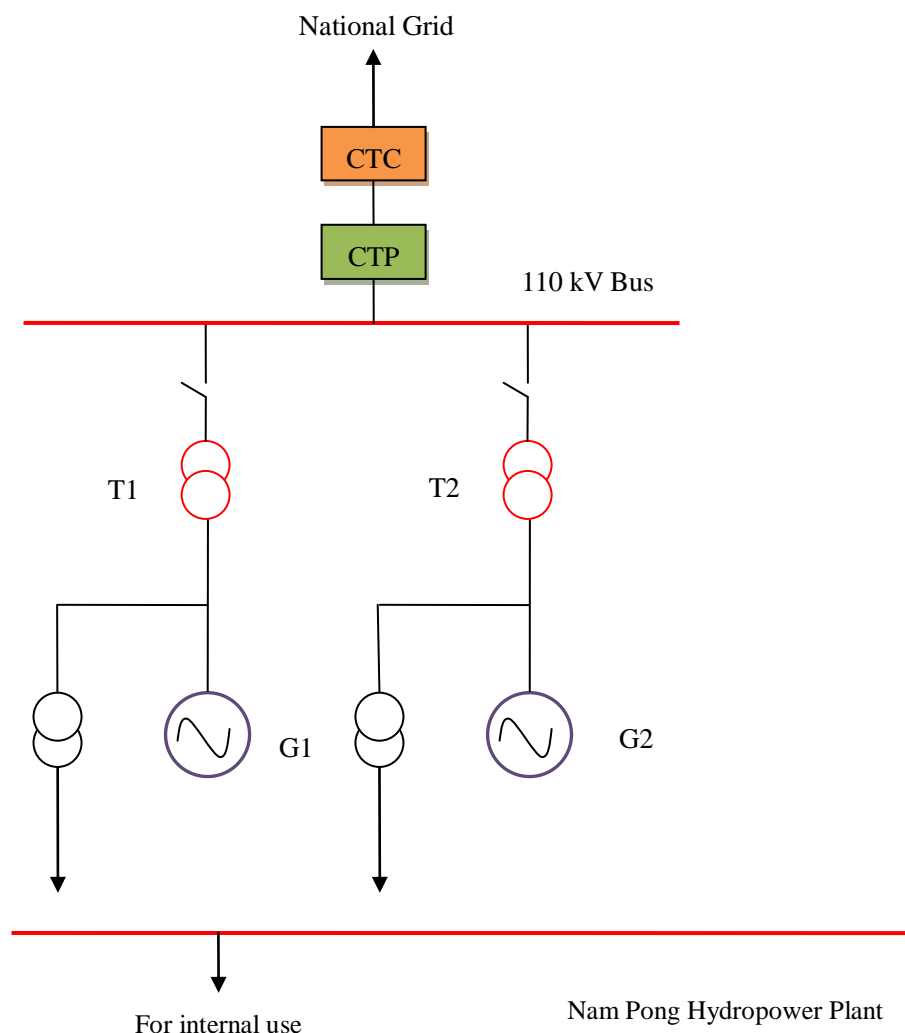
**Cap<sub>PJ</sub>**: Installed capacity of the hydro power plant after the implementation of the project activity. This will be checked by the manufacture's nameplate, to calculate the power density.

### 3.6.3 Monitoring plan

The monitoring plan in section B.7.2 includes the calculation equation and determination procedure of  $EG_{\text{facility},y}$ . The monitoring information provide in Annex 4 of the PDD supplements the description of technical equipment, figure of monitoring meter systems, monitoring organization, Calibration of metering equipment, Data recording and archiving procedures, Emergency procedures and training.

A detailed monitoring chart is provided in the Annex 4 of the PDD.

The following figure shows the plant operation flow diagram of the proposed project, but PP confirm the lay-out of power transmission line from generation to gird is not final version.



Note:

**CTC** : Main power meter

**CTP** : Back-up power  
meter

**T1, 2** : Transformers

**G1, 2** : Generators

The metering system includes the main meter and a back-up meter. The back-up meter will be used in case of failure of the main meter. The main and backup meters monitoring electricity supplied to the grid and electricity used from the 110kv line will be installed at the grid-connecting point in Transformer Station, the accuracy will be at least 0.5S. Before on-site installation, the meters will be calibrated and verified. The meters will also be calibrated and verified every two years during operation. This is verified to be in accordance with local requirement Decision No 65/2002/QD-BKHCNMT, issued by Minister of Scientific, Technology and Environment /4.34/. The authenticity of the provided monitoring chart is cross-checked via interviewing project participants.

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. All monitored data records will be kept until 2 years after the end of the crediting period.

In case of any unforeseen event that is not covered under the 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.

CAR04 was raised to ask PP to supplement the Layout of Power Transmission Lines from the Generation to the Grid with the Metering System. The Layout of Power Transmission Lines from the Project to the Grid with the Metering System has been applied in the revised PDD. This CAR was closed. For detailed resolution please see Table 2 in Appendix A.

During document review and on-site visit, the validation team is able to verify that necessary procedures related to data handling, quality assurance, and monitoring personnel have been appropriately implemented.

According to the described validation method, the estimations in the PDD for the parameters monitored ex-post are considered to be reasonable.

Complying with Para. 124 of VVM, the validation team confirms that monitoring plan complies with the requirements of the methodology; the monitoring arrangements described in the monitoring plan are feasible; the project participants are able to implement the monitoring plan.

### **3.7 Sustainable Development**

The proposed project activity will contribute to sustainable development in the following ways:

- Reducing the dependence on exhaustible fossil fuels for power generation by using renewable hydropower;
- Reducing air pollution by displacing fossil fuel power plants;
- Reducing the adverse health impacts from air pollution;
- Reducing the emissions of greenhouse gases to combat climate change;
- Contributing to local economic development in many ways.

No CARs, CLs or FARs were raised in this section.

Complying with Para. 127 of VVM, the validation team confirms that the host Party's DNA formally confirmed the contribution of the project to the sustainable development of Viet Nam in the issued LoA, which is elaborated in Section 3.1: Participation and Approval.

### **3.8 Local Stakeholder Consultation**

The stakeholder consultation meeting was held on 05 September 2007. The stakeholder consultation activities were prior to the publication of PDD in UNFCCC website (20/05/2011).



The announcements of the stakeholder consultation meeting were made through prior invitation and radio broadcast. The invitations were checked by the validation team.

Representatives of local people and village authorities, representatives of local authorities participated the meeting. All participants agreed that the project will use the water resources to generate electricity, certainly contribute to reduce the emission of greenhouse gases into the atmosphere and environment protection in Viet Nam.

This project will increase local budget and reduce poverty; help the improvement of the transportation system in the region, creates favourable conditions for living and production activities of local people, helps the transportation of goods and people, and facilitates the communication among areas in the region; improve the living standard of local people, narrowing the cultural and economic gap among ethnic groups and areas in the region. Therefore, they fully support the project without any objections.

Some comments were raised regarding some impacts such as: noises from machines, transportation vehicles, dust during ground leveling. However, the construction site is far from residential area and these impacts only occur during construction. Therefore, impacts are insignificant.

Related evidences were submitted and checked by the validation team, including the meeting minutes/4.24/, filled stakeholder consultation questionnaires/4.24/ and documents regarding compensation/4.25//4.26//4.27//4.28/. Local officials and resident representatives were interviewed, who confirmed that all stakeholders support the construction of the project/4.30//4.31/, and no adverse opinions were expressed in or after the consultation meeting. Based on the above, the validation team hereby confirmed that the local stakeholder consultation was adequately performed.

CL09 was raised to ask PP to provide the evidences to illuminate the public opinion collected at the consultant meeting and due account was taken of any comments received both of EIA stage and CDM develop stage. The PP provided the relevant laws and regulations. In these exiting laws and regulations of Vietnam, there aren't the requests on achieving the documents during the consultation for the EIA. And in EIA approved by the authority, the public consultation process and results had been described. Meanwhile, the relevant evidences on the public opinion collected at the consultant meeting have been provided. The validation team considered it was valid. This CL was closed. For detailed resolution please see Table 2 in Appendix A.

Complying with Para. 130 of VVM, by means of document review and on-site interview with local officials and stakeholders, the validation team confirms that the Local Stakeholder Consultation was adequately carried out.

### 3.9 Environmental Impacts

The environmental impacts of the project activity were clearly described in Section D.1 of the PDD as per the environment commitment and its approval, the major aspects are: impact on land, water flow, air quality, flora and aquatic life, and also the impact from noise, waste and hazardous materials and land occupation, etc. There is no trans-boundary impact identified.



As described in the Environmental Impact Assessment Report /2.6/ and the PDD/1.1//1.2/, the negative environmental impact brought by the project activity will be strictly monitored, and mitigation measures will be taken to safeguard the environment quality. Mitigation measures to reduce negative impacts were also listed in the PDD, including: recover lost land and make compensation of local households, waste collection and treatment, dust removal and installation of monitoring equipment to monitor absorption and distortion of water rising and water quality released from the plant.

These measures are considered to be credible via document review and on-site interview. The description in the PDD was cross-checked with related evidences of Environmental Impact Assessment Report/2.6/, Certificate of Environmental Protection Commitment/2.7/, documentations regarding compensation, etc. Related information was also interviewed and confirmed with governmental officials, representatives from different organizations and local residences.

No CARs, CLs or FARs were raised in this section.

## **4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS**

The PDD was made publicly available from 20/05/2011 in accordance with paragraph 40(b) of the modalities and procedures for the CDM and receive, within 30 days, comments from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available (<http://cdm.unfccc.int/Projects/Validation/DB/3VHK8VLSJ9JXISHJ615255JZ5SJ3NE/view.html>). Some comments were received during this process. Detailed refer to following list.



### The response on the comments obtained in GSP.

No.	Comments	Submitted by	PP's response	DOE's Opinion
The 1 <sup>st</sup> comments				
1	<p>It is evident from the PDD that the values are consistent and it is definitely forged and cooked up values to show a non CDM project as a CDM project. What is this?</p> <p>DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also.</p> <p>After careful study of PDD it is found that DPR/FR is in different versions made and submitted with different purposes to different agencies which is totally unacceptable, illegal and unethical.</p> <p>PP/Consultant may show some undertaking letter from bank manager to DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE.</p> <p>While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other parties by the PP/Consultant is same as the one submitted to DOE.</p> <p>In this particular project there is clear cut evidence that DPR/FR</p>	<p>zhong zhou li,  <a href="mailto:zhongzhouli8@gmail.com">zhongzhouli8@gmail.com</a></p>	<p>This comment has been randomly distributed to many CDM projects and is not specifically aimed at this project. The pre-feasibility study report and feasibility study report have been submitted to validation team for cross-checking the input values in the financial analysis. The FSR is approved by the local authority of Nghe An province.</p>	<p>This question is focused by the validation team. Via document review and on-site visit on 22/06/2011 to 23/06/2011, CEC checked the values applied in the PDD were sourced from the TDR of the project. The values in the PDD were same with those in the TDR. The TDR was calculated by the other consultant - Power Engineering Consulting Joint Stock Company 1 but verified by Song Da Consulting Joint Stock Company. They are all the third parties who are accredited by the government for preparing and issuing such a technical design.</p> <p>We had a serious on-site validation through interviewing with relevant government officials. According to Government Decree No.12/2009/ND-CP on "Management of investment projects on the construction of works", the process to conduct an investment project is regulated as follows:</p> <p>Making Basic Design Report (BDR) for the project, the BDR is designed at basic studying level. The purposed of BDR is applied for investment license which will be issued by the national authority. The TDR is designed at a studying level with detailed, standardized parameters that are based on the basic design report which was approved by national authorities. Making Building Drawing and construction.</p> <p>We cross-checked two reports and approval, the</p>



	<p>values are changed/ fabricated mischievously and intentionally.</p> <p>This must be probed fully. DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes.</p> <p>Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes</p> <p>DOE must not accept any reports and undertakings from PP/Consultant.</p> <p>DOE must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts.</p> <p>DOE to write to the party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant.</p> <p>This project is a fabricated and fake CDM project and must be rejected by the DOE right away. DOE should not support this kind of projects otherwise CDM EB should suspend this DOE for at least one year</p>			<p>technical parameters in them are fully same. Meanwhile, through cross-checked the investment analysis in the Basic Design Report (BDR) applied to request for investment license and the Technical Design Report (TDR) applied to request for registration of CDM project, it was found that the IRR in BDR was lower than it in TDR.</p> <p>Since the BDR is prepared in 2007 and the decision making time in 2010, the decision making has been relied on the TDR which is a more detailed and more updated than those made in the BDR.</p> <p>The validation team considered the input parameters in TDR is more conservative and updated than those in BDR.</p> <p>Through interviewing with Bui Xuan Hung, the official who came from Department of Industry and Trade and was responsible for examining and approving the project, he confirmed that the BDR was only requested to submit to Department of Industry and Trade of Nghe An Provincial People's Committee. Until on site visiting, the loan agreement was still not be signed.</p> <p>Besides, CEC checked the BDR archived by Department of Industry and Trade for approval of the project implementation, and found the values in this BDR were same with that in the BDR submitted to CEC.</p>
The 2 <sup>nd</sup> comments				
1	Layout of power transmission lines from the generation to the consumer with the metering system is not shown. It should	lawrance, lawrance_38@yahoo.com	The layout of power transmission line from the generation to the consumer has	Through on-site interview with relevant government official, it was confirmed that



	include the distance of transmission lines. DOE has to check the meters are installed to monitor electricity generated, net electricity used in Bhutan, net electricity exported to India. Pls. clarify.		been shown in the PDD including the distance of transmission line. The project is located in Vietnam, and electricity generated will be exported to the Vietnam national grid under a PPA with the power purchaser. However, The commentator mentions the net electricity used in Bhutan, India, which must mean a project in India. Therefore, It is clear that the comment does not specifically aim at this project. The comment is dismissed.	electricity generated by the proposed project would not be exported to India. So, this condition mentioned in this comment does not exist.
2	The status of the construction & commission of the project is not stated in the PDD.		The status of the construction and commission of the project has been stated in the PDD.	The status of the construction and commission of the project has been stated in the PDD. The proposed project is in the early state of construction when the on-site visit was carried out. The expected date of commission has been added in the PDD.
3	What is the basis of calculation for transmission loss, auxiliary consumption and transformer losses? What is the length of transmission line?		In Vietnam (host country), there are no mandatory requirements on the calculation of transmission loss and internal use; therefore, the PP applied the common practice value in Vietnam. The evidence has been made available to DOE during the validation. The length of transmission line has been indicated in the PDD and cross-checked by DOE.	The layout of power transmission line from the generation to the consumer has been shown in the PDD. According to the requests of relevant regulations, only 1 % of the gross power generation is requested to consider for parasitic and loss load. The PP applied the required value in Vietnam.
4	The project is claimed to be run of river hydro project. So the calculation of reservoir is wrong. The criterion 3 is applicable only to pumped storage or accumulation hydro projects. What does reservoir refer to as per PP?		The proposed project is not claimed to be run of river hydro project in the PDD. The criterion 3 of the Methodology ACM0002, version 12.2.0 refers to new and existing reservoir, not to pumped storage or accumulation reservoir. Therefore, the comment does not specifically aim at this project. The comment is dismissed.	The project is a new-constructed hydropower station, involves construction of a reservoir with an area of 0.32 km <sup>2</sup> and a power density of 93.75 W/m <sup>2</sup> . But the proposed project is not claimed to be a run of river hydro project in PDD. The calculation of reservoir is complied with the request of the criterion 3 of the Methodology ACM0002, version 12.2.0.



