ISHASHA 6.6 MW
SMALL HYDROPOWER PROJECT

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Summary:

LGAI Technological Center, S.A. (hereafter referred to as Applus+ Certification) has been contracted by C-Quest Capital LLC to conduct the verification of the project "Ishasha 6.6 MW Small Hydropower Project", VCS ID 1286, against VCS Standard Version 4.1.

The verification includes confirming the implementation of the monitoring plan of the registered VCS PD and MR (Project ID 1286) and the application of the monitoring methodology as per AMS-I.D. version 17 "Grid connected renewable electricity generation".

The project activity involves generation of electricity by using the renewable energy source (Hydro) supplying to the Uganda Electricity Transmission Company Limited. The project is environmentally benign as it results in the reduction of emissions from grid connected fossil fuel-based power plants. Therefore, the project reduces greenhouse gas emissions and thereby contributes to sustainable development.

A risk based approach has been followed to perform this verification. In the course of verification, 03 Corrective Action request (CARs), 00 Forward Action Request (FAR) and 02 Clarification request (CLs) were raised and successfully closed.

The review of the project design documentation, monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, telephonic interviews and stakeholders have provided Applus+ Certification with sufficient evidence to validate the fulfillment of the stated criteria.

Applus+ Certification confirms that the project is implemented in accordance with the registered VCS- PD. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the project's GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the

emission reductions from the project activity “Ishasha 6.6 MW Small Hydropower Project” in Uganda during the period 01-May-2020 to 01-March-2021 (including both days) amount to 8,514 tCO_2e.

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1 INTRODUCTION

1.1 Objective

Applus+ Certification has been contracted by C-Quest Capital LLC (project proponent), to undertake the verification of the renewable energy project titled "Ishasha 6.6 MW Small Hydropower Project" (VCS ID 1286). The verifiers have reviewed the GHG data collected to date for the monitoring period from 01-May-2020 to 01-March-2021 (including both days) covered in this verification.The objective of this verification is a thorough and independent assessment of registered project activities against the applicable VCS requirement by the VVB. The verification process shall determine whether the proposed project activity complies with the requirements of latest VCS guidelines, applicability conditions of the selected methodology, relevant host country regulations and guidance issued by the VCS Board.

1.2 Scope and Criteria

The scope of the verification was the independent and objective review and ex-post determination of the monitored reductions in GHG emissions from "Ishasha 6.6 MW Small Hydropower Project". The verification of this project was based on the registered project description/1.1,1.2/ & monitoring report /4/ and supporting documents submitted by the project proponent to the verification team. The documents were reviewed against the following guidance and protocols:

VCS standard Version 4.1, Issued:19-September-2019 Updated: 22-April-2021/16/

Approved baseline and monitoring methodology AMS-I.D. version 17 "Grid connected renewable electricity generation"/14/

Validated VCS Project Description, version 01 dated 28-February-2014 /1.1/

Revised approved CDM PDD version 10, dated 26-September-2016 /1.2/

VCS Program Guide, Version 4.0, dated 19-September-2019 /17/

CDM VVS for project activities version 02.0 /22/

CDM PS for project activities version 02.0 /21/

The verification is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Level of Assurance

The level of assurance of the verification report falls under reasonable assurance engagements as selected by the Client. The verification team verified the complete monitoring data for all the parameters of the monitoring plan and confirms that the reported emission reductions are free from any type of material errors.

1.4 Summary Description of the Project

The project activity is generation of electricity by using hydro-electricity generators. The energy generated is supplied to the Uganda Electricity Transmission Company Limited (UETCL)/9/, which operates the national grid system. The project is environmentally benign as it results in the reduction of emissions from grid connected fossil fuel-based power plants. The project activity leads to reduction of greenhouse gas (GHG), as the energy is generated from renewable source. The emission reductions were real, measurable, and verifiable and plays a beneficial role in the mitigation of climate change.

The Project activity involves installation of a run-of river hydropower plant system with capacity 6.4 MW/1.2/. The unit consists of two Francis turbines of capacity 3.4 MW and two synchronous generators manufactured by Leroy Somer generators rated 4.0 MVA operating at power factor of 0.8, resulting in net generation capacity of 6.4MW/18/.

The project activity uses the water supply of Ishasha River, Kanungu district of Western Uganda. The project site is accessible by means of access roads to the nearest town. Location of the project was verified through Google Map (https://www.gps-coordinates.net/) as well as through sharing of live coordinates by onsite PP representatives and found consistent with the data provided in the registered VCS-PD/1.1/.

The Turbine Generators were commissioned on 06-March-2011, which was verified against the revised CDM PDD/1.2/ and commissioning certificates/9/. Eco Power Uganda Limited (EPUL) is the project implementer and is responsible of day-to-day monitoring of the project activity as per the registered monitoring plan.

By document review and online interview with PP representatives present onsite of the project activity, the verification team confirms that all the components of installed technology are fully functional. The total emission reductions achieved under the monitoring period01-May-2020 to 01-March-2021 are 8,514 tCO2e/5/.

2 VERIFICATIONPROCESS

The registered VCS project is undergoing periodic verification under VCS, the approach adopted to ensure the quality of emission reductions is described in the following sections.

2.1 Method and Criteria

Verification was conducted using Applus+ Certification procedures in line with the requirements specified in the VCS standard Version 4.1 Requirements, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques. The project activity does not fall under category "grouped projects", hence any sampling methods not to be employed by the validation/verification body for the verification of GHG emission reductions or removals generated by the project.

