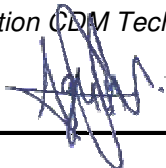




**Validation report form for renewal of crediting period for
CDM project activities
(Version 03.0)**

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	Xekaman 3 Hydropower Project, Lao PDR (UNFCCC number-5583 ¹)
Number and duration of the next crediting period	2 nd renewable crediting period (30/04/2020 to 29/04/2027)
Version number of the validation report	02
Completion date of the validation report	13/04/2021
Version number of PDD to which this report applies	1.5
Project participants	- Xekaman 3 Power Company Limited (private entity)- Lao People's Democratic Republic - Viet Lao Power Joint Stock Company (private entity)- Viet Nam - ecotawa AG (private company)- Switzerland
Host Party	Lao People's Democratic Republic
Applied methodologies and standardized baselines	ACM0002 Version 20.0 Standardized baselines- Not applicable
Mandatory sectoral scopes	01
Conditional sectoral scopes, if applicable	NA
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	792,824 tCO ₂ e
Name and UNFCCC reference number of the DOE	LGAI Technological Center, S.A. (Applus+ Certification) UNFCCC Ref. No. E-0032
Name, position and signature of the approver of the validation report	Mr. Agustin Calle de Miguel <i>Applus+ Certification CDM Technical Manager</i> Signature: 

¹ <https://cdm.unfccc.int/Projects/DB/SQS1324398658.36/view>

SECTION A. Executive summary

The project activity is to build and operate a hydropower plant with an accumulation reservoir located along the Nam Pagnou River (tributary of the Xekaman River) in the South of Laos being around 10km from the Vietnam border (beeline). The project, which is expected to meet the future growing demand for power supply in Vietnam is part of the Vietnam-Lao partnership for energy development.

The project is owned and built by the Xekaman 3 Power Company Limited².

The hydropower plant will produce 977.5 GWh per year, with an installed capacity of 250 MW³. The Xekaman 3 hydropower plant is a diversion plant. Water from a storage reservoir is directed through tunnel and penstock to the powerhouse. The power scheme has a reservoir area at maximum water level of 5.251km². The energy density is thus around 47.6 W/m². The electricity produced will be transmitted to Vietnam by a 92 km long 230 kV dual circuit line.

The project will reduce GHG emissions by annually 792,824 tCO₂ by producing electricity with a renewable source thus substituting electricity produced in Vietnam to a large extent by fossil means. Only electricity sold to Vietnam is accounted for. The electricity supplied to Laos will thus not be included in any ER calculations. Only the combined grid factor Vietnam is taken to determine the Combined Margin. This is as per the 1st registered PDD and will continue for 2nd renewal as well.

As the proposed activity is a Greenfield activity and in the absence of the project activity the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources in the grid

Validation Scope: Ecotawa AG has contracted Applus+ Certification to conduct the validation of the renewal of the crediting period of the project activity. The scope is defined as an independent and objective review of the project design document (PDD) for the renewal of the crediting period. The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002 version 20. The validation of the renewal of the crediting period was based on the requirements in the CDM validation and verification standard for project activities, version 02 and renewal of crediting period in accordance with requirements of CDM methodological tool "TOOL11 – Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period" – version 03.0.1.

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

Validation Process: The project assessment is based on the "CDM validation and verification standard for project activities, version 02 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the CDM project activity are appointed.

Once the project is made available for the global stakeholder consultation process, the members of the assessment team carried out:

- I A desk review of the project design documentation for renewal of crediting period;
- II Follow-up interviews with project stakeholders;
- III The resolution of outstanding issues and the issuance of the final validation report and opinion.

The prepared validation report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the CDM-EB.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. Applus+ Certification has developed a specific Checklist customized for the project.

² The Company was granted the Foreign Investment License 002-06/KHDT by the Laotian Committee for Planning and Investment and the Business License 0003/TD-DN (files 7 and 8)

³ Total production; production to the grid is 1.5% less; see for details and source table 1 of the PDD

The checklist demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from validating the identified criteria.

Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of Applus+ Certification.

The composition of audit team shall be approved by Applus+ Certification ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT).
- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Mr. Sukanta Das	LA/TE	YES	YES	YES	YES
Denny Xue	TR	YES	YES	YES	NA

The complete list of CVs is included as Appendix 2 of this report.

Document review

The Project Design Document submitted by the Client was reviewed against the approved methodology and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources like 3rd party Government documents has been done. A complete list of all documents and evidence material reviewed is included in Appendix 3 of this report.

Follow-up interviews

A telephonic interview is conducted by Applus+ Certification with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in section C.2 and C.3 of this report.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the validation process, the concerns raised and responses given are summarized in Appendix 4 below.

The final PDD version1.5 submitted by PP on 15/03/2021 serves as the basis for the final assessment presented. Additional changes to the project during the validation process are not considered to be significant with respect to the main CDM objectives. The two CDM main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

As final step of a validation of the final documentation including the validation report and the checklist have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of interest.

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

Conclusion

Applus+ Certification has performed a validation of the renewal of the crediting period of the “Xekaman 3 Hydropower Project, Lao PDR”. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria, e.g. ACM0002 version 20, given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation for the renewal of the crediting period and the subsequent follow-up interviews have provided Applus+ Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by Applus+ Certification for the renewal of the crediting period with the UNFCCC.

Applus+ Certification has received a confirmation from the host Party that the project activity assists it in achieving sustainable development.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the positive list of renewable project 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 annual emission reductions of 792,824 tCO₂e.

The validation has been performed following the requirements of the latest version of the CDM validation and verification standard for project activities, version 02 and on the basis of the contractual agreement. The single purpose of this report is its use during the registration process as part of the CDM/ UNFCCC project cycle.

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.	Lead Auditor/ Technical Expert	OR	Das	Sukanta	True Quality Certifications Private Limited- Outsourced	YES	No	YES	YES

					entity			
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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	EI	Xue	Denny	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustín	Applus+ Certification

SECTION C. Means of validation

C.1. Desk/document review

The details of the document observed during desk review /validation process are listed below in Appendix 3 of this report.