5	The justification of opting out alternative 3 and alternative 4 is not justified adequately. It should be based on latest published data and figures. Refer B.4. Pls. clarify		The justification of opting out the alternatives has been included in the PDD in accordance with the latest version of the "Tool for the demonstration and assessment of additionality, Version 06.0.0".	According to the latest published data and future, the justification of opting out the alternatives is complied with the requests of the latest version of the "Tool for the demonstration and assessment of additionality, Version 06.0.0".
6	The bilateral agreements, PPA with India are the documents, DOE to check thoroughly.		The project is located in Vietnam and the electricity generated will be exported to the Vietnam national grid under PPA with the power purchaser. However, the commentator refers to a project in India by saying "PPA with India". It is clear that the comment is not specifically aim at this project and thus is dismissed.	Through on-site interview with relevant government official, it was confirmed that electricity generated by the proposed project would not be exported to India. So, this condition mentioned in this comment does not exist.
7	Date of investment decision should be at the time of DPR preparation. So, the basis of the cost escalation factors at a later date for CDM consideration is not valid. Pls. clarify. Refer B5. Step 3a. (Investment barrier).		The investment decision was made in July 2010 while the date of completion of TDR is 06/2010. The interval of time is less than one year, so the basis of cost escalation factors is considered to be valid. It is however clear that the comment does not specifically aim at this project because the PP of the proposed project does not applied barrier analysis.	The basis of the investment analysis is the TDR of the proposed project. The draft TDR was finished in 11/2009 and the final TDR was in 06/2010, and the Investment Decision on implementing the investment project and CDM project by the Management Board of ZaHung JSC was 17/07/2010; then the cost escalation did not happen. The validation team considered the input parameters in TDR is valid.
8	How the CDM benefit will alleviate the technical barriers. As per additionality tool, if the barriers are not alleviated by CDM, then the project is not additional.		For the purpose of additionality demonstration and assessment, the PP does not apply the barrier analysis. Therefore, this comment does not specifically aim at this project.	For the purpose of additionality demonstration and assessment, the PP does not apply the barrier analysis. Therefore, this comment does not specifically aim at this project.
9	Emission factor for state is not calculated. It should be made available to DOE to clearly validate this value. Emission factor for India is not as per "Tool for emission factor for the system".		During the validation, emission factor for the national grid was required to calculate by the DOE. The database was also made available to DOE	During the validation, the database was checked and emission factor for the national grid was required to calculate by the validation team. The result is inconsistent with Emission factor of Vietnam national grid (Ref. No.:



				151/KTTVBKD(H) by the Ministry of Natural Resources and Environment (DNA of Vietnam) on 26/03/2010/4.1/ based on the Tool to calculate emission factor for electricity system.
10	Electricity generated by the project, auxiliary consumption, transmission losses, transformer losses, net electricity exported to India, net electricity exported to the grid. These parameters to be monitored continuously and to be cross checked with sale receipts.		Electricity generated by the project, auxiliary consumption, transmission losses, transformer losses, net electricity exported to the grid will be monitored in accordance with the methodology and cross-checked with creditable materials.	Through on-site interview with PO and relevant government official, confirmed that electricity generated by the project, auxiliary consumption, transmission losses, and transformer losses, net electricity exported to the grid will be monitored in accordance with the methodology and cross-checked with creditable materials.
11	The Meth mentions that if investment analysis option is used, apply the following: a) Apply an investment comparison analysis, as per Step 3 of the Combined tool to identify the baseline scenario and demonstrate additionality. If more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P3; b) Apply a benchmark analysis, as per Step 2b of the. Tool for the demonstration and assessment of additionality. If more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P2. But PP failed to apply like this. Pls. clarify.		For the purpose of investment analysis in the context of proposed project, the PP applied benchmark analysis approach. By doing so, the "Tool for the demonstration and assessment of additionality, version 06.0.0" is strictly followed. Plausible and credible alternatives have been considered and assessed in the PDD.	In the PDD, PP clearly illuminates that benchmark analysis approach is applied for the purpose of investment analysis according to the "Tool for the demonstration and assessment of additionality, version 06.0.0"; and plausible and credible alternatives have been considered and assessed in the PDD.
12	PLF should be based on EB48 Annex 11 guideline which says The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval; (b) The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company); But PDD doesn't demonstrate how PLF has been arrived at.		The plant load factor is determined by the third party who designs the FSR. This information has been indicated in the PDD and assessed by DOE.	In PDD, how PLF has been arrived at has been demonstrated. The plant load factor is determined by the third party who designs the TDR and verified by another third party. Through cross-checked with similar registered CDM projects, it is within normal range. So it is considered rational.
13	Whether PLF includes machine shutdown, machine availability. Whether grid availability is accounted for in the calculation of gross generation. To my surprise, critical parameter like PLF is		The PLF has been indicated in the PDD and assessed by the DOE.	The PLF has been indicated in the PDD, and the validation team confirmed it is inconsistent with TDR.





	missing from the PDD. How DOE has allowed this.			
14	Common practice analysis should be based on EB 39 Annex 10 (Additionality tool). Each step of common practice analysis should be fulfilled as per tool.		Common practice analysis is based on the latest version of the "Tool for the demonstration and assessment of additionality, Version 06.0.0". Each step of the analysis is fulfilled as per this tool.	Common practice analysis is based on the latest version of the "Tool for the demonstration and assessment of additionality, Version 06.0.0". Each step of the analysis is fulfilled as per this tool.
15	Emission reduction calculation should be based on EB 50 Annex 14 "Tool for emission factor for the electricity system.		The emission reduction calculation is based on the latest version of "Tool to calculate the emission factor for an electricity system" version 02.2.1, Annex 19, EB63. The data for the calculation is provided by DNA and has been made available to DOE during the validation.	The emission reduction calculation is based on the latest version of "Tool to calculate the emission factor for an electricity system" version 02.2.1, Annex 19, EB63. The data for the calculation is correct and valid.
16	Whether only one set of main meter, check meter set is enough for three projects. The monitoring parameters need to be checked by DOE.		The proposed project activity involves the implementation of only one hydropower plant. The metering system is designed in accordance with local regulations and international standard, and is approved by the power purchaser before the project is operated. Therefore, it shall be compatible to the project. The monitoring parameters are taken into account in accordance with the Methodology and checked by the DOE during the validation.	Through on-site visit, the proposed project applies one set of main meter and back meter solely. The validation team considers that the monitoring parameters are inconsistent with the requests of approved monitoring methodology applied by the proposed project.
17	The main meter and check meter technical parameters like accuracy level, make, etc. needs to be mentioned in the PDD.		The main meter and check meter technical parameters like accuracy level shall be as per relevant laws and regulations of the host country. This information is mentioned in the PDD.	The validation team confirmed the main meter and check meter technical parameters like accuracy level is mentioned in the PDD, and it is clearly illuminated that the meters will be installed as per relevant laws and regulations of the host country.



## 5 VALIDATION OPINION

China Environmental United Center Co., Ltd (CEC) has performed a validation of the “Nam Pong Hydropower Project” in Viet Nam based on UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation, the subsequent on-site interviews and the further cross-check of references have provided CEC with sufficient evidences to determine the fulfillment of stated criteria in the protocol. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Hence, CEC will recommend the project for registration by the CDM EB.

An analysis as provided by the applied methodology demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions as specified within the final PDD version.

The total emission reductions from the project are estimated to be on the average 70,353 tCO<sub>2</sub>e per year over the selected 7-year renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

It is CEC's opinion that Nam Pong Hydropower Project, as described in the PDD version 1.5, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria, correctly applies the baseline and monitoring methodology ACM0002 version 12.2.0, and also meets the stated validation criteria. CEC thus requests the registration of the project as a CDM project activity.

Beijing xx/12/2011

Beijing, xx/12/2011

XU Linghua

TANG Dingding

Validation Team Leader

Chairman of Board

## REFERENCES

- 1 PDD/LoA
  - 1.1 PDD Version 1.0 dated 15/04/2011
  - 1.2 PDD Version 1.5 dated 29/11/2011
  - 1.3 Letter of Approval from Viet Nam DNA(ref. 48/2011/DMHCC-BCD) dated 28/09/2011
  - 1.4 Letter of Approval from the Swiss DNA(Annex I Party) (G514-3487) dated 27/09/2011
  - 1.5 Modalities of Communication(MoC), dated on 31/10/2011
- 2 EIA/FSR/PDR and its Approval
  - 2.1 Technical Design Report of Nam Pong Hydropower Project, produced by Power Engineering Consulting Joint Stock Company 1, draft dated 11/2009, final dated 06/2010.
  - 2.2 Verification Report on Technical Design Report of Nam Pong Hydropower Project, produced by Song Da Consulting Joint Stock Company (SDCC.,JSC), dated 01/2010.

First Explanation Report on the Verification Report, produced by Power Engineering Consulting Joint Stock Company 1, dated 01/2010.

Second Verification Report on Technical Design Report of Nam Pong Hydropower Project, produced by Song Da Consulting Joint Stock Company (SDCC.,JSC), dated 04/2010.

Second Explanation Report on the Verification Report, produced by Power Engineering Consulting Joint Stock Company 1, dated 04/2010.

Last Explanation Report on the Verification Report, produced by Power Engineering Consulting Joint Stock Company 1, dated 13/05/2010.

Explaining comments of Board of Management of ZaHung JSC in the meeting of approving the Technical design of Nam Pong hydropower project on 28/05/2010, produced by Power Engineering Consulting Joint Stock Company 1, dated 15/06/2010.
  - 2.3 Decision on approving Technical design of Nam Pong hydropower project, issued by ZaHung Joint Stock Company, dated on 17/07/2010, ref. No.48/QD-HDQT.
  - 2.4 Basic Design Report of Nam Pong Hydropower Project, produced by Song Da Consulting Joint Stock Company, dated 06/2007.
  - 2.5 Approval of Basic Design Report of Nam Pong Hydropower Project, issued by NGHE AN PROVINCIAL PEOPLE'S COMMITTEE, No.230/SCN-QLDN, dated 16/08/2007.
  - 2.6 Environmental Impact Assessment Report of Nam Pong Hydropower Project, produced by INSTITUTE for ENVIRONMENTAL SCIENCE AND TECHNOLOGY, dated 11/2007.
  - 2.7 Approval of Environmental Impact Assessment Report of Nam Pong Hydropower Project, issued by PEOPLE COMMITTEE OF NGHE AN PROVINCE, No.5023/QD-UBND.DC, dated 13/12/2007.
- 3 Baseline and Monitoring Methodology
  - 3.1 Research and Determine the Emission Factor of Viet Nam National Grid, issued by Ministry of Resources and Environment Department of Meteorology Hydrology and Climate Change on 26/03/2010.
  - 3.2 Summation of Operation of National Power System in 1995-2007, EVN.bv
  - 3.3 Decision No 65/2002/QD-BKHCMNT, Minister of Scientific, Technology and Environment, 19/08/2002;



#### 4 Additionality

- 4.1 Registered hydropower project in Vietnam
- 4.2 Business registration certificate of ZaHung JSC, issued by Hanoi Investment and Planning Authority, ref. 0103010125, dated 25/09/2008.
- 4.3 Business registration certificate of Power Engineering Consulting Joint Stock Company 1, issued by Hanoi Investment and Planning Authority, ref. 0103021734, dated 02/01/2008.
- 4.4 Business registration certificate of Song Da Consulting Joint Stock Company, issued by Hanoi Investment and Planning Authority, the first, ref. 0103006450, dated 23/02/2005; the latest, ref.0100105454, dated 05/10/2010.
- 4.5 Information on Power Plants Connected to the National Electricity Grid in 2005,2006 and 2007, issued by Power System Development Department, Institute of Energy, Vietnam Electricity-EVN, 08/2008.  
Approving the Strategy on Development of Vietnam Electricity Industry in the 2004-2010 Period, with Orientations towards 2020, issued by the Prime Minister of Government, No. 176/2004/QĐ-TTg, dated 05/10/2004.
- 4.6 The Master Plan of Electricity Expansion for period of 2006-2015 with perspective to 2025 - EVN (Master Plan VI), approved by the Prime Minister, July 2007.
- 4.7 Industrial Review of Vietnam,  
<http://www.tapchicongnghe.vn/News/channel/1/News/89/3751/Chitiet.html>
- 4.8 Investment License for Ha Do Joint Stock Company (Ha Do JSC), No.271110000013, issued by People's Committee of Nghe An Province, dated 21/11/2007.  
Modificative Investment License for ZaHung Joint Stock Company (ZaHung JSC), No.271110000013/GCNĐC/01, issued by People's Committee of Nghe An Province, dated 15 /05/2009.
- 4.9 EF Calculation Spreadsheet of this Project.  
IRR Calculation Spreadsheet of this Project.
- 4.10 Construction Contract, signed between ZaHung Joint Stock Company and Song Da 505 Joint Stock Company and Song Da 902 Branch of Song Da 9 Joint Stock Company, dated 14/01/2011.
- 4.11 Confirmation of Notification of Prior CDM Consideration in UNFCCC Website, UNFCCC, dated on 14/08/2009.  
[http://cdm.unfccc.int/Projects/PriorCDM/notifications/index\\_html](http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html).
- 4.12 Notification of Prior Consideration of the CDM (incl. Notification Form), Project Proponent, dated on 14/08/2009.  
[http://www.noccop.org.vn/modules.php?name=Airvariable\\_Projects&file=index&opcase=viewprocat&pro\\_cate\\_id=77&menuid=96](http://www.noccop.org.vn/modules.php?name=Airvariable_Projects&file=index&opcase=viewprocat&pro_cate_id=77&menuid=96)
- 4.13 Decision of Management Board of ZaHung JSC to developing the project as CDM project, dated 17/07/2010.
- 4.14 Lending rate, Weekly report of Vietnam State Bank, from the beginning of 2010 up to July 2010. [www.sbv.gov.vn/en/](http://www.sbv.gov.vn/en/).
- 4.15 Decision No 18/2008/QĐ-BCT Promulgating the Regulation on Avoided Cost Tariff, issued by MINISTRY OF INDUSTRY AND TRADE, dated 18/07/2008.  
Decision No.73/QĐ-DTDL-Promulgation on Avoided Cost Tariff for 2010, issued by



MINISTRY OF INDUSTRY AND TRADE / ELECTRICITY REGULATORY AUTHORITY OF VIETNAM, dated 30/12/2009.