It is to be assessed and determined whether the proposed implementation and operation of the project activity, and the steps taken to report emission reductions comply with the criteria and relevant guidance provided by the VCS Board. The verification process consists of the following three phases;

A desk review of the VCS PD and VCS MR

Telephonic interviews with project stakeholders

The resolution of outstanding issues and issuance of final report and opinion.

2.2 Document Review

The verification is performed primarily as a document review of the registered VCS PD/1.1/, previous MR and Verification report and associated documents as stated in details in appendix 1 of this document. The assessment is performed by a verification team referring the Applus+ Certification internal procedures in line with latest VCS requirements. The cross checks between information provided in the Monitoring report, VCS PD and information from sources other than those used, if available, the team's sectoral or local expertise and, if necessary, independent background investigations.

2.3 Interviews

Due to the current situation with the global COVID-19 pandemic scenario and country wide lock down in most of countries across the globe, an on-site inspection has not been performed by the assessment team. However, the representatives of the PPs and onsite staff of PP were interviewed online via Skype/WhatsApp on 18-August-2021 i.e. personnel responsible for monitoring of the project activity, data collection and management, and QA/QC procedure. The details of the people interviewed are mentioned in the table below –

S N	Name	Organization
1	Mr. RavindaJayasuriya	Eco Power Uganda Limited
2	Mr. KanchanaAbeyratne	Eco Power Uganda Limited
3	Mr. Tridip Kumar Goswami	C-Quest Capital LLC

The topics covered during interview ranges from general features and implementation of project to technical details of the project like calibration details, monitoring and measuring system and data collection, recording and archiving procedures. The assessment was drawn based on the feedback received during interview coupled with the review of supporting documents.

2.4 Site Inspections

As discussed in the above section, physical site inspection is not done for the current verification. However, to achieve a reasonable level of assurance, the assessment team has followed the alternative means to substantiate the verification criteria as described in the below table –

Assessment Criteria	Means of verification/source documents	Assessment opinion
Description of project activity	i. Commissioning certificates /9/ ii. PPA signed with UETCL/10/ iii. Latest VCS verification report /2.1/. iv. Interview with PP representatives on 18-August-2021	The information's with reference to project capacity, technology, plant equipment's and commissioning dates as provided in section 1.1 of MR are found consistent with the documents.
Compliance of the project implementation with the registered project designdocument	i. Monthly JMRs signed by UETCL and EPUL/8/ ii. Geographical co-ordinates (Location of Project activity) verified through Google Map[1] as well as sharing of live location from PP representative onsite. iii. Latest VCS verification report /2.1/. iv. PPA signed with UETCL /10/	Verified documents indicated the following information: • Serial number of energy meters (Main and Check) • Capacity of project • Name of project participant (Ownership of the project activity) Location of power house is verified through Google Map. Daily generation records are

[1] https://www.gps-coordinates.net/

Assessment Criteria	Means of verification/source documents	Assessment opinion
	v. Interview with PP representatives on 18-August-2021 vi. Latest photographs of major project equipment's installed at site (i.e. Turbine, generators, energy meters, weir intake, penstock, tailrace etc.)/18/	verified on sample basis to check the operational status of project activity. Grid connectivity of the project is confirmed through the PPA. All the information's regarding the project implementation as discuss above are further verified through previous VCS verification report/2.1/ and found consistent.
Compliance of the registered monitoring plan with applied methodologies andstandardized baselines	i. Interview with PP representatives on 18-August-2021 ii. PPA signed with UETCL /10/ iii. Monthly JMRs signed by UETCL and EPUL/8/ iv. Invoices raised by project developer to UETCL/7/ v. Photograph of all the WTGs, energy meters installed at site and screen shots of online monitoring system/18/	The organizational structure, responsibilities and competencies of the personnel confirmed through interview with PP representatives. Frequency of monitoring of parameters listed under approved monitoring plan is verified through JMRs /Invoices. The methods used for measuring, recording, storing, aggregating, and reporting the data on monitored parameters are verified though PPA and interactions with site personnel. Procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are mentioned in the MR is confirmed through interview with PP representativesand found satisfactory.
Compliance with the	i. Calibration certificates of energy meters/6/ ii. Monthly JMRs signed	Calibration frequency and energy meter specifications (Sr.No., make, accuracy

Assessment Criteria	Means of verification/source documents	Assessment opinion
calibration frequency requirements for measuring instruments	by UETCL and EPUL/8/ iii. PPA signed with UETCL/10/	class) is verified through calibration certificates, photographs of energy meters and further verified through monthly JMRs and found consistent. Responsibility of calibration and maintenance of energy meters is solely under control of UETCL; this is verified through the PPA.
Assessment of data and calculation of emission reductions or net removals	i. Monthly JMRs signed by UETCL and EPUL/8/ ii. Invoices raised by project developer to UETCL/7/ iii. Latest VCS verification report for last verification/2.1/	Monthly values of monitoring parameters used in ER calculation are verified through JMRs and cross verified with the invoices. Methods, formulae and emission factor for calculating baseline emissions have been followed are in accordance with the applied methodology /14/ and as described in the previous approved VCS verification report/2.1/.