C.2. On-site inspection

As per the paragraphs 30 & 31 of CDM validation and verification standard for project activities, version 02.0, the on-site inspection for validation of the project activity is mandatory as the estimated GHG emission reduction of this project activity is more than 100,000 tCO₂e. DOE has taken remote audit measures to validate pre-project information and implementation of the project activity, applying standard auditing techniques for verification, as referred in section 7.1.3.1 of the “CDM validation and verification standard for project activities, Version 02.0”.

No Physical audit was conducted by the VVB for this CDM renewal validation due to high threat of COVID-19 pandemic and restriction of International travel to and from India (base of team leader)

Hence, in-line with the The Executive Board of the Clean Development Mechanism (CDM) decision , at its 108th meeting, agreed to further extend the period in which DOEs may apply alternative measures of validation/verification to mandatory on-site inspections until 30 June 2021. Assessment team applied alternative measure i.e. conducted remote audit, telephonic interview and standard auditing techniques to comply with the requirement of Section 7.1.3.1 of the “CDM validation and verification standard for project activities, Version 02.0”.

Moreover, as per para 278 of CDM project cycle procedure for project activities version 02, “*The DOE, after validating that the new version of the PDD meets all applicable requirements for renewal of the crediting period in the “CDM project standard for project activities” by following the applicable provisions of the “CDM validation and verification standard for project activities” and other applicable CDM rules and requirements, shall submit, through a dedicated interface on the UNFCCC CDM website, a request for renewal of crediting period of the registered CDM project activity using the “Renewal of crediting period request form” (CDM-REN-FORM) together with the new version of the PDD and the validation report. **Such a submission shall be made no earlier than 270 days prior to, but no later than one year after, the expiry of the crediting period***”

The 2nd renewal CP for this project is due on 30/04/2020 and thus within 1 year the RCP validation report together with new version of the PDD need to be submitted via the dedicated interface to the executive board for its further action. Taking into consideration the above guideline the DOE could not postponed the onsite visit and hence in line with EB 108 meeting report DOE adopted alternative measure i.e. conducted remote audit, telephonic interview and standard auditing techniques to comply with the requirement of Section 7.1.3.1 of the “CDM validation and verification standard for project activities, Version 02.0”.

The objective of the remote audit/telephonic interview is to:

- Confirm the implementation and operation of the project;
- Review the data flow for generating, aggregating and reporting the monitoring parameters;
- Confirm the correct implementation of procedures for operations and data collection inline with the PDD;
- Cross-check the information provided in the PDD documentation with other sources;
- Check the monitoring equipment against the host country requirements & information in the PDD and the approved methodology, including calibrations, maintenance, etc.;

- Review the calculations and assumptions used to obtain the GHG data and ER;
- Identify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters.

To verify the implementation of project activity, onsite operation & maintenance, monitoring & management practices; assessment team has conducted Skype video call/telephonic interviews with the onsite in-charge and also had a detail discussion with the PP representative and reviewed third party statutory documents i.e. Commissioning certificates, Power Purchase Agreement, sample JMRs & Invoice, employment & training records, breakdown log, O&M schedule etc. Some snapshots of the remote audit through Skype are provided in this report.

There is no pre-project information that is relevant to the requirements for registration of the project activity and which may not be traceable after the registration, being project is already implemented as per the registered CDM PDD. To validate the implementation of project activity, onsite operation & maintenance, monitoring & management practices; assessment team has conducted telephonic interviews with onsite in-charge and also had a detail discussion with the project participant and reviewed third party statutory documents i.e. Commissioning certificates, Power Purchase Agreement, Sample JMRs etc. After telephonic interviews with concerned onsite persons, document reviews; assessment team concluded that the project activity is still implemented and operated in-line with the registered CDM PDD of 1st crediting period. There is no change in the project design or operation and monitoring practices at site which can alter the applicability or additionality of the project activity. Assessment team therefore of the opinion that project is implemented as described in the registered PDD for first crediting period and no change is envisaged for the proposed second crediting period.

Duration of on-site inspection: 04/03/2021- Remote audit and telephonic interview				
No.	Activity performed on-site	Site location	Date	Team member
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring.	Remote audit The project is located at Lao People's Democratic Republic	04/03/2021 (Remote audit and telephonic interview)	Mr. Sukanta Das

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Wunderlin	Daniel	PP representative	04/03/2021 (Remote audit and telephonic interview)	Project Implemetation Baseline Operation and Maintenance JMR/invoice Management practices Calibration EF calculation ER calculation etc.	Mr. Sukanta Das

C.4. Sampling approach

The assessment team did not apply any sampling approach for the project activity.

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	00	01	00
Application and selection of methodologies and standardized baselines	00	01	00
Validity of original baseline or its update	00	00	00
Estimated emission reductions or net anthropogenic removals	00	01	00
Validity of monitoring plan	00	01	00
Crediting period	00	01	00
Project participants	00	00	00
Post-registration changes	00	00	00
Others (please specify)	00	00	00
Total	00	05	00

