




**Validation report form for renewal of crediting period for
CDM project activities
(Version 03.0)**

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

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Title: Thac Xang Hydropower Project UNFCCC Ref No: 6439
Number and duration of the next crediting period	2 nd Crediting period Duration: 01/04/2020 to 31/03/2027
Version number of the validation report	2.1
Completion date of the validation report	26/04/2020
Version number of PDD to which this report applies	8.1 of 23/04/2020
Project participants	<ol style="list-style-type: none"> 1. Su Pan 1 Hydropower Joint Stock Company 2. Energy and Environment Consultancy Joint Stock Company 3. Nordic Environment Finance Corporation NEFCO in its capacity as Fund Manager to the NEFCO Carbon Fund (NeCF)
Host Party	Vietnam
Applied methodologies and standardized baselines	ACM0002 "Grid-connected electricity generation from renewable sources" - Version 20.0
Mandatory sectoral scopes	1 : Energy industries (renewable - / non-renewable sources)
Conditional sectoral scopes, if applicable	NA
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	69,921 tCO _{2e}
Name and UNFCCC reference number of the DOE	Carbon Check (India) Private Ltd. E-0052
Name, position and signature of the approver of the validation report	Vikash Kumar Singh, Compliance Officer 

SECTION A. Executive summary**>>Purpose and general description and location:**

The project intends to reduce greenhouse gas (GHG) emission by generating electricity from a hydro power plant connected to grid. In absence of the project activity, equivalent amount of electricity would have been generated in fossil fuel dominated grid. The project's installed capacity and estimated annual gross power generation is 20 MW and 76,350 MWh, respectively. The net electricity generated will be supplied to the national grid via a newly constructed transmission line. The project is located on Bac Giang river in Hung Viet commune, Trang Dinh district, Bac La commune, Van Lang district and Hong Phong commune, Binh Gia district, Lang Son province, Viet Nam.

Validation scope:

The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism. The scope of the validation is defined as an independent and objective review of the project design document, the validity of methodology used, the project's baseline study, estimated emission reductions and monitoring plan and other relevant documents. The information in these documents is reviewed against CDM VVS for Project Activities (version 02.0) /B03/, Kyoto Protocol requirements, CDM Executive Board/UNFCCC rules.

Validation process:

The validation has been performed as described in the CDM VVS for Project Activities (version 02.0) /B03/ and constitutes the following steps:

- Desk review of the registered PDD on the UNFCCC website
- Desk review of the revised PDD and the relevant documents
- Follow-up Interviews
- Issuance of Validation Report

The following CDM requirements have been considered:

- Article 12 of the Kyoto Protocol,
- Modalities and procedures for CDM (Marrakech Accords) Para 49(a)
- Subsequent decisions by the COP/MOP and CDM Executive Board
- Host country criteria (National and/or Sectoral policies)
- Criteria given to provide for consistent project operations, monitoring and reporting

Conclusion:

Energy and Environment Consultancy Joint Stock Company has commissioned Carbon Check (India) Private Ltd. (CCIPL) to carry out the validation (renewal of crediting period) of the project activity "Thac Xang Hydropower Project" in Vietnam, with regard to the relevant requirements for CDM activities. The project correctly applies the baseline and applicable monitoring methodology ACM0002: "Grid-connected electricity generation from renewable sources" (version 20.0) /B01/.

The project results in reductions of CO₂ equivalent emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is continued to be 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.

The monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is CCIPL's opinion that the project participants are able to monitor as per the monitoring plan.

The total emission reductions from the project are estimated to be 489,447 tCO₂e over a 7-year crediting period, averaging 69,921 tCO₂e annually. The emission reduction forecast has been

checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not alter.

During the course of validation, the DOE had raised two (2) clarifications and one (1) corrective action requests, all of which have been successfully resolved by the PP.

CC IPL concludes that the CDM Project Activity “Thac Xang Hydropower Project” in Vietnam, as described in the PDD /01/, meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakesh Accords) Para 49 (a) and the subsequent decisions by the COP/MOP and CDM Executive Board. The selected baseline and monitoring methodology (ACM0002, Version 20) /B01/ is applicable to the project and correctly applied. CC IPL therefore requests the approval of the renewal of the crediting period for the registered CDM project with UNFCCC.

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader, Validator and Technical Expert (TA 1.2) and	EI	Buragohain	Champok	CC IPL	√	X	√	√
2.	Local Expert	EI	Trang	Ngoc	CC IPL	√	X	√	√

B.2. Technical reviewer and approver of the validation report for RCP

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Agarwalla	Sanjay Kumar	CC IPL
2.	Approver	IR	Singh	Vikash Kumar	CC IPL

SECTION C. Means of validation

C.1. Desk/document review

>>The PDD, version 7.0 of 20/03/2020, version 8.0 of 16/04/2020 and version 8.1 of 23/04/2020 /01/, in particular the applicability of the methodology, the baseline determination, the additionality of the project activity, the starting date of the project, the monitoring plan, the emission reduction calculations provided in the form of a spreadsheet (Ref. 6439_Thac Xang_ER Calculation_Renewal of Crediting Period_Ver 1.0) of 20/03/2020 and version 2.0 (Ref. 6439_Thac Xang_ER Calculation_Renewal of Crediting Period_Ver 2.0) of 16/04/2020 /02/ were assessed as part of the validation.