- 4.16 Decision No.588.QD- BTC electricity price for calculating royalties on natural water used in 2010, issued by Ministry Of Finance, 22/03/2010.
- 4.17 Decision No. 2014/QD-BCN DECISION on Promulgation of Temporary Regulation on Contents of Investment Financial-Economic Analyses and Price Frame for Electricity Sale and Purchase from Power Generation Projects, issued by the Ministry of Industry, dated 13/06/2007.
- 4.18 Circular No.45/2009/TT-BTC\_guiding value added tax, royalties and business income tax, issued by the Ministry of Finance, dated 11/03/2009.
- 4.19 Viet Nam Construction Code - TCXDVN 285:2002
- 4.20 Decree of the Government on electricity activities and use, No.45/2001/ND-CP, dated 02/08/2001.
- 4.21 Prospectus of Nam Mu Hydropower Joint Stock Company  
[http://images1.cafef.vn/Images/Uploaded/DuLieuDownload/Ban%20Cao%20Bach/HJS\\_BCB.doc](http://images1.cafef.vn/Images/Uploaded/DuLieuDownload/Ban%20Cao%20Bach/HJS_BCB.doc)
- 4.22 Ea Krong Rou Hydropower Project of Mien Trung Power Investment and Development Joint Stock Company.  
<http://www.cophieu68.com/profilesymbol.php?id=seb>,  
<http://www.mientrungpid.com.vn/?page=13>
- 4.23 Interview with Truong Thanh Construction Company Limited and confidential documentation provided to DOE.  
The Government Decree No. 17/2001/ND-CP.
- 4.24 Minutes of meeting to consult public opinions, dated 05/09/2007.
- 4.25 Approval of budget for ground clearance compensation and support for the construction of Nam Pong Hydropower project in Chau Hanh commune and Chau Phong commune, Quy Chau district, Nghe An province, issued by ZaHung Joint Stock Company, dated 27/01/2011.
- 4.26 Approval of budget for ground clearance compensation and support for the construction of Nam Pong Hydropower project in Chau Hanh commune and Chau Phong commune, Quy Chau district, Nghe An province, issued by ZaHung Joint Stock Company, dated 07/10/2010.
- 4.27 Approval of budget for ground clearance compensation and support for the construction of Nam Pong Hydropower project in Chau Hanh commune and Chau Phong commune, Quy Chau district, Nghe An province, issued by ZaHung Joint Stock Company, dated 31/12/2010.
- 4.28 Decision on approval of plan for ground clearance compensation and support for the construction of Nam Pong Hydropower project in Chau Hanh commune and Chau Phong commune, Quy Chau district, Nghe An province, issued by People's Committee of Quy Chau district, No.268/QD.UBND, dated 27/01/2011.  
Decision on approval of plan for ground clearance compensation and support for the construction of Nam Pong Hydropower project in Chau Hanh commune and Chau Phong commune, Quy Chau district, Nghe An province, issued by People's Committee of Quy Chau district, No.1353/QD.UBND, dated 05/10/2010.  
Decision on approval of plan for ground clearance compensation and support for the construction of Nam Pong Hydropower project in Chau Hanh commune and Chau Phong



- commune, Quy Chau district, Nghe An province, issued by People's Committee of Quy Chau district, No.1781/QD.UBND, dated 29/12/2010.
- 4.29 Decree on Management of Investment Projects on the Construction of Works, issued by the Government, No. 12/2009/ND-CP, dated 12/02/2009.
  - 4.30 Response Official letter of FFC of Chau Hanh commune, dated 10/09/2007.  
Response Official Letter of Chau Hanh commune, dated 10/09/2007.
  - 4.31 Response Official letter of FFC of Chau Phong commune, dated 11/09/2007.  
Response Official Letter of Chau Phong commune, dated 11/09/2007.
  - 4.32 The Implementation Status of Nam Pong Hydropower Project in Quy Chau District, Nghe An Province, issued by ZaHung JSC, dated 15/08/2011.
  - 4.33 Detailing and Guiding the Implementation of a Number of Articles of the Law on Environmental Protection, Decree No. 80/2006/ND-CP, issued by the Government, dated 09/08/2006.
  - 4.34 Ordinance on Exercise of Democracy in Communes, Wards and Townships, No. 34/2007/PL-UBTVQH11, issued by the Standing Committee of National Assembly, 20/04/2007.
  - 4.35 <http://cdm.unfccc.int/Projects/Validation/DB/3VHK8VLSJ9JXISHJ615255JZ5SJ3NE/view.html>
- 5 Tools
- 5.1 UNFCCC, Clean Development Mechanism Validation and Verification Manual (VVM), version 01.2, EB 55
  - 5.2 UNFCCC, ACM0002/Version 12.2.0, "Consolidated methodology for grid-connected electricity generation from renewable sources"
  - 5.3 UNFCCC, "Tool to calculate the emission factor for an electricity system", version 02.2.1, EB 63
  - 5.4 UNFCCC, "Tool for the demonstration and assessment of additionality", version 06.0.0.
  - 5.5 UNFCCC, Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM, version 03.
  - 5.6 UNFCCC, Guidelines for the Reporting and Validation of Plant Load Factors, Version 01.
  - 5.7 UNFCCC, Tool to determine the remaining lifetime of equipment (Version 1)
  - 5.8 UNFCCC, Guidance on the Assessment of Investment Analysis, version 05.0, EB 62
  - 5.9 Proposed New Baseline and Monitoring Methodologies (CDM-NM), version 07, EB 41, [http://cdm.unfccc.int/Reference/Guidclarif/pdd/PDD\\_guid04\\_v07.pdf](http://cdm.unfccc.int/Reference/Guidclarif/pdd/PDD_guid04_v07.pdf)
  - 5.10 UNFCCC, PDD Template, Version 03, EB 25, [http://cdm.unfccc.int/Reference/PDDs\\_Forms/PDDs/PDD\\_form04\\_v03\\_2.doc](http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/PDD_form04_v03_2.doc)
  - 5.11 UNFCCC, Procedures for Modalities of Communication between Project Participants and the Executive Board and MoC Form, Version 01, EB 45



**Persons interviewed:**

Name	Department & Position
Vu Van Quang	Energy and Environment Consultancy Joint Stock Company/ Project Manager
Do Thi Thanh Mo	Energy and Environment Consultancy Joint Stock Company/ Project Developer
Ha Quang Thang	ZaHung Joint Stock Company/ Deputy manager of business department
Bui Xuan Hung	Department of Industry and Trade/ Chief of power management department
Vi Van Hanh	Deputy chairman of the Chau Hanh Commune/ Affected person
Nguyen Dinh Phan	Head of the Hua Na hamlet/ Affected person
Vi Thi Xuan	Affected person



## Appendix 1 Validation Protocol

**Table 1 Requirements Checklist**

CHECKLIST QUESTION MoV=Means of Verification, DR=Document Review, I=Interview	Ref.	MoV	comments	Draft Concl	Final Concl
<b>A. General Description of Project Activity</b> <i>The project Design is assessed</i>					
<b>A.1. Title of the Project Activity</b>					
A.1.1 Does the used project title clearly enable to identify the unique CDM activity?	1.1,1.2 1.3,1.4 1.5,	DR	Yes.  The used project title is “Nam Pong Hydropower Project”; it is identifying the unique CDM activity clearly. The project title is consistent with both LoAs and MoC. The title of the project and version number of the document and data is complete and correct.	OK	OK
A.1.2 Are there any indication concerning the revision number and the date of the revision?	1.1,1.2	DR	Yes.  The version 01.0 was compiled for the GSP in UNFCCC website.  The final revised PDD version 1.5 is dated 29/11/2011.	OK	OK
A.1.3 Is the PDD revision history consistent with the time line of the project’s history?	1.1,1.2	DR	Yes.  The PDD applied the latest UNFCCC template completely accurately.	OK	OK
<b>A.2. Description of the Project Activity</b>					
A.2.1 Is the description delivering a transparent overview of the project activities?	1.1,1.2	DR	Yes.  An overview of the project is described transparently in section A.2 of the PDD.  The Nam Pong hydropower project activity involves the construction of a two generating unit hydropower plant having installed capacity of 30 MW. The	GAR06 GL04	OK





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<b>CHECKLIST QUESTION</b> MoV=Means of Verification, DR=Document Review, I=Interview	Ref.	MoV	comments	Draft Concl	Final Concl
			<p>project is located on Nam Pong stream in Chau Hanh and Chau Phong communes, Quy Chau district, Nghe An province, Viet Nam.</p> <p>The project's installed capacity and estimated annual gross power generation is 30 MW and 123.29 GWh, respectively. The net electricity generated (with an estimated annual volume of 122.057 GWh<sup>1</sup>) will be supplied to the national grid via a newly constructed transmission line from the plant to a transformer station.</p> <p>The project involves construction of a reservoir with an area of 0.32 km<sup>2</sup> and a power density of 93.75 W/m<sup>2</sup>, accordingly. Total expected CO<sub>2</sub> emission reduction is 492,471 tCO<sub>2</sub> over the first crediting period of 7 years.</p> <p>CAR 06 Please provide the accurate value of the power density and construction period.</p> <p>CL01 (1) The electricity generation in Approval of Basic Design Report and Investment License is different with it applied in PDD; it is 121.08 GWh and 123.29 GWh respectively. Please clarify it. (2) Please clarify the method that the estimated net electricity supplied to the national grid is calculated and provide the evidences.</p>		
A.2.2 What major proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	2.1,2.2 2.3,2.4 2.5,2.6 2.7	DR	<p>The project activity is the displacement of part of the electricity otherwise supplied by fossil fuel fired power plants.</p> <p>The following documents deliver evidences for the project activity and checked against the information in PDD by the validation team:</p>	OK	OK

<sup>1</sup> The gross power generation subtracts 1% for parasitic and loss load. Technical Design Report of Nam Pong HPP  
China Environmental United Certification Center Co., Ltd.

<b>CHECKLIST QUESTION</b> MoV=Means of Verification, DR=Document Review, I=Interview	Ref.	MoV	comments	Draft Concl	Final Concl
			<ul style="list-style-type: none"> <li>● EIA and EIA Approval</li> <li>● Technical Design Report and Approval</li> <li>● Investment License</li> </ul>		
A.2.3 Is the information provided by the PDD consistent with the information provided by the proofs?	1.1,1.2 2.1,2.2 2.3,2.4 2.5,2.6 2.7	DR	The information provided in PDD is cross-checked with the information provided by proofs, major description and data are consistent and correct.	OK	OK
A.2.4 Is the project a large scale project, a small scale project with average annual emission reductions above 15,000t or a bundled small scale project? Has on-site visit been carried out?	2.1,2.2 2.3,2.4 2.5,2.6 2.7	DR	The project activity is a large scale project activity (total installed capacity is 30MW) with estimated annual emission reductions of 70,353 t CO <sub>2</sub> e per year, above 15,000 t CO <sub>2</sub> e per year.  During 21 June 2011 to 23 June 2011, the validation team performed an on-site visit and interviews with project participants, local officials and stakeholders to confirm the provided information and to resolve the issues identified during the desk review.	OK	OK
A.2.5 Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment?	1.1,1.2	DR I	The project activity starts constructing just now at the start of the validation.  CL03  Please add the construction and commission statue of the proposed project in PDD.	CL03	OK
A.2.6 Does the project activity involve alternation of existing installation? If so, have the	1.1,1.2 2.1,2.3 2.4,2.5	DR I	The proposed project does not involve alteration of existing installations.	OK	OK



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CHECKLIST QUESTION MoV=Means of Verification, DR=Document Review, I=Interview		Ref.	MoV	comments	Draft Concl	Final Concl
differences between pre-project and post-project activity been clearly described in the PDD?		2.6,2.7				
<b>A.3. Project Participation</b> Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM Glossary with respect to the terms Party, Letter of Approval, Authorization and Project Participant.						
A.3.1	Is the form required for the indication of project participants correctly applied?	1.1,1.2 1.3,1.4 1.5	DR	Yes. The form is correctly applied.	OK	OK
A.3.2	Which Parties and project participants are participating in the project?	1.1,1.2 1.3,1.4 1.5	DR	The project participants representing the host are: ZaHung Joint Stock Company and Energy and Environment Consultancy Joint Stock Company of Vietnam, and Vietnam Carbon Assets Limited of Switzerland are the project participants representing the Annex I country.	OK	OK
A.3.3	Has the project provided written approvals of all parties involved?	1.3,1.4	DR	The Letter of Approval (LoA) of the host Party was issued by the DNA of Viet Nam on 28/09/2011, confirming the project is a bilateral CDM project, with ZaHung Joint Stock Company and Energy and Environment Consultancy Joint Stock Company as project participants. The LoA also confirmed the voluntary participation of the proposed project, in compliance with permission requirements and assisting Viet Nam in achieving sustainable development. The LoA of the DNA of Viet Nam was provided by the project participant. The validation team confirmed its authenticity by cross-checking other LoAs of the Viet Nam DNA published on UNFCCC website. The information of Project Participants and project title is consistent with the list of approved projects published by the Viet Nam DNA.  The Letter of Approval from Annex I Party (Switzer	CAR01	OK



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<b>CHECKLIST QUESTION</b> MoV=Means of Verification, DR=Document Review, I=Interview	<b>Ref.</b>	<b>MoV</b>	<b>comments</b>	<b>Draft Concl</b>	<b>Final Concl</b>
			the Federal Office for the Environment (FOEN), acting as the Swiss DNA dated 27/09/2011. Authenticity was confirmed by crosschecking with against the list of approved projects published by the Swiss DNA.  CAR01 The Letter of Approval from the DNA of Switzerland has not been obtained, and the name of PO in the Letter of Approval from the DNA of Viet Nam is in consistent with the actual.		
A.3.4 Do the written approvals confirm that the corresponding party is a Party to the Kyoto Protocol?	1.3,1.4	DR	Vietnam has ratified the Kyoto Protocol on 25/09/2002. The Switzerland has ratified the Kyoto Protocol on 09/07/2003. Please refer to CAR01	CAR01	OK
A.3.5 Do the written approvals confirm that the participation is voluntary?	1.3,1.4	DR	The LoAs confirmed the voluntary participation of the proposed project, Please refer to CAR01	CAR01	OK
A.3.6 Does the written approval from the host country confirm that the project contributes to the sustainable development in the country?	1.3	DR	The LoA of host country confirmed the voluntary participation of the proposed project, in compliance with permission requirements and assisting host country in achieving sustainable development. Please refer to CAR01	CAR01	OK
A.3.7 Do the written approvals refer to the precise project title in the PDD submitted for registration?	1.1,1.2 1.3,1.4	DR	As per the letter of approval from Viet Nam, Project activity title is: Nam Pong Hydropower Project is consisting with the title in the PDD. Please refer to CAR01	CAR01	OK
A.3.8 Are the written approvals	1.1,1.2	DR	Yes.	CAR01	OK



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unconditional with regard to A 3.3 to A3.6?	1.3,1.4		Please refer to CAR01		
A.3.9 Is the information regarding the project participants listed in section A.3 and in Annex 1 of the PDD internally consistent to each other?	1.1,1.2 1.3,1.4 1.5	DR	Yes. The information regarding the project participants listed in section A.3 and in Annex 1 of the PDD internally consistent to each other.  Please refer to CAR01	CAR01	OK
A.3.10 Are all project participants listed in the PDD approved at least by one Party involved?	1.1,1.2 1.3,1.4 1.5	DR	Yes. All project participants listed in PDD are approved by the involved Party.  Please refer to CAR01	CAR01	OK
A.3.11 Are any other project participants approved but not listed in the PDD?	1.1,1.2 1.3,1.4 1.5	DR	No. There are no other project participants approved but not listed in the PDD.	OK	OK
A.3.12 Will the project create other environmental or social benefits than GHG emission reductions?	1.1,1.2	DR	Yes. Besides GHG emission reduction, the proposed project activity also helps meeting electricity demand and downgrading the relying on fossil fuel, contributes to the abatement of other pollutants brought by thermal power plants, contributes to local economic development, etc. More project specific information about its contribution to sustainable development has been provided, including contribution to the national economic development, improving of the infrastructure of local villages and providing employment opportunities and training in operation period.	OK	OK



