

Verification Report for Carbon Offset Units (CoUs) for Project (UCR ID Number: 090)

Title: “11.998 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh”



Project Owner details:

Government of Arunachal Pradesh,

Address: Vidyut Bhawan, Itanagar, Arunachal Pradesh 791111, India.

Submitted by:

Naturelink Solutions Pvt Ltd


Approved Verifier, UCR

Contact No.: +91 8320809503

Email: arjun@thenaturelink.in

COVER PAGE	
Project Verification Report Form (VR)	
BASIC INFORMATION	
Name of approved UCR Project Verifier / Reference No.	Mr. Arjun K Vyas (Lead Verifier)
Type of Accreditation	<input type="checkbox"/> CDM Accreditation <input type="checkbox"/> ISO 14065 Accreditation <input checked="" type="checkbox"/> UCR Approved Verifier
Approved UCR Scopes and GHG Sectoral scopes for Project Verification	Sectoral Scope: 01 Energy Industries
Validity of UCR approval of Verifier	10/06/2022 onwards
Completion date of this VR	10/06/2022
Title of the project activity	11.998 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh.
Project reference no. (as provided by UCR Program)	090
Name of Entity requesting verification service (can be Project Owners themselves or any Entity having authorization of Project Owners, example aggregator.)	Government of Arunachal Pradesh
Contact details of the representative of the Entity, requesting verification service (Focal Point assigned for all communications)	Creduce Technologies Private Limited- Address: 2-O-13,14 Housing Board Colony, Banswara, Rajasthan - 327001, India.
Country where project is located	India
Applied methodologies (Approved methodologies by UCR Standard used)	AMS-I.D.: "Grid connected renewable electricity generation", version 18
Project Verification Criteria: Mandatory requirements to be assessed	<input checked="" type="checkbox"/> UCR Standard <input checked="" type="checkbox"/> Applicable Approved Methodology <input type="checkbox"/> Applicable Legal requirements /rules of host country

	<input checked="" type="checkbox"/> Eligibility of the Project Type <input checked="" type="checkbox"/> Start date of the Project activity <input checked="" type="checkbox"/> Meet applicability conditions in the applied methodology <input checked="" type="checkbox"/> Credible Baseline <input checked="" type="checkbox"/> Do No Harm Test <input checked="" type="checkbox"/> Emission Reduction calculations <input checked="" type="checkbox"/> Monitoring Report <input checked="" type="checkbox"/> No GHG Double Counting <input type="checkbox"/> Others (please mention below)
Project Verification Criteria: Optional requirements to be assessed	<input checked="" type="checkbox"/> Environmental Safeguards Standard and do-no-harm criteria <input type="checkbox"/> Social Safeguards Standard do-no-harm criteria
Project Verifier's Confirmation: The <i>UCR Project Verifier</i> has verified the UCR project activity and therefore confirms the following:	<p>The UCR Project Verifier Arjun K Vyas, certifies the following with respect to the UCR Project Activity "11.998 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh</p> <p><input checked="" type="checkbox"/> The Project Owner has correctly described the Project Activity in the Project Concept Note (dated 27/03/2022) including the applicability of the approved methodology A.M.S I. D and meets the methodology applicability conditions and has achieved the estimated GHG emission reductions, complies with the monitoring methodology and has calculated emission reductions estimates correctly and conservatively.</p>

	<p><input checked="" type="checkbox"/> The Project Activity is likely to generate GHG emission reductions amounting to the estimated 40,110 TCO_{2e}, as indicated in the PCN, which are additional to the reductions that are likely to occur in absence of the Project Activity and complies with all applicable UCR rules, including ISO 14064-2 and ISO 14064-3.</p> <p><input checked="" type="checkbox"/> The Project Activity is not likely to cause any net-harm to the environment and/or society</p> <p><input checked="" type="checkbox"/> The Project Activity complies with all the applicable UCR rules and therefore recommends UCR Program to register the Project activity with above mentioned labels.</p>
Project Verification Report, reference number and date of approval	<p>Verification Report UCR Project ID: 090</p> <p>Date: 10/06/2022</p>
Name of the authorised personnel of UCR Project Verifier and his/her signature with date	<p>Arjun K Vyas</p> 

Project Verification Report

A. Executive Summary

The verification work has been contracted by project aggregator Creduce Technologies Pvt Ltd to perform an independent verification of its UCR project titled “**11.998 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh. UCR approved project ID:090**”, to establish number of CoUs generated by project over the crediting period from 01/01/2014 to 31/12/2021 (both days included).

