MONITORING REPORT

CARBON OFFSET UNIT (CoU) PROJECT

Title	**:**	2 MW Kalm Small Hydro Power project by Sunshine Hydro Power Limited
Version	**:**	2.0
MR Date	**:**	07/10/2024
First CoU Issuance Period	**:**	9 years 2 months 15 days
First Monitoring Duration	**:**	17/10/2014 to 31/12/2023

Monitoring Report (MR)

CARBON OFFSET UNIT (CoU) PROJECT

BASIC INFORMATION

Title of the project activity	2 MW Kalm Small Hydro Power project by Sunshine Hydro Power Limited
UCR Project Registration Number	064
Version	2.0
Completion date of the MR	07/10/2024
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: (first and last days included (17/10/2014 to 31/12/2023)
Project participants	Creduce Technologies Private Limited (Aggregator) M/s Sunshine Hydro Power Limited (Project Owner)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I. D: "Grid connected renewable electricity generation", version 18
Sectoral Scope	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of GHG emission reductions for this monitoring period	
Total:	57077CoUs (57077 tCO_2e)

Year	Total CoUs generated
2014	973 CoUs
2015	7425 CoUs
2016	5040 CoUs
2017	6831 CoUs
2018	4671 CoUs
2019	5453 CoUs
2020	8173 CoUs
2021	6080 CoUs
2022	5043 CoUs
2023	7388 CoUs

SECTION - A - Description of project activity

A.1 Purpose and General description of Carbon offset Unit (CoU) project activity

The proposed project tile under UCR is "2 MW Kalm Small Hydro Power project by Sunshine Hydro Power Limited", which is a grid connected Hydro Electric Power project located in Chamba district in the state of Himachal Pradesh (India). The project is an operational activity with continuous reduction of GHG, currently being applied under "Universal Carbon Registry" (UCR).

A.1.1 Purpose of the project activity:

The project activity is promoted by Sunshine Hydro Power Limited (herein after called as project proponent 'PP'). The proposed project activity is installation and operation of 2 Pelton Hydro Turbine Generators having individual capacity1000kW with aggregated installed capacity of 2.00MW in District -Chamba, Himachal Pradesh state of India. This project activity is also called as Kalm small hydroelectric power (SHEP) project.

Kalm SHEP project isa run-of-river project located in Chamba District in the state of Himachal Pradesh. It utilizes flow of Kalm nallah perennial tributary of Beas River which in turn is a tributary of Ravi River for generation of hydro power. The project envisages a generation capacity of 2.00MW of power by utilizing the available head of nalla hat elevations El 2800m above mean sea level. The project activity aims to harness kinetic energy of water (renewable source) to generate electricity. The project comprises a Trench weir which diverts the water into an intake placed on the left bank of Kalm nallah. The diverted water passes through Desilting basin. Desilted water enters into water conductor system, forebay and the steel pressure shaft. A surface powerhouse is suitably located on a terrace at left bank of the nallah. Tail water from the powerhouse is discharged back into the nallah. The project utilises a net head of about 337m. The project activity has been commissioned for commercial operation as on 17/10/2014.

The annual and the total CO_2e emission reduction by the project activity over the defined monitoring period is as per **Annexure I.**

A.1.2 Description of the installed technology and equipment:

The project activity involves 2 numbers hydro turbine generators of Pelton Horizontal type (1000 KW each) with internal electrical lines connecting the project activity with local evacuation facility i.e., a sub-station at Lahru. The generators generate power at 3.3kV, which can further be stepped up to 33 KV. The project activity can operate in the frequency of 50 Hz (± 3%) and in the voltage range of 3.3kV ± 10%. The average life time of the generator is around 35 years as per the equipment supplier specification.

A.1.3 Relevant dates for the project activity (e.g., construction, commissioning, continued operation periods, etc.)

The duration of the crediting period corresponding to the monitoring period is covered in this monitoring report. Here the start date of generation has been considered as commissioning date of project.