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	Assessment team checked the PDD version 11.0 forms supplied by the project participant and found that the latest form applicable in the UNFCCC web site is used for the presentation of the PDD.																								
Findings	CAR 01 was raised during the validation process and closed successfully. Please refer Appendix 4 for the detail closure of the CAR																								
Conclusion	<p>The PDD mentions all the criteria as detailed out in PDD form version 11.0 properly and found correct by the assessment team.</p> <p>Assessment team also checked the commissioning details and found the same to be correct. All the two units of the project activity were commissioned & synchronized to grid on June 2013- Unit 1 and July 2013- Unit 2 respectively. The commissioning test report were checked and assessment team conform that the dates are correct.</p> <p>The technical details for the revision of Crediting period were checked by the assessment team from the details available from the manufacturers and registered PDD of 1st CP. During the remote audit as well the name plate capacity of the project is checked and it was observed that the detail as mentioned in registered CDM PDD is implemented onsite. The technical details are as below:</p> <p>The total installed capacity of the project activity is 250 MW. The brief technical particulars of the project activity are given below in the table.</p> <p>Table 1: Characteristics of the Hydropower Plant</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Generation capacity</td> <td>MW</td> <td>250</td> </tr> <tr> <td>Maximum rated flow rate</td> <td>m³/s</td> <td>62.3</td> </tr> <tr> <td>Operating hours per year</td> <td>Hours</td> <td>3,910</td> </tr> <tr> <td>Average annual power production</td> <td>MWh</td> <td>977,500</td> </tr> <tr> <td>Internal usage of electricity</td> <td>Percentage</td> <td>1.5%</td> </tr> <tr> <td>Electricity production for the grid per annum</td> <td>MWh</td> <td>962,838</td> </tr> </tbody> </table> <p>The hydropower plant has one reservoir with a concrete faced rock-filled dam. Characteristics of the reservoir are listed in the following table.</p> <p>Table 2: Characteristics of the Reservoir</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Unit</th> <th>Value</th> </tr> </thead> </table>	Parameter	Unit	Value	Generation capacity	MW	250	Maximum rated flow rate	m ³ /s	62.3	Operating hours per year	Hours	3,910	Average annual power production	MWh	977,500	Internal usage of electricity	Percentage	1.5%	Electricity production for the grid per annum	MWh	962,838	Parameter	Unit	Value
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Reservoir level at normal water level	meter	960
Reservoir level at dead water level	meter	925
Reservoir level at surcharge water level (check flood)	meter	964
Reservoir area at normal water level	km ²	5.13
Reservoir area at maximum water level	km ²	5.251
Power density	W/m ²	47.6
Total volume of reservoir	million m ³	141.5
Useful volume of reservoir	million m ³	108.5
Length of dam crest	meter	540
Maximum height of dam	meter	101.5

Table 3: Turbine Specifications

Parameter	Specification
Producer	Va Tech Hydro GmbH, Austria; Manufacturing in Austria and China
Type	Synchronous hydraulic turbine of Francis type, vertical shaft (set)
Number of units	2
Characteristics	Power rating: 127.551 MW each Q _{max} : 31.1 m ³ /s Guaranteed turbine efficiency: η_{average} 94.95%

Table 4: Generator Specifications

Parameter	Specification
Producer	Va Tech Hydro GmbH, Austria; Manufacturing in Austria, China and India
Type	Synchronous generator of vertical shaft, bracket type, three-phase (set) Three-phase dry-type excitation transformer, natural cooling of air convection
Number of units	2
Characteristics	Power rating: 125 MW each 15.75kV

Assesment team also checked the feeder details of the connected power plant to the sub-station and found that the arrangements are done as per the host country regulation. The transmission line connects to the Vietnam national grid through a 230 kV dual circuit line with a length of 92 km. The voltage supplied for the Vietnamese national grid is 230 kV, and for Laos the charge is 115 kV

Assessment team checked the geographical coordinate of the project activity with GPS meter and found that same were correct. The latitude and longitude as mentioned in the registered PDD for 1st crediting period are as below:

The exact project location is as under:

Power house: Latitude: 15.3756 and Longitude: 107.4064
(equivalent to 15°22'32" N, 107°24'23" E)

No post registration changes is envisaged for the 2nd CP as the project is implemented as per the registered PDD of 1st CP and in continuous operation apart from scheduled maintenance (as per manufacturer specification) and thus there is no scenario observed which can alter the requirement of the methodology. The project activity complies with the applicability criteria of the large scale CDM Project activity category. The capacity of the proposed project is 250 MW, which is higher than the maximum qualifying Type I capacity of 15 MW. Thus the project qualifies as Large scale project. There is no change in installed capacity of the project as mentioned in registered PDD for 1st CP. The same is checked by the assessment team during document review as well remote audit and found correct.