It is noteworthy that no sampling plan for verification is applied as 100% data is verified for the current monitoring period. Most of the reference document referred by the assessment team (above table) are either issued /endorsed by grid utility (UETCL), an external government agency, hence is deemed authentic.

The assessment team has also used documents such as approved CDM PRC validation report/2.2/ and verification reports/2.1/ available publicly. Furthermore, the project activity already verified under VCS previously and currently undergoing periodic VCS verification. Hence, based on the information's available through approved documents (VCS verifications), it can be confirmed that project is implemented and being operated as described in the registered PD/1.1/.

The assessment team has verified sufficient appropriate audit evidences, to reduce audit risk to an acceptably low level as requisite to achieve reasonable level of assurance for the current verification.

2.5 Resolution of Findings

The objective of this step is to identify, discuss and conclude on the issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and Verification On-site assessment. The verification team prepares and/or updates a verification protocol (internal document) that records the conformities and non-conformities, which may be of following types;

CAR (Corrective Action Request) is raised if one of the following occurs:

- Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CRs raised by the Applus+ Certification during verification shall be resolved prior to submitting a request for issuance.

FAR (Forward Action Request) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

During the current verification, 03 Corrective Action request (CARs) and 02 Clarification request (CRs) and 00 Forward Action Request (FARs) were raised and successfully closed.

All the findings that are raised and communicated to project participant during the verification are included under Appendix 3. The section also includes the response, if provided, by the project participants and an assessment by the verification team if it was closed out or otherwise.

2.5.1 Forward Action Requests

The project activity is undergoing periodic verificationunder VCS; there were no FARs raised during the previous verification. Also, no FAR is raised during the current verification.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification, as Applus+ Certification holds the accreditation for Validation of projects under this Sectoral Scope

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is registered under CDM with UNFCCC reference number 6381 and fixed crediting period of 10 years from 01-July-2012 to 30-June-2022/15/.

Even though the project has been registered under the CDM and crediting periods under both programme (CDM & VCS) overlaps, but credits for the same GHG emission reductions under the VCS and the CDM have not been claimed by PP.

3.2 Methodology Deviations

There is no methodology deviation identified during the current monitoring period.

3.3 Project Description Deviations

Deviation accepted during the previous monitoring period are as follows:

a) A project description deviation was sought in the firstmonitoring period which focuses on the design capacity of the project activity. As per the registered PDD, the capacity was stated as 6.6 MW. However, the plant design capacity of 6.4 MW was produced during the actual implementation. The deviation has been approved by the CDM EB during the Post registration correction process/19/. Therefore, the verification team accepts the justification provided by the PP in the MR/4/. The verification team confirms that the change does not impacts the additionality and the appropriateness of the baseline scenario.

b) There is Load Factor of the plant has changed from the one described in the registered PDD. The Plant Load Factor applied in the registered PDD is 50.86% which is changed to 56.36% in the revised PDD.The deviation has been approved by the CDM EB during the Post registration correction process/19/. Therefore, the verification team accepts the justification provided by the PP in the MR/4/. The verification team confirms that the change in the plant Load Factor does not impact the additionality and scale of the project. The verification team confirms thatthe change also has no impact on the applicability/ application of methodology under which the project has been registered.

c) The Main Meter and the Check Meter system are to be installed, owned, and maintained by EPUL as per registered PDD. During actual implementation, the responsibility on meter maintenance has been transferred from EPUL to UETCL. The change took place since the plant started to operate.The deviation has been approved by the CDM EB during the Post registration correction process/19/.Therefore, the verification team accepts the justification provided by the PP in the MR/4/. The verification team confirms that the change does not impacts the additionality and the appropriateness of the baseline scenario.

d) Another project description deviation as the information about calibration frequency of meter is not provided in the registered monitoring plan. As per manufacturer specification, the recommended calibration frequency is every 5 years. The same is incorporated in registered PDD. The change was already accepted by the CDM EB. The verification team confirms that the change does not affect the calculation of emission reduction, additionality and the appropriateness of baseline scenario.

e) A project description deviation was sought during the monitoring period 01-November-2013 to 31-December-2014. PP shall provide all parameter used to calculate baseline, project and leakage GHG emissions in MR. Parameter EFCO2,grid,y is used for calculation of baseline emissions. However, it was not included in revised PDD/1.2/ as ex ante parameter. PP has made a correction in the monitoring period 01-November-2013 to 31-December-2014 and the correction is applicable for the subsequent monitoring periods also. The value of the parameter is 0.6673 tCO2e/MWh and it was already corroborated at the time of the validation. The parameter is now listed as ex-ante parameter in the revised PDD/1.2/. The change was already accepted by the CDM EB. The verification team confirms that the change does not affect the calculation of emission reduction, additionality and the appropriateness of baseline scenario.

f) The VCS crediting period of project activity has been extended to 10 years from 06-March-2011 to 05-March-2021 during the previous monitoring period. The extended crediting period is within the CDM crediting period and therefore accepted by previous VCS verification VVB. The verification team confirms that the change does not impact the additionality and the appropriateness of the baseline scenario.

3.4 Grouped Project

Not applicable. The project activity is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

Ishasha Hydro Electric Power Project involve the construction and operation of a 6.4 MW hydroelectric power plant with two sets of Francis type turbine units (2 x 3.4 MWm) and the corresponding alternators (2 x 4000 kVA) operating at power factor of 0.8, resulting in net generation capacity of 6.4MW/18/. The alternators were manufactured and supplied by M/s Leroy Somer. The turbines are first hand francis type turbines manufactured in Slovenia.

