



## Verification Report

**UCR ID: 028**

**Prepared by**




**Naturelink Solutions Pvt. Ltd.**

<b>Title</b>	<b>3 MW Small Scale Hydro Power project in Jemeithang, Arunachal Pradesh, India</b>
<b>Project Owner</b>	<b>Hydro Power Development Corporation of Arunachal Pradesh Limited</b>
<b>Project Location</b>	<b>Park View Apartment, Lower Niti Vihar, District Papum Pare, Itanagar, Arunachal Pradesh – 791111, India</b> <b>Coordinates: 27°42'26.95" N and 91°43'31.87" E</b>
<b>Date</b>	<b>29/04/2025</b>

**COVER PAGE****Project Verification Report Form (VR)****BASIC INFORMATION**

<b>Name of approved UCR Project Verifier / Reference No.</b>	Naturelink Solutions Pvt. Ltd
<b>Type of Accreditation</b>	<input type="checkbox"/> CDM Accreditation <input type="checkbox"/> ISO 14065 Accreditation <input checked="" type="checkbox"/> UCR Approved Verifier
<b>Approved UCR Scopes and GHG Sectoral scopes for Project Verification</b>	Sectoral Scope: 01 Energy Industries
<b>Validity of UCR approval of Verifier</b>	May - 2022 onwards
<b>Completion date of this VR</b>	29/04/2025
<b>Title of the project activity</b>	3 MW Small Scale Hydro Power project in Jemeithang, Arunachal Pradesh, India
<b>Project reference no. (as provided by UCR Program)</b>	028
<b>Name of Entity requesting verification service</b>	M/s. Creduce Technologies Private Limited (Aggregator) Hydro Power Development Corporation of Arunachal Pradesh Limited (Project owner)
<b>Contact details of the representative of the Entity, requesting verification service</b> (Focal Point assigned for all communications)	Shailendra Singh Rao (Creduce) shailendra@credcue.tech Hydro Power Development Corporation of Arunachal Pradesh Limited (Project Owner)
<b>Country where project is located</b>	India
<b>Applied methodologies</b>	AMS-I.D: Grid connected renewable electricity generation– Version 18.0
<b>Sectoral Scope(s):</b>	1 Energy industries (renewable - / non-renewable sources)
<b>Project Verification Criteria:</b>	<input checked="" type="checkbox"/> UCR Verification Standard

Mandatory requirements to be assessed	<input checked="" type="checkbox"/> Applicable Approved Methodology <input type="checkbox"/> Applicable Legal requirements /rules of the 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)
<b>Project Verification Criteria:</b> 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
<b>Project Verifier's Confirmation:</b> The <i>UCR Project Verifier</i> has verified the UCR project activity and therefore confirms the following:	The UCR-approved verifier Naturelink Solution Pvt. Ltd., verifies the following with respect to the UCR Project Activity "3 MW Small Scale Hydro Power project in Jemeithang, Arunachal Pradesh, India" <input checked="" type="checkbox"/> The project aggregator has correctly described the project activity in the Project Concept Note/9/ including the applicability of the approved methodology AMS-I.D/4/ 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. <input checked="" type="checkbox"/> The project activity is likely to generate GHG emission reductions amounting to the estimated 10,450 tCO <sub>2</sub> e, as indicated in the monitoring report/10/18/, which are additional to the reductions that are likely to occur in the absence of the Project Activity and complies with all applicable UCR rules, including ISO 14064-2 and ISO 14064-3.

	<input checked="" type="checkbox"/> The project activity is not likely to cause any net-harm to the environment and/or society  <input checked="" type="checkbox"/> The project activity complies with all the applicable UCR rules and therefore recommends UCR Program register the Project activity with above mentioned labels.
<b>Project Verification Report, reference number and date of approval</b>	Verification Report UCR  UCR ID: 028  Version: 1.0  Date: 29/04/2025
<b>Name of the authorised personnel of UCR Project Verifier and his/her signature with date</b>	  Ms. Trapti Joshi GHG Assessor Naturelink Solution Pvt. Ltd. Date: 29/04/2025