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

<p>Means of validation</p>	<p>The assessment team has validated the documentation referred to in the revised PDD for renewable of crediting period and verified the documentation content for verifying the justification of the applicability of the methodology ACM0002 version 20 and confirmed that the documentation referred to in the PDD is correctly quoted and interpreted. The assessment team has also cross-checked the information provided in the registered PDD of 1st CP with the documentation other than from the PDD based on the local and sectoral knowledge of the assessment team.</p> <p>Following documentation has been reviewed by the assessment team:</p> <ul style="list-style-type: none"> - Telephonic interview with PP representative and site personnel. - Remote audit and Interview with the concerned person mentioned in this report - Technical detail analysis of the power plant from the documents submitted by the manufacturer. - Commissioning certificates of the turbines <p>The assessment of the project's compliance with the applicability criteria of ACM0002 version 20 are documented in detail in section B.2 of the PDD.</p>							
<p>Findings</p>	<p>Applicability criteria were not explained properly as per the requirement of the applied approved methodology for the present crediting period. CAR 02 was raised during the validation and closed successfully. Please refer Appendix 4 for the detail closure of the CAR</p>							
<p>Conclusion</p>	<p>The applied baseline methodology is justified as it has been demonstrated that the proposed project activity is:</p> <table border="1"> <thead> <tr> <th>Applicability Criterion</th> <th>Project case</th> </tr> </thead> <tbody> <tr> <td> <p>1. The methodology is applicable to grid-connected renewable energy power generation project activities that:</p> <ul style="list-style-type: none"> 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 e) Involve a replacement of (an) existing plant(s)/unit(s) </td> <td> <p>Assessment team confirm that the project is the installation of a new grid connected renewable hydro power plant with an accumulation reservoir on a site where no renewable power plant was operated prior to the implementation of the project activity. Option a is thus applicable.</p> </td> </tr> <tr> <td> <p>2. A. The methodology is applicable under the following conditions: 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;</p> <p>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</p> </td> <td> <p>The project activity involves the installation of a new hydropower plant. Hence this criteria is meet</p> <p>Assessment team confirm that the project is the installation of a new grid connected renewable hydro power plant with an accumulation reservoir on a site where no renewable power plant was operated prior to the implementation of the project activity</p> </td> </tr> </tbody> </table>		Applicability Criterion	Project case	<p>1. The methodology is applicable to grid-connected renewable energy power generation project activities that:</p> <ul style="list-style-type: none"> 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 e) Involve a replacement of (an) existing plant(s)/unit(s) 	<p>Assessment team confirm that the project is the installation of a new grid connected renewable hydro power plant with an accumulation reservoir on a site where no renewable power plant was operated prior to the implementation of the project activity. Option a is thus applicable.</p>	<p>2. A. The methodology is applicable under the following conditions: 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;</p> <p>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</p>	<p>The project activity involves the installation of a new hydropower plant. Hence this criteria is meet</p> <p>Assessment team confirm that the project is the installation of a new grid connected renewable hydro power plant with an accumulation reservoir on a site where no renewable power plant was operated prior to the implementation of the project activity</p>
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	<p>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>	
	<p>3. a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or</p> <p>b. The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (7), is greater than 4 W/m²; or</p> <p>(c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (7), 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 (7), is lower than or equal to 4 W/m², all of the following conditions shall apply:</p> <ul style="list-style-type: none"> (i) The power density calculated using the total installed capacity of the integrated project, as per equation (8), is greater than 4 W/m²; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be: <ul style="list-style-type: none"> 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>The project activity was to install a new hydropower plant. This criteria is not applicable.</p> <p>The project activity was to install a new hydropower plant. This criteria is not applicable.</p> <p>The project activity resulted in a new reservoir, with a power density of 47.6 W/m²; which is greater than 4 W/m²</p> <p>This criteria is not applicable.</p>
	<p>4. In the case of integrated hydro power projects, project proponent shall:</p> <p>(a) Demonstrate that water flow from upstream power</p>	<p>The project activity is the installation of new hydropower plant not a Integrated hydro project with a single reservoir. Hence this criteria is not applicable.</p>

	<p>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 (if any), and rainfall for minimum of five years prior to the implementation of the CDM project activity.</p>	
	<p>5. The methodology is not applicable to:</p> <p>(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;</p> <p>(b) Biomass fired power plants/units.</p>	<p>Not applicable as this is Hydro project.</p>
	<p>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”.</p>	<p>The project activity is the installation of a new hydropower plant. Hence this creteria is not applicable.</p>
<p>Applus+ Certification confirms that the application of the baseline methodology is transparent and conservative and confirms that the chosen baseline and monitoring methodology i.e. ACM0002 version 20 is applicable to the project activity.</p>		

D.3. Validity of original baseline or its update

Means of validation	The baseline scenario as depicted in the updated PDD is checked during the desk review and also during the interview with the plant official.
Findings	The baseline is selected as per the requirement of the approved methodology

Conclusion	ACM0002 version 20 for the present Crediting period. No CAR raised for this criteria.
	<p>Assessment team referred “Methodological tool (EB 66, Annex 47) “Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period.” (Version 03.0.1)” and CDM validation and verification standard for project activities, version 02” to check the originality of the baseline. Following are the observation of the assessment team regarding selected baseline for the project activity in this present 2nd renewable crediting period:</p> <p><u>Step 1.1 (EB 66, Annex 47): Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies</u></p> <p>The baseline for the project activity is the electricity delivered to the grid by the project activity which would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources into the grid. The project activity is claiming the emission reductions from the net exported electricity to the grid only. In absence of project activity this quantity of electricity would have been generated from the electricity grid mix (mainly fossil fuel). There is no change in host country regulation which can impact the baseline of the project activity.</p> <p>The baseline remains unchanged for the present (2nd)crediting period since there is no policy been revised and/or is currently in force as well, therefore the baseline scenario is still in compliance with all the relevant mandatory national and/or sectoral policies.</p> <p><u>Step 1.2 (EB 66, Annex 47) : Assess the impact of circumstances</u></p> <p>There are no new circumstances that can impact the original baseline. The baseline emission factor value is however updated based on the current data available for the grid.</p> <p><u>Step 1.3 (EB 66, Annex 47): Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested</u></p> <p>As per the “Tool to determine the remaining lifetime of equipment”, the remaining lifetime of the equipment is the time for which the existing equipment can continue to operate before it has to be replaced/discarded. As per this Tool, Project participant can use one of the following options to determine the remaining lifetime of the equipment:</p> <p>(a) Use manufacturer’s information on the technical lifetime of equipment and compare to the date of first commissioning; (b) Obtain an expert evaluation; (c) Use default value</p> <p>The project activity started commercial operation in the year June and July 2013 and since commissioning, the project activity is running satisfactorily. As per Manufacturer specification and Registered PDD, the technical lifetime of hydro power plant is 40 years (As per 1st CP). Thus the remaining lifetime of equipment’s exceeds the crediting period for which renewal is requested. Thus as per manufacturers information, the remaining lifetime of equipment exceeds crediting period as per option 1 of Tool to determine the remaining lifetime of the Equipment.</p> <p>The below conditions are fulfilled. (i)The equipment has been operated and maintained according to the recommendations of the equipment supplier; (ii) There are no periodic replacement schedules or scheduled replacement practices specific to the industrial facility, that require early replacement of equipment before the expiry of the technical lifetime; and (iii) The equipment has no design fault or defect and did not have any industrial accident due to which the equipment cannot operate at rated performance levels.</p>

An per option (a), evaluating the remaining lifetime for the type of equipment has been approached and requested to determine the remaining lifetime of the equipment. The assessment of remaining life time of the equipment's had been done and confirmed that the remaining technical lifetime of the equipment of the project activity exceeds the crediting period for which renewal is requested. As the remaining technical lifetime of the equipment is not less than the end of the crediting period or which renewal is requested, the current baseline holds good for this crediting period too.