Appendix 3 lists the documentation that was reviewed during the validation.

C.2. On-site inspection

Duration of on-site inspection: NA				
No.	Activity performed on-site	Site location	Date	Team member
1.	NA	NA	NA	NA

On site visit for this validation on renewal of crediting period is not done as per VVS paragraph 30 and 31 /**B03**/ as described below:

“30. It is mandatory for the DOE to conduct an on-site inspection at validation for the proposed CDM project activity if:

- a) Its estimated annual average of greenhouse gas (GHG) emission reductions or net anthropogenic GHG removals is more than 100,000 t CO₂ eq; or
- b) (There is pre-project information that is relevant to the requirements for registration of the project activity and may not be traceable after the registration.

“31. For cases that are not referred to in paragraph 30 above, it is optional for the DOE to conduct an on-site inspection at validation. If the DOE does not conduct an on-site inspection as a means of validation, it shall describe the alternative means used and justify that they are sufficient for the purpose of validation.”

On checking the revised and approved PDD /03/ and the updated PDD provided for renewal of crediting period /01/, it is confirmed that the proposed project is a green field project, there is no pre-project information before the project, and that the estimated annual average of greenhouse gas (GHG) emission reductions or net anthropogenic GHG removals of the project activity is less than 100,000 tCO₂e.

Hence, CCIPL has not conducted an on-site visit, which is in conformity with paragraphs 30 and 31 of CDM Validation and Verification Standard for project activities version 02.0 /**B03**/. In addition, CDM Executive Board’s decision to relax mandatory site visits by DOEs for a period of three months (23 March to 23 June 2020) because of COVID-19 was followed.

The alternative means used and justified for the purpose of validation are demonstrated as below:

The validation team has carried out telephonic interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for RCP. During the desk review, the relevant documents, including the revised and approved PDD /03/ and corresponding validation reports for the 1st crediting period, the previous periodic monitoring report and verification reports, the picture of nameplate of the main equipment, the picture of monitoring meters, the latest version of Power Purchase Agreement and other relevant background documents were provided and assessed. The project description in the PDD for the renewable crediting period has been verified from these documents. Validation team can confirm the project design, construction, operation and monitoring plan were not changed for 2nd crediting period. And the baseline scenario information also can be confirmed as it was defined by the applied methodology ACM002 version 20.0.

The validation report, the approved post registration change and previous verification reports were checked, comparing the relevant evidence and interview with the PP representative and operation staff through telephone, CCIPL has confirmed that the project is implemented in line with the PDD and the monitoring system is in line with the latest approved PDD and latest MR. There is no change of the project design, construction, operation and monitoring plan.

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Nguyen Tien	Hai	Energy and Environment Consultancy Joint Stock Company	08/04/2020	- Confirmation of technical specifications - Baseline scenario - Project boundary - Applicability of the methodology	Champok Buragohain & Ngoc Trang

					<ul style="list-style-type: none"> - Application of the methodology - Monitoring plan - Data management and reporting, QA/QC systems - Monitoring / measuring systems - Metering guidelines, Meter specifications – Accuracy, make - Calibration requirements – procedure, frequency/schedule 	
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C.4. Sampling approach

>> N/A

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	-	-
Application and selection of methodologies and standardized baselines		-	-
Validity of original baseline or its update	-	-	-
Estimated emission reductions or net anthropogenic removals	1		
Validity of monitoring plan	1	1	-
Crediting period	-	-	-
Project participants	-	-	-
Post-registration changes	-	-	-
Others (please specify)	-	-	-
Total	2	1	0

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	The updated PDD /01/ has been validated against the valid version of the applicable PDD form version 11 /B09/ and the instructions therein for filling out the PDD form.
Findings	NA
Conclusion	CCIPL confirms that the updated PDD /01/ is in compliance with the latest version of the PDD form (version 11) and the instructions therein for filling out the PDD form. CCIPL also confirms that the project participants have updated the relevant sections of the PDD in accordance with the relevant requirements in the Project Standard /B02/. CCIPL further confirms that the information transferred to the updated version of the PDD is materially the same as that in the revised and approved PDD /03/.