Project activity was fully commissioned in 06-March-2011,which was verified against the revised PDD/1.2/ and commissioning certificates/9/.

Online interview with PP representatives of the project activity was carried out on 18-August-2021 by the verification team to check the implementation status of the project activity and the instrumentation installed for the project activity. Project location (Kanungu District of South-Western Uganda) was confirmed during the interview and it was observed that the project withdraws water from Ishasha River to run two turbines installed under this project activity. The water is transported through penstock of 1,140 metres. The runoff of water tailrace was directed to the Ishasha River.

The energy generated from the project activity will be transmitted to the Uganda Electricity Transmission Company Limited (UETCL), which operates the national grid. This was verified from the PPA signed/10/ and invoices raised to UETCL/7/.

The Monitoring Report, provided the downtime of the plant, occurred during this monitoring period is given in the table below.

Year 2020		Year 2021	
Jan	-	Jan	756:08
Feb	-	Feb	672:00
Mar	-	Mar	-
Apr	-	Apr	-
May	380:04	May	-
Jun	588:20	Jun	-
Jul	754:39	Jul	-
Aug	362:54	Aug	-
Sep	97:14	Sep	-
Oct	848:08	Oct	-
Nov	724:30	Nov	-
Dec	771:36	Dec	-

Furthermore, the PP has informed and reported that there was a major breakdown happened in Turbine 1 inlet value on 02-October-2020, as Turbine 1 main inlet value shutter metal ring was found damaged. This led to non-operation of Turbine 1 since October 2020. The damaged part was not replaced during the monitoring period due to non-availability of part from country of origin (China). Therefore, the project Turbine 1 not functioning from 02-October -2020 till 01-March-2020, which led to lower generation from the project activity during this monitoring period. The PP has provided the photograph and plant log book to verification of breakdown due to not functioning of the Turbine-1 during the period 02-October -2020 till 01-March-2020. The same has been verified also through Interview with the personnel (plant operator) from the operation team and found to be correct, hence accepted.

Interview of the personnel was conducted by the verification team, which revealed that all the QA/QC procedures listed in the revised PDD/1.2/ have been followed while operating the project activity.

All parameters stated in the monitoring plan in revised PDD/1.2/ and the applied methodology/14/ has been fulfilled in the current monitoring report. All baseline emission parameters have been verified and found satisfactory. The discussion regarding each parameter has been elaborated in the further section of this report.

PP will not claim the carbon credits under any other GHG emission reduction scheme (including CDM) for the present monitoring period under VCS and PP has provided declaration on the same during the validation. Hence, there is no possibility of double counting.

The project contributes to sustainable development in Uganda in the following ways –

1) Hydropower project does not result in emissions of pollutants into the atmosphere nor does it emit residuals that can have a negative impact on soil, vegetation, drinking water etc. The project will also contribute to a reduction in emissions other than GHG emissions related to conventional fossil fuel-based power generation, such as emissions of sulphur dioxide, nitrogen oxides, and particulates.
2) The project resulted in additional employment opportunities for local people, especially during the construction phase. Construction materials for the substantial quantum of concrete used for the project and access roads was sourced locally. Presently, around 16 local personnel employed at the project facility as confirmed from the details of employees shared during interviews.

Assessment team concludes the following:

- The implementation status of project activity was found to be in compliance with revised PDD/1.2/
- VVB has conducted the online interviews with PP representatives present onsite to confirm the implementation status of the project.

- The commissioning date of the project activity was found to be accurately and consistently recorded.
- The actual operation of project activity was found to be following the flow diagram provided in revised PDD/1.2/.
- There was no increase in emission reduction from estimates made in revised PDD/1.2/, therefore no additional explanation was sought from PP regarding the same.
- The project is registered under VCS program with reference number 1286/13/ and CDM program with reference number 6381/15/

4.2 Safeguards

4.2.1 No Net Harm

There is no negative impact to any socio-economic conditions of the region due to the project activity. As per the ESIA report prepared for the project activity, the project is runoff the river type of project with very little diversion of natural water channel.

All potential negative social impacts were identified before The National Environment Management Authority of Uganda given approval to the project activity in 2006/23/. All concerns have been addressed by Project developer before the project commissioning.

This project activity will not involve any negative environmental or socio-economic impacts, as the generation of power is by using hydro which is a clean source of energy.

4.2.2 Local Stakeholder Consultation

Local Stakeholder consultations were done before registration of the project activity and validated by VVB during CDM validation of the project activity. Not applicable for the current monitoring period. There was no stakeholder comment /inputs received during this monitoring period, however, PP has also placed a grievance register onsite, wherein, the stakeholders can put down his/her feedback and the same will be addressed on timely manner. However, there is no feedback/grievance has been reported within this monitoring period. Therefore, no corrective action was required to be undertaken. This is verified by VVB through a copy of grievance register.

4.3 AFOLU-Specific Safeguards

For non-AFOLU projects,this section is not required.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The project activity has been monitored as per the monitoring plan mentioned in revised PDD/1.2/. All the deviations identified during the previous monitoring periods have been considered and implemented under the current monitoring period. The verification team confirms that the flow of information (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values) is as per the monitoring plan mentioned in revised PDD/1.2/.