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CHECKLIST QUESTION MoV=Means of Verification, DR=Document Review, I=Interview	Ref.	MoV	comments	Draft  Concl	Final  Concl
A.4. Technical Description of the Project activity <i>Validation of project technology focuses on the project engineering, choice of technology and competence/maintenance needs. The auditor should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.4.1 Location of the project activity					
A.4.1.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	1.1,1.2 2.1,2.3 2.4,2.5 2.6,2.7	DR  I	Yes.  The project is located on Nam Pong stream, Chau Hanh and Chau Phong communes, Quy Chau district, Nghe An province. This project has the following co-ordinates: Co-ordinates of dam: 19°31 ' 15 " Northern latitude, 105°02 ' 10 " Eastern longitude	OK	OK
A.4.1.2. How is it ensured and/or demonstrated, that the project participants can implement the project at this site (ownership, licenses, contracts etc.)?	4.2,4.8 4.10, 4.25, 4.26, 4.27, 4.28	DR  I	The Nam Pong hydropower project received the Investment License No.271110000013 issued by People's Committee of Nghe An Province on 21 November 2007 for Ha Do Joint Stock Company (Ha Do JSC) and the Modificative Investment License No.271110000013/GCNĐC/01 issued by People's Committee of Nghe An Province on 15 May 2009 for ZaHung Joint Stock Company (ZaHung JSC), which accredits the legal right of the project owner to invest in and construct the Nam Pong hydropower project.	OK	OK
A.4.2 Category(ies) of the project activity					
A.4.2.1. To which category (ies) does the project activity belonging to? Is the category correctly identified and indicated?	1.1,1.2	DR	The project falls under scope 1(Energy industries (renewable/non-renewable sources).  The category is correctly identified in Section A 4.2 of the PDD.	OK	OK
A.4.3 Technology to be employed by the project activity					



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A.4.3.1. Does the technical design of the project activity reflect current good practices?	1.1,1.2 2.1,2.3 2.4,2.5	DR I	Yes. After document review and on-site visit, the project uses well established hydropower generation technology for electricity generation and transmission and hence reflects the current good practices to use renewable resources to generate electricity.	OK	OK
A.4.3.2. Does the description of the technology to be applied provide sufficient and transparent input/information to evaluate its impact on the greenhouse gas balance?	1.1,1.2 2.1,2.3 2.4,2.5 2.6,2.7	DR	The description of the technology is complete, relative document evidences have been provided and checked. The project activity comprises the use of hydropower for the substitution of grid supplied electricity mainly from coal fired plants. The structure includes a dam, intake, tunnel, pressurized well, penstock, a power house, and a discharge canal. The project will install two water turbine and generator sets with an individual capacity of 15MW. The reservoirs area is 0.32 km <sup>2</sup> . Technical data of the turbine / generator units including rated discharge, rated output, average efficiency, etc. are listed in Table A.2.	OK	OK
A.4.3.3. Does the implementation of the project activity require any technology transfer from Annex I countries to the host country (ies)?	1.1,1.2 2.1,2.3 2.4,2.5	DR I	No. The equipments of the power plant are made in China. Technology transfer is involved. The technology is in advance.	OK	OK
A.4.3.4. Is the technology implemented by the project activity environmentally safe?	1.1,1.2 2.1,2.3 2.4,2.5 2.6,2.7	DR I	Yes. As the project is a hydro power project, it is clear that the technology implemented by the project activity is environmentally safe.	OK	OK



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A.4.3.5. Is the information provided in compliance with actual situation or planning?	1.1,1.2 2.1,2.3 2.4,2.5	DR I	As the project was starting to construct just now when the validation team made the on-site visit, the purchase contract had not been signed. But the information obtained during on-site interview is compliance with the planning.	OK	OK
A.4.3.6. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1.1,1.2 2.1,2.3 2.4,2.5	DR	No. It is not expected that there will be a substitution because the turbines, generators and the other equipment will be newly commissioned and installed. The expected lifetime of the project is under normal circumstances longer than the crediting period.	OK	OK
A.4.3.7. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	1.1,1.2 2.1,2.3 2.4,2.5	DR, I	Yes. The project participant will make arrangements for its staff to become familiar with the operation of a hydropower station. The professional technicians and engineers will train the hydropower plant staffs on the monitoring procedures, operation regulation, maintenance procedures and other required knowledge regarding the hydropower plant before the start of operation of the project.	OK	OK
A.4.3.8. Is information available on the demand and requirements for training and maintenance?	1.1,1.2	DR I	The effort to train the staffs initially and during the operation period was described by the project owner during on-site visit and in the PDD, and the demand and requirements will be defined in written form before operation.	OK	OK
A.4.3.9. Is a schedule available for the implementation of the project?	1.1,1.2 2.1,2.3 2.4,2.5 4.10	DR I	The planning schedule in the past and for the future was clearly described by the project owner during on-site visit.	OK	OK
<b>A.4.4 Estimated amount of emission reductions over the chosen crediting period</b>					





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A.4.4.1. Is the form required for the indication of projected emission reductions correctly applied?	1.1,1.2	DR	Yes. The form is correctly applied	OK	OK
A.4.4.2. Are the figures provided consistent with other data presented in the PDD?	1.1,1.2	DR	Yes. The figures provided are consistent with other data presented in the PDD.	OK	OK
<b>A.4.5 Public funding of the project activity</b>					
A.4.5.1. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project activity?	1.1,1.2 2.1,2.3 2.4,2.5	DR, I	Yes. According to the statement in Section A 4.5 of the PDD there is no public funding for the project activity. By reviewing the Technical Design Report and interviewing during the on-site visit, the validation team confirmed that no public funds are used by the project.	OK	OK
A.4.5.2. Is all information provided consistent with the details given in remaining Sections of the PDD (in particular Annex 2)	1.1,1.2	DR	Yes. The information on public funding is consistent with the information provided in Annex 2 that no public funding takes place.	OK	OK
<b>B. Application of a Baseline and Monitoring Methodology</b> <i>The validation of the baseline established whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario. And the validation of monitoring plan is appropriate for the project activity and in line with the applied methodology.</i>					



CHECKLIST QUESTION	Ref.	MoV	comments	Draft	Final
MoV=Means of Verification, DR=Document Review, I=Interview				Concl	Concl
B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity(Baseline Methodology)					
It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1 Does the project apply an approved methodology and the correct version thereof?	1.1,1.2 6.2	DR	Yes. The project applies approved methodology ACM0002. This methodology is applicable to grid-connected renewable power generation project activities that install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity. The application is justified as follows: The proposed project involves the installation of a new grid-connected renewable power plant at a site where no renewable power plant was operated prior to the implementation of the project activity; The project activity is the installation of a hydro power plant; The project activity has a new reservoir, the power density is 93.75 W/m <sup>2</sup> , larger than 4W/m <sup>2</sup> . Please refer to CAR06.	CAR06	OK
B.1.2 Is the applied version the most recent one and/or this version still applicable?	1.1,1.2 6.2	DR	Yes. The PDD for global stakeholder publication started on 20/05/2011, at which time the ACM0002 version 12.2.0 was the applicable version.	OK	OK
B.1.3 Does the methodology refer to the tools with the latest approved versions?	1.1,1.2 6.3,6.4	DR	Yes. The PDD correctly identifies the referred tools as per the methodology: Tool to calculate the emission factor for an electricity system, version 02.2.1; Tool for the demonstration and assessment of additionality, version 06.0.0.	OK	OK
B.2. Justification of the choice of the methodology and why it is applicable to the project activity					
It is assessed whether the project applies an appropriate baseline methodology.					

The latest PDD dated on 29/11/2011 applied the ACM0002 version 12.2.0

<b>CHECKLIST QUESTION</b> MoV=Means of Verification, DR=Document Review, I=Interview	Ref.	MoV	comments	Draft Concl	Final Concl
B.2.1 Is justification of the choice of methodology that the project activity meets each of the applicability conditions provided?	1.1,1.2 6.2	DR	<p>The methodology is applicable under the following conditions:</p> <p>The project activity is construction of a new hydropower plant. This has been confirmed by the validation team by reviewing the TDR.</p> <p>However, in case of hydro power plants, one of the following conditions must apply:</p> <ul style="list-style-type: none"> <li>• The project activity is implemented in an existing <b>reservoir</b>, with no change in the volume of reservoir; or</li> <li>• The project activity is implemented in an existing <b>reservoir</b>, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions selection, is greater than 4W/m<sup>2</sup>; or</li> <li>• The project activity results in new <b>reservoirs</b> and the power density of the power plant, as per definitions given in the Project Emission Section, is greater than 4W/m<sup>2</sup>.</li> </ul> <p>The project activity is to create a new reservoir, with a power density of 93.75 W/m<sup>2</sup>, which is greater than 4W/m<sup>2</sup>.</p> <p>Please refer to CAR06</p>	CAR06	OK
B.2.2 Does the GHG emission reductions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed	1.1,1.2 6.2	DR, I	<p>No other project emission or leakage sources contribute more than 1% and not mentioned by the methodology have been found at this stage.</p>	OK	OK

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CDM project activity contribute more than 1% the overall expected average annual emission reductions, which are not addressed by the applied methodology?					
<b>B.3. Description of the sources and gases included in the project boundary</b> <i>Project Boundaries are the limits and borders defining the GHG emission reduction project</i>					
B.3.1 Are the project's spatial boundaries (geographical) clearly defined?	1.1,1.2	DR	Yes. The spatial extent of the project boundary includes the project power plant and all power plants connected physically to Viet Nam national electricity grid, which is in accordance with the methodology.	OK	OK
B.3.2 Are all sources and GHGs included in the project boundary as required in the applied methodology?	1.1,1.2 6.2	DR I	As per methodology the main emission sources (baseline) included in the project boundary is CO <sub>2</sub> produced by fossil-fuel fired power plants that is displaced due to the project activity.	OK	OK
B.3.3 In case the methodology allows to choose whether a source and/or gas is to be included, is the choice sufficiently explained and justified?	1.1,1.2 6.2	DR	N/A	OK	OK
<b>B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario(Baseline Scenario Determination)</b> <i>The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the</i>					



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baseline scenario has been followed in a complete and transparent manner.					
B.4.1 What is the baseline scenario?	1.1,1.2 6.2	DR	The baseline scenario is that in the absence of project activity, the same amount of electricity would have been generated by existing fossil fuel power plants of the National Grid.	OK	OK
B.4.2 What other alternative scenarios have been considered and why is the selected scenario the most likely one?	1.1,1.2 4.5,4.6 4.7,4.8 6.2	DR	According to ACM0002 version 12.2.0, the baseline scenario is determined properly as: “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. In the absence of the project activity, the clean energy generated by this proposed project would have been generated through non-renewable sources from Power Plants connected to the Viet Nam national grid. The baseline scenario is correctly determined.  CAR02  In Sub-step 1a of section B.5, please supplement the alternatives of the proposed project in according to the applied methodology ACM0002 ver.12.2.0.	CAR02	OK
B.4.3 Has the baseline scenario been determined according to the methodology?	1.1,1.2 6.2	DR	Yes.  It is determined according to the methodology.	CAR02	OK
B.4.4 Has the baseline scenario been determined using conservative assumptions where possible?	1.1,1.2 4.5,4.6 4.7,4.8	DR	Yes.  According to the deduction from the available information, the assumptions are conservative.	CAR02	OK



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	6.2		Please refer to CAR02.		
B.4.5 Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	1.1,1.2 4.5,4.6 4.7,4.8	DR	Yes.  The relevant national and/or sectoral policies, macro-economic trends and political aspirations have been taken into account.  Please refer to CAR02.	CAR02	OK
B.4.6 Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	1.1,1.2 4.5,4.6 4.7,4.8 6.2	DR	Yes.  The baseline scenario has been determined in compliance with the data provided by Viet Nam DNA and IPCC 2006. It is compatible with the available data and all literature and sources are clearly referenced.  Please refer to CAR02.	CAR02	OK
<b>B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below that would have occurred in the absence of the registered CDM project activity (Additionality Assessment and Demonstration)</b>					
<i>The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.</i>					
<b>B.5.1 Methodology</b>					
B.5.1.1. Does the additionality justification follow the requirements of the applied methodology and/or methodological tools?	1.1,1.2 6.2	DR	According to ACM0002 ver.12.2.0, the additionality of the project activity shall be demonstrated and assessed using the latest version of the “Tool for demonstration and assessment of addtionality, <b>ver 05.2</b> “approved by the CDM EB, which is available on the UNFCCC CDM website. In PDD the” Tool for the Demonstration and Assessment of Additionality (ver.06.0.0)” was referred to which is the latest version.	OK	OK
<b>B.5.2 Prior consideration of the CDM</b>					
B.5.2.1. Is the project starting date	1.1,1.2	DR	Yes.	OK	OK



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reported in accordance with the CDM glossary of terms	4.5,4.6 4.7,4.8 4.10, 6.1,6.2	I	<p>Overview of key events and timeline of the CDM consideration was provided in Section B.5 to demonstrate that CDM incentive was seriously considered before the start of the project, besides the documented evidences were provided to support this.</p> <p>The start date of the proposed project activity is 14/01/2011, when the construction contract was signed.</p> <p>The validation team cross-checked related documents. The construction contract is the first contract of the project. Other major activities haven't been signed, including the signing of the equipment purchase contract and bank loan contract. So the construction contract is the earliest activity of either the implementation and construction or real action of the proposed project activity as per CDM glossary.</p>		
B.5.2.2. In case the project start date is prior to the date of publication of the PDD for global stakeholder consultation, was the incentive from the CDM seriously considered and are details given in the PDD?	1.1,1.2 4.35	DR	<p>It has been demonstrated that CDM was seriously and beforehand considered before the decision to go ahead with the project by the following activities in accordance with the "Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM" version 03 (hereinafter referred to as the CDM consideration guideline), Annex 13, EB 62 /6/.</p> <p>The start date of project activity is 14/01/2011, is before the date of GSP (20/05/2011).</p> <p>The starting date of the project activities is 14/01/2011 after 02/08/2008. The project participant had informed Vietnamese DNA in 14/08/2009 and the UNFCCC secretariat in 14/08/2009 of the commencement of the project activity and of their intention to seek CDM status. The UNFCCC secretariat</p>	GL04	OK