D.2. Application and selection of methodologies and standardized baselines

Means of validation	The PP has applied the methodology ACM0002 Version 20 /B01/. This version of the methodology is the latest version and currently valid for the submission of project activity. The proposed project activity meets the criteria defined in the
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baseline methodology as described below:	
Criteria	DOE assessment
<p>This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or I Involve a replacement of (an) existing plant(s)/unit(s).</p>	<p>The project activity is a greenfield hydro power plant connected to grid. Hence, meets the applicability condition.</p>
<p>The methodology is applicabl under the following conditions:</p> <ul style="list-style-type: none"> a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit 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, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity. 	<p>The project activity is installation of a new hydro power project with a new reservoir. This is consistent with revised and approved PDD /03/ and hence justifies the applicability condition.</p>
<p>In case of hydro power plants, one of the following conditions shall apply:</p> <ul style="list-style-type: none"> (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is 	<p>The project activity results in a new reservoir and the power density of the power plant is greater than 4 W/m². This is consistent with revised and approved PDD /03/ and hence applicability condition is justified.</p>

	<p>implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (3), is greater than 4 W/m² ; or</p> <p>I The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m² ; or</p> <p>(d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m² , all of the following conditions shall apply:</p> <p>(i) The power density calculated using the total installed capacity of the integrated project, as per equation (4), is greater than 4 W/m²;</p> <p>(ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity;</p> <p>(iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.</p>	
	<p>In the case of integrated hydro power projects, project proponent shall:</p> <p>(a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or</p> <p>(b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries</p>	<p>The hydro power plant is not a integrated power plant.</p>

	(if any), and rainfall for minimum five years prior to implementation of CDM project activity.	
	The methodology is not applicable to: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; (b) Biomass fired power plants/units.	Not applicable for the project activity as the project is a hydro power project.
	In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.	The project activity is a new hydro power plant and does not involve any retrofit, rehabilitation, replacement or capacity addition. Hence, not applicable for the project activity.
	The project activity correctly applied all applicable tools as referred by the methodology.	
Findings	N/A	
Conclusion	CCIPL hereby confirms that the selected baseline and monitoring methodology has been previously approved by the CDM Executive Board, and is applicable to the Project, which complies with all the applicability conditions therein and the selected version is valid at the time of submission of the proposed project activity for renewal of crediting period. It is also confirmed that the methodology is correctly applied by comparing it with the actual text of the applicable version of the methodology and there is no deviation from the selected methodology.	

D.3. Validity of original baseline or its update

Means of validation	<p>The project participant has included the assessment of the validity of the original baseline as per the tool “Assessment of the validity of the original/ current baseline and update of the baseline at the renewal of a crediting period”, Version 3.0.1 /B05/, which has been concluded to be still valid and applicable for the project</p> <p>The tool consists of two steps. The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period.</p> <p>Step 1: Assess the validity of the current baseline for the next crediting period</p> <p>Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies</p> <p>The project is a new hydro power plant connected to grid. In the absence of the project equivalent power would have been generated in the fossil fuel dominated grid. Therefore, baseline is the grid emission. Electricity Law No. 28/2004/QH11 dated on 03/12/2004 and Law No. 50/2010/QH12 on “Economical and Efficient use of energy” dated on 17/06/2010 are the main laws that govern the electricity sector in Viet Nam /B07/, /B08/. Their implementation is regulated under Government Decree No. 14/2014/ND-CP on “Stipulating in detail the implementation of electricity law regarding electricity safety” dated on 26/02/2014. The national policy does not mandate hydro power for electricity generation nor prohibit use of fossil fuel to generate electricity. Therefore, the baseline scenario is still valid as per the original PDD /03/.</p> <p>Step 1.2: Assess the impact of circumstances</p>
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The circumstances existing at the time of requesting renewal of crediting period are the same as existing in the validation of the project activity. The estimated baseline emissions using hydropower to supply renewable electricity to the Vietnam national grid that is currently dominated by fossil fuel power plants. The baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment. It could be observed that the emission factor of the Vietnam national grid applied for the 1st crediting period was 0.5558 tCO₂/MWh and updated to 0.92975 tCO₂/MWh as per latest Vietnam national electricity grid emission factor for 2018 /04/. The grid emission factor is calculated following steps as per tool 'Tool to calculate the emission factor for an electricity system' version 7.0 /B06/. DOE accessed the emission factor from publicly available source /B11/ and confirms that it meets the tool /B06/ requirements. It can be confirmed that most of the electricity is still generated by fossil fuel power plants. At the time of requesting renewal of the crediting period, the conditions used to determine the baseline scenario in the previous crediting period are still valid. New circumstances have not been observed which will harm the validity of the baseline scenario.

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.

In the absence of the project activity, the equivalent electricity would have generated in fossil fuel dominated grid. Therefore the baseline identified is the continuation of use of the current equipment(s) without any investment. An investment is not necessary before the end of the next crediting period (i.e. 31/03/2027) as it is realistic to consider that fossil fuel dominated grid will exceed the crediting period for which renewal is requested. The project has a life of 30 years from 15/09/2014 which will not end until the end of the second crediting period.