The assessment of each parameter identified in the project activity to calculate the GHG emission reductions have been done in the tables given below –

1. **Data/Parameter, Unit** Annual electricity supplied by the project to the grid (EG_y) in MWh

	Discussion and verification assessment
Purpose of data	Baseline emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	The quantity of net electricity generation supplied by the project plant to the grid are monitored from the bi-directional energy meter of accuracy class 0.2s. Make - CEWE Instrument Model – CEWE Promoter W (year 2011) Accuracy class by energy meter – 0.2s Calibration Frequency – Once in 5 years
Measuring/Reading / Recording frequency	Continuous monitoring of electricity generation and import, monthly recording of net electricity export (Joint Meter Reading Reports)/8/
Data collection (from data generation, aggregation, to recording, calculation and reporting)	At the end of each month, the data from the monthly meter readings as provided in Joint Meter Reading Report/8/, will be added up to obtain the total monitoring period net electricity generation. The revised PDD/1.2/ states that the calibration frequency of the equipment should as per the manufacturer specification i.e., once in five years. There is nodelay in calibration observed during current monitoring period. Therefore, it was accepted by the assessment team.
Verified value	12,760.75 MWh
Cross checks	The verified values were crosschecked from the monthly invoices raised to Uganda Electricity transmission company limited/7/. The values in Joint Meter reading reports/8/ and Invoices raised to UETCL /7/are same.
QA/QC procedures applied	The necessary QA/QC procedures are in place and the data management system is effective and reliable.The technical details of the meters are specified in the MR/4/ are found consistent with calibration certificates/6/.

	Serial Number	Calibration Date	Validity
Main Meter	CW001303	18-12-2010	17-12-2015
		14-06-2016	13-06-2021
Check Meter	CW001304	18-12-2010	17-12-2015
		15-06-2016	14-06-2021

2. **Data/Parameter, Unit** Installed capacity of hydro power plant after the implementation of the project activity (***Cap*** $_{PJ}$) in MW

	Discussion and verification assessment

Data / Parameter	
Purpose of data	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not Applicable as the value of the parameter would be determined based on manufacturer's specification or recognized standards.
Measuring/Reading/ Recording frequency	This parameter is calculated and the calculation is done Yearly/1.2/
Data collection (from data generation, aggregation, to recording, calculation and reporting)	The value of the parameter was verified from the PRC validation opinion approved by CDM EB /2.2/, which is consistently reported in the MR/4/
Verified value	6.4 MW
Cross checks	The value of the parameter was cross checked from the revised PDD/1.2/.
QA/QC procedures applied	Not Applicable. There is no change observed in project equipment since commissioning and last verification.

Parameter, Unit Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (A_{PJ}) in m^2

	Discussion and verification assessment
Purpose of data	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not Applicable as the value of the parameter measured from topographical surveys, maps, satellite pictures, etc. of reservoir area.
Measuring/Reading/ Recording frequency	This parameter is calculated and the calculation is done Yearly/1.2/
Data collection (from data generation, aggregation, to recording, calculation and reporting)	Ishasha Dam reservoir layout/12/, submitted by the PP, was used by the assessment team to check the value of the parameter as per revised PDD/1.2/, which is consistently reported in the MR/4/
Verified value	9,608 m^2
Cross checks	Not Applicable. There is no change observed in reservoir area since commissioning and last verification.
QA/QC procedures applied	Not Applicable. There is no change observed in reservoir area since commissioning and last verification.

The above-mentioned parameter was measured in accordance with the approved revised PDD/9/ and monitoring plan of the applied methodology/11/ as *ex-post*. The following parameters were directly taken from the approved revised PDD/9/ to calculate the emission reduction as *ex-ante* fixed:

a) **$FC_{i,m,y}$, $FC_{i,j,y}$, $FC_{i,k,y}$, Mass or volume unit**: The data is sourced from utility official publications, collected from UETCL and was used for the calculation of operating margin at the time of validation/1.2/.

b) **$NCV_{i,y}$, GJ/ mass or volume unit**: The revised PDD/1.2/ gives the value of 41.4TJ/10^3 tonnes for diesel/distillate and 39.8TJ/10^3tonnes for residual fuel. The values have been sourced from IPCC guidelines on National GHG Inventories.

c) **$EF_{co2,l,j}$ and $EF_{co2,m,l,y}$**: The revised PDD/1.2/ gives the value of 72.6 tCO_2/TJ for diesel/distillate and 75.5 tCO_2/TJ for residual fuel. The values have been sourced from IPCC guidelines on National GHG Inventories.

d) **$EG_{m,y}$, $EG_{j,y}$, $EG_{k,y}$, MWh**: The data is sourced from the most recent three data collected from Electricity Regulatory Authority(ERA) and Uganda Electricity Transmission Company Limited(UETCL). and was used for the calculation of operating margin at the time of validation/1.2/.

e) **$EF_{CO2,grid,y}$,tCO_2/MWh**: The parameter is CO2 emission factor of the grid. The value of the parameter is 0.6673 as per the revised PDD/1.2/.

f) **Cap_{BL}, W:** The parameter is 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 of the parameter is 0 as per the revised PDD/1.2/.

g) **A_{BL}, m^2**: The parameter is 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 (m^2). For new reservoirs, this value is zero. The value of the parameter is 0 as per the revised PDD/1.2/