# Table of Contents

1.	Project Verification Report .....	5
1.1	Executive Summary.....	5
1.2	Description of the Project.....	6
1.3	Project Verification team, technical reviewer and approver:.....	8
2	Verification Process .....	8
2.1	Desk/document review.....	8
2.2	Remote Inspection.....	8
2.3	Interviews .....	9
2.4	Clarification request (CLs), corrective action request (CARs) and forward action request (FARs) raised .....	10
3	Project Verification findings .....	11
3.1	Identification and eligibility of project type.....	11
3.2	General description of project activity .....	11
3.3	Application and selection of methodologies and standardized baselines .....	12
3.3.1	Application of methodology and standardized baselines .....	12
3.3.2	Clarification on applicability of methodology, tool, and/or standardized baseline .....	13
3.3.3	Project boundary, sources and GHGs.....	15
3.3.4	Baseline scenario .....	16
3.3.5	Estimation of emission reductions or net anthropogenic removal.....	16
3.3.6	Monitoring Report.....	18
3.4	Start date, crediting period and duration.....	19
3.5	Environmental impacts and safeguard assessment .....	19
3.6	Project Owner- Identification and communication .....	20
3.7	Others (Double Counting of Credits) .....	20
4	Internal quality control: .....	21
5	Project Verification opinion:.....	21
6	Competence of team members and technical reviewers .....	21
	Appendix 1: Abbreviations .....	22
	Appendix 2: Document reviewed or referenced.....	23
	Appendix 3: Clarification request, corrective action request and forward action request.....	24

# 1. Project Verification Report

## 1.1 Executive Summary

The verification work has been contracted by project aggregator Creduce Technologies Pvt Ltd and Hydro Power Development Corporation of Arunachal Pradesh Limited to perform an independent verification of its UCR project titled “**3 MW Small Scale Hydro Power project in Jemeithang, Arunachal Pradesh, India**” UCR approved project ID:028, to establish a number of CoUs generated by the project over the crediting period from 01/01/2022 to 31/12/2023 (both days included).

Verification for the period: 01/01/2022 to 31/12/2023

In our opinion, the total GHG emission reductions over the crediting / verification period stated in the Monitoring Report (MR)/10/, submitted are found to be correct and in line with the UCR guidelines. The GHG emission reductions were calculated on the basis of UCR guideline which draws reference from, the standard baseline, AMS-I. D: Grid connected renewable electricity generation– Version 18.0/4/. The verification was done remotely by way of video calls, and submission of documents for verification through emails.

It is certified that the emission reductions from the 3 MW Small Scale Hydro Power project in Jemeithang, Arunachal Pradesh, India (UCR ID – 028) for the period 01/01/2022 to 31/12/2023 amounts to **10,450 CoUs (10,450 tCO<sub>2</sub>e)**.

### Objective

The objective of this verification is to have an independent third-party assessment of whether the project activity conforms to the qualification criteria set out in the UCR Program Manual/1/, UCR CoU Standard/2/ and UCR verification standard/3/ to attain real, measurable, accurate and permanent emission reductions.

### 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. To verify the project implementation and operation with respect to the registered PCN/9/.
2. To verify the implemented monitoring plan with the registered PCN/9/ applied baseline and monitoring methodology.
3. To verify that the actual monitoring systems and procedures follow the monitoring plan.
4. To evaluate the GHG emission reduction data and express a conclusion whether the reported GHG emission reduction data is free from material misstatement
5. To verify that reported GHG emission data is sufficiently supported by evidence.
6. Agreement stating assurance to avoid double accounting/8/ for the project to be verified, along with required proof.

The project is assessed against the requirements of the UCR Program Manual/1/, UCR CoU Standard/2/ and UCR verification standard/3/, ISO 14064-2:2019.

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 the project is not part of the present assignment and project is deemed validated post-registration by UCR.

## 1.2 Description of the Project

Project activity involves construction and operation of Sumbachu small hydroelectric project of installed aggregated capacity of 3 MW at Jemeithang village of Tawang district of Arunachal Pradesh India. The diverted water flows through a desilting basin, after which the sediment-free water moves into the water conductor system, forebay, and steel pressure shaft. A surface powerhouse is strategically positioned on a terrace along the left bank of the nallah. After passing through the powerhouse, the tailwater is returned/discharged to the nallah. The project harnesses a net head of approximately 271 meters. It causes minimum environmental impacts and will reduce dependence on fossil fuels.

The proposed project activity is promoted by Hydro Power Development Corporation of Arunachal Pradesh Limited (herein after called as project proponent PP). The project activity aims to harness kinetic energy of water (renewable source) to generate electricity. Project activity is displacing the gross electricity generation i.e., 11,612 MWh from the NEWNE grid, which otherwise would have been imported from the NEWNE grid.

The details of the project activity are verified with the PCN/9/, MR/10/ and relevant documents submitted for verification as mentioned in appendix-2. Assessment team verified the technical specifications listed below through the provided technical specification document and remote audit conducted on date 23/04/2025 and found it correct.