Step 1.4: Assessment of the validity of the data and parameter

"Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity".

Following data parameters are updated from revised and approved PDD /03/:

Data/Parameter	Value in PDD	Value in updated PDD	Assessment
Operating margin CO ₂ emission factor for grid connected power generation in year y ($EF_{grid,OM,y}$)	0.6240 tCO ₂ /MWh	0.8795 tCO ₂ /MWh	The updated emission factor is as per latest national grid emission factor data published on 12/03/2020 and hence correctly considered by PP for the second crediting period /04/.
Build margin CO ₂ emission factor for grid connected power generation in year y ($EF_{grid,BM,y}$)	0.4876 tCO ₂ /MWh	0.9465 tCO ₂ /MWh	The updated emission factor is as per latest national grid emission factor data published on 12/03/2020 and hence correctly considered by PP for the second crediting period /04/.

	<p>Combined margin CO₂ emission factor for grid connected power generation in year y ($EF_{grid,CM,y}$)</p>	<p>0.5558 tCO₂/MWh</p>	<p>0.92975 tCO₂/MWh</p>	<p>The combined margin is calculated considering 25% of OM and 75% of BM as per 'Tool to calculate the emission factor for an electricity system' /B06/. The data and calculation is correct and hence the updated value is accepted for the second crediting period.</p>
Findings	N/A			
Conclusion	<p>CCIPL concludes that the original baseline is valid and assessment is done as per methodological tool 'Tool for the assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period v3.0.1'. The assessment meets the requirements of paragraph 404 of VVS Standard version 02.0 /B03/.</p>			

D.4. Estimated emission reductions or net anthropogenic removals

<p>Means of validation</p>	<p>Baseline Emissions: In line with applied methodology ACM0002, version 20, baseline emissions are calculated as below:</p> $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$ <p>$EG_{PJ,y} = EG_{facility,y}$ is the quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr). This is to be calculated from monitoring parameters ($EG_{y,export}$, $EG_{y,import,110\text{ kV}}$ and $EG_{y,import,35\text{ kV}}$) as per monitoring plan given in section B.7.1 of the PDD and Appendix 5 of the PDD. For ex-ante estimation this is considered to be 75,205 MWh per year.</p> <p>Grid emission factor ($EF_{grid,CM,y}$) is calculated as per 'Tool to calculate the emission factor for an electricity system' version 07 /10/ considering latest national data and fixed to be 0.92975 tCO₂/MWh for the entire second crediting period.</p> <p>Accordingly baseline emission is estimated to be 69,921 tCO₂e per year.</p> <p>Project Emissions: In line with the applied methodology project emission applicable for the project activity is emissions from water reservoir of hydropower plants ($PE_{HP,y}$): For hydropower project activity that results in new single or multiple reservoirs and/or the increase of single or multiple existing reservoirs, the power density (PD) of the project activity shall be calculated as follows:</p>
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$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

- PD** = Power density of the project activity (W/m²)
- Cap_{PJ}** = Installed capacity of the hydro power plant after the implementation of the project activity (W)
- Cap_{BL}** = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero
- A_{PJ}** = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m²)
- A_{BL}** = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m²). For new reservoirs, this value is zero

If the power density of the project activity is greater than 4 W/m² and less than or equal to 10 W/m², project emissions to be calculated as below:

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

Where:

- PE_{HP,y}** = Project emissions from water reservoirs (t CO₂e/yr)
- EF_{Res}** = Default emission factor for emissions from reservoirs of hydro power plants (kg CO₂e/MWh)
- TEG_y** = Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (MWh)

If the power density of the project activity is greater than 10 W/m²,
 $PE_{HP,y} = 0$

Area of the reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m²)-'A_{PJ}' to be monitored once at the beginning of the crediting period. As per survey report by third party on 14/04/2020 the area of the reservoirs is 1,800,000 m² /13/.

Installed capacity of the hydro power plant after the implementation of the project activity (W) 'Cap_{PJ}' to be monitored at the beginning of each crediting period. There is no change in the capacity of the project from first crediting period and hence the value of 20,000,000 W is applicable for second crediting period as well.

Therefore, PD is 11.11 W/m² and hence $PE_{HP,y} = 0$.

Leakage emissions:

As per the applied methodology ACM0002, version 20.0, leakage emission is zero.

Therefore, ex-ante emission reduction from the project activity is 69,921 tCO₂e per year.

Findings	CL 1 was raised to clarify the measurement date of area of the reservoir which PP clarified and provided correct document and hence CL is closed.
Conclusion	CC IPL confirms, the PDD correctly lists assumption and data used by the PP for estimating emission reduction including their references and sources. Source of data and assumptions are correctly quoted and interpreted in the PDD.