GHG Calculations:

The calculation of emission reduction has been done in accordance to the applied methodology/11/. As per the applied methodology, the values of project emission and leakages are considered as zero for the project activity. The equation used for calculation of baseline emission is given below:

Baseline emissions are calculated as follows:

$$BE_y = EG_y * EF_{co2,\,grid}$$

Where,

BE_y	=	Baseline Emissions in year y (t CO_2)
EG_y	=	Annual Electricity supplied by the project to the grid
$EF_{CO2, grid}$	=	CO2 emission factor of the grid (t CO_2/MWh)

Therefore, the baseline emissions for Year 2020 (from May 2020 till Dec 2020)

= 10,664.67MWh * 0 .6673 tCO2/MWh

= 7,116 tCO_2e (Round down Value)

Therefore, the baseline emissions for Year 2021 (from Jan 2021 till Feb 2021)

= 2,096.08 MWh * 0 .6673 tCO2/MWh

= 1,398tCO_2e (Round down Value)

The Total baseline Emissions = 7,116 + 1,398= 8,514tCO_2e

Project emissions are calculated as follows:

As per the paragraph 20 of AMS-I.D., version 17 /14/, the project emissions have to be considered following the procedure described in the methodology ACM0002 for emissions from water reservoirs of hydro power plants. It has been clearly shown by the PP in the MR/4/ that the power density of the project activity is 666.11W/m^2, which is greater than 10W/m^2. Therefore, as per ACM0002 it can be taken as zero. This consideration was found to be in line with the applied methodology AMS-I.D. version 17/14/.

Leakages have been considered as zero for the project activity as per the appliedmethodology/14/.

Therefore,

Net Emission reductions = Baseline emissions - Project emissions – Leakage

= 8,514 – 0 – 0 =8,514 tCO_2e

The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed. The assumptions, emission factors and default values that were applied in the calculations are justified. All the data were made available and have monitored as per required monitoring frequency. The means of verification for the values of parameters, used for baseline emission calculation, is described above.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The project activity under consideration consists of a well-defined management structure which ensures the quality of data monitored. The project monitoring system and reporting procedure are well managed by Eco Power Uganda Limited. The project facility has a dedicated team comprising of the members having vast standing experience in the said field of operations and the roles and responsibilities towards the project operation and management are well structured. The project activity ensures the data acquisition and data processing system in two parallel ways, one is automatically online registering procedure through online data logging and another is the manual logging procedure in the log book. The project activity employs trained personnel at project site as per the operational responsibility to monitor and archive data.

All the parameters used for the determination of the Emission Reductions are discussed in previous section of this report. All the data recorded are in compliance with the monitoring plan. During the interview with onsite personnel's the assessment team interviewed employees from all the departments for understanding the entire data flow system and ensures the robustness of the data corroboration procedure maintained in the Eco Power Uganda Limited.

The emission reduction calculation for the project activity is estimated based on the electricity supplied by the TG sets installed at site. Monthly values of electricity generated inserted in the ER sheet was verified with the Joint Meter Reading Report/8/ and Invoices provided by the project proponent/7/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.The data variable used for the calculation of emission reductions is the net electricity supplied by the project activity. The parameter has been monitored through electronic meters; therefore, the likelihood of error is purely systematic in nature. The energy meters have been calibrated by the manufacturer/6/. The monthly JMRs/8/ for the energy generated issued by the state utility have been submitted to the assessment team and 100% of the data has been verified.

Therefore, the assessment team confirms that the emission reductions are free from any omissions, misstatement and material errors

4.6 Non-Permanence Risk Analysis

.Not Applicable as this section is not applicable for non-AFOLU projects.

5 VERIFICATION CONCLUSION

LGAI Technological Center, S.A. (also referred to as Applus+ Certification), contracted by C-Quest Capital LLC, has performed the independent verification of the emission reductions for the VCS project activity (VCS ID- 1286) "Ishasha 6.6 MW Small Hydropower Project" in Uganda for the monitoring period 01-May-2020 to 01-March-2021 as reported in the Monitoring Report Version 02.0 dated 24-August-2021/4/. TheEco Power Uganda Limited is responsible for the collection of data in accordance with the monitoring plan and C-Quest Capital LLC is responsible for the reporting of GHG emissions reductions from the project activity.

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity

Applus+ Certification commenced the verification on the basis of the baseline and monitoring methodology AMS-I.D. version 17/14/, the monitoring plan contained in the approved revised CDM PDD /1.2/ and VCS guidelines version 4.0/17/, Monitoring Report Version 02.0 dated 24-August-2021/4/as per the process described under Section 2 of this report.

Applus+ Certification verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Applus+ Certification planned and performed the verification by obtaining evidence and other information and explanations that Applus+ Certification considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 01-May-2020 to 01-March-2021 are fairly stated in the Monitoring Report Version 02.0 dated 24-August-2021/4/. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology AMS-I.D. version 17/14/, and the VCS standard 4.1/16/.