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			<p>was also informed in writing of the commencement of the project activity and of their intention to seek CDM status on 14/08/2009, which is valid in <a href="http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html">http://cdm.unfccc.int/Projects/PriorCDM/notifications/index_html</a>. This was within 6 months of the starting date and serious consideration of CDM in the decision to proceed with the project activity was confirmed. In addition, CDM was considered prior to the starting date in the TDR in 06/2010 /16/ and in a board meeting of project owner on 17/07/2010 /28/.</p> <p>The project started by global stakeholder consultation on 20/05/2011, which is about 4 months after the starting date. Hence, no gaps of more than two years between the starting date and the start of validation were identified and sufficient efforts to secure CDM status were confirmed.</p> <p>CL04</p> <p>Please provide the evidences to show that the Host Party DNA had been informed the prior consideration of CDM by PP.</p>		
B.5.2.3. How and when was the decision to proceed with the project taken?	1.1,1.2 4.13	DR	<p>The decision was made on the board meeting on 17/07/2010. The board decided to apply to CDM to proceed with the project after the Technical Design Report was completed. The board considered that the revenue from the CDM can help them to overcome the investment barriers. Without CDM revenues, the pre-tax project IRR of the proposed project in the Technical Design Report is 9.96%, lower than the benchmark at the time of decision making which is defined as the date of issuing the Investment Decision on implementing the investment project by the Management Board on 17 July</p>	OK	OK



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			2010.		
B.5.2.4. Is the project start date consistent with the available evidences?	1.1,1.2 4.10	DR	Yes.  The project start date is the date of the construction Contract signed, which is later than the CDM decision made on 17/07/2010.After the CDM decision, the project owner took a serious consequent action to implement the project, such as signing the ERPA with the project buyer and beginning the construction of the project, etc..	OK	OK
B.5.2.5. Have real and continual actions been taken during the implementation of the project?	1.1,1.2 4.10 4.11, 4.12,	DR	See comments above in B5.2.3 and B 5.2.4  CAR07  In Major milestones table, the Notifying the CDM project to the Viet Nam DNA is not included, please supplement it.	<del>CAR07</del>	OK
<b>B.5.3 Step 1:Identification of alternatives</b>					
B.5.3.1. Have all realistic alternatives been identified to the project?	1.1,1.2	DR	Yes.  A complete list of credible alternatives has been identified to the project activity in the PDD.  Please refer to CAR02	<del>CAR 02</del>	OK
B.5.3.2. Contains the list of alternatives at least the status-quo situation and the project not undertaken as a CDM project?	1.1,1.2	DR	Yes.  The alternatives contain the status-quo situation and the project not undertaken as a CDM project.  Refer to CAR02.	<del>CAR 02</del>	OK
B.5.3.3. Do all identified alternatives comply with applicable	1.1,1.2 6.2	DR	Yes.  All identified alternatives comply with applicable regulation.	<del>CAR02</del>	OK



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				Concl	Concl
regulation?			Refer to CAR02		
<b>B.5.4 Step 2 Investment analysis</b>					
B.5.4.1. Is an appropriate analysis method chosen for the project?	1.1,1.2 6.2	DR	Yes.  Since the proposed project will earn revenues from not only the CDM but also the electricity output, the simple cost analysis method is not appropriate. Investment comparative analysis method is only applicable to the case that alternative baseline scenario is similar to the proposed projects, so it is not applicable to the proposed project. Therefore, comparative analysis will be conducted to demonstrate the additionality of the proposed project.	OK	OK
B.5.4.2. Is a clear, viewable and unprotected Excel spreadsheet available for the investment calculation?	1.1,1.2 4.9,6.2	DR	The Excel Spreadsheet of the project finance indicators and IRR calculations is viewable and unprotected.  CAR03 The latest version of Guidelines on the assessment of investment analysis should be used.  CAR05 In IRR calculation spreadsheet, some input parameters, e.g. construction period, project lifetime, income tax, are not in consistent with TDR. So,  (1) Please demonstrate the rationality and validity of all of input parameters applied in the investment analysis and provide the relevant evidences.  (2) In the investment analysis spreadsheet, the lending rate of the “Assumption” table and “Loan rate” table is inconsistent.  (3) The evidence on the sources of the income tax is unclear in PDD, please	CAR03 CAR05	OK

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			further clarify it.		
B.5.4.3. Does the period chosen for the investment analysis reflect the technical lifetime of the project activity or in case a shorter period is chosen, is the fair value of the project activity's assets at the end of the investment analysis period (as a cash inflow)included?	1.1,1.2 2.1,2.3 4.17	DR I	Yes.  The operation period for IRR calculation is 40 years, which reflects the technical lifetime of project activity. And it is consistent with which was regulated for hydropower with capacity under and equivalent 30 MW at Decision No.2014/QD-BCN issued by Vietnam Industry of Ministry on 13 June 2007. It is appropriate.	OK	OK
B.5.4.4. Is the fair value calculated in accordance with local accounting regulations (where available) or international best practice?	1.1,1.2 2.1,2.3 4.15, 4.16 4.17 4.18	DR	Yes.  The fair values of the proposed project are in accordance with the Technical Design Report and Decision No. 206/2003/QD-BTC.	OK	OK
B.5.4.5. Are depreciation and other non-cash related items added back to net profits for the purpose to calculate the financial indicator?	1.1,1.2 2.1,2.3 4.17, 6.8	DR	The project participant applied local commercial lending rates as the benchmark. This is pre-tax benchmark therefore project IRR has been calculated pre-tax accordingly. So according to "Guidance on Assessment of Investment Analysis" (version 05), Annex 5, EB 62: " <i>Depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, should be added back to net profits for the purpose of calculating the financial indicator</i> "	CL05	OK



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			<p>(e.g. IRR, NPV). Taxation should only be included as an expense in the IRR/NPV calculation in cases where the benchmark or other financial indicator is intended for post-tax comparisons" and "...In cases where a post-tax benchmark is applied the DOE shall ensure that actual interest payable is taken into account in the calculation of income tax", the project cash flow is not need to considered depreciation and interest.</p> <p>CL05</p> <p>In investment analysis, project cash flow is not considered depreciation and residual value. Please clarify it.</p>		
B.5.4.6. Is taxation excluded in the investment analysis or is the benchmark intended for post-tax comparison?	1.1,1.2 2.1,2.3 4.18, 6.8	DR	The benchmark is intended for pre-tax comparison, therefore project IRR had been calculated pre-tax accordingly. This is stipulated in the applied regulation and assessed to be correct.	OK	OK
B.5.4.7. Were the input values used in the investment analysis valid and applicable at the time of the investment decision?	1.1,1.2 2.1,2.3 4.13, 4.15, 4.16 4.17 4.18	DR	<p>The input values used in the investment analysis are derived from the Technical Design Report. The finalization of the Technical Design Report and the investment decision were in the two months and therefore the input values are valid and applicable at the time of investment decision, and the validation team had checked the data in Table B.4 are correct.</p> <p>Please refer to CAR05.</p> <p>CL07</p> <p>The date of verification report of the TDR is Jan 2010, but the date of</p>	<del>CAR05</del> <del>CL07</del>	OK



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			Finalizing the TDR is Jun 2010, this is not reasonable. Please clarify it.		
B.5.4.8. In case of Project IRR, are the costs of financing expenditures (loan repayments and interests) included from the calculation of Project IRR?	1.1,1.2 2.1,2.3 4.9,6.8	DR	Yes. The costs of financing expenditures (loan repayments and interests) are included from the calculation of project IRR.	OK	OK
B.5.4.9. In case of Equity IRR: is the part of the investment costs, which is financed by equity considered as net cash outflow and is the part financed by debt excluded in net cash outflow?	1.1,1.2 2.1,2.3 4.9,6.8	DR	N/A The project does not apply equity IRR.	OK	OK
B.5.4.10. Is the type of benchmark chosen appropriate for the type of IRR calculated (e.g. local commercial lending rates or weighted average costs of capital for project IRR; required/expected returns on equity for equity IRR)	1.1,1.2 2.1,2.3 4.9,4.1 4, 6.8	DR	Yes. The project participant applies the local lending rates available at the time of making the investment decision as the benchmark. Weekly, the State Bank of Vietnam publishes a monetary report that provides the statistic data of the interest rates prevailing in the market during the reporting period. Such a report is published at the website of the State Bank weekly ( <a href="http://www.sbv.gov.vn/en/">www.sbv.gov.vn/en/</a> ).	OK	OK

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B.5.4.11. Is the benchmark value suitable for the project activity?	1.1,1.2 2.1,2.3 4.9,4.1 4, 6.8	DR	Yes.  The benchmark of the Nam Pong project is 13.60%. This benchmark is derived from the average long-term lending rates available from the beginning of 2010 up to the date of making the investment decision. It is suitable for the project activity.  CL06  (1) The description of Benchmark on Page 13 in PDD is different between the para.2 and para.3 of Sub-step 2b, please clarify it. And clarify the rationality of the benchmark applied and provide the valid evidences on the benchmark.  (2)The DOE carried out validation activity of ZaHung Hydropower Project in Page 18 of PDD is inconsistent with the provided evidence, please clarify it.	CL06	OK
B.5.4.12. In case of internal benchmark:  Is it ensured that the project cannot be developed by other developers than the PP?	1.1,1.2 2.1,2.3 4.9,4.1 4, 6.8	DR	Yes.  According to the project IRR of 9.96%, which is lower than the benchmark, the project didn't have financial attractive. so it can conclude that the project can't be developed by other developers than the PP.	OK	OK
B.5.4.13. Was the benchmark consistently used in the past for similar projects with similar risks?	1.1,1.2 2.1,2.3 4.9,4.1 4, 6.8	DR	Yes.  The benchmark is chosen from national published assessment code and was consistently used in similar projects assessment with similar risks.	OK	OK



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				Concl	Concl
B.5.4.14. Was sensitivity analysis appropriately assessed by the project participants? Please assess and determine under what conditions variations in the result would occur and likelihood of these conditions.	1.1,1.2 2.1,2.3 4.9, 4.14, 6.8	DR	The sensitivity analysis was assessed in the PDD. Four parameters are analyzed in the sensitivity analysis. And the elaboration was verified and found robust.  CL10  In selected financial parameters of sensitivity analysis, please clarify why the change of annual O&M cost is not considered.	CL10	OK
<b>B.5.5 Step 3:Barrier analysis</b>					
B.5.5.1. Are there any barriers given which have a clear and definable impact on the profitability of the project?	1.1,1.2 6.2	DR	N/A	OK	OK
B.5.5.2. How is it justified and evidenced that the barriers given in the PDD are real?	1.1,1.2 6.2	DR	N/A	OK	OK
B.5.5.3. How is it justified that one or a set of real barriers prevent(s) the implementation of the project activity?	1.1,1.2 6.2	DR	N/A	OK	OK
<b>B.5.6 Step 4 Common practice analysis</b>					
B.5.6.1. Is the defined region for the common practice analysis	1.1,1.2 6.2	DR	Yes.  Whole country is defined as the region for common practice analysis, which	OK	OK

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appropriate for the technology/industry type?			is appropriate for similar investment conditions and natural conditions etc.		
B.5.6.2. To what extent similar projects have been undertaken in the relevant region?	1.1,1.2 6.2	DR	Yes.  The PP analyzed the eight similar projects with installed capacity between 5MW and 50MW in Viet Nam. The essential distinctions are investing part. The argument is assessed to be appropriate and evident	OK	OK
B.5.6.3. In case similar projects are identified, are there any key differences between the proposed project and existing or ongoing projects and what kind of differences is observed?	1.1,1.2 4.19, 4.20 4.21 4.22 4.23	DR	Yes.  After comparing and elimination, only one similar project is identified, which was borrowed ODA soft-loan from India. The evidence was checked by the validation team to be valid. The key difference of the proposed project with the identified similar project is the availability of investment.	OK	OK
<b>B.6. Emission Reductions</b>  <i>It is assessed whether the ex-ante calculation of project emissions, baseline emissions, leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values (where applicable) is justified. Further calculation of emission reductions shall be assessed.</i>					
<b>B.6.1 Explanation of methodological choices</b>					
B.6.1.1. Are the equations applied correctly according to the applied approved methodology?	1.1,1.2 5.2	DR	The calculations are correctly applied according to ACM0002:  Step 1: Identify the relevant electric power system. The power to be generated from the Project will be delivered to the national grid, in addition, so it is considered as the relevant electric power system. The ex-ante	OK	OK



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			<p>calculation method with fixed emission factors (for OM and BM) is selected.</p> <p>Step 2: Choose whether to include off-grid power plants in the project electricity system (optional).</p> <p>Step 3: Select a method to determine the operating margin (OM). The share of the low-cost/must run resources in National Grid is less than 50%, therefore simple OM is used.</p> <p>Step 4: Calculate the operating margin emission factor according to the selected method. Option 3 is selected.</p> <p>Step 5: Calculate the build margin(BM) emission factor. The project uses the share of different type capacity in capacity addition as weight; the weighted average of emission factors of different type capacity is calculated as the BM emission factor.</p> <p>Step 6: Calculate the combined margin (CM) emission factor. The weight of <math>EF_{OM}</math> is 0.5 and the weight of <math>EF_{BM}</math> is 0.5 by default.</p> <p>The PDD refers to the Operating Margin (OM) Emission Factor and the Build Margin (BM) Emission Factor published by the Viet Nam DNA on 03/2010. The BM is 0.5064 tCO<sub>2</sub>e/MWh, the OM is 0.6465 tCO<sub>2</sub>e/MWh. And the CM is 0.5764 tCO<sub>2</sub>e/MWh.</p>		
B.6.1.2. In case the methodology allows for different methodology choices, are the equations applied properly justified and have they been	1.1,1.2 5.2	DR	<ol style="list-style-type: none"> <li>with a surface area of reservoir at reservoir full level of 0.32 km<sup>2</sup>, the power density of the project is 93.75 W/m<sup>2</sup>, greater than 10W/m<sup>2</sup>, so the project emission is 0 according to ACM0002 ver.12.2.0</li> <li>The baseline scenario has identified according to methodology ACM0002, no alternative for choice.</li> </ol>	OK	OK

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used reflecting the other methodological choices (i.e. baseline identification)?					
B.6.1.3. Have conservative assumptions been used when calculating the emission reduction?	1.1,1.2 5.2	DR	According to the methodology ACM0002 ver.12.2.0, the project emission is 0 as the power density is greater than 10W/m <sup>2</sup> , so it is conservative.	OK	OK
<b>B.6.2 Data and parameters that are available at validation</b>					
B.6.2.1. Is the list of parameters presented in Chapter B.6.2 considered to be complete and correct with regard to the requirements of the applied methodology?	1.1,1.2 5.2	DR	Yes. The list of parameters is complete in the PDD with regard to the requirements of the applied methodology.  CL08  The list of parameters presented in Section B6.2 is not considered to be complete and correct. Supplement and correction should be made.	CL08	OK
B.6.2.2. Is the choice of ex-ante or ex-post vintage of OM and BM factors clearly specified in the PDD?	1.1,1.2 3.1,3.3 5.2	DR	Yes. Ex-ante is clearly specified.	OK	OK
<b>B.6.3 Ex-ante calculation of emission reduction</b>					
B.6.3.1. Are the GHG calculations documented in a complete and transparent manner?	1.1,1.2 5.2	DR	Yes. Detailed descriptions are given and conservative IPCC values are adopted. Please refer to CL08	CL08	OK