Step 1.4(EB 66, Annex 47): Assessment of the validity of the data and parameters

This step stipulates that "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."

The project chosen **ex-ante default value i.e. Emission Factor**. As per the Guidance given in Tool the emission factor is updated as follows:

The project chosen **ex-ante default value i.e. Emission Factor**. As per the Guidance given in Tool the emission factor is updated as follows:

1. The operating margin is calculated as per the latest version of Official National emission factor for grid connected power generation 2019 available to the project participant. The operating margin calculation is checked by the assessment team and found correct.
2. The build margin is considered from Official National emission factor for grid connected power generation 2019 as per "Tool to calculate the emission factor for electricity system" version 07. The value considered is checked by the assessment team and found correct.
3. The Combined margin calculation is carried out as per "Tool to calculate the emission factor for electricity system" version 07. The value considered is checked by the assessment team and found correct.

The emission factor is fixed ex-ante and thus will be used for the complete 2nd renewable crediting period and for entire verification conducted under 2nd renewable crediting period.

Application of Steps 1.1, 1.2, 1.3 and 1.4 confirmed that the current baseline is valid for the Second crediting period but data and parameters needs to be updated. Therefore step 2 is used

Step 2.1: Update the current baseline

This step is applicable since the Steps 1.1, 1.2, 1.3 and/or 1.4 showed that the current baseline needs to be updated. As evident from the explanation provided above the baseline scenario remains unchanged.

Updated the baseline emissions based on the latest approved version of the methodology applicable to the project activity for the subsequent crediting period, without reassessing the baseline scenario.

Step 2.2: Update the data and parameters

The updated Data and/or parameter are followed for estimating the baseline emissions

Hence as per ACM0002 version 20 the baseline of the project is as follows:

"The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid".

	The above selected baseline is correct and thus applicable to the project activity and in line with approved methodology for the applied renewable of crediting period.
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D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	The emission reduction sheet, Official National emission factor for grid connected power generation 2019 (Latest applicable) and PDD Form, version 11 (latest PDD template applicable) is checked by the assessment team.												
Findings	CAR 03 was raised and closed successfully.												
Conclusion	<p>The baseline emissions as discussed in section B.6.1 of the PDD will include emissions that would have occurred in the absence of the project activity. The emission reduction calculation has been done as per the ACM0002 version 20</p> <p>Baseline Emission (BE_y):</p> <p>BE_y = EG_{pj,y} x EF_{grid,CM}</p> <p>Where:</p> <p>BE_y = Baseline emissions in year y (t CO₂/yr)</p> <p>EG_{pj,y} = EG_{PJ,facility,y} = Quantity of net electricity generation supplied by the project plant to the Vietnamese grid</p> <p>EF_{grid,CM} = EF_{grid,y} = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO₂/MWh)</p> <p>EF_{grid,CM,y} = EF_{grid,y} = Baseline emission factor = 0.823425 tCO₂/MWh</p> <p>BE_y</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>Parameter</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Operating margin (weighted average years 2015-2019)</td> <td>0.8907 tCO₂/MWh</td> </tr> <tr> <td>Build margin (year 2019)</td> <td>0.8010 tCO₂/MWh</td> </tr> <tr> <td>Combined margin (2019)</td> <td>0.823425 tCO₂/MWh</td> </tr> <tr> <td>Annual energy generation to the grid</td> <td>962,838 MWh</td> </tr> <tr> <td>Annual emission reductions (962,838 MWh x 0.823425 tCO₂/MWh)</td> <td>792,824 tCO₂ (ROUND DOWN)</td> </tr> </tbody> </table> <p>Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors according to the procedure prescribed in the “Tool to calculate the emission factor for an electricity system” version 07.0 which is sourced from Official National emission factor for grid connected power generation 2019 and forms the part of emission reduction calculation. The baseline emission factor calculation is checked by the validation team and found that the calculation is transparent and conservative.</p> <p>Hence, BE_y= 792,824 tCO_{2e}</p> <p>Project Emissions:</p> <p>The power density of the project activity (PD) is calculated as follows:</p> $PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} \text{-----(formula 2 of meth)}$ <p>Where: PD Power density of the project activity (W/m²)</p>	Parameter	Value	Operating margin (weighted average years 2015-2019)	0.8907 tCO ₂ /MWh	Build margin (year 2019)	0.8010 tCO ₂ /MWh	Combined margin (2019)	0.823425 tCO ₂ /MWh	Annual energy generation to the grid	962,838 MWh	Annual emission reductions (962,838 MWh x 0.823425 tCO ₂ /MWh)	792,824 tCO ₂ (ROUND DOWN)
Parameter	Value												
Operating margin (weighted average years 2015-2019)	0.8907 tCO ₂ /MWh												
Build margin (year 2019)	0.8010 tCO ₂ /MWh												
Combined margin (2019)	0.823425 tCO ₂ /MWh												
Annual energy generation to the grid	962,838 MWh												
Annual emission reductions (962,838 MWh x 0.823425 tCO ₂ /MWh)	792,824 tCO ₂ (ROUND DOWN)												