Verification for the period : 01/01/2014 to 31/12/2021

In my opinion, the total GHG emission reductions over the crediting / verification period stated in the Monitoring Report (MR), submitted to me is found to be correct and in line with the UCR guidelines.

The GHG emission reductions were calculated on the basis of UCR Protocols which draws reference from, Standard Baseline, AMS. I. D – Grid connected renewable electricity generation (Version 18.0). Owing to the Covid pandemic, the verification was done remotely by way of video calls, phone calls and submission of documents for verification through emails.

I am able to certify that the emission reductions from the 11.998 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh. UCR (UCR ID – 090) for the period 01/01/2014 to 31/12/2021 amounts to 40,110 CoUs (40,110 tCO₂eq).

Scope

The scope of the verification is the independent, objective review and ex post determination of the monitored reductions in GHG emission by the project activity.

1. The quality of data management and records of underlying data;
2. Completeness and accuracy of calculations and baseline emission reports;
3. Proper inclusion and documentation of all project locations,
4. Correct application of offset rules for filling Baseline Period data gaps;
5. Other data, methods and procedures deemed necessary to establish the accuracy of emission reductions.
6. Agreement stating Assurance to avoid double accounting for the project to be verified, along with required proof.

The project is assessed against the requirements of the UCR programme verification Guidance Document, UCR Standard, UCR Programme Manual and related rules and guidelines. Due professional care has been exercised and ethical conduct has been followed by the assessment team during the verification process. The verification report is a fair presentation of the verification activity. The validation of project is not part of present assignment and projects deemed validated post registration by UCR.

Description of the Project

As described in the Project Concept Note (PCN), the project activity involves hydro project of installed aggregated capacity of 11.998 MW at West Siang, Shi Yomi, Changlang and Anjaw district respectively. The details of the project activity are verified with the project report copy submitted for verification.

As mentioned in the Monitoring Report and Emission Reduction Calculation sheet submitted for the verification, the project replaces anthropogenic emissions of greenhouse gases (GHGs) estimated to be approximately 40,110 tCO₂e for the said period under verification, there on displacing 44,566 MWh amount of electricity from the generation mix of power plants connected to the Indian electricity grid, which is mainly dominated by the fossil-fuel based power plant.

The project activity is a grid connected renewable energy generation project having capacity of less than 15 MW. The project is a small-scale activity. The methodology applied in the Monitoring Report is verified against the A.M.S I. D “Grid connected renewable electricity generation” version 18.0.

Verified total emission reductions achieved through the project activity during the monitoring period is summarised below:

Summary of the Project Activity and ERs Generated for the Monitoring Period

Start date of this Monitoring Period	01/01/2014
Carbon credits claimed up to	31/12/2021
Total ERs generated (tCO ₂ eq)	40,110 tCO ₂ eq
Leakage	0

B. Project Verification team, technical reviewer and approver:

No.	Role	Last name	First name	Affiliation	Involvement in		
					Doc review	Off-Site inspection	Interviews
1.	Team Leader	Vyas	Arjun	Lead Verifier	Yes	No	Yes
2.	Validator	Vyas	Arjun	Lead Verifier	Yes	No	Yes
3.	Technical Expert	Shah	Kalindi	Outsourced Entity	Yes	No	No

C. Means of Project Verification

Desk/document review

The project documents submitted to UCR approved verifier Mr. Arjun K Vyas was reviewed by the technical expert and validated by the verifier at Gandhinagar. The documents reviewed involves verification of legal status of individual project owner for consistency, project related documents like installation and commissioning of equipment used in project activity. Environmental clearances from state or central pollution control board Consent to establish and operate, monitoring related meters/parameters equipment measuring instruments and their calibration records, to establish running of equipment for the crediting period etc.