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				<b>Concl</b>	<b>Concl</b>
B.6.3.2. Is the calculation of the operating margin and build margin emission factors documented electronically in a spreadsheet with the relevant information as defined per the “Tool for calculation of emission factor for electrical system”? Has this spreadsheet been submitted to the validation team?	1.1,1.2 5.2	DR	Yes.  The calculation electronically in a spreadsheet is provided to the DOE.	OK	OK
B.6.3.3. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	1.1,1.2 5.2	DR	Yes.	OK	OK
<b>B.6.4 Summary of the ex-ante estimation of emission reductions</b>					
B.6.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1.1,1.2 4.9,5.2	DR	As demonstrated in the PDD, the hydropower project will result in fewer GHG emissions than the baseline scenario.	OK	OK
B.6.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?	1.1,1.2 5.2	DR	Yes.  The table is complete. It includes emissions due to the project activity, baseline emissions, leakage emissions and the overall emission reductions.	OK	OK



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B.6.4.3. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	1.1,1.2 4.9,5.2	DR I	The ex-ante estimate of emission reductions due to the project is calculated for the first crediting period of 7 years starting with the expected start of crediting date on 01/07/2013.	OK	OK
B.6.4.4. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?	1.1,1.2 4.9	DR	It is consisting.	OK	OK
<b>B.7. Application of the monitoring methodology and description of the monitoring plan</b>					
<i>It is assessed whether the monitoring plan is appropriate for the project activity and in line with the applied methodology</i>					
<b>B.7.1 Data and parameters monitored</b>					
B.7.1.1. Is the list of parameters presented considered to be complete with regard to the requirement of the applied methodology?	1.1,1.2 5.2	DR	Yes.  All the following parameters are presented with regard to the requirement of the applied methodology ACM0002.  EG <sub>y,export</sub> :Electricity supplied by the proposed hydropower plant to the national grid;  EG <sub>y,import</sub> :Electricity supplied by the national grid to the proposed hydropower plant;  EG <sub>factivity,y</sub> :Net electricity supplied to the national grid by the proposed hydropower plant;  Cap <sub>PJ</sub> : Installed capacity of Nam Pong Hydropower project after the implementation of the project activity.	OK	OK



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			<p>A<sub>PJ</sub> : Area of the reservoir measured in the surface of water, after the implementation of the project activity, when the reservoir is full.</p> <p>The five data are required by the monitoring methodology ACM0002 and they have been included in the Monitoring Plan.</p>		
B.7.1.2. Are the means of monitoring of all parameters contained in the monitoring plan in accordance with the requirements of the applied methodology?(such as name of the data/parameter, data unit, description, source of data, measurement equipment, monitoring frequency, QA/QC procedures)	1.1,1.2 5.2	DR	<p>The information of all parameters contained in the monitoring plan, including label, data unit, description, source of data and QA/QC procedure etc are stated clearly and transparently.</p> <p>The description and other information provided for the monitoring parameters were reviewed by the validation team and deemed to be appropriate.</p>	OK	OK
<b>B.7.2 Description of the monitoring plan</b>					
B.7.2.1. Is the operational and management structure clearly described and in compliance with envisioned situation?	1.1,1.2 5.2	DR I	<p>Yes.</p> <p>The data recording method and the monitoring management structure, and emergency, calibration, QA/QC procedure etc. are clearly described in Section B7.2 and Annex 4.</p> <p>CAR04</p> <p>Please supplement the Layout of Power Transmission Lines from the</p>	CAR04	OK

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			Generation to the Grid with the Metering System.		
B.7.2.2. Are the responsibilities and institutional arrangements for data collection and archiving clearly provided?	1.1,1.2 5.2	DR I	Yes. The project owner is responsible for recording the data collection and archiving the data.	OK	OK
B.7.2.3. Does the monitoring plan provide current good monitoring practice?	1.1,1.2 5.2	DR I	Yes. The monitoring plan includes monitoring organization, monitoring equipment and program, data collection, calibration, data management and monitoring report.	OK	OK
B.7.2.4. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	1.1,1.2 5.2	DR I	Yes. All monitored data records are kept until 2 years after the end of the crediting period.	OK	OK
B.7.2.5. If applicable: Does annex 4 provide useful information enabling a better understanding envisioned monitoring provisions?	1.1,1.2 5.2	DR I	The parameters monitored are clearly described in Annex 4 for a better understanding of the envisioned monitoring plan.	OK	OK
<b>B.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)</b>					



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B.8.1	Is there any indication of a date when the baseline was determined?	1.1,1.2 5.2	DR	Yes. It is determined on 15/04/2011 in the PDD.	OK	OK
B.8.2	Is this consistent with the time line of the PDD history?	1.1,1.2 5.2	DR	Yes. It is consistent.	OK	OK
B.8.3	Is the information on the person(s)/entity (ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	1.1,1.2 5.2	DR	Yes.	OK	OK
B.8.4	Is information provided whether this person/entity is also considered a project participant?	1.1,1.2 5.2	DR I	This person/entity responsible for the application of the baseline and monitoring methodology is also considered a project participant	OK	OK
<b>C. Duration of the Project Activity/Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>						
<b>C.1. Duration of the project activity</b>						
C.1.1	Are the project's starting date and operational lifetime clearly defined and evidenced?	1.1,1.2 5.2	DR	The starting date of the proposed project activity is defined as the day on which the construction contract was signed; The definition of the starting date of the project was in line with the "Glossary of CDM terms" because it is the earliest date on which the owner committed to expenditures related to the	OK	OK



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			project activity.		
<b>C.2. Choice of the crediting period and related information</b>					
C.2.1 Is the assumed crediting period clearly defined and reasonable (renewable crediting period of Max 7 years with potential for 2 renewals or fixed crediting period of Max.10 years)?	1.1,1.2 5.2	DR	The renewable crediting period of 7*3 years is reasonable considering the life time of the project (40 years).	OK	OK
<b>D. Environmental Impacts</b>					
<i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the auditor.</i>					
<b>D.1. Documentation on the analysis of the environmental impacts, including Trans- boundary impacts</b>					
D.1.1 Has an analysis of the environmental impacts of the project activity been sufficiently described?	1.1,1.2 2.6,2.7	DR	Yes.  The environmental impacts of the project activity have been clearly described in Section D.1 of the PDD. The contracts of the compensation have been reviewed by the auditor. The ecological water flux has been revised according to the EIAs.	OK	OK
D.1.2 Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	1.1,1.2 2.6,2.7 4.33	DR	Yes.  The EIA is a must in Viet Nam for new hydropower projects. The EIA of the proposed project was approved by People Committee of Nghe An Province on 13/12/2007. The document has been reviewed by the auditor.	OK	OK





**CEC-6028C-B/3**

Nam Pong Hydropower Project

<b>CHECKLIST QUESTION</b> MoV=Means of Verification, DR=Document Review, I=Interview	<b>Ref.</b>	<b>MoV</b>	<b>comments</b>	<b>Draft Concl</b>	<b>Final Concl</b>
D.1.3 Will the project create any adverse environmental effects?	1.1,1.2 2.6,2.7	DR I	As described in the PDD, the project activity will have a little negative environmental impact.	OK	OK
D.1.4 Are Trans-boundary environmental impacts considered in the analysis?	1.1,1.2 2.6,2.7	DR I	There is no trans-boundary impact described in the EIA report or approval of EIA of the proposed project.	OK	OK
<b>D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party.</b>					
D.2.1 Have identified environmental impacts been addressed in the project design?	1.1,1.2 2.1,2.3 2.6,2.7	DR	Yes.	OK	OK
D.2.2 Does the project comply with environmental legislation in the host country?	1.1,1.2 2.6,2.7 4.33	DR	Yes.  The EIA was done and approved by the authorized organization.	OK	OK
<b>E. Stakeholder Comments</b>  <i>The auditor should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.</i>					
<b>E.1. Brief description how comments by local stakeholders have been invited and compiled</b>					
E.1.1 Have relevant local stakeholders been invited to consultation prior to the publication of the PDD?	1.1,1.2 2.6, 4.24 4.30 4.31	DR I	The stakeholders were consulted through questionnaires on 05/09/2007.  This is prior to the publication of the PDD.	OK	OK
E.1.2 Have appropriate media been	1.1,1.2	DR	The local residents were consulted by holding a meeting between the project	OK	OK



**CEC-6028C-B/3**

*Nam Pong Hydropower Project*

<b>CHECKLIST QUESTION</b> MoV=Means of Verification, DR=Document Review, I=Interview	<b>Ref.</b>	<b>MoV</b>	<b>comments</b>	<b>Draft Concl</b>	<b>Final Concl</b>
used to invite comments by local stakeholders?	2.6	I	owner and the representatives of the local people.		
E.1.3 If a stakeholder consultation process is required by regulation/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	2.6,2.7 4.33	DR I	The stakeholder consultation process is required in the EIA in Viet Nam. It has been carried out in accordance with the regulation	OK	OK
<b>E.2. Summary of the comments received</b>					
E.2.1 Is a summary of the stakeholder comments received provided?	1.1,1.2 2.6,2.7	DR I	Yes.  Confirmed by detailed documents. The process is described in a complete and transparent manner. The summary of the stakeholder comments received is provided in Section E.2 of PDD.  CL09  Please provide the evidences to illuminate the public opinion collected at the consultant meeting and due account was taken of any comments received both of EIA stage and CDM develop stage.	CL09	OK
<b>E.3. Report on how due account was taken of any comments received</b>					
E.3.1 Has due account been taken of any stakeholder comments received?	1.1,1.2 2.6,2.7	DR I	The overall comments with regards to the project were positive and the relevant stakeholders are satisfied with the compensations.	OK	OK



**Table 2 Resolution of Corrective Action and Clarification Requests**

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
<p>CAR01</p> <p>The Letter of Approval from the DNA of Switzerland has not been obtained, and the name of PO in the Letter of Approval from the DNA of Viet Nam is inconsistent with it in the investment license and PDD version 1.0.</p>	<p>The Letter of Approval (LoA) from the DNA of Switzerland will be submitted to the DOE before submitting to the EB for registration.</p> <p>The LoA from the DNA of Viet Nam was issued for Nam Pong Hydropower Project (Nam Pong HPP) with Project Owner is Ha Do Joint Stock Company (Ha Do JSC).</p> <p>However, The Nghe An Provincial People's Committee (Nghe An PPC) approved the transfer of the right to invest in the Nam Pong HPP from the Ha Do JSC to the ZaHung Joint Stock Company (ZaHung JSC) on 18 December 2008.</p> <p>DNA Vietnam will issue an official letter to endorse that ZaHung JSC is Project Participant of Nam Pong HPP. The document will be submitted to the DOE before submitting to the EB for registration.</p> <p>3<sup>rd</sup> response:</p> <p>The LoAs from the DNA of Viet Nam and Switzerland are submitted to the DOE.</p>	<p>Ok.</p> <p>The LoAs from the DNA of Viet Nam and Switzerland have been submitted by PP. The name of the Proposed Project and the PP are the same with them in PDD.</p> <p>CAR01 was closed.</p>



<p>CAR02</p> <p>In Sub-step 1a of section B.5, please supplement the alternatives of the proposed project in according to the applied methodology ACM0002 ver.12.2.0.</p>	<p>The supplement alternatives of the proposed project activity have been added in the revised PDD. Kindly find attached the revised PDD. <u>2<sup>nd</sup> response:</u></p> <p>The baseline scenario has been clarified in the revised PDD. The revised PDD is attached herewith.</p>	<p>Ok.</p> <p>The potential renewable power sources in Nghe An include Hydropower and wind power, but wind power plants will be built along the coast line or in the islands. The project location does not provide sufficient renewable resources except for the water resource. The supportive document in support of full out/considering the alternative scenarios 4 has been provided.</p> <p>So, CAR02 was closed out.</p>
<p>CAR03</p> <p>The latest version of Guidelines on the assessment of investment analysis, Tool to calculate the emission factor for an electricity system and Tool for the demonstration and assessment of additionality should be used.</p>	<p>The latest version of Guidelines on the assessment of investment analysis, Tool to calculate the emission factor for an electricity system, Tool for the demonstration and assessment of additionality and Methodology ACM0002 has been applied in the revised PDD.</p>	<p>Ok.</p> <p>The latest version of Guidelines on the assessment of investment analysis, Tool to calculate the emission factor for an electricity system, Tool for the demonstration and assessment of additionality and Methodology ACM0002 has been applied in the revised PDD.</p> <p>So, CAR 03 is closed out.</p>
<p>CAR04</p>	<p>The Layout of Power Transmission Lines from the Generation to the Grid with</p>	<p>Ok.</p>



Please supplement the Layout of Power Transmission Lines from the Generation to the Grid with the Metering System.	the Metering System has been added in the revised PDD.	The Layout of Power Transmission Lines from the Generation to the Grid with the Metering System has been applied in the revised PDD.  So, CAR 04 is closed out.
<p>CAR05</p> <p>In IRR calculation spreadsheet, some input parameters, e.g. construction period, project lifetime, income tax, etc. are not in consistent with TDR. So,</p> <p>(1) Please demonstrate the source, rationality and validity of all of input parameters applied in the investment analysis and provide the relevant evidences.</p> <p>(2) In the investment analysis spreadsheet, the lending rate of the</p>	<p>1. All input values for the investment analysis are referred from the Technical Design Report which was conducted by the third party contracted by the project owner and verified by another third engineering party therefore it is compliance with EB guidelines. Evidence for all input values of the investment analysis have been submitted to the DOE.</p> <p>Further demonstration of rationality and validity of all of input parameters applied in the investment analysis are as follows:</p> <p>Gross capacity, annual net electricity generation, total investment cost, investment schedule were calculated by the third party who designed Technical Design Report for this project.</p> <p>Lifetime for financial analysis was based on the maximum technical lifetime of equipments in the project activity according to "Tool to determine the remaining lifetime of equipment"/Version 01/ EB 50, Annex 15.</p> <p>Electricity price is calculated based on Decision No.73/QD-DTDL dated 30 December 2009 issued by the Ministry of Industry and Trade on "<i>Promulgation on Avoided Cost Tariff for 2010</i>"</p> <p>Resources tax was calculated according to the Circular No.45/2009/TT-BTC</p>	<p>Ok.</p> <p>1<sup>st</sup> conclusion:</p> <p>1. Please further clarify if there is the relevant description on the lifetime in TDR.</p> <p>2. The income tax used in investment analysis is not in consistent with the relevant request of Decree No.124.2008.ND-CP_Enterprise Income Tax.</p> <p>2<sup>nd</sup> conclusion:</p> <p>PP revised the project lifetime according to TDR; and clarified that 40 years lifetime is mentioned in the TDR that is maximum lifetime in the range from 20 to 40 years, which is regulated for hydropower with capacity under and equivalent 30 MW at Decision No.2014/QD-BCN issued by</p>