Verification period:From01-May-2020 to 01-March-2021(including both days)

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 2020 (from 01-05-2020 to 31-12-2020)	7,116	0	0	7,116
Year 2021 (from 01-01-2021 to 01-03-2021)	1,398	0	0	1,398

Total	8,514	0	0	8,514

APPENDIX 1: DOCUMENT REFERENCES

S.No	Title of Document	Version	Date
1.1	Registered VCS-PD	01	28-02-2014
1.2	Revised approved CDM-PDD	10	26-09-2016
2.1	VCS Verification Report formonitoring period from 01-01-2016 to 30-04-2018 VCS Verification Report for monitoring period from 01-05-2018 to 30-04-2020	2.0 01.1	22-08-2018 12-06-2020
2.2	CDM PRC Validation Report (CDM Ref: CDM- PRC-6381-002)	01	06-12-2016
3.	VCS Monitoring Report (Draft)monitoring period from 01-05-2020 to 01-03-2021	01	13-08-2021
4.	VCS Monitoring Report (Final)monitoring period from 01-05-2020 to 01-03-2021	02.1	27-10-2021
5.	ER spread sheet (corresponding to the final monitoring report)	01	13-08-2021
6	Certificates of Calibration for all the meters belongs to project activity		
6.1	• 1st Calibration test certificate for energy meter CW001303(main meter) • 2nd Calibration test certificate for energy meter CW001303(main meter)	-	18-12-2010 14-06-2016
6.2	• 1st Calibration test certificate for energy meter CW001303(check meter) • 2nd Calibration test certificate for energy meter CW001303(check meter)	-	18-12-2010 15-06-2016
7.	Invoices addressed to Uganda electricity transmission company limited (UETCL) for this monitoring period	-	01-05-2020 to 01-03-2021
8.	Joint Monthly Meter Readings for this monitoring period	-	
9.	Commissioning certificate of Project activity	-	06-03-2011
10.	• Power Purchase Agreement Between UETCL and EPUL • Subsequent amendment in PPA	-	17-08-2007 20-11-2008
11.	Environmental Audit Report for the project activity	-	12-03-2011
12.	Ishasha Dam Reservoir Layout	-	13-01-2011
13.	VCS webpage for the project, VCS ID 1286; https://registry.verra.org/app/projectDetail/VCS/1286	-	-
14.	"Grid connected renewable electricity generation", AMS-I.D.	17	03-06-2011
15.	UNFCCC CDM project webpage, CDM ID 6381; https://cdm.unfccc.int/Projects/DB/AENOR1339140439.41/view	-	-
16.	VCS Standard	4.1	Issued: 19-09-2019 Updated: 22-04-2021
17.	VCS Program Guide	4.0	19-09-2019
18.	Latest photographs of major project equipment's installed at site (i.e. Turbine, generators, energy meters, weir intake, penstock, tailrace etc.)	-	18-08-2021
19.	CDM-PRC-6381-001 weblink - https://cdm.unfccc.int/PRCContainer/DB/prcp519601910/view	-	-
20.	CDM-PRC-6381-002 Weblink - https://cdm.unfccc.int/PRCContainer/DB/prcp451272962/view	-	-
21.	CDM Project Standard for Project activity	02.0	29-11-2018
22.	CDM Validation and Verification Standard for Project activity	02.0	29-11-2018
23.	Certificate of EIA approval from NEMA	-	13-12-2006
24.	CQC LLC - Uganda Self Declaration Letter	-	24-08-2021

APPENDIX 2: ABBREVIATIONS

Abbreviations	Full texts
CAR	Corrective Action Request
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	Clean Development Mechanism Validation and Verification Standard
EB	Executive Board
EF	Emission Factor
EPC	Engineering ,Procurement and Construction
ER	Emission Reductions
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CR	Clarification Request
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GOI	Government of India
IPCC	Intergovernmental Panel on Climate Change
MGR	Monthly Generation Reports
MP	Monitoring Plan
MR	Monitoring Report
MWh	Megawatt hour
NCV	Net Calorific Value
PD	Project Description
PP	Project Proponent
PS	Project Standard
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVB	Validation and Verification Body
VVS	Validation and Verification Standard

APPENDIX 3: FINDINGS OVERVIEW

Findings Overview Summary

Type	CAR	CL	FAR
Total Number raised	03	02	00

Remaining FAR from validation and/or previous verification

~~FAR ID~~	~~N/A~~	~~Section no.~~	~~N/A~~	~~Date:N/A~~
~~Description of FAR~~				
~~N/A~~				
~~Project participant response~~				~~Date:N/A~~
~~N/A~~				
~~Documentation provided by project participant~~				
~~N/A~~				
~~VVB assessment~~				~~Date:N/A~~
N/A				

Table 1. CR from this verification

CL ID	01	Section no.	1.10	Date : 19/08/2021
Description of CL				
Declaration document pertaining to section 1.10 of VCS MR version 01.				
Project participant response				Date:24/08/2021
Signed declaration letter is being provided to the VVB for reference.				
Documentation provided by project participant				
Self-Declaration Letter from CQC dated 24-August-2021				
VVB assessment				Date: 28/08/2021
The PP has submitted the Self-Declaration Letter dated 24-August-2021 as accordance to section 1.10 of VCS MR. This found to be correct, hence accepted. CL#01 is closed.				