The PCN is made available to verifier post approval by UCR which is considered as validated documents and the content of validated PCN are considered as record wherever required. Further the communication agreement made between project owner and project aggregator is document of UCR registry hence the project aggregator is treated as authorized representative of project owner. All the documents submitted by project aggregator to verifier is treated as documents submission on behalf of project owner.

The list of submitted document is available in subsequent section of this verification report under section "Document reviewed or referenced"-section I.

On-Site inspection- Not applicable.

Date of off-site inspection: DD/MM/YYYY to DD/MM/YYYY	Not applicable as per UCR guideline site visit not conducted for this verification activity.		
No.	Activity performed Off-Site	Site location	Date
1.			

Interviews: Not applicable

As per UCR guideline the site visit was not conducted during the course of verification and no interview conducted.

No.	Interview			Date	Subject
	Last name	First name	Affiliation		
1.					

Sampling approach:

Out of 19 project sites, 3 sample sites were selected for the verification namely Teepani MHS (2 x 250 kW), Solegamang MHS (1 x 50 kW) and Sirikorong MHS (2 x 250 kW). For the verification of monitoring parameter of electricity generation departmental database was made available to verifier and the same has been verified. Data are being monitored on monthly basis. Since physical visit of installation site was not conducted, meter photos, and Technical Specification/Purchase Order Copies are used for the verification.

Clarification request (CLs), corrective action request (CARs) and forward action request (FARs) raised

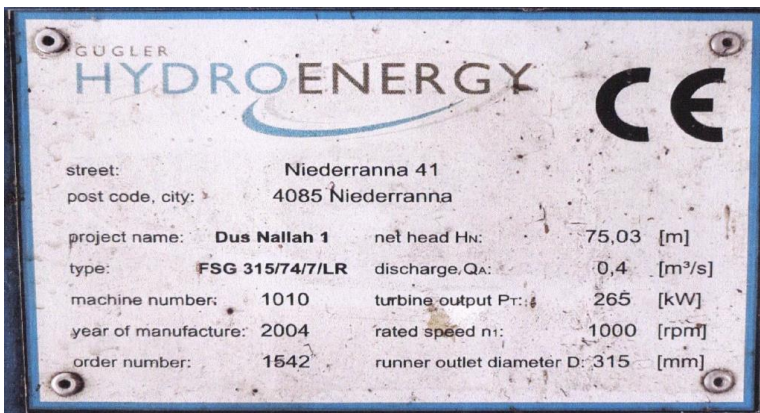
Areas of Project Verification findings	No. of CL	No. of CAR	No. of FAR
Green House Gas (GHG)			
Identification and Eligibility of project type	NIL	NIL	NIL
General description of project activity	NIL	NIL	NIL
Application and selection of methodologies and standardized baselines	--	--	--
- Application of methodologies and standardized baselines	NIL	NIL	NIL
- Deviation from methodology and/or methodological tool	NIL	NIL	NIL
- Clarification on applicability of methodology, tool and/or standardized baseline	NIL	NIL	NIL
- Project boundary, sources and GHGs	NIL	NIL	NIL
- Baseline scenario	NIL	NIL	NIL
- Estimation of emission reductions or net anthropogenic removals	NIL	NIL	NIL
- Monitoring Report	NIL	NIL	NIL
Start date, crediting period and duration	NIL	NIL	NIL
Environmental impacts	NIL	NIL	NIL
Project Owner- Identification and communication	NIL	NIL	NIL
Others (please specify)	NIL	NIL	NIL
Total	NIL	NIL	NIL