The technical specification is listed below;

Design Discharge	1.485 cumecs
Gross Head	281 m
Net Head	271 m
Diversion Weir	
Type	Trench weir
Shape	Trapezoidal
Length	20 m
Design Discharge	1.84 m <sup>3</sup> /s including 5% flushing
Feeder Channel	
Length	55 m
Shape / Material	Rectangular / R.C.C (cut and cover)
Size	Bed width 1.00 m Height 1.20 m
Design Discharge	1.747 cumecs
Desilting Tank	
Total Length	35.0 m
Width	5.00 m
Full supply depth	1.80 m
Free board	0.30 m
Type / Material	R.C.C

Design Discharge	1.747 m <sup>3</sup> /s
Power Channel	
Length	270 m
Shape / Material	Rectangular / R.C.C (cut and cover)
Size	Bed width 1.17 m Height 1.20 m
Forebay Tank	
Total Length	12.0 m
Width	6.00 m
Full supply depth	2.70 m
Free board	0.50 m
Type / Material	R.C.C
Design Discharge	1.5 m <sup>3</sup> /s
Penstock	
Number	One
Diameter – Main pipe	750 mm (I.D.)
After bifurcation	520 mm (I.D.) and 16 mm thickness
Thickness for main pipe	8 mm, 12 mm, 16 mm & 20 mm
Length	728 m

As mentioned in the monitoring report/10/ and emission reduction calculation sheet/11/ submitted for verification, the project replaces anthropogenic emissions of greenhouse gases (GHGs) estimated to be 10,450 tCO<sub>2</sub>e for the verification period, there on displacing 11,612 MWh amount of electricity from the generation of fossil-fuel based power plants connected to the Indian electricity grid.

The proposed project activity is installation and operation of Small-Scale Hydro Power Project comprising of installation and operation of two hydro turbine generators of Horizontal Pelton of 1500 kW capacity each with aggregated installed capacity of 3.0 MW. The project is a small-scale activity. The methodology applied in the monitoring report is verified against the AMS-I.D: Grid connected renewable electricity generation - Version 18.0/4/ total emission reductions (ERs) achieved through the project activity during the monitoring period is summarised below:

<b>Summary of the Project Activity and ERs Generated for the Monitoring Period</b>	
Project start date	23/01/2020
Start date of this Monitoring Period	01/01/2022
Carbon credits claimed up to	31/12/2023
Total ERs generated (tCO <sub>2</sub> e)	10,450 tCO <sub>2</sub> e
Leakage Emission	0
Project Emission	0



## 1.3 Project Verification team, technical reviewer and approver:

Sr. No.	Role	Last name	First name	Affiliation	Involvement in		
					Doc review	Remote inspection	Interviews
1.	Team Leader & Technical Expert	Joshi	Trapti	Naturelink Solutions Pvt. Ltd.	Yes	Yes	Yes

## 2 Verification Process

### 2.1 Desk/document review

The desk review was conducted by the verification team that included:

- A review of data and information presented to assess its completeness;
- A review of the initial PCN/9/, MR/10/, emission reduction calculation sheet/11/, Methodology - AMS-I. D V18.0/4/.
- A cross-check between information provided in the monitoring report/10/ and data from other sources such as Joint Meter Reading of electricity generated by hydro power plant/13/ or similar data sources;
- A review of calculations and assumptions made in determining the GHG data and emission reductions calculation/11/;

The list of submitted documents is available in a subsequent section of this verification report under the appendix - 2 "Document reviewed or referenced".

### 2.2 Remote Inspection

As per the UCR Verification standard version 2.0, the verification team conducted remote inspection of project activity via video conferencing on 23/04/2025 as mentioned in the below table.

Date of remote inspection:		23/04/2025			
No.	Activity performed During remote inspection	Site location	Date	Project Personnel	
1.	Opening meeting	Project location	23/04/2025	Batak Takar-Engineer, HPDCAPL	

				Mr. Kashyap Trivedi – Senior Consultant,  Creduce Technologies Private Limited
2.	Remote inspection of all installation	Project location	23/04/2025	Batak Takar- Engineer, HPDCAPL  Mr. Kashyap Trivedi – Senior Consultant, Creduce Technologies Private Limited
3.	Closing meeting	Project location	23/04/2025	Batak Takar- Engineer, HPDCAPL  Mr. Kashyap Trivedi – Senior Consultant,  Creduce Technologies Private Limited

The following parameters were assessed but not limited to:

- An assessment of the implementation and operation of the registered project activity as per the registered PCN/9/;
- A review of information flows for generating, aggregating, and reporting the monitoring parameters;
- Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PCN/9/ and MR/10/;
- A cross-check of the monitoring equipment including calibration reports and observations of monitoring practices against the requirements of the PCN/9/ and MR/10/ and selected methodology/4/;
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