	<p>All values used in the PDD are considered reasonable in the context of the proposed CDM project activity.</p> <p>The baseline methodology and corresponding tools have been correctly applied to calculate project, baseline and leakage emissions, and emission reductions.</p> <p>All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.</p>
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D.5. Validity of monitoring plan

Means of validation	The monitoring plan in the PDD has been updated to comply with the latest applicable version of the monitoring methodology (ACM0002 ver.20.0).		
	Parameter	Description	Means of validation
	EG _{y,export} (MWh/year)	Electricity supplied by the proposed hydropower plant to the national grid	To be monitored using energy meter continuously and recorded monthly. Recorded value to be cross checked with invoices raised. Energy meters to be calibrated at least every three years /14/. It is noted that calibration frequency of energy meters were atleast once in two years during first crediting period as per national standard (Minister of Scientific, Technology and Environment). The updated national standard from Minister of Scientific, Technology and Environment require calibration of energy meters at least once in three years /14/. Hence calibration frequency during the second crediting period is accepted. The monitoring of the parameter is as per applied methodology /B01/.
	EG _{y,import,110 kV} (MWh/year)	Electricity imported from 110 kV national grid to the hydropower plant	To be monitored using energy meter continuously and recorded monthly. Recorded value to be cross checked with invoices raised. Energy meters to be calibrated at least every three years /14/. It is noted that calibration frequency of energy meters were atleast once in two years during first crediting period as per national standard (Minister of Scientific, Technology and Environment). The updated national standard from Minister of Scientific, Technology and Environment require calibration of energy meters at least once in three years /14/. Hence calibration frequency during the second crediting period is accepted. The monitoring of the parameter is as per applied methodology /B01/.
EG _{y,import,35 kV} (MWh/year)	Electricity imported from 35 kV national grid (for backup purpose in case of 110 kV grid is failure) to the	To be monitored using energy meter continuously and recorded monthly. Recorded value to be cross checked with invoices	

		hydropower plant	raised. Energy meters to be calibrated at least every three years /14/. It is noted that calibration frequency of energy meters were atleast once in two years during first crediting period as per national standard (Minister of Scientific, Technology and Environment). The updated national standard from Minister of Scientific, Technology and Environment require calibration of energy meters at least once in three years /14/. Hence calibration frequency during the second crediting period is accepted. The monitoring of the parameter is as per applied methodology /B01/.
	$EG_{\text{facility},y}$ (MWh/year)	Net electricity supplied by the proposed hydropower plant in year y	Calculated as difference of $EG_{y,\text{export}}$ and $EG_{y,\text{import}, 110\text{kV}}$ and $EG_{y,\text{import},35\text{kV}}$ ($EG_{y,\text{export}} - EG_{y,\text{import}, 110\text{kV}} - EG_{y,\text{import},35\text{kV}}$)
	A_{PJ} (m ²)	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full.	This value to be monitored once at the beginning of the crediting period. The measurement is done on 25/07/2018 and on 14/04/2020. The second crediting period start from 01/04/2020 and hence the measured value of 1,800,000 m ² is applicable for the entire second crediting period.
	Cap_{PJ} (W)	Installed capacity of the hydro power plant after the implementation of the project activity	The installed capacity as per commissioning reports is 20,000,000 W /08/,/09/,/11/ which is still same at the beginning of the second crediting period as seen during site visit.
Findings	CL 1 was raised to calrify the measurement date of area of the reservoir which PP clarified and provided correct document and hence CL is closed. CAR 01 was raised to calrify the calibration frequency of energy meters and inconsistency of A_{PJ} value in PDD which PP has corrected in the updated PDD and hence CAR is closed.		
Conclusion	CCIPL confirms that the monitoring plan included in the updated PDD is valid as per the applied methodology and conforms the revised and approved PDD /03/.		

D.6. Crediting period

Means of validation	In accordance to paragraph 270 of the PCP for project activity version 02 /B04/, the new crediting period shall start on the day immediately after the expiration of the current crediting period regardless of the date when the crediting period is deemed renewed. The current crediting period expired on 31/03/2020 and therefore the new crediting period starts from 01/04/2020. The hydro plant commissioned on 15/09/2014 /05/ and with expected operational lifetime of 30 years /03/ the technical life of the project ends on 14/09/2044, whereas the second crediting period ends on 31/03/2027. Therefore, the project is expected to be operational during the second crediting period.
Findings	NA
Conclusion	CCIPL confirms that the second period was correctly and clearly defined as from 01/04/2020 to 31/03/2027 as per CDM project cycle procedure.