<p>“Assumption” table and “Loan rate” table is inconsistent.</p> <p>(3) The evidence on the sources of the income tax is unclear in PDD, please further clarify it.</p>	<p>was issued by Ministry of Finance on 11 March 2009, Decision No.588/QD-BTC was issued by Ministry of Finance on 22 March 2010 which are applicable at the time of making the investment decision.</p> <p>2. The lending rate of the “Assumption” table and “Loan rate” table has been corrected in the revised investment analysis spreadsheet.</p> <p>3. The project participant applied local commercial lending rates as the benchmark. This is pre-tax benchmark therefore project IRR has been calculated pre-tax accordingly. The income tax has been removed in the revised investment analysis spreadsheet.</p> <p><u>2<sup>nd</sup> response:</u></p> <p>1. The project lifetime of 40 years is mentioned in the TDR that is maximum lifetime in the range from 20 to 40 years, which was regulated for hydropower with capacity under and equivalent 30 MW at Decision No.2014/QD-BCN issued by Vietnam Industry of Ministry on 13 June 2007. In previous version of the PDD, the project participant applied the project lifetime of 37 year according “Tool to determine the remaining lifetime of equipment”/ Annex 15, EB50. However, in this version, the project participant has changed to apply the project lifetime of 40 years as indicated in the TDR that is conservative approach because the lifetime of 40 years is longer than depreciation period of 20 years as regulated by Vietnam Government. Full value of assets has been completely depreciated and no fair value remains. The supporting document, the revised PDD and spreadsheet are attached</p>	<p>Vietnam Industry of Ministry on 13 June 2007 and provided the relevant evidence. Through checked the Decision No.2014/QD-BCN issued by Vietnam Industry of Ministry on 13 June 2007, the validation confirmed it was correct.</p> <p>PP clarified this project applied local commercial lending rates as the benchmark. This is pre-tax benchmark therefore project IRR has been calculated pre-tax accordingly. The income tax is not included in the investment analysis spreadsheet. Confirmed it is complied with finance calculation methods.</p> <p>Please Clarify questions as following:</p> <p>(1) According to the “20111004_The response to the questions of the DOE”, the verification report did not aim at final TDR, so, the rationality and validity of all of input parameters applied in the investment analysis need to be further demonstrated.</p> <p>(2) Based on the provided Investment</p>
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	<p>herewith.</p> <p>2. ZaHung JSC is not newly established company for this project activity (established in November 2005) so ZaHung JSC is not exempted income tax according to Article 15, 16 of Decree No.124.2008.ND-CP_Enterprise Income Tax. The income tax rate of ZaHung JSC in the proposed project is 25%. However, the project participant applied local commercial lending rates as the benchmark. This is pre-tax benchmark therefore project IRR has been calculated pre-tax accordingly. The income tax is not included in the investment analysis spreadsheet.</p> <p>4<sup>th</sup> response:</p> <p>The investment procedures in Vietnam include major steps as follows (as regulated at Article 16/2/c of Government Decree No. 12/2009/ND-CP dated 12 Feb 2009:</p> <p>1. The project owner contracts an accredited third party to prepare the full Feasibility Study – FSR (BDR). This BDR will be submitted to the government (in this project case, it was submitted the Department of Industry and Trade (DOIT)) for validation and approval.</p> <p>2. After the BDR is approved, a full Technical Design Report (TDR) based on the approved BDR is prepared. There is no requirement as per law to validate and calibrate the contents of TDR since it is based on the approved BDR. There is also no requirement to submit to government authority for approval of</p>	<p>license and its Amendment, it is observed that the total investment cost is 588 billion VND. However, in the investment analysis of the proposed project, the applied total investment cost is 695.571billion VND. Please explain and clarify this inconsistency.</p> <p>Please further clarify the source of the project lifetime in Table 5 of PDD.</p> <p>4<sup>th</sup> conclusion:</p> <p>Through cross-checked the relevant evidences provided by PP, confirmed that all of these processed were complied with the requests of Government Decree No.12/2009/ND-CP on “Management of investment projects on the construction of works”.</p> <p>Comparing TDR with BDR, the most important indicators such as capacity, numbers of turbines, generators and main design are exactly the same. But the TDR was prepared after the BDR, then it was updated the latest standards, cost norms</p>
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	<p>the TDR. According to Decree No. 12/2009/ND-CP, a project owner has to take the responsibility to approve the TDR (Article 18) – see the quotation in CL02.</p> <p>3. After the TDR, the working-drawing designing steps will be conducted that also be approved by the project owner but no approval of the government is required.</p> <p>In the proposed project case, the project owner contracted a third party to prepare the TDR, which is based on the BDR approved by the government. This TDR was further verified by another accredited third party. After that, the final TDR is issued. Since the BDR is prepared in 2007 and the decision making time in 2010, the decision making has been relied on the TDR which is a more detailed and more updated than those made in the BDR.</p> <p>The TDR is prepared by a third party who is a national authority since they are the consultant accredited by the government that they have full competences and rights to prepare such reports. Hence, this TDR prepared by a national authority contracted by the project owner is fully in line with the EB regulation and the VVM.</p> <p>Furthermore, the data inputs for decision making meet the EB requirements because they are prepared by an accredited third party contracted by the project owner and most latest available information at the decision making time.</p> <p>(5) As explained above, the project owner has its own sovereign and liability to</p>	<p>available at the preparation time.</p> <p>Through cross-checked the input parameters of the BDR and TDR, confirmed the differences mentioned in 4<sup>th</sup> response (higher electricity output (1.8%) in TDR, higher investment cost (24.4%) and higher electricity price (18.9%)) were real and correct. The project IRR based on the input parameters of the BDR (9.74%) is slightly lower than the project IRR based on the values of most updated TDR (9.96%). The validation team considered the input parameters in TDR is more conservative and updated than those in BDR.</p> <p>The TDR was prepared by a third qualified party and verified by another third qualified party, then approved by PO. It is the obligation and sovereign of an independent power investor as regulated in Article 12/2 of the Government Decree No. 12/2009/ND-CP “<i>Investors shall themselves decide on investment in and take responsibility for Projects funded with capital</i></p>
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	<p>approve the TDR that is based on the FSR (BDR) approved by the government. The TDR is not a new design but in-depth technical details compared to the BDR. So the BDR serves as the basis and foundation for the TDR. The TDR is prepared after the BDR then it shall be updated the latest standards, cost norms available at the preparation time.</p> <p>The most important indicators such as capacity, numbers of turbines, generators and main design in the TDR are the same as those in the BDR. There are only slight differences among TDR and BDR, which include: higher electricity output (1.8%) in TDR, higher investment cost (24.4%) and higher electricity price (18.9%). The comparison between the input parameters of the BDR and TDR is attached herewith. The project IRR based on the input parameters of the BDR is slightly lower than the project IRR based on the values of most updated TDR.</p> <p>(6) Again, this TDR is based on the BDR that was already approved by the government but it is not a new design report independent from the BDR. The government does not approve the total investment that can be adjusted and updated by the investors as it is the obligation and sovereign of an independent power investor as regulated in Article 12/2 of the Government Decree No. 12/2009/ND-CP “<i>Investors shall themselves decide on investment in. and take responsibility for Projects funded with capital and other sources or mixed sources</i>”.</p> <p>In the investment license of this proposed project stated clearly “<i>The total <u>proposed</u> investment cost.</i>” (Article 4 of the investment license).</p>	<p><i>and other sources or mixed sources</i>”. The TDR has been approved by PO. The input parameters applied in investment analysis are rational.</p> <p>The total investment cost in this TDR is prepared and validated by national authorities who are accredited by the government. Therefore, it is fully in line with the EB rules and VVM.</p> <p>In TDR, the construction period is 30 months, but in GSP PDD and IRR calculation, PP applied it as 3 years. In revised PDD and IRR calculation sheet, PP revised it according to TDR. Through cross-checked the TDR and the Decision No.2014/QD-BCN, the validation team considered it was rational.</p> <p>So, CAR05 was closed out.</p>
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	<p>The total investment cost in this TDR is prepared and validated by national authorities who are accredited by the government. Therefore, it is fully in line with the EB rules and VVM.</p> <p>The sources for the decision making depend on their availability at that time. The TDR that is the in-depth report of the approved BDR provides the most updated input values at the decision making time (2010), while the BDR was made in 2007. Therefore the input parameters for investment analysis have been relied on the TDR which is the most updated at the decision making time. There are other projects relied on the TDRs in making the investment decision. Please refer to the registered projects:</p> <ul style="list-style-type: none"> <li>- An Diem 2 Hydropower Project –at <a href="http://cdm.unfccc.int/Projects/DB/DNV-CUK1249408838.42/view">http://cdm.unfccc.int/Projects/DB/DNV-CUK1249408838.42/view</a>.</li> <li>- Ban Coc Hydropower Project at <a href="http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1292294597.27/view">http://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1292294597.27/view</a></li> </ul> <p>The source of information TDR / BDR has no affect on the additionality of the project. The information as per TDR is a conservative for investment analysis as it results in higher IRR. Thereby any other project using TDR as source of information is technically and legally in line with the proposed project as the basic project design and output parameters do not change drastically, which is also a requirement as per the regulations.</p> <p>The accurate values of the construction period have been corrected in the revised PDD and spreadsheet. The PDD and spreadsheet are attached</p>	
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	<p>herewith.</p> <p>The project lifetime is sourced from the TDR that has been corrected in Table 5 of the revised PDD. The revised PDD is attached herewith.</p>	
<p>CAR 06</p> <p>Please provide the accurate value of the power density and construction period.</p>	<p>The accurate values of the power density and the construction period have been corrected in the revised PDD and spreadsheet. The PDD and spreadsheet are attached herewith.</p>	<p>PP provided the accurate value of the power density and construction period. Through checked it, the validation team considered it was correct.</p> <p>So, CAR06 was closed out.</p>
<p>CAR07</p> <p>In Major milestones table, the Notifying the CDM project to the Viet Nam DNA is not included, please supplement it.</p>	<p>Notifying the CDM project to the Viet Nam DNA has been added in the milestone table of the revised PDD. The revised PDD is attached herewith.</p>	<p>PP supplemented the milestone table.</p> <p>So, CAR07 was closed out.</p>
<p>CL01</p> <p>(1) The electricity generation in Approval of Basic Design Report and Investment License is different with it applied in PDD; it is 121.08 GWh and 123.29 GWh respectively. Please clarify it.</p>	<p>(1) According to Government Decree No.12/2009/ND-CP on “Management of investment projects on the construction of works”, the process to conduct an investment project is regulated as follows:</p> <ul style="list-style-type: none"> <li>– Making Basic Design Report (BDR) for the project, the BDR is designed at basic studying level. The purposed of BDR is applied for investment license which will be issued by the national authority. Approving Basic Design Report and issuing Investment License for the project by the national authorities. Making Technical Design Report (TDR) for the project. The TDR</li> </ul>	<p>Ok.</p> <p>The PP clarified that the BDR is designed at basic studying level, the electricity generation was calculated at the basic level to assess the potential electricity generation; however, the TDR is designed at a studying level with detailed, the electricity generation applied in the PDD is the value in the Technical Design Report which was</p>



<p>(2) Please clarify the method that the estimated net electricity supplied to the national grid is calculated and provide the evidences.</p>	<p>is designed at a studying level with detailed, standardized parameters that are based on the basic design report which was approved by national authorities. Making Building Drawing and construction.</p> <ul style="list-style-type: none"> <li>- The electricity generation in the Approval of Basic Design Report and Investment License is different with it applied in PDD because of the following reasons:</li> <li>- The electricity generation in the Approval of Basic Design Report and Investment License was calculated by Song Da Consulting Joint Stock Company at the basic level to assess the potential electricity generation.</li> <li>- The electricity generation applied in the PDD is the value in the Technical Design Report which was calculated by the other consultant - Power Engineering Consulting JSC 1 but verified by Song Da Consulting Joint Stock Company. Therefore, the TDR is at high accurate and the applied value in the PDD is most updated data.</li> </ul> <p>(2) The net electricity supplied to the national grid is calculated by the gross power generation subtracts 1% for parasitic and loss load. The gross electricity generated and parasitic and loss load were calculated by the third parties who prepared the BDR and TDR.</p> <p>Please refer supporting document no. 10.1. General Description_Volume 2.1, page 7 (or page 8-5).</p> <p>In addition, the parasitic and loss load value applied for the proposed project activity is suitable because it is in the range from 1% to 2% of other hydropower</p>	<p>calculated by the other consultant - Power Engineering Consulting Joint Stock Company 1 but verified by Song Da Consulting Joint Stock Company. Therefore, the TDR is at high accurate and the applied value in the PDD is most updated data.</p> <p>The net electricity supplied to the national grid is calculated by the gross power generation subtracts 1% for parasitic and loss load. The parasitic and loss load value applied for the proposed project activity is suitable because it is in the range from 1% to 2% of other hydropower plants in Vietnam which were registered to the CDM projects.</p> <p>Through check the relevant documents provided by PP, i.e. Basic Design Report (BDR) developed by Song Da Consulting Joint Stock Company, Technical Design Report (TDR) of the proposed project developed by Power Engineering Consulting Joint Stock Company 1, Verification Report of TDR issued by Song Da Consulting Joint Stock Company, Approval Report of TDR issued by the Board of ZaHung Joint Stock</p>
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	plants in Vietnam which were registered to the CDM projects. The statistic of parasitic and loss load for registered hydropower projects in Vietnam are attached herewith.	Company, the validation team considered it was reasonable and conservative.  So, CL01 is closed out. Detailed analysis refers to CAR05.
CL02  Please provide the evidences to clarify the approval procedure of the Technical Design Report.	<p>As explained above, there is no request to approve the Technical Design Report by the national authorities. The Technical Design Report of this project was conducted by the third party - Power Engineering Consulting Joint Stock Company 1 that has been verified by Song Da Consulting Joint Stock Company. After that the project owner approved TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on "Management of investment projects on the construction of works"/ Article 18/1.a.</p> <p>The evidences to clarify the approval procedure of the Technical Design Report are attached herewith.</p> <p>4<sup>th</sup> response:</p> <p>As explained above, there is no request by law to approve the Technical Design Report by the government. However, the TDR shall be based on the Feasibility Study Report (FSR or Basic Design Report – BDR) that has to be approved by the government. The TDR of this project was conducted by the third party contracted by the project owner - Power Engineering Consulting Joint Stock Company 1 who is accredited by the government for preparing and issuing such a technical design. Then the TDR has been verified by Song Da Consulting Joint Stock Company – another party accredited by the government.</p>	<p>Ok.</p> <p>1<sup>st</sup> conclusion:</p> <p>According to the section 10.2 of Ref. 03.201004_The second Explanation report.pfd:</p> <p>10.2. Proposal</p> <p>Technical design of Nam Pong Hydropower project in Nghe An province which is made by TDR Designing consultancy, meets the requirements of technical design period after being calibrated.</p> <p>However, Technical design document is legal basis for construction and operation; therefore it is need to be calibrating before being submitted to authorities for approving.</p> <p>So, we think it means that the TDR should be approved by authorities, but PO does not belong to authorities. Please further clarify it.</p> <p>4<sup>th</sup> conclusion:</p>