## 2.3 Interviews

No.	Interview			Date	Subject
	Last name	First name	Affiliation		

1.	Takar	Batak	Engineer, HPDCAPL	23/04/2025	Hydro turbine specification and connections, energy meter readings, transformer specification, hydro power generation operations details with presentations, Monitoring plan, calibration details of the energy meter  Legal ownership of the project, Implementation of the project, Start date and crediting period, Double counting of the carbon credits, Project boundary, hydro power generation operations details with presentations
2.	Trivedi	Kashyap	Senior Consultant Creduce Technologies Pvt. Ltd.	23/04/2025	Project Overview, PCN, Monitoring Report, Methodology, eligibility criteria, Baseline emissions, Emission Reduction Calculation

## 2.4 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
<b>Green House Gas (GHG)</b>			
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 (Double counting of credits)	NIL	NIL	NIL
<b>Total</b>	<b>NIL</b>	<b>NIL</b>	<b>NIL</b>

## 3 Project Verification findings

### 3.1 Identification and eligibility of project type

<b>Means of Project Verification</b>	<p>The project is eligible as per UCR project Standard, Version 7.0 (Project Eligibility, Registration, Issuance and Registry Guidance Document)/2/ which is acceptable since the project has not been registered under any other GHG program for the issuance of the Monitoring period (01/01/2022 to 31/12/2023) and the project activity was commissioned on 23/01/2020 (1500kW x 2). The commissioning certificates/14/ of the hydro power plant at Tawang, Arunachal Pradesh, provided by HPDCAPL has been verified in this regard.</p> <p>Prior to the commencement of the project activity, the project owner got approval for the installation and operation of hydro power plant in the district of Tawang, Arunachal Pradesh and PO have signed power purchase agreement/12/ with state utility to supply electricity via grid.</p> <p>The project also delivers real, measurable and additional emission reduction of 10,450 tCO<sub>2</sub>e over the crediting period (01/01/2022 to 31/12/2023).</p> <p>Project applies an approved CDM monitoring and baseline methodology AMS-I. D: Grid connected renewable electricity generation - Version 18.0./4/</p>
<b>Findings</b>	No findings were raised
<b>Conclusion</b>	<p>The project is eligible as per the requirements of the UCR project Standard, Version 7.0 (Project Eligibility, Registration, Issuance and Registry Guidance Document)/2/.</p> <p>The project verification team cross checked the other GHG programmes like Clean Development Mechanism (CDM) Registry, VERRA Registry, Gold Standard (GS) Registry for the information regarding the consistency of the title of the project activity, GPS coordinates, Legal Ownership of the Project activity and confirmed that the project was not submitted or registered under any other GHG programmes and non-voluntary non-GHG Programs.</p>

### 3.2 General description of project activity

<b>Means of Project Verification</b>	<p>The project activity aims to harness kinetic energy of water (renewable source) to generate electricity. The net generated electricity from the project activity is transferred to Andhra Pradesh State electricity board under power purchase agreement/12/.</p> <p>The proposed project activity is installation and operation of Small-Scale Hydro Power Project comprising of 1.5 MW x 2 units of hydro</p>
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	<p>Turbine and Generators with an aggregated installed capacity of 3 MW.</p> <p>The project activity has applied AMS-I. D: Grid connected renewable electricity generation– Version 18.0/4/ falls into the small-scale category as per applied CDM methodology.</p> <p>A power purchase agreement/12/ is signed between Hydro Power Development Corporation of Arunachal Pradesh Limited and state utility for transfer of electricity generated by hydro turbine generators. The project activity generated total 11,612 MWh electricity and displacing 10,450 tCO<sub>2</sub>e.</p> <p>In the absence of the project activity, the equivalent amount of power would have been generated by the operation of grid-connected fossil fuel-based power plants and by the addition of new fossil fuel-based generation sources into the grid.</p> <p>The Location details has been verified during the online assessment and geo coordinates verified through google earth/maps.</p> <p>The technical specification mentioned in the PCN/9/ is verified against the technical specifications mentioned in Detailed project report /15/.</p>
<b>Findings</b>	No findings were raised
<b>Conclusion</b>	The description of the project activity is verified to be true based on the review of PCN/9/, MR/10/, Commissioning Certificates/14/ and power purchase agreement/12/ of Hydro power plant.

### 3.3 Application and selection of methodologies and standardized baselines

#### 3.3.1 Application of methodology and standardized baselines

<b>Means of Project Verification</b>	<p>The project activity applied AMS-I. D: Grid connected renewable electricity generation– Version 18.0/4/ falls into the small-scale category as per CDM methodology.</p> <p>Standardized baseline is “In the absence of the project activity, the equivalent amount of electricity would have been imported from the grid (which is connected to the unified Indian Grid system), which is carbon intensive due to being predominantly sourced from fossil fuel-based power plants” which is as per the project activity and clearly mentioned in PCN/9/ and MR/10/.</p>
<b>Findings</b>	No finding was raised
<b>Conclusion</b>	The methodology applied is appropriately meeting the requirements of UCR General project eligibility criteria and guidance/2/,

standardized baseline. The methodology version is correct and valid.  
The referenced methodology is applicable to project activity.