D.7. Project participants

Means of validation	CCIPL confirm the list of project participants from the review of project view page at UNFCCC website for the activity (UNFCCC Ref: 6439) /B10/. CCIPL also reviewed the letter of approval (Ref. No.30/2012/DMHCC-BCD) dated: 22/03/2012 issued from the DNA of Vietnam and approval from Govt. of Sweden (Reference: 880-12-3063) dated 14/05/2012 and the latest MoC dated: 01/03/2013 to confirm the name of the project participants.
Findings	N/A
Conclusion	CCIPL confirms that the project participants of the proposed CDM project activity is listed in the updated PDD and this information is consistent with the information provided in the section that contains the contact information for project participants.

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents ¹	N	-	-
Corrections	N	-	-
Change to the start date of the crediting period	N	-	-
Inclusion of a monitoring plan	N	-	-
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N	-	-
Changes to the project design	N	-	-
Changes specific to afforestation and reforestation project activities	N	-	-

SECTION E. Internal quality control

>>The final validation report has undergone a technical review and quality reviewer before being submitted to the project participant(s) and UNFCCC Executive Board. A technical reviewer qualified in accordance with CCIPL's qualification scheme for CDM validation and verification has performed the technical review.

SECTION F. Validation opinion

>> Carbon Check (India) Private Limited (CCIPL) has performed an assessment of the request for renewal of the crediting period of CDM project activity "Thac Xang Hydropower Project" (UNFCCC Ref. No.: 6439). The assessment was performed in accordance with the "CDM Validation and Verification Standard for Project Activities (version 02.0) /B03/ and included an assessment of:

- The impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant EB guidance with regard to renewal of the crediting period at the time of requesting renewal of crediting period;
- The correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period.

The review of the project design documentation and the subsequent follow-up interviews have been taken by CCIPL with sufficient evidences to determine the validity of the original baseline and/or its update through an assessment. The project correctly applies the baseline and monitoring methodologies ACM0002 "Grid-connected electricity generation from renewable sources" (version 20) /B03/.

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

The total emission reductions from the project are estimated to be 489,447 tCO_{2e} over a 7-year crediting period, averaging 69,921 tCO_{2e} annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not alter.

The monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is CCIPL's opinion that the project participant is able to implement the monitoring plan.

In summary, it is CCIPL's opinion that the CDM project activity (UNFCCC Ref. No.: 6439) "Thac Xang Hydropower Project" as describe in the PDD /01/ (version 8.1; Dated: 23/04/2020) meets all relevant UNFCCC requirements for the renewal of the crediting period. Hence CCIPL requests the renewal of the crediting period of the project.

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH ₄	Methane
CL	Clarification Request
COD	Chemical Oxygen Demand
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EF	Emission Factor
EIA	Environmental Impact Assessment
EECJSC	Energy and Environment Consultancy Joint Stock Company
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
kW	Kilo Watt
LoA	Letter of Approval
MoC	Modalities of Communication
MoV	Means of Verification
MR	Monitoring Report
ODA	Official Development Assistance
PDD	Project Design Document
PE	Project Emission
PP(s)	Project Participant(s)
RCP	Renewal of crediting period
Ref.	Document Reference
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers



Carbon Check (India) Private Ltd. Champok Buragohain

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator Team Leader Technical reviewer
 Verifier Technical Expert Local Expert¹

In the following Technical Areas:

TA 1.1 TA 3.1 TA 5.2 TA 9.2 TA 13.2
 TA 1.2 TA 4.1 TA 8.1 TA 10.1 TA 14.1
 TA 2.1 TA 5.1 TA 9.1 TA 13.1

Mr. Vikash Kumar Singh
Compliance Officer

Date of Approval
24/12/2019

Mr. Amit Anand
CEO

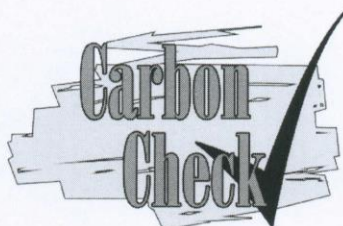
Valid Till
23/12/2020

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2017	Annual Revision
24/12/2017	Annual Revision
24/12/2018	Annual Revision
24/12/2019	Annual Revision

¹ India

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 e-mail: info@carboncheck.co.in



Carbon Check (India) Private Ltd.

NGUYEN, HONG NGOC TRANG

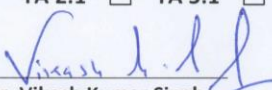
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator Team Leader Technical reviewer
 Verifier Technical Expert Local Expert¹

In the following Technical Areas:

TA 1.1 TA 3.1 TA 5.2 TA 9.2 TA 13.2
 TA 1.2 TA 4.1 TA 8.1 TA 10.1 TA 14.1
 TA 2.1 TA 5.1 TA 9.1 TA 13.1


 Mr. Vikash Kumar Singh
 Compliance Officer


 Mr. Amit Anand
 CEO

Date of Approval
 24/12/2019

Valid Till
 23/12/2020

Revision History of the Document

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24/12/2019	Annual Revision

¹ Brazil

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 e-mail: info@carboncheck.co.in



Carbon Check (India) Private Ltd.