	<p>The accreditations by the government for the two national authorities are attached herewith. After that the project owner approved the TDR. The approval procedure of the TDR is in line with instructions in Government Decree No.12/2009/ND-CP on “Management of investment projects on the construction of works”/ Article 16/1.b which regulates that</p> <p><i>“b/ Technical design is made on the basis of the basic design under the approved investment project on the construction of works, which must indicate all technical specifications and ensure that to-be-used materials are conformable with applicable regulations and standards, as a basis for carrying out the working drawing designing step;”</i> (Article 16/1.b)</p> <p>and</p> <p><i>“Article 18. Evaluation and approval of technical designs and working drawing designs</i></p> <p><i>Article 18.1. Design evaluation and approval in case of three-step designing</i></p> <p><i>a/ For technical designs:</i></p> <p><i>Investors shall evaluate and approve technical designs. The evaluation and approval results must be recorded in writing, stating:</i></p> <ul style="list-style-type: none"> <li><i>- The technical design's conformity with the basic design;</i></li> <li><i>- The rationality of work structure solutions;</i></li> <li><i>- The observance of applicable construction regulations and standards;</i></li> <li><i>- Assessment of the work's safety;</i></li> <li><i>- The rationality of the selection of technological chains and equipment, for</i></li> </ul>	<p>PP detailed clarified the requests of law and regulation on the preparing and issuing of the TDR and provided the relevant evidences. According to the requests of Government Decree No.12/2009/ND-CP on “Management of investment projects on the construction of works”:</p> <p>1. A TDR can be conducted by investors themselves or consultants based on the Feasibility Study Report (FSR or Basic Design Report – BDR) that has to be approved by the government.</p> <p>The TDR of this project was conducted by the third party contracted by the project owner - Power Engineering Consulting Joint Stock Company 1 who is accredited by the government for preparing and issuing such a technical design based on the Basic Design Report – BDR that has to be approved by the NGHE AN PROVINCIAL PEOPLE'S COMMITTEE (ref. 230/SCN - QLDN) on 16/08/2007;</p> <p>2. The Technical Design Report is verified by</p>
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	<p><i>works subject to technological requirements;</i></p> <p>Furthermore, this Decree, Article 16.3. regulated that “3. <i>Investors shall make designs for the construction of works. If capable, investors may themselves make these designs, if incapable, they shall hire consultants to do so. Particularly for three-step designing, construction contractors that are fully capable as prescribed may make working drawing designs.</i>”</p> <p>TDRs can be prepared by a capable authority but there is not required to submit it for the validation/approval of the government, unless there is major change compared to the BDR, such as the capacity is higher the threshold or the location of the project. If any accident happens and/or under inspections the government notices that the project activity is not in line with the approved BDR, then a project owner shall take fully liabilities and the Investment License could be withdrawn any time.</p> <p>In this case, the TDR is based on the approved BDR then the validation of the TDR of this project is made by a third party – a national authority who is accredited by the government. Then it is approved/ accepted officially by the project owner. It is therefore in fully line with the approval procedures for a TDR regulated in the government Decree as detailed above and also the EB rule and VVM. For further detail, please see CAR05.</p>	<p>another qualified third party.</p> <p>This project was verified by Song Da Consulting Joint Stock Company.</p> <p>These two parties are accredited by the government and the accreditations by the government for the two national authorities are provided.</p> <p>3. Investors shall evaluate and approve technical designs. The evaluation and approval results must be recorded in writing (Article 18).</p> <p>The PO of this project approved the TDR according to the Decree.</p> <p>Through cross-checked the relevant evidences, confirmed that based on the verification report of the second party, the first party who was contracted to prepare the TDR has revised the TDR and issued the final TDR version. The project owner approves this TDR and makes the decisions based on this TDR. All of these processed were complied with the requests of Government Decree No.12/2009/ND-CP on</p>
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	The evidences to clarify the approval procedure of the Technical Design Report are attached herewith.	“Management of investment projects on the construction of works”. So, CL02 was closed out.
CL03 Please add the construction and commission status of the proposed project in PDD.	The proposed project is in the early state of construction. The construction schedule for the proposed project is attached herewith. The expected date of commission has been added in the PDD.	Ok. To this question, PP clarified it and supplemented the relevant description in revised PDD. Through cross-checked it with the information obtained from on-site visiting, the validation team considered it was valid. So, CL03 is closed out.
CL04 Please provide the evidences to show that the Host Party DNA had been informed the prior consideration of CDM by PP.	The evidences to show that the Host Party DNA had been informed the prior consideration of CDM by PP is attached here with. This information may be check by the accessing DNA's website as follows: <a href="http://www.noccop.org.vn/modules.php?name=Airvariable_Projects&amp;file=index&amp;opcase=viewprocat&amp;pro_cate_id=77&amp;menuid=96">http://www.noccop.org.vn/modules.php?name=Airvariable_Projects&amp;file=index&amp;opcase=viewprocat&amp;pro_cate_id=77&amp;menuid=96</a>	Ok. The validation checked the evidence (Vietnam DNA's website) and confirmed it is valid. So, CL04 is closed out.
CL05 In investment analysis, project cash flow is not considered depreciation,	The project participant has applied the project lifetime of 40 years as indicated in the TDR. This lifetime of 40 years is longer than the depreciation period of 20 years as regulated by Vietnam Government. Full value of assets has been completely depreciated and no fair value remains. So in investment analysis,	Ok. The PP clarified that the benchmark of the project is pre-tax benchmark, therefore project IRR had been calculated pre-tax





<p>residual value and interest. Please clarify it.</p>	<p>the fair value is no need to be considered according to “Guidance on Assessment of Investment Analysis” (version 05), Annex 5, EB 62: <i>“or - if a shorter period is chosen - include the fair value of the project activity assets at the end of the assessment period”</i></p> <p>The project participant applied local commercial lending rates as the benchmark. This is pre-tax benchmark therefore project IRR has been calculated pre-tax accordingly. So according to “Guidance on Assessment of Investment Analysis” (version 05), Annex 5, EB 62: <i>“Depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, should be added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV). Taxation should only be included as an expense in the IRR/NPV calculation in cases where the benchmark or other financial indicator is intended for post-tax comparisons”</i> and <i>“...In cases where a post-tax benchmark is applied the DOE shall ensure that actual interest payable is taken into account in the calculation of income tax”</i>, the project cash flow is not need to considered depreciation and interest.</p>	<p>accordingly. The project cash flow was not need to considered depreciation and interest. And lifetime of 40 years is longer than the depreciation period of 20 years as regulated by Vietnam Government. Full value of assets has been completely depreciated and no fair value remains. The fair values of the proposed project are in accordance with the Technical Design Report and Decision No. 206/2003/QD-BTC. These are complied with the relevant request in “Guidance on Assessment of Investment Analysis” (version 05), Annex 5, EB 62. The validation team considered it was rational and valid.</p> <p>So, CL05 was closed out.</p>
<p>CL06</p> <p>(1) The description of Benchmark on Page 13 in PDD is different between the para.2 and para.3 of</p>	<p>1. The benchmark of Nam Pong project is derived from the average long-term commercial lending rates available from the beginning of 2010 up to the date of making the investment decision. The description of Benchmark has been corrected in the revised PDD.</p>	<p>Ok.</p> <p>(1) PP corrected the parlance on the benchmark in the revised PDD. Through cross-checked the relevant document provided by PP, the validation team</p>



<p>Sub-step 2b, please clarify it. And clarify the rationality of the benchmark applied and provide the valid evidences on the benchmark.</p> <p>(2) The DOE carried out validation activity of ZaHung Hydropower Project in Page 18 of PDD is inconsistent with the provided evidence, please clarify it.</p>	<p><u>2<sup>nd</sup> response:</u></p> <p>The parlance on the benchmark has been corrected in the revised PDD. The revised PDD is attached herewith.</p> <p>The applied benchmark is consistent with “Guidelines on the assessment of investment analysis”/ Version 05, Annex 05, EB62, which states that “<i>Local commercial lending rates or weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR</i>”.</p> <p>2. The information mentioned in Page 18 has been corrected in the revised PDD that is consistent with the provided evidence.</p>	<p>considered it was reasonable.</p> <p>(2) The information mentioned in Page 18 has been corrected in the revised PDD that is consistent with the provided evidence.</p> <p>So, CL06 was closed out.</p>
<p>CL07</p> <p>The date of verification report of the TDR is Jan 2010, but the date of Finalizing the TDR is Jun 2010, this is not reasonable. Please clarify it.</p>	<p>The designing consultancy has to be based on the verification report of the TDR that is dated in Jan 2010 in order to complete the final TDR that is dated in Jun 2010. The final TDR was approved by Management Board of ZaHung Joint stock company.</p> <p>4<sup>th</sup>_response:</p> <p>As explained in CAR05 and CL02, the project owner contracted a third party to prepare the TDR, which is based on the BDR that was already approved by the government. The project owner then contracted another third accredited party to validate this TDR. Based on this validation result, the first party who was contracted to prepare the TDR has revised the TDR and issued the final TDR version. The validation report of the TDR was issued in Jan 2010. The first</p>	<p>Ok.</p> <p>1<sup>st</sup> conclusion:</p> <p>According to the “20111004_The response to the questions of the DOE”, that is not clear what the relation of the TDR and the verification report of the TDR is. Please clarify it.</p> <p>(2) In CAR05, the verification report is the basis of the rationality and validity of all of input parameters applied in the investment analysis. But when the TDR was verified by</p>



	<p>consultant then revised the TDR accordingly and issued the final version in Jun 2010. The project owner approves this TDR and makes the decisions based on this TDR as regulated by the Decree No. 12.2009. For further clarification on the validity of the input parameters, please refer to CL 02 and CAR 05.</p>	<p>another third engineering party, there wasn't TDR yet. So, it can't be the basis of the rationality and validity of all of input parameters applied in the investment analysis. Please clarify it.</p> <p>4<sup>th</sup> conclusion:</p> <p>PP clarified that the project owner contracted a third party to prepare the TDR, which is based on the BDR that was already approved by the government, and then contracted another third accredited party to validate this TDR. Based on this validation result, the first party who was contracted to prepare the TDR has revised the TDR and issued the final TDR version. So the date of verification report of the TDR was earlier than the date of Finalizing the TDR.</p> <p>Through cross-checked the relevant process documents of the verification report provided by PP, the information mentioned in No. 1350/CV-TVD1-D1 "on explaining comments of Board of Management of ZaHung JSC in the meeting of approving the Technical</p>
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		<p>design of Nam Pong hydropower project on 26/05/2010" showed that the Technical Design Report was composed by PEEC1 in November 2009, the final TDR was issued based on this validation result. The validation team considered it was valid.</p> <p>So, CL07 was closed out.</p>
<p>CL08</p> <p>The list of parameters presented in Section B6.2 is not considered to be complete and correct. Supplement and correction should be made.</p>	<p>The list of parameters presented in Section B.6.2 has been updated in the revised PDD. Kindly find the attached PDD.</p> <p><u>2<sup>nd</sup> response:</u></p> <p>The supplemented parameters in the calculation for emission factor are included in Annex 3 of the revised PDD. The spreadsheet of emission factor is attached herewith.</p> <p><u>3<sup>rd</sup> Response:</u></p> <p>The parameters in the calculation for emission factor were supplemented in Section B.6.2. Kindly find the attached PDD.</p>	<p>Ok.</p> <p>PP supplemented the list of parameters presented in Section B6.2 in PDD. Confirmed it is complete and correct.</p> <p>So, CL08 was closed out.</p>
<p>CL09</p> <p>Please provide the evidences to illuminate the public opinion collected at the consultant meeting and due account was taken of any</p>	<p>The consultations of relevant stakeholders for the EIA have been conducted according to the existing regulations. The public opinion includes the relevant national and local authorities, local people. The EIA report has been approved, which has already attached the public stakeholder opinions in the Annex. There is no regulation on achieving the documents during the consultation for the EIA; therefore the detailed documents of this consultation process are no longer</p>	<p>Ok.</p> <p>The PP provided the relevant laws and regulations. In these exiting laws and regulations of Vietnam, there aren't the requests on achieving the documents during the consultation for the EIA. And in EIA</p>



comments received both of EIA stage and CDM develop stage.	<p>kept by the project owner. the EIA report has been already approved by the authority that proved that the public consultation has been made properly according to the law</p> <p>The public consultation for CDM has been made via the meeting as instructed in the regulation of the DNA. The invitation letters to the meeting have been sent to the DOE. Please find them attached herewith. The Minutes of meeting has been made as instructed by the DNA, in which summarized the public opinions raised during the meeting already and the feedbacks from the project owner. The Minutes is attached herewith.</p>	<p>approved by the authority, the public consultation process and results had been described. Meanwhile, the relevant evidences on the public opinion collected at the consultant meeting have been provided. The validation team considered it was valid.</p> <p>So, CL09 is closed out.</p>
<p>CL10</p> <p>In selected financial parameters of sensitivity analysis, please clarify why the change of annual O&amp;M cost is not considered.</p>	<p>As guided in Annex 05 “Guidelines on the Assessment of Investment Analysis”/Version 05, EB 62, “<i>Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation (all parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude),...</i>”, O&amp;M cost of this project constitutes less than 20% of total project cost, so annual O&amp;M cost was not considered.</p> <p>Nonetheless, O&amp;M cost has been included in the sensitivity analysis in the revised PDD.</p>	<p>Ok.</p> <p>According to the request of the validation team, PP has supplemented the relevant analysis in revised PDD. Through checking the analysis and supporting evidences, the validation team considered it was correct.</p> <p>So, CL10 was closed out.</p>
<p>CL11</p> <p>Please ensure all of the links are valid.</p>	<p>All the links have been corrected in the revised PDD.</p>	<p>Ok.</p> <p>CL10 is closed out.</p>





## Appendix 2 Certificate of Competence

### XU Linghua

Qualification in accordance with CEC-4001C-B/5 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area(s): 1.2, 5.1, 11.1, 12.1, 13.1

Beijing, 25 Mar 2011

ZHANG Xiaodan

CDM Supervisor, Technical Director

ZHANG Ruizhi

Project Implementation Management Division

### WANG Yanping

Qualification in accordance with CEC-4001C-B/5 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area(s): 1.2, 15.1

Beijing, 25 Mar 2011

ZHANG Xiaodan

CDM Supervisor, Technical Director

XU Linghua

Quality Assurance Management Division



## HUANG Wenjing

Qualification in accordance with CEC-4001C-B/5 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Technical Expert: Yes

Industry Sector Expert for Technical Area (s): 1.2

Note: Mr. HUANG Wenjing, has the working experience of hydropower project in Viet Nam, and knows the relevant laws and regulations of Viet Nam which guarantee that the validation team meets the requirement of Para 45 of CDM Accreditation Standard for Operational Entities (ver.03.0) EB62 Annex 01.

Beijing, 28 Apr 2011

ZHANG Xiaodan

CDM Supervisor, Technical Director

XU Linghua

Quality Assurance Management Division

## ZHANG Jiajia

Qualification in accordance with CEC-4001C-B/5 *Operation Instruction for Personal Competence Assessment* for CDM

CDM trainee Auditor: Yes

Industry Sector Expert for Technical Area (s):

Beijing, 25 Mar 2011

ZHANG Xiaodan

CDM Supervisor, Technical Director

XU Linghua

Quality Assurance Management Division





## **YIN Yun**

Qualification in accordance with CEC-4001C-B/5 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area(s): 1.1, 1.2, 2.2, 3.1

Beijing, 25 Mar 2011

ZHANG Xiaodan



CDM Supervisor, Technical Director

XU Linghua



Quality Assurance Management Division

## **LIU Qingzhi**

Qualification in accordance with CEC-4001C-B/5 *Operation Instruction for Personal Competence Assessment* for CDM

CDM Auditor: Yes

Industry Sector Expert for Technical Area(s): 1.2, 5.1, 11.1, 12.1

Beijing, 25 Mar 2011

ZHANG Xiaodan



CDM Supervisor, Technical Director

XU Linghua



Quality Assurance Management Division