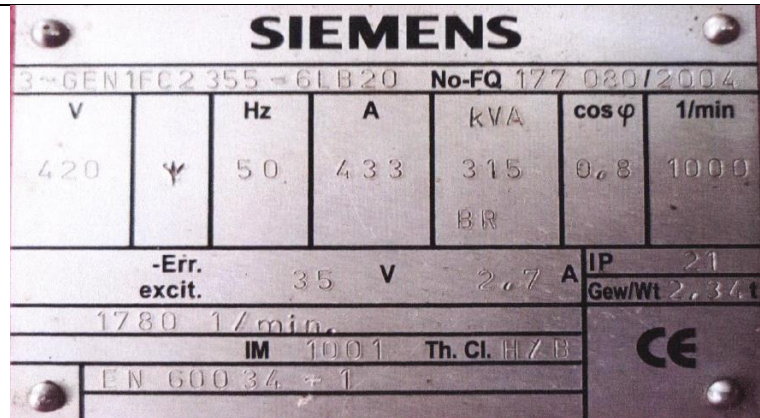
D. Project Verification findings

Identification and eligibility of project type

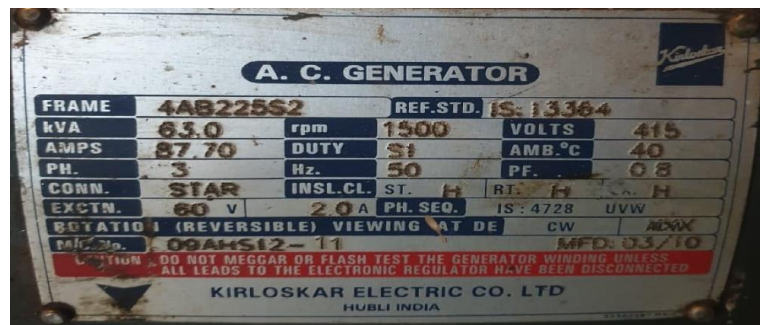
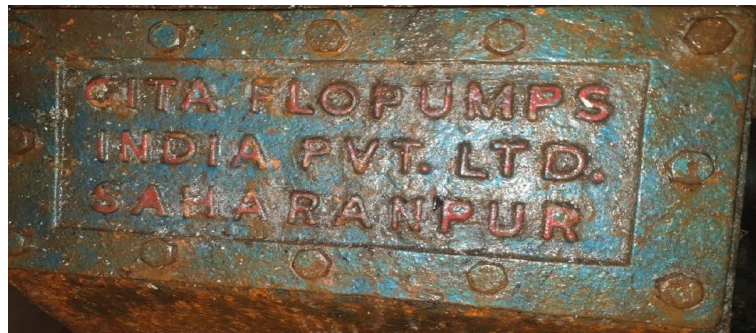
Means of Project Verification	Project has taken reference of CDM methodology AMS-I D, version 18 Grid Connected Renewable Electricity Generation.
Findings	<ol style="list-style-type: none">1. Project activity is described through UCR approved PCN.2. UCR project communication agreement clearly defines the Project Proponent and Project Aggregator.
Conclusion	<p>The UCR approved format is used for description and project meets the requirement of UCR verification standard and UCR project standard.</p> <p>UCR project communication agreement submitted to verifier and the same has been verified. Methodology referenced and applied appropriately describing the project type. The eligibility of project aggregator is verified using UCR communication agreement, Project correctly applies the verification standard, UCR project standard and UCR regulations.</p> <p>The project activity is overall meeting the requirements of UCR Verification standard and UCR project standard.</p>