CL ID	02	Section no.	1.6	Date :19/08/2021
Description of CAR				
The project crediting period ending on 05-March-2021 for this VCS project. However, the PP is considering monitoring period end date as 01-March-2021. Therefore, PP is requested to clarify why the end date of this monitoring period is not consistent with end date of crediting period as only 4 days may be remaining under the first crediting period after this verification?				
Project participant response				Date:24/08/2021
PP acknowledges the fact that project crediting period will end on 05-March-2021. However, Joint monthly Reading of main and check energy meters were taken once every month only. The last Joint monthly Reading was taken on 01-March-2021 and next was done on 01-April-2021. Since, PP don't have any authentic readings for 05-March-2021 for Main and Check Energy Meters, it was decided to keep the end date of monitoring period as 01-March-2021.				
Documentation provided by project participant				
-				
VVB assessment				Date:28/08/2021
The PP has clarified that Joint monthly Reading of main and check energy meters were taken once every month only. The last Joint monthly Reading was taken on 01-March-2021, therefore the PP is considered the end date of monitoring period as 01-March-2021. Hence accepted. CL#02 closed				

Table 2. CAR from this verification

CAR ID	01	Section no.	2.2	Date :19/08/2021
Description of CAR				
1. Please elaborate the initial LSC and how due account of all and any input received during ongoing communication has been taken. Describe if any or provide statement no relevant communication has been received, etc. 2. PP needs to submit copy of visitor register and clarify if there is any comment received during current monitoring period.				
Project participant response				Date:24/08/2021
1. LSC was conducted initially at the time of project start as part of CDM registration of the project activity. Further details of measure taken to address the concerns of local community has been mentioned in the revised MR. 2. Copy of visitor register has been provided to VVB for reference. No negative comment or concern raised during this monitoring period.				

Documentation provided by project participant	
• Revised MR version 2.0 dated 24-August-2021 • Copy of Visitor register maintained at project site	
VVB assessment	**Date:28/08/2021**
The PP has provided the requested documents and same was verified by the VVB team and found to be correct and hence accepted. The CAR#1 closed.	

CAR ID	02	Section no.	3	Date :19/08/2021
Description of CAR				
The PP has requested to provide the current implementation status of project as it was discussed during remote- site visit, there was one turbine was not operational and also the PP has requested to provide shut down-time hour of the project fall under this monitoring period.				
Project participant response				**Date:24/08/2021**
Same has been updated in the revised MR.				
Documentation provided by project participant				
• Revised MR version 2.0 dated 24-August-2021 • Details of Downtime (Shut down) from Plant log book				
VVB assessment				**Date:28/08/2021**
The PP has submitted the revised MR with updated information of current implementation status of project and also provided the Plant Log book data to verify the same. This was checked and found to be correct, hence accepted. CAR#02 is closed.				

CAR ID	03	Section no.	5.4	Date :19/08/2021
Description of CAR				
The PP is requested to provide comparison of actual emission reductions value against ex-ante estimated value for the equivalent period in section 5.4 of the VCS-MR.				
Project participant response				**Date:24/08/2021**
The actual emission reduction achieved are less than ex-ante estimated values for the equivalent period of 10 months which comes out to be 15,855 tCO_2e. Same is being updated in revised MR.				
Documentation provided by project participant				

Revised MR version 2.0 dated 24-August-2021	
VVB assessment	**Date:28/08/2021**
The PP has submitted the revised MR with updated information of comparison of actual emission reductions value against ex-ante estimated value for the equivalent period in section 5.4 of the VCS-MR. This was checked and found to be correct, hence accepted. CAR#02 is closed.	

Table 3. FAR from this verification

~~**FAR ID**~~	~~N/A~~	~~**Section No.**~~	~~N/A~~	~~**Date:**N/A~~
~~**Description of FAR**~~				
~~N/A~~				
~~**Project participant response**~~				~~**Date:**N/A~~
~~N/A~~				
~~**Documentation provided by project participant**~~				
~~N/A~~				
VVB assessment				**Date:**N/A
N/A				

APPENDIX 2: COMPETENCY STATEMENT

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 the 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	Qualification	Coverage of scope	Coverage of technical Area	Financial aspect	Host country Experience	Attendance to the Assessment (remote)
Vivek Ahirwar	Lead Auditor (LA)	Yes (1)	Yes (1.2)	N/A	Yes	Yes
Vivek Ahirwar	Technical Expert (TE)	Yes (1)	Yes (1.2)	N/A	Yes	Yes
Simon Shen	Technical Reviewer (TR)	Yes (1)	Yes (1.2)	N/A	N/A	N/A

The curricula vitae of the VVB's team members are provided below:

Vivek Kumar Ahirwar is a BEE-Certified Energy Auditor by Govt of India with over eight years of relevant experience in energy efficiency, energy audit, thermal and electrical energy generation technology from renewable source and energy conservation in energy intensive industries, designated consumers and commercial buildings, implementation of energy conservation building codes, research, process and green building projects. He is a certified lead auditor for ISO 14001 EMS and 14064. He has experience under various categories of projects stating from renewable to waste to supercritical projects and WCD. He has successfully audited more than 100 GHG (CDM/VCS/GS) projects in different states across the India. He has done Mater in Technology (Energy Management) from a premier institute, School of Energy & Environmental Studies, DAVV, Indore (M.P.), India and Bachelor of Engineering (Mechanical Engineering) from Govt. Engineering college, Rewa, RGPV, India.

Simon Shen (master degree in thermal energy engineering, bachelor degree in environmental engineering) is a lead auditor appointed by Applus+ certification for the GHG project assessment. He is based in Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ certification, he had been worked for TÜV SÜD as a GHG validator/verifier and ISO 9001/14001 lead auditor for 3.5 years.