	<p>Cap_{PJ} Installed capacity of the hydro power plant after the implementation of the project activity (W)</p> <p>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</p> <p>A_{PJ} Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m²)</p> <p>A_{BL} Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m²). For new reservoirs, this value is zero</p> <p>The Power Density PD is calculated based on formula 2.</p> <p>Data required⁴: Cap_{PJ}: 250 MW A_{PJ}: 5.251 km² A_{BL} = 0 Cap_{BL} = 0</p> <p>The energy intensity is thus 47.6 W/m². According to ACM0002 if the power density is >10 W/m² the project emissions are 0. Project emission is therefore considered as zero.</p> <p><u>Leakage Emissions:</u></p> <p>Leakage emission is neglected as per the methodology ACM0002 version 20.</p> <p><u>Emission Reductions:</u></p> <p>The project activity reduces carbon dioxide emissions through displacement of grid electricity generation with predominantly fossil fuel based power plant by renewable electricity. The emission reduction (ER_y) due to project activity during a given year y is calculated as the difference between baseline emissions (BE_y), project emissions (PE_y) and leakage emission (LE_y) as per the formulae given below:</p> <p>ER_y = BE_y – PE_y</p> <p>ER_y = 792,824 – 0 t CO_{2e}</p> <p>ER_y = 792,824 t CO_{2e} (Rounded Down)</p>
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D.5. Validity of monitoring plan

Means of validation	Assessment team checked the monitoring practice onsite and also checked the requirement of ACM0002 version 20 and procedure mentioned in the registered PDD of 1 st CP.
Findings	CAR 04 was raised during the validation process. Please refer Appendix 4 for the complete closure of the CAR.
Conclusion	<p><u>Parameters determined ex-ante:</u></p> <p>1. EF_{grid,CM} := (0.823425 tCO₂/MWh) Combined Margin emissions factor for grid connected power generation in year y calculated using the latest version of “Tool to calculate the emission factor for an electricity system version 07.” Combined Margin is computed using the official data sources and is in-line with the guidance provided in the tool. The value is considered from Official National emission factor for grid connected power generation 2019. The combined margin emissions factor is calculated as follows:</p> <p>EF_{grid,CM} = EF_{grid,OM} * W_{OM} + EF_{grid,BM} * W_{BM}</p>

⁴ File 6, p. V.12 and File 19, p.I

Where:

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh)

$EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh)

W_{OM} = Weighting of operating margin emissions factor (%) = 25%

W_{BM} = Weighting of build margin emissions factor (%) = 75%

The above weighing is as per “Tool to calculate the emission factor for an electricity system”, version 07.0.0 for other projects (Hydro in this case) and for second crediting period. The value is fixed ex-ante for the entire duration of 2nd crediting period. As the value is sourced from Official National emission factor for grid connected power generation 2019 (publicly available document) no further analysis is required.

2. $EF_{CO_2,i}$ = CO₂ emission factor of fossil fuel type i

Value taken from IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided IPCC Guidelines on National GHG inventories, 2006. Values used

Anthracite Coal: 94.6

Other Bituminous coal: 89.5

Natural gas: 54.3

Fuel Oil: 75.5

Diesel oil: 72.6) is sourced from the IPCC and found correct.

3. $FC_{i,m,y}$ = Amount of fossil fuel type i consumed by power plant m in the year y

The value sourced from VIETNAM MONRE. Data years 2017/8/9 used i.e. 3 most recent year's prior validation which is assessed to be correct. The parameter is considered Once for 2nd crediting period determined ex-ante.

4. $EG_{m,y}$: Net electricity generated by power plant m in the project electricity system in the year y

The value sourced from VIETNAM MONRE, 2021. Data years 2017/8/9 used i.e. 3 most recent years prior validation. The parameter is considered Once for 2nd crediting period determined ex-ante

5. NCV_{Diesel} = Net calorific value of fossil fuel type i

The value is sourced from VIETNAM MONRE 2021. The parameter is considered Once for 2nd crediting period determined ex-ante

6. Cap_{BL} : = Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero The value is sourced from Plant site. Since the project is greenfield (new hydro) project therefore the value is considered zero for the entire duration of 2nd crediting period.

7. 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. Since the project is greenfield (new hydro) project therefore the value is considered zero for the entire duration of 2nd crediting period.

Parameters determined ex-post:

1. $EG_{PJfacility,y} = EG_{pj,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

The value for the parameter will be sourced from the primary source i.e. Monthly energy Meter Reading report of main and check meters located at Energy meters (two M21 in Than My Station). Representative of state utility and representative of

	<p>PP takes the monthly reading of both the main and check meters jointly.</p> <p>The electricity supplied to the Vietnamese grid will be measured with two main meters and two backup meters at Thanh My station of EVN. The electricity consumed by the project from the grid will also be measured by the mentioned meters. All electricity consumed for internal use will be purchased from Vietnam - no electricity will be bought from the Lao grid. The net electricity is calculated (total supplied electricity to the grid minus the consumption of electricity coming from the grid).</p> <p>Formula for net electricity supplied :</p> $EG_{y,net} = (M21_{supplied} + M21_{supplied}) - (M11_{consumed} + M11_{consumed})$ <p>(please see figure 7 in the PDD)</p> <p>The net electricity export/supplied to the Vietnamese grid is the difference between the measured quantities of the grid electricity export and the import. Total electricity produced and total electricity supplied to Laos grid will also be monitored for cross check. But electricity export to Laos will not be included in the emission reduction calculation - only the export to Vietnam.</p> <p>Measuring equipment will be certified and calibrated according to Vietnamese standards which is once in year.</p> <p>The data will be archived electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.</p> <p>2. CAP_{PJ} : Installed capacity of the hydro power plant after the implementation of the project activity</p> <p>The parameter will be sourced from the name plate capacity installed at the project site. The same is in line with applied methodology and thus acceptable to the assessment team. The rated capacity of the project at this time of validation is 250 MW. The equipment is not changed since the hydropower plant was built and operational since 2013. Thus the capacity did not change from 1st CP.</p> <p>3. A_{PJ}: Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full</p> <p>The parameter can be checked during the onsite visit. The reservoir level will be controlled regularly when the water overflows the dam in order to assess the highest level of the reservoir. Based on the water level and on the topographical survey which was carried out during the feasibility study the largest reservoir area can be calculated.</p> <p>The data will be archived electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.</p>
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D.6. Crediting period

Means of validation	The crediting period is checked as per UN home page (reference number :5583) and discussion with Client.
Findings	No CAR/CL raised on the section.
Conclusion	This is 2 nd renewable crediting period and the duration is 7-year renewable (2 nd CP duration: (30/04/2020 to 29/04/2027).