General description of project activity

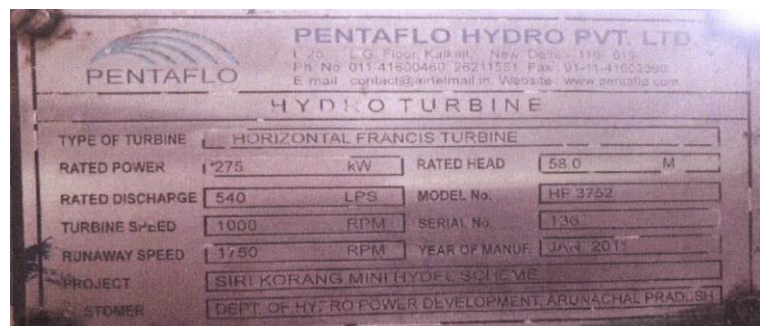
Means of Project Verification	<p>The project activity involves the setting up of a run-of-river hydro power plants that were commissioned for operation as per the commissioning certificate verified. Each unit of Turbine is coupled with AC generator as verified with the name plate:</p> <p><u>Teepani MHS</u></p> 
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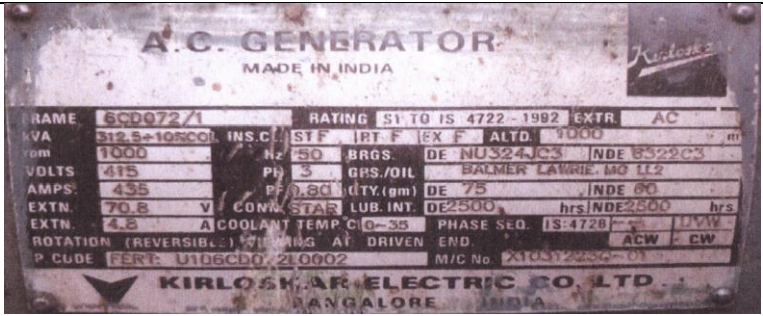


Solegamang MHS



Sirikorong MHS



	 <p>The power evacuation at the Substation is confirmed by Electricity generation sheet.</p>
Findings	<ol style="list-style-type: none"> 1. Project Commissioning date is mentioned in the commissioning certificate. 2. Turbine Capacity is same as mentioned in the name plate and technical specifications. 3. Project implementation and sale of energy abide the power purchase agreement.
Conclusion	The description of the project activity is verified to be true based on the review of PCN, MR, Commissioning Certificate, Purchase Order Copies and Technical Specification sheet.

Application and selection of methodologies and standardized baselines

(.a.i) Application of methodology and standardized baselines

Means of Project Verification	Project has taken reference of CDM methodology A.M.S I.D. CDM website is referred to check the latest version of the methodology. For the applicability mentioned in the PCN and MR, Turbine Specification, Commissioning certificate, Detailed Project Report documents were referred.
Findings	The methodology applied is applicable for the project activity.
Conclusion	Methodology application is appropriate meeting the requirements of UCR and its standardized baseline. The methodology version is correct and valid. Referenced methodology is applicable to project activity.

(.a.ii) Clarification on applicability of methodology, tool and/or standardized baseline

Means of Project Verification	The documents reviewed are A.M.S I. D “Grid connected renewable electricity generation” version 18, UCR Program standard, and UCR Verification Standard.
Findings	Emission factor calculated using the methodology is higher than UCR standard recommends.
Conclusion	Methodology has not been applied “as it is” rather it is referenced. The emission factor considered for the calculation of the emission reductions is verified with the UCR Program Standard. The total installed electrical energy generation capacity of the project equipment

	does not exceed 15 MW thus meeting the requirement of small-scale project.
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(.a.iii) Project boundary, sources and GHGs

Means of Project Verification	Letter from CPCB dated 07/03/2016 No. B-29012/ESS(CPA)/2015-16. PCN section B.4.
Findings	Project boundary is appropriately defined in PCN version 01 which is physical and geographical site of power house.
Conclusion	Project boundary is correctly defined in revised PCN version 01. GHG source correctly identified and reported. The project meets the requirements of UCR project standard, Verification standard and methodology requirements for boundary, GHG source.