Sanjay Agarwalla

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator Team Leader Technical reviewer
 Verifier Technical Expert Local Expert¹

In the following Technical Areas:

TA 1.1 TA 3.1 TA 5.2 TA 9.2 TA 13.2
 TA 1.2 TA 4.1 TA 8.1 TA 10.1 TA 14.1
 TA 2.1 TA 5.1 TA 9.1 TA 13.1

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

Date of Approval
24/12/2019

Valid Till
24/12/2020

Revision History of the Document

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¹ India

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 e-mail: info@carboncheck.co.in

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
/01/	EECJSC	Updated Project design document form for the project activity “Thac Xang Hydropower Project” in Vietnam	Version 7.0 of 20/03/2020; version 8.0 of 16/04/2020; version 8.1 of 23/04/2020	PP
/02/	EECJSC	Emission reduction worksheet ‘Ref. 6439_Thac Xang_ER Calculation_Renewal of Crediting Period_Ver 1.0’	Version 01 of 20/03/2020 and version 2.0 of 16/04/2020	PP
/03/	EECJSC	Revised and approved PDD for the project “Thac Xang Hydropower Project” in Vietnam	Version 6.0 of 12/08/2016 (https://cdm.unfccc.int/UsrManagement/FileStorage/W0495ULXGI2FKZ16QVH8DMNPO3JSYC)	Others
/04/	Ministry of Natural Resources and Environment	Vietnam national electricity grid emission factor for 2018	No: 263/BDKH-TTBVTOD, 12/03/2020	PP
/05/	TUV Nord	Verification/certification report for ‘Thac Xang Hydropower Project’ covering monitoring report from 01/03/2018 to 28/02/2019	Version 1.0 of 16/05/2019 (https://cdm.unfccc.int/Projects/DB/JCI1339819821.64/iProcess/RWTUV1554370909.95/view)	Others
/06/	Administrator Investment and planning department, Ha Noi City	Business Registration Certificate to Su Pan 1 Hydropower Joint Stock Company	Registered on 17/12/2009	PP
/07/	Su Pan 1 Hydropower Joint Stock Company and Electricity of Vietnam	Power Purchase Agreement between Su Pan 1 Hydropower Joint Stock Company and Electricity of Vietnam with 20 years validity from commercial operation date	Dated 01/02/2014	PP
/08/	Electricity Regulatory Authority of Viet Nam	Electricity generation license to Su Pan 1 Hydropower Joint Stock Company	Dated 04/03/2015	PP
/09/	Thac Xang(Bac Giang2) Hydropower	Technical specification of turbines and Generators	-	PP
/10/	EECJSC	Photographs of Turbines and Generator with nameplate	Photographs submitted on 24/03/2020	PP
/11/	EECJSC	Layout of the project	No.125C-09-01	PP
/12/	EECJSC	Single line diagram with metering arrangement	Dated 25/12/2013	PP
/13/	HECC Construction Technology and hydroelectric consulting corporation	Report on reservoir surface area of Thac Xang Hydropower Project	Survey report dated 25/07/2018 and on 14/04/2020	PP
/14/	Directorate for Standards, Metrology and Quality under Ministry of Science and Technology of the Socialist Republic of Viet Nam	Power meters – Verification/calibration procedure	Decision No. 2739/QD-TDC	PP
/B01/	UNFCCC	ACM0002: Grid-connected	Version 20	Others

		electricity generation from renewable sources		
/B02/	UNFCCC	Standard: CDM project standard for project activities	Version 02 of 29/11/2018	Others
/B03/	UNFCCC	Standard: CDM Validation and Verification standard for project activities	Version 02 of 29/11/2018	Others
/B04/	UNFCCC	CDM project cycle procedure for project activities	Version 02 of 29/11/2018	Others
/B05/	UNFCCC	Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period	Version 3.0.1, EB 66 annex 47	Others
/B06/	UNFCCC	Tool07: Tool to calculate the emission factor for an electricity system	Version 07.0 of 31/08/2018	Others
/B07/	Socialist Republic of Vietnam	Electricity Law	No. 28/2004/QH11	Others
/B08/	Socialist Republic of Vietnam	Law on Economical and Efficient use of energy	Law No. 50/2010/QH12	Others
/B09/	UNFCCC	Project Design Document Form (CDM-PDD-FORM)	Version 11 of 31/05/2019	Others
/B10/	UNFCCC	Project 6439 : Thac Xang Hydropower Project	https://cdm.unfccc.int/Projects/DB/JCI1339819821.64/view	Others
/B11/	Department of Climate Change - Ministry of Natural Resources and Environment	Emission factor of Vietnam's electricity grid in 2018	http://www.dcc.gov.vn/tin-tuc/3620/He-so-phat-thai-cua-luoi-dien-Viet-Nam-nam-2018.html	Others