### 3.3.2 Clarification on applicability of methodology, tool, and/or standardized baseline

Means of Project Verification	Applicability as per AMS-I. D version 18.0	Verifier assessment
	<p>1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:</p> <p>a. Supplying electricity to a national or a regional grid; or</p> <p>b. Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.</p>	<p>The project activity “3 MW Small Scale Hydro Power project in Jemeithang, Arunachal Pradesh, India” incorporates installation and operation Hydro power plant for supplying of electricity to the national grid, hence (a) applied here is appropriate as PP has signed power purchase agreement/12/ with HPDCAPL to supply electricity.</p> <p>This was confirmed during the online assessment and through document review of power purchase agreement/12/ and monthly energy bills/JMR /13/.</p>
	<p>2. This methodology is applicable to project activities that:</p> <p>a. Install a greenfield plant;</p> <p>b. Involve a capacity addition in (an) existing plant(s);</p> <p>c. Involve a retrofit of (an) existing plant(s);</p> <p>d. Involve a rehabilitation of (an) existing plant(s)/ unit(s); or</p> <p>e. Involve a replacement of (an) existing plant(s).</p>	<p>The project is green field plant and involves installation and generation of electricity from total 3 MW (1.5 MW x 2) capacity of hydro turbine generator connected to the Indian national grid. The electricity generated from project activity is exported to the Indian national grid, there by displacing electricity from the grid which would have otherwise been generated by operation of grid connected power plants and by addition of new generation sources into the grid. The project activity generates 11,612 MWh of electricity and displaces 10,450 tCO<sub>2</sub>e.</p>
	<p>3. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <p>a. The project activity is implemented in an existing reservoir with no change in the volume of reservoir;</p>	<p>Small scale hydro power plant does not consist of reservoir. As the project activity is a run-off river type hydro power plant, this criterion is not relevant for the project activity.</p>

	<p>b. The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m<sup>2</sup>.</p> <p>c. The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m<sup>2</sup>.</p>	
	4. If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The project activity is a 3 MW hydro power project, i.e., the only component is a renewable power project below 15 MW, thus the criterion is not applicable to this project activity.
	5. Combined heat and power (co-generation) systems are not eligible under this category.	The project activity does not involve co-generation. Hence this criterion is not applicable.
	6. In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	<p>No capacity addition in the existing renewable plant. The project activity is a 3 MW hydro power project whose capacity is below 15 MW. This is new installation of hydro power plant which was verified and confirmed through online assessment and interviews with project owner and their representatives.</p> <p>Hence this criterion is not applicable.</p>
	7. In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	There is no retrofit or replacement in the project activity, hence it is not applicable.
	8. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for	The project activity is a greenfield 3 MW hydro power project; hence, this criterion is not applicable to this project activity.

	electricity generation for supply to a grid, then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS-I.C.: Thermal energy production with or without electricity” shall be explored.	
	9. In case biomass is sourced from dedicate plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply.	The project activity is new greenfield activity of hydro power plant and does not involve biomass, hence this criterion is not applicable.
<b>Findings</b>	No findings were raised	
<b>Conclusion</b>	The verification team confirms that all the applicability criteria set by the applied CDM methodology/4/ and its eligible tools are met. The relevant information against those criteria is also included in the PCN/9/ and MR/10/. The selected CDM methodology for the project activity is applicable.	

### 3.3.3 Project boundary, sources and GHGs

<b>Means of Project Verification</b>	<p>As per the applied methodology AMS-I. D version 18.0/4/, the spatial extent of the project boundary includes industrial, commercial facilities consuming energy generated by the system. The components of the project boundary mentioned in the section B.4 of PCN/9/ were verified against the para 18 of the applied methodology.</p> <p>The project verification team conducted desk review of the implemented project to confirm the appropriateness of the project boundary identified and GHG sources required by the methodology have been included within the project boundary.</p> <p>The project location is clearly depicted with the help of a pictorial depiction in section A.3. of the PCN/9/ and duly verified by the project verification team via geographical coordinates, commissioning certificate/14/ of the project activity &amp; power purchase agreement/12/ between Hydro Power Development Corporation of Arunachal Pradesh Limited and state utility.</p>
<b>Findings</b>	No findings raised
<b>Conclusion</b>	The project verification team was able to assess that complete information regarding the project boundary has been provided in



	<p>PCN/9/ and MR/10/ and could be assured from the DPR/15/, commissioning certificates/14/, geographical coordinates, Single line diagram/17/ and power purchase agreement/12/.</p> <p>The project verification team confirms that the identified boundary is relevant and all emissions sources are included in the project activity.</p>
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### 3.3.4 Baseline scenario