(.a.iv) Baseline scenario

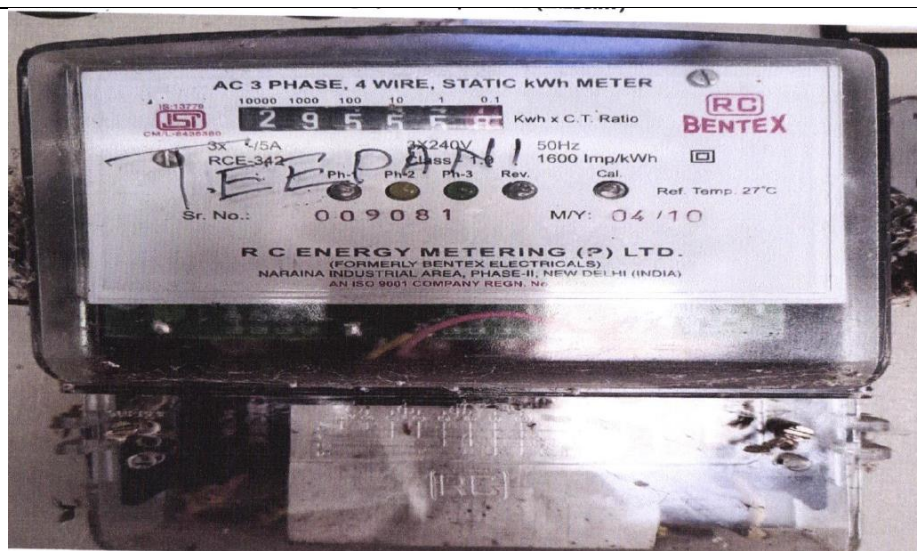
Means of Project Verification	PCN Section B.5 and General Project Eligibility Criteria and Guidance, UCR Standard.
Findings	Declared information is correct and verified.
Conclusion	Baseline scenario is appropriately described. The conservative or default value for emission considered. The baseline scenario is in accordance with UCR project verification standard and UCR project standard.

(.a.v) Estimation of emission reductions or net anthropogenic removal

Means of Project Verification	Joint Meter Reading Reports, and General Project Eligibility Criteria and Guidance, UCR Standard, page 4.
Findings	Declared information is correct and verified.
Conclusion	Emission reductions are correctly calculated. The data used are either monitored at plant and hence the emission reduction is reported correctly and meets the requirements of UCR verification standard and UCR project standard.

(.a.vi) Monitoring Report

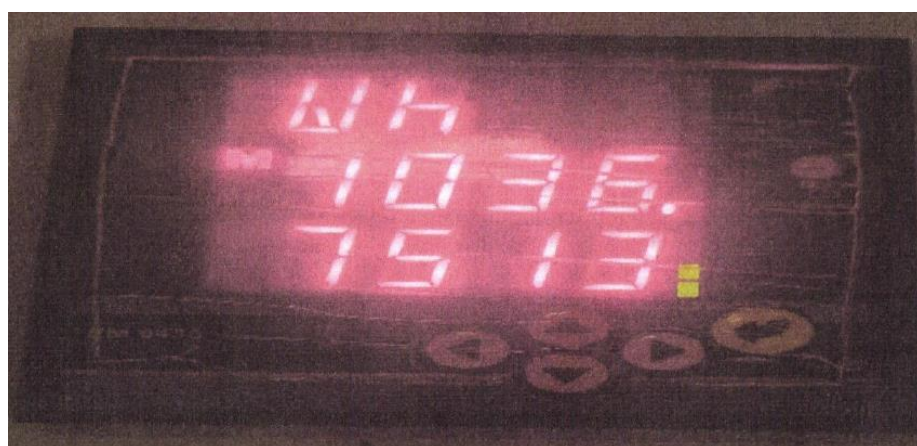
Means of Project Verification	Joint Meter Reading Reports, and General Project Eligibility Criteria and Guidance, UCR Standard, page 4. Energy meters installed at the site: <u>Teepani MHS</u>
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Solegamang MHS



Sirikorong MHS



Findings

Declared information is correct and verified.

Conclusion

Monitoring parameter as reported through MR adequately represents the parameters relevant to emission reduction calculation. Department of Hydro Power Development, Arunachal Pradesh ensures the accuracy of data reported. The number of CoUs generation is calculated based on this accurately reported data. The calculation was done using excel sheet where all the parameters reported. The

	emission factor for electricity is as per UCR standard for electricity component. Based on monitoring and emission reduction calculations are correctly calculated and reported. The monitoring report meets the requirements of UCR project verification requirements.
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Start date, crediting period and duration

Means of Project Verification	PCN and MR, Purchase order of Turbine and technical Specification sheet, Commissioning certificate, Detailed Project Report documents were referred.
Findings	Declared information is correct and verified.
Conclusion	The start date, crediting period and project duration reported correctly and this meets the requirements of UCR verification standard and UCR project standard.