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

CL ID	01	Section no.	D.4	Date: 09/04/2020
Description of CL				
<i>PP is requested to clarify how the value of 1,800,000 m2 for 'A_{PJ}' is determined in line with methodology requirement 'to be monitored at the beginning of each crediting period' as the measurement was taken on 25/07/2018</i>				
Project participant response				Date: 17/04/2020
<i>The reservoir's surface area "APJ" was measured annually by the authorized third party during the first crediting period and it has also been measured at the beginning of the second crediting period of the project activity. The latest measurement was conducted on 14/04/2020. The report on reservoir surface area (2020) is attached herewith</i>				
Documentation provided by project participant				
<i>Report on reservoir surface area measurement in 2020.</i>				
DOE assessment				Date: 20/04/2020
<i>Third party report prepared by HECC Construction Technology and hydroelectric consulting corporation dated 25/07/2018 and 14/04/2020 are reviewed by the validation team and confirms the value to be correct. The survey is done start of the second crediting period which meets the methodology requirement. Hence, CL is closed.</i>				

CL ID	02	Section no.	B.7.1	Date: 09/04/2020
Description of CL				

As per Appendix 5 of the PDD, energy meters involved in the project are CT110-1, CT110-2, CT110-3, M and TE 1 and TE 2. Parameters to be monitored are $EG_{y,export}$ and $EG_{y,import}$. PP is requested to clarify which meters are linked to which parameters and whether calibration shall cover all meters?	
Project participant response	Date: 17/04/2020
<p>The information has been clarified in the revised PDD.</p> <p>$EG_{y,export}$ and $EG_{y,import}$, 110kV are determined based the main power meter CT110-1. In case CT110-1 is failure, it will be determined based on the first backup meter CT110-2. If both CT110-1 and CT110-2 are failure, the second backup meter CT110-3 will be used to determine $EG_{y,export}$ and $EG_{y,import}$, 110kV</p> <p>TE1 and TE2 are installed at the output of generator to measure total electricity generated by each generator (TEG_y). The power density of the project activity is higher than 10 W/m² so no need to monitor TEG_y and TE1, TE2.</p> <p>M is installed at the 35 kV backup transmission line to measure the electricity imported from the 35 kV line in case of the 110 kV line is failure</p>	
Documentation provided by project participant	
The revised PDD	
DOE assessment	Date: 20/04/2020
The monitoring arrangement with flow diagram is clearly explained in Appendix 5 of the PDD. Calibration procedure is described in section B.7.1 of the PDD and Appendix 5 of the PDD. Explanation is consistent with actual monitoring arrangement which is checked from last verification and monitoring reports and hence CAR is closed.	

Table 2. CAR from this validation

CAR ID	01	Section no.	D.5	Date: 09/04/2020
Description of CAR				
<ol style="list-style-type: none"> PP is requested to clarify the basis of considering calibration frequency every two years for energy meters. A_{PJ}, value in section B.6.3 is 1,800,000 m² whereas in section B.7.1 it is 2,500,000 m². Please clarify the reason for different value. Page 27 of the PDD (section B.7.3) refers Annex 5 which is not available in the PDD. 				
Project participant response				Date: 17/04/2020
<ol style="list-style-type: none"> The basis of calibration frequency has been updated in the revised PDD. According to Decision No. 2739/QD-TDC on “promulgating metrological technical standard of Viet Nam” issued by Directorate for Standards, Metrology and Quality under Ministry of Science and Technology of the Socialist Republic of Viet Nam on 23/12/2019, Article 2, the metrology standard – DLVN 39:2019 takes effect from 01/01/2020. Paragraph 8.3, DLVN 39:2019 – “Power meters – Verification/calibration procedure”, the calibration frequency of three phases power meter is every 3 years. It was a typo mistake. The value has been corrected to 1,800,000 m² in the revised PDD. The reference has been corrected to Appendix 5 				
Documentation provided by project participant				
Decision No. 2739/QD-TDC on “promulgating metrological technical standard of Viet Nam” Viet Nam metrology standard DLVN 39:2019 - “Power meters – Verification/calibration procedure” The revised PDD and ER calculation spreadsheet				
DOE assessment				Date: 20/04/2020
PP has corrected calibration frequency of energy meters as per national standard and editorial corrections of A_{PJ} value appendix reference. Details are correct and hence CAR is closed.				

Table 3. FAR from this validation

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
-				
Project participant response				Date: DD/MM/YYYY
-				
Documentation provided by project participant				
-				
DOE assessment				Date: DD/MM/YYYY
-				

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN) and version 02.0 of the “CDM project cycle procedure for project activities” (CDM-EB93-A06-PROC);• Make editorial improvements.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Renewal of crediting period
Keywords: crediting period, project activities, validation report