D.7. Project participants

Means of validation	The project participant names were checked from UN homepage https://cdm.unfccc.int/Projects/DB/SQS1324398658.36/view
Findings	No CAR/CL raised on the section.

Conclusion	Following are the details of PP (host country). The same is correct and in line with PDD registered under first Crediting period as well as MOC obtained from UN home page. The details are true for the second Crediting period as well.		
	Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
	Lao People's Democratic Republic (host)	Xekaman 3 Power Company Limited (private entity)	No
	Socialist Republic of Vietnam (host)	Viet Lao Power Joint Stock Company (private entity)	No
	Switzerland	ecotawa AG (private entity)	No

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 ⁵	N	NA	NA
Corrections	N	NA	NA
Change to the start date of the crediting period	N	NA	NA
Inclusion of a monitoring plan	N	NA	NA
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N	NA	NA
Changes to the project design	N	NA	NA
Changes specific to afforestation and reforestation project activities	N	NA	NA

SECTION E. Internal quality control

As final step of a validation of the final documentation including the Renewable crediting period validation report and the checklist have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of interest.

SECTION F. Validation opinion

Applus+ Certification has performed validation of the renewal of the crediting period of the project activity "Xekaman 3 Hydropower Project, Lao PDR". The validation of the renewal of the crediting period was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria, e.g. ACM002 version 20, given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation for renewal of crediting period and the subsequent follow-up interviews have provided Applus+ Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by Applus+ Certification for the renewal of the crediting period with the UNFCCC.

⁵ 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).

Applus+ Certification has received a confirmation from the host Party that the project activity assists it in achieving sustainable development.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the positive list of renewable project 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 annual emission reductions of 40,723 tCO₂e.

Moreover, assessment team confirm that the information as presented in the registered PDD version 1.3 dated 16/10/2011 for the 1st crediting period is trasfered correctly to the later version of the PDD (version 11 template) applicable for the 2nd crediting period renewal.

The validation of the renewal of the crediting period has been performed following the requirements of the latest version of the CDM validation and verification standard for project activities, version 02 and on the basis of the contractual agreement. The single purpose of this report is its use during the registration process as part of the CDM/UNFCCC project cycle.

Appendix 1. Abbreviations

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification request
CMS	Central Monitoring system
CP	Crediting period
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
ER	External Resource
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
IR	Internal Resource
OR	Outside resource
OEM	Original Equipment manufacturer
OM	Operating Margin
PP	Project Participant

Appendix 2. Competence of team members and technical reviewers

1. Mr. Sukanta DAS, has done M. SC in (Electronics and Photonics) and M. Tech in (Energy technology) from Tezpur Central University/ Indian Institute of technology Bombay in India. He is a certified lead auditor for ISO 14001 EMS LA and ISO 9001 QMS LA from InternationalSC App for Certified Auditors (IRCA) and Certified Lean Management practitioner from Quality Council of India (QCI). He has more than (11) years of working experience at TUV NoRD/ Re-consult/CRA/APPLUS certifications under various categories of projects stating from Renewable to waste to supercritical projects. He was JI/ CDM Lead Assessor in TUV NoRD and was involved in more than 100 CDM validation and verifications activities in Gold Standard, VCS, CDM projects as a team leader/technical reviewer / validator / verifier covering the sectoral scope 1, 3 and 13 technical areas 1.1/1.2/3.1/13.1. Currently he is associated with True Quality Certifications Private Limited and is empanelled with Applus+ Certification to carry out GHG audit.
2. Mr. Denny Xue; Mr. Denny Xue has a Bachelor's Degree on Thermal Energy Engineering and Master's Degree on Environmental Engineering. He has more than 10 years of experience on CDM project development. Before he joined Applus+ LGAI, he has been worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development. He is working with Applus+ since 2011 carrying out Validation and verification for CDM/GS/VCS project under scope 1 and 13 as auditor, lead auditor, technical expert and technical reviewer.

Appendix 3 Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	NA	Contract of the project participant with the DOE	Contract document signed between PP and DOE	Project participant
2.	NA	Technical specifications of hydro power plant and other equipments	Manufacturer technical specifications	Project participant
3.	NA	Draft updated PDD for RCP RCP PDD based on which opinion is provided	Version 1.4 dated 08/03/2020 Version 1.5 dated 15/03/2021	Project participant
4.	NA	Estimated Emission reduction calculation sheet Estimated Emission reduction calculation sheet	version 01 dated 08/03/2020 version 02 dated 15/03/2021	Project participant
5.	NA	ACM0002 version 20	UNFCCC CDM web site	UNFCCC
6.	NA	Ministry of Environment and forest: www.envfor.nic.in UNFCCC www.cdm.unfccc.int	Reference link is provided.	Independent Search
7.	NA	Tools/ guidelines used in the project activity: <ul style="list-style-type: none"> • Clarification on national and/or sectoral policies Para 27 EB 55. • Tool to determine the remaining lifetime of the project activity in line with Annex 15 EB 50. • Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion, Version 3. • Tool to calculate the emission factor for an electricity system version 07. • Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period.” (Version 03.0.1). 	UNFCCC CDM web site	UNFCCC
8.	NA	Commission Certificate for hydro Power plant	Commissioning test certificate	Project participant
9.	NA	Sample energy reading copies for the power plant	-	Project participant