<b>Means of Project Verification</b>	<p>The baseline scenario as per paragraph 19 of the applied methodology, prescribed the baseline scenario of the project activity. In the absence of the project activity, the users would have been supplied electricity from the national grid.</p> <p>As per the UCR General project eligibility criteria and guidance/2/; “The project owner has opted UCR recommended emission factor of 0.9 tCO<sub>2</sub>/MWh for the 2013-2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Emission factors for the post 2020 period is to be selected as the most conservative estimate between the national electricity/power authority published data set and UCR default of 0.9 tCO<sub>2</sub>/MWh”.</p>
<b>Findings</b>	No findings raised
<b>Conclusion</b>	<p>The project verification team concluded that the identified baseline scenario reasonably represents what would occur in the absence of the project activity.</p> <p>The calculated baseline emission for each vintage year of crediting period is rounded down as per UCR CoU verification standard /3/.</p>

### 3.3.5 Estimation of emission reductions or net anthropogenic removal

<b>Means of Project Verification</b>	<p>The project verification team checked whether the equations and parameters used to calculate GHG emission reductions or net anthropogenic GHG removals for PCN/9/ and MR/10/ is in accordance with applied methodology. Project Verification team checked section B.5 and C.5.1 of the PCN/9/ &amp; MR/10/ respectively to confirm whether all formulae to calculate baseline emissions, project emission and leakage have been applied in line with the underlying methodology.</p> <p>The emission reduction calculation has been carried out as per the CDM SSC methodology AMS-I.D, Version 18.0/4/.</p> $BE_y = EGPJ,y \times EF_{grid,y}$ <p>Where,</p>
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	<p><math>BE_y</math> = Baseline emissions in year y (t CO2)</p> <p><math>EGPJ,y</math> = 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)</p> <p><math>EF_{grid,y}</math> = UCR recommended emission factor of 0.9 tCO2/MWh has been considered.</p> <p>(Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)</p> <p>Project emissions:</p> <p>As per paragraph 39 of the applied methodology, For most renewable energy project activities, <math>PE_y = 0</math>. Since Hydro power is a GHG emission free source of energy project emission considered as Zero for the project activity.</p> <p>Leakage Emissions:</p> <p>As per the paragraph 42 of the applied methodology AMS-I.D Version 18.0, there are no emissions related to leakage in this project.</p> <p>Emission reductions</p> <p>As per Paragraph 43, Equation 09 of the applied methodology, emission reductions are calculated as follows</p> $ER_y = BE_y - PE_y - LE_y$ <p>Where:</p> <p><math>ER_y</math> = Emission reductions in year y (tCO2)</p> <p><math>BE_y</math> = Baseline Emissions in year y (t CO2)</p> <p><math>PE_y</math> = Project emissions in year y (t CO2)</p> <p><math>LE_y</math> = Leakage emissions in year y (t CO2)</p> <table><tr><th>Year</th><th>Electricity generated (MWh)</th><th>Emission factor (tCO2/MWh)</th><th>Total Emission reduction (tCO2e)</th></tr><tr><td>2022-2023</td><td>11,612</td><td>0.9</td><td>10,450</td></tr></table>	Year	Electricity generated (MWh)	Emission factor (tCO2/MWh)	Total Emission reduction (tCO2e)	2022-2023	11,612	0.9	10,450
Year	Electricity generated (MWh)	Emission factor (tCO2/MWh)	Total Emission reduction (tCO2e)						
2022-2023	11,612	0.9	10,450						
Findings	No findings were raised								
Conclusion	The combined margin emission factor as per “CO2 Baseline Database for the Indian Power Sector” current version 18, December 2022 by CEA/6/ which results into higher emission factor than the UCR recommended emission factor of 0.9 tCO2/MWh; Hence for 2022-23 vintage UCR default emission factor remains conservative								

	<p>as per General project eligibility criteria and guidance of the UCR Project Standard /2/.</p> <p>Project Verification team confirm that the algorithms and formulae proposed to calculate project emissions, baseline emissions, leakage and emission reductions in the PCN/9/ and MR/10/ is in line with the requirements of the selected methodology AMS-I.D, version 18.0/4/.</p> <p>For emission reduction calculation, the assessment team confirms that;</p> <p>All assumptions and data used by the project participants are listed in the PCN/9/ and MR/10/ including their references and sources.</p> <p>All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PCN/9/ and MR/10/.</p> <p>The baseline methodology and the applicable tool(s) have been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions.</p>
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### 3.3.6 Monitoring Report