Positive Environmental impacts

Means of Project Verification	PCN
Findings	Declared information is correct and verified.
Conclusion	The positive environmental impact meets the requirement of UCR verification standard and UCR project standard.

Project Owner- Identification and communication

Means of Project Verification	PCN, Communication Agreement, MR, Purchase order of Turbine, Commissioning certificate, Power Purchase Agreement.
Findings	Declared information is correct and verified.
Conclusion	Project owner identified through communication agreement signed between PP and PA. Equipment purchase order and commission verified. Also, legal document like Power Purchase Agreement clearly establishes the project owner. The identification and communication correctly meet the requirement of project verification and UCR project standard.

Positive Social Impact

Means of Project Verification	Project has provided temporary employment to local people during its installation and commissioning. Also post commissioning some of people have employed permanently and local people were engaged leading to social financial benefit to surrounding. Overall social impact of project implementation is positive on the surrounding area.
Findings	--

Conclusion	Project has overall positive social impact.
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Sustainable development aspects (if any)

Means of Project Verification	Not Applicable
Findings	--
Conclusion	The Project has capability to address SDG 7 Affordable and Clean Energy and SDG 13 Climate Action

E. Internal quality control:

- Due professional care has been taken while reviewing the submitted document.
- There is no conflict of interest as the verifier has no other engagement with either aggregator or project owner directly or indirectly.
- Verification team consists of experience personnel.
- Technical review is performed by experienced and independent person.

F. Project Verification opinion:

Considering the above-mentioned verification conducted on the basis of UCR Protocol, which draws reference from UCR Protocol Standard Baseline, AMS.I. D – Grid connected renewable electricity generation (Version 18.0), the documents submitted during the verification including the data, Project Concept Note (PCN) / Monitoring Report (MR), I am able to certify that the emission reductions from the project - 11.998 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh. (UCR ID – 090) for the period 01/01/2014 to 31/12/2021 amounts to 40,110 CoUs (40,110 tCO₂eq).

G. Abbreviations

Abbreviations	Full texts
UCR	Universal Carbon Registry
CPCB	Central Pollution Control Board
DHPD	Department of Hydro Power Development
MR	Monitoring report
PCN	Project Concept Note
VR	Verification Report
VS	Verification Statement
DAA	Avoidance of Double Accounting Agreement
COD	Commercial Operation Date
PP/PO	Project Proponent / Project Owner
PA	Project Aggregator
PPA	Power Purchase Agreement
ER	Emission Reduction
CoUs	Carbon offset Units.
tCO ₂ eq	Tons of Carbon Dioxide Equivalent
kWh	Kilo-Watt Hour
MWh	Mega-Watt Hour
kW	Kilo-Watt
MW	Mega-Watt

CDM	Clean Development Mechanism
SDG	Sustainable Development Goal
CAR	Corrective Action Request
CL	Clarification Request
FAR	Forward Action Request
GHG	Green House Gas
HEP	Hydro Electric Power

H. Competence of team members and technical reviewers

No.	Last name	First name	Affiliation	Technical Competence
1.	Vyas	Arjun	Lead Verifier	Mr. Arjun K Vyas is post graduate engineer having more than 10 years of experience in the field of Energy, Power and Carbon mitigation projects. As a verifier, he has diverse portfolio of Renewable Energy Projects. Projects verified by him has gained more than 50 million CoUs.
3.	Shah	Kalindi	Outsourced Entity	Mrs. Kalindi Shah is post graduate scientist in the field of Climate Change. Currently, she is acting as technical expert for reviewing the project documents and emission reduction calculations.