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

Table 1. CLs from this validation

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

Table 2. CARs from this validation

CAR ID	01	Section no.	D.1	Date: 05/03/2021
Description of CAR				
Following observation are made in this section:				
3. The technical details are mentioned in the PDD, however the supporting are not submitted to the assessment team. CAR is thus raised.				
4. The feeder details of the power plant are missing in the revised PDD.				
5. The commission certificate is not submitted to the assessment team.				
6. The version number is not in continuation of last registered PDD. Corrective action is sought for the same.				
Project participant response				Date: 15/03/2021
1. For supporting of the technical details pictures of the generators and turbines are added to the answers.				
2. The feeder of the power plant is the Nam Pagnou River a tributary of the Xekaman River. This is mentioned in sector A1 and also in Map 2 of sector A2.				
3. The commission certificates are submitted.				
4. The version number has been changed to 1.5. The registered PDD was version 1.3.				
Documentation provided by project participant				
1. Pictures of the technical parts see files 72: - pictures of power plant with name plates capacity, power factor, voltage, etc. - Pictures of the metering system in Xekaman 3 hydropower plant and at Than My station with all technical details				
2. PDD version 1.5, sectors A1 and A2				
3. Commission certificates see file 73 and file 74				
4. PDD version 1.5 attached				

DOE assessment	Date: 18/03/2021
<p>Following are the observation of the DOE:</p> <ol style="list-style-type: none"> 1. The technical specifications were checked and found correct. CAR is closed. 2. The feeder details of the power plant is now included in the revised PDD version 1.5. CAR is closed 3. The commission certificates are now submitted. CAR is closed. 4. The version number is now corrected. CAR is closed. 	

CAR ID	02	Section no.	D.2	Date: 05/03/2021
Description of CAR				
<p>The latest methodology available on UN web site is ACM0002 version 20, however PP applied version 19. Corrective action is sought for the same in the relevant sections of the PDD.</p> <p>Moreover, all the applicability criteria is not described in the PDD. Corrective action is sought for the same in the relevant sections of the PDD</p>				
Project participant response				Date: 15/03/2021
<p><i>The PDD was changed to the latest methodology available (version 20). For the Xekaman 3 Hydropower Project the simplified procedure for demonstrate the additionality cannot be used. Thus TOOL32 was not used for the adaptation of the PDD.</i></p> <p><i>The applicability criteria has been inserted in table 5 of the adapted PDD according to ACM0002 version 20.0</i></p>				
Documentation provided by project participant				
- Adapted PDD version 1.5				
DOE assessment				Date: 18/03/2021
All the applicability criteria is now revised as per the latest meth ACM0002 version 20. CAR is closed.				

CAR ID	03	Section no.	D.4	Date: 05/03/2021
Description of CAR				
<p>The generation as mentioned in the PDD is different from the generation as mentioned in the 1st CP registered PDD. Moreover, emission reduction sheet is not submitted and hence Calculated ER is reserved.</p> <p>Moreover, assessment team could not confirm whether latest emission factor is used. Corrective action is sought in the PDD and ER sheet wherever applicable.</p>				
Project participant response				Date: 15/03/2021
<p><i>The PDD was adapted based on the latest national emission factor of Vietnam (MONRE, January 2021). The electricity generation was corrected according to the 1st CP. This value is based on the feasibility study. The emission reduction is calculated in the CER-Spreadsheet. The calculation is made conservative (rounding down all values).</i></p>				
Documentation provided by project participant				
<p>- Adapted PDD version 1.4 - CER-Spreadsheet version 15.03.2021 - MONRE, January 2021: Latest National Emission Factor of Vietnam (see file 70)</p>				
DOE assessment				Date: 18/03/2021
The generation is as per the 1 st CP registered PDD. The EF is now updated. The ER sheet is submitted and thus CAR is closed.				

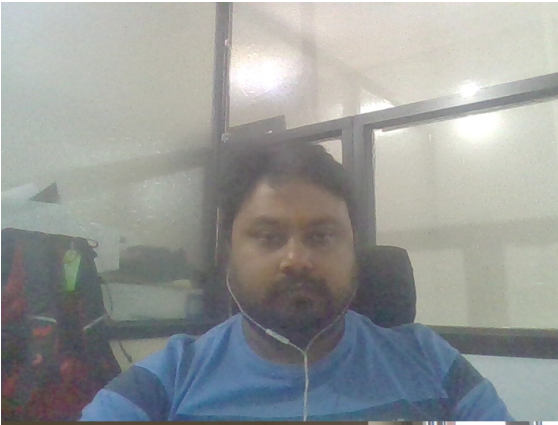
CAR ID	04	Section no.	D.5	Date: 05/03/2021
Description of CAR				
The source of data for Net electricity supplied to the grid is not clear. The sample supporting is required to confirm the same. The section is thus reserved.				
Project participant response				Date: 15/03/2021
<p><i>For the net electricity supplied to the grid only the main meters (2 M21 meters in figure 7 of the PDD) in Than My station are relevant. Reading these two meters the calculation of the net electricity supplied is made conservatively: The grid loss for export and for import is subtracted. A formula has been integrated in the adapted PDD.</i></p> <p><i>The figure 7 cannot be made more simply because according to the purchase contract all the meters must be installed. According to purchase contract EVN will cover the grid loss for the supply to Xekaman 3 hydropower plant.</i></p>				
Documentation provided by project participant				
- Adapted PDD version 1.5				
DOE assessment				Date: 18/03/2021
The explanation is acceptable and the source of the data is as per the onsite practice and the requirement of the applied meth. CAR is closed.				

CAR ID	05	Section no.	D.6	Date: 05/03/2021
Description of CAR				
The start date of the 2 nd crediting period is incorrect. Corrective action is sought in section C.3.2 of the PDD.				
Project participant response				Date: 15/03/2021
<p><i>The first crediting period lasted from 30/04/2013 to 29/04/2020. According to the CDM project cycle procedure for project activities (version 02.0) the new crediting period shall start on the day immediately after the expiration of the current crediting period (see paragraph 270). Thus the 2nd CP will start as it is mentioned in the PDD on 30/04/2020</i></p>				
Documentation provided by project participant				
- Adapted PDD version 1.5				
DOE assessment				Date: 18/03/2021
Explanation is acceptable. 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

SNAPSHOTS OF REMOTE AUDIT:



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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