<b>Means of Project Verification</b>	<p>The monitoring report/10/ submitted by the PP has been verified thoroughly and is in compliance with the applicable methodology and UCR General project eligibility criteria and guidance/2/ for calculation of GHG emission reductions.</p> <p>The assessment team has reviewed all the parameters in the monitoring plan against the requirements of the applied methodology and confirmed that monitoring parameters are applied in line with the requirement of the methodology and relevant in the context of the program. The procedures have been reviewed by the assessment team through document review, interviews with the respective monitoring personnel and online assessment.</p> <p>As per the CEA guidelines/5/ for installation and operation of Meters, the energy meter shall be tested in five years.</p> <p>Monitoring methodology, data management and calibration of the energy meter were also discussed with project owner.</p>
<b>Findings</b>	No findings were raised
<b>Conclusion</b>	<p>The project verification team confirms that,</p> <p>The monitoring report/10/ is in compliance with the applicable methodology and UCR General project eligibility criteria and guidance/2/.</p>

	<p>The monitoring parameters reported in PCN/9/ and MR/10/ adequately represents the parameters relevant to emission reduction calculation.</p> <p>The number of CoUs generation is calculated based on accurately reported data. The calculation was done using an excel sheet where all the parameters were reported.</p> <p>UCR recommended emission factor for electricity generation is opted which is conservative.</p> <p>In the MR/10/, emission reduction calculations sheet/11/ are correctly calculated and reported. The monitoring report/10/ meets the requirements of UCR project verification requirements.</p> <p>The project proponent has carried out calibration of energy meter for the monitoring period.</p> <p>Energy meter details are as follows:</p> <p>Only single tri-vector-meter (ABT) meter of class 0.2s is installed at project site and it was calibrated on 09/03/2017.</p> <p>The Calibration reports are verified with available serial number of meters. The errors are within permissible limits.</p>
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### 3.4 Start date, crediting period and duration

<b>Means of Project Verification</b>	The Commissioning certificates/14/ of the installation of the project activity has been verified as per PCN/9/ and MR/10/.
<b>Findings</b>	No findings raised
<b>Conclusion</b>	The Hydro power plant was commissioned on 23/01/2020. The project crediting period is first monitoring period which is from 01/01/2022 to 31/12/2023. The crediting period is also appropriate as per UCR General project eligibility criteria and guidance/2/.

### 3.5 Environmental impacts and safeguard assessment

<b>Means of Project Verification</b>	<p>As The guidelines on Environmental Impact Assessment have been published by Ministry of Environment, Forests and Climate Change (MoEF&amp;CC), Government of India (GOI) under Environmental Impact Assessment notification 14/09/2006.</p> <p>Further amendments to the notification have been done, The Hydro Power projects up to 25 MW are listed in white category, hence, No EIA required.</p> <p>The impact of the project activity on the environmental safeguards has been carried out.</p>
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	<p>Out of all the safeguards no risks were identified to the environment due to the project implementation and operation.</p> <p>And the following have been indicated as positive impacts:</p> <p>Environment Air - CO<sub>2</sub> emissions: The project activity being renewable power generation avoids CO<sub>2</sub> emissions that would have occurred in baseline scenario due to the electricity generation in thermal power plants.</p> <p>Environment - Natural Resources: Replacing fossil fuels with renewable sources of energy.</p> <p>Impacts identified as 'Harmless':</p> <p>Solid waste Pollution: - Any Solid-waste if generated from the plant shall be discarded in accordance with host country regulation. The parameter is being monitored as 'Project Waste' and Proper mitigation action has been implemented for waste management.</p> <p>Land use: since the hydro power plant does not require larger area, there is no significant damage to land.</p> <p>Emission due to transportation of hydro power plant components: The emissions associated with the transport of the modules are insignificant compare to manufacturing facilities.</p>
<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	The project activity displaces fossil fuel consumption and provides affordable and clean energy. The project has also avoided total 10,450 tCO <sub>2</sub> e, hence it has positive impact. It is confirmed that there is no EIA is required as per host country rule mentioned in the CPCB letter/19/.

### 3.6 Project Owner- Identification and communication

<b>Means of Project Verification</b>	<p>The information and contact details of the project owner has been appropriately incorporated in the PCN/9/ and MR/10/.</p> <p>The legal owner of the project activity has been identified through the commissioning certificates/14/ and power purchase agreement/12/ of the hydro power project.</p>
<b>Findings</b>	No findings raised.
<b>Conclusion</b>	The project verification team confirms that the legal ownership of the project belongs to Hydro Power Development Corporation of Arunachal Pradesh Limited

### 3.7 Others (Double Counting of Credits)

<b>Means of Project Verification</b>	The verification team has referred other GHG programs to avoid double counting of emission reduction
<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	Double accounting agreement/8/ is signed between PO and Aggregator dated and found to appropriate as per Universal Carbon Registry Program Manual (Ver 6.1) August 2024/1/.

## 4 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 the aggregator or project owner directly or indirectly.
- Verification team consists of experienced personnel.
- Technical review is performed by an independent person.