I. Document reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UCR	Communication Agreement		PA
2	Creduce	Project Concept Note ver. 2.0		PA
3	Creduce	Monitoring Report		PA
4	Creduce	Avoidance of double accounting		PA
5	Creduce	Emission Reduction Excel		PA
6	DHPD & PP	Energy Generation Sheet (2014-2021)		PA
7	DHPD	Commissioning Certificate		PA
8	PP	Purchase order of Turbine		PA
9	PP	Purchase order of Generator		PA

J. Clarification request, corrective action request and forward action request

Table 1. CLs from this Project Verification

CL ID	XX	Section no.		Date: DD/MM/YY YY
Description of CL				
Project Owner's response				Date: DD/MM/YY YY
Documentation provided by Project Owner				
UCR Project Verifier assessment				Date: DD/MM/YY YY

Table 2. CARs from this Project Verification

CAR ID	XX	Section no.		Date: DD/MM/YY YY
Description of CAR				
Project Owner's response				Date: DD/MM/YY YY
Documentation provided by Project Owner				
UCR Project Verifier assessment				Date: DD/MM/YY YY

Table 3. FARs from this Project Verification

FAR ID	XX	Section no.		Date: DD/MM/YY YY
Description of FAR				

Project Owner's response	Date: DD/MM/YY YY
Documentation provided by Project Owner	
UCR Project Verifier assessment	Date: DD/MM/YY YY

ANNEXURE I: Photographs of the Power Plant

Figure-1: Teepani MHS (2 x 250 kW)



TURBINE-GENERATOR SETS



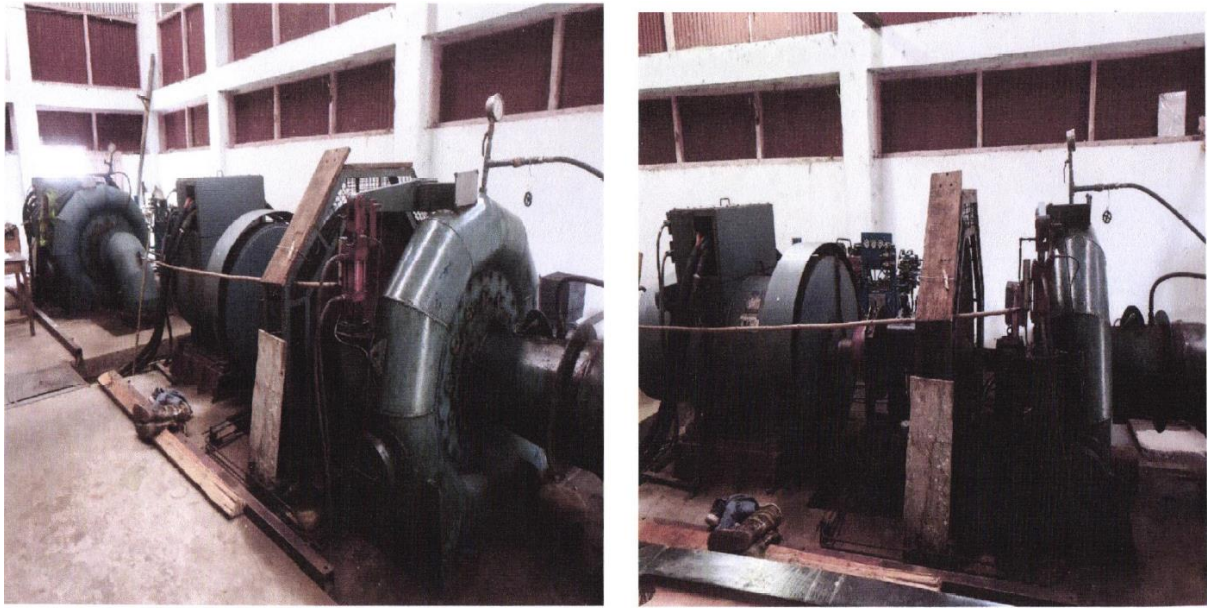
PANEL BOARD

Figure-2: Solegamang MHS (1 x 50 kW)



Solegamang MHS TG Set

Figure-3: Sirikorong MHS (2 x 250 kW)



Sirikorong MHS TG Sets installed on TG Deck