## 5 Project Verification opinion:

The project verification was conducted on the basis of UCR Program Manual/1/, UCR Project Standard (General project eligibility criteria and guidance)/2/, UCR Verification standard /3/, AMS -I.D. Version 18.0 /4/, Project Concept Note (PCN)/9/, Power purchase agreement/12/, Commissioning Certificates/14/, Calibration Reports/16/, Monitoring Report (MR)/10/ and other documents mentioned in Appendix-2.

The verification team raised 00 Nos. of Clarification Requests (CLs) and 00 Nos. of Corrective Action Request. All the queries were closed satisfactorily.

It is hence certified with a reasonable level of assurance that the emission reductions from the project Hydro Power Project by Hydro Power Development Corporation of Arunachal Pradesh Limited (UCR ID – 028) for the period 01/01/2022 to 31/12/2023 amounts to **10,450 CoUs** (10,450 tCO<sub>2</sub>e) as per the UCR Verification standard/3/.

## 6 Competence of team members and technical reviewers

No.	Last name	First name	Role and Affiliation	Technical Competence
1.	Joshi	Trapti	GHG Assessor - NSPL	Ms. Trapti Joshi is having M.Tech. In Environmental Engineering. She has experience in conducting environmental audits in CDM/VCS/GS registry. She has performed the Renewable sector and Waste handling projects. Also, she has done Master's thesis in Solid waste management project through LCA Gabi Software.

## Appendix 1: Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CL	Clarification Request
COD	Commercial Operation Date
CoUs	Carbon offset Units
CPCB	Central Pollution Control Board
DAA	Avoidance of Double Accounting Agreement
DPR	Detailed Project Report
ER	Emission Reduction
FAR	Forward Action Request
GHG	Green House Gas
HPDCAPL	Hydropower Development Corporation of Arunachal Pradesh Ltd.
JMR	Joint Meter Reading
kW	Kilo-Watt
kWh	Kilo-Watt Hour
MR	Monitoring report
MW	Mega-Watt
MWh	Mega-Watt Hour
NSPL	Naturelink Solutions Private Limited
PA/ PP	Project Aggregator / Project Proponent
PCN	Project Concept Note
PO	Project Owner
PPA	Power Purchase Agreement
SDG	Sustainable Development Goal
tCO <sub>2</sub> e	Tons of Carbon Dioxide Equivalent
UCR	Universal Carbon Registry
VR	Verification Report
VS	Verification Statement

## Appendix 2: Document reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	UCR	UCR Program Manual	Version 6.1, August 2024	UCR website
2.	UCR	UCR CoU Standard (General project eligibility criteria and guidance)	Version 7.0, August 2024	UCR website
3.	UCR	UCR Program Verification standard	Version 2.0, August 2022	UCR website
4.	CDM	AMS-I. D: Grid connected renewable electricity generation	Version 18.0	CDM website
5.	CEA	Central Electricity Authority (Installation and Operation of Meters) (Amendment) Regulations, 2022	Dated 28/02/2022	-
6.	CEA	CO <sub>2</sub> baseline database for the Indian Power sector	Version 18.0 dated December 2022	-
7.	PO	Communication agreement between PP and PO	Dated 13/12/2021	PA
8.	Creduce	Double Accounting Agreement	Dated 29/04/2025	PA
9.	Creduce	Project Concept Note	Version 2.0 dated 26/07/2022	PA
10.	Creduce	Monitoring report	Version 2.0 dated 22/04/2025	PA
11.	Creduce	Emission reduction excel – “3 MW Small Scale Hydro Power Project by Hydro Power Development Corporation of Arunachal Pradesh Limited”	Version 2.0, dated 22/04/2025	PA
12.	HPDCAPL & PO	Power purchase agreement	-	PA
13.	HPDCAPL & PO	JMR/Monthly Energy Bills	-	PA
14.	HPDCAPL	Certificate of Commissioning	-	PA
15.	CPCB	CPCB	CPCB letter F.No.B-29012/IPC-VI/2017-18/ date 17/11/2017	PA
16.	L&T	Meter Calibration	-	PA



## Appendix 3: Clarification request, corrective action request and forward action request

**Table 1. CLs from this Project Verification**

CL ID	--	Section no.		Date:
Description of CL				
Project Owner's response				Date:
Documentation provided by Project Owner				

**2. CARs from this Project Verification**

CAR ID	--	Section no.		Date:
Description of CAR				
Project Owner's response				Date:
Documentation provided by Project Owner				

**Table 3. FARs from this Project Verification**

FAR ID	--	Section no.		Date:
Description of FAR				
Project Owner's response				Date:
Documentation provided by Project Owner				

Photographs of the Remote inspection conducted on 30/09/2024