UCR Project ID	:	**064**
Start Date of Crediting Period	:	17/10/2014

A.1.4 Total GHG emission reductions achieved or net anthropogenic GHG removals by sinks achieved in this monitoring period

The total GHG emission reductions achieved in this monitoring period are as follows:

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	17/10/2014
Carbon credits claimed up to	31/12/2023
Total ERs generated (tCO_2e)	57077 tCO_2e
Leakage Emission	0
Project Emission	0

A.1.5 Baseline Scenario

As per the approved consolidated methodology AMS-I.D. Version 18, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: **"The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise, been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid".**

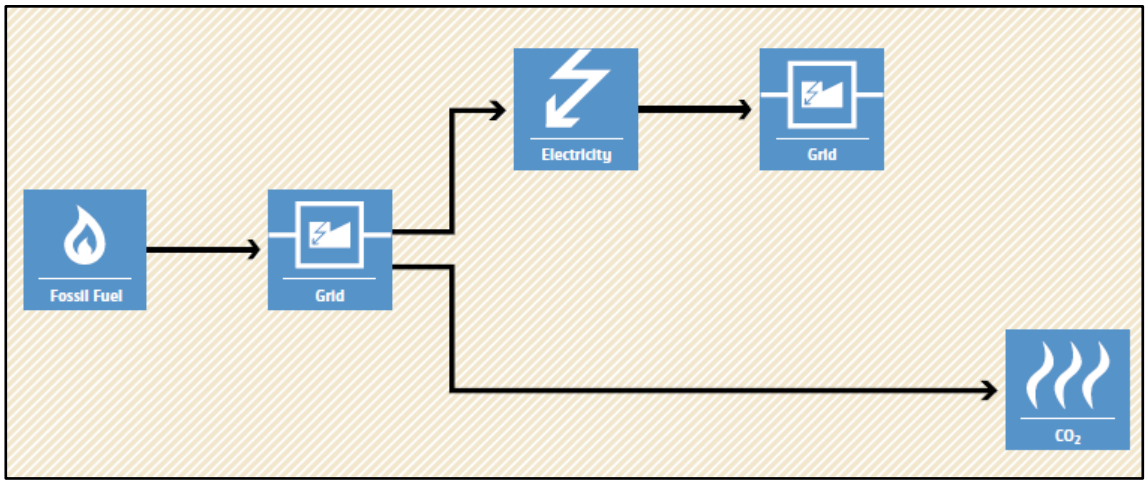


Figure 1 Baseline Scenario

A.2 Location of Project Activity

Country	:	India
State	:	Himachal Pradesh
Village	:	Nalli
Lattitude	:	32°25'59.537" N
Longitude	:	76°01'49.518E

This project location is situated near village Nalli of Chamba district in the state of Himachal

Pradesh. The nearest railway station to Chamba is Pathankot Railway Station located about 185 kms. The Project site is about 58 kms from Pathankot on Pathankot-Nurpur-Chauwari state highway.

The representative location map is included below:

Figure-1- Location of the project activity (courtesy: google images and www.mapofindia.com)

A.3 Parties and project participants

Party (Host)	Participants
India	**Contact person** **Shailendra Singh Rao** **Mobile** +91 9016850742, 9601378723 **Address** 2-O-13,14 Housing Board Colony, Banswara, Rajasthan -327001, India **M/s Sunshine Hydro Power Limited (Developer)** **Address**: 215-216, Sahil Plaza, Dalhousie Road, Pathankot, District Gurdaspur – 145001, Punjab,India

A.4 Methodologies and standardized baselines

Sectoral Scope : 01 Energy industries (Renewable/Non-Renewable Sources)

Type : Renewable Energy Projects

Category	:	AMS-I. D: "Grid connected renewable electricity generation", Version 18

A.5 Crediting period of project activity

Start date of the crediting period: 17/10/2014

Crediting period corresponding to this monitoring period: 17/10/2014 to 31/12/2023 (Both dates are inclusive)

A.6 Contact information of responsible persons/entities

Contact person	**:**	**Shailendra Singh Rao**
Mobile	:	+91 9016850742, 9601378723
Address	:	2-O-13,14 Housing Board Colony, Banswara, Rajasthan -327001, India

SECTION - B - Implementation of project activity

B.1 Description of implemented registered project activity

B.1.1 Provide information on the implementation status of the project activity during this monitoring period in accordance with UCR PCN

The proposed project activity is promoted by Sunshine Hydro Power Limited (herein after called as project proponent 'PP'). The proposed project activity is installation and operation of 2 Pelton Hydro Turbine Generators having individual capacity 1000 kW with aggregated installed capacity of 2.00 MW in District - Chamba, Himachal Pradesh state of India. This project activity is also called as Kalm small hydroelectric power (SHEP) project

B.1.2 For the description of the installed technology, technical process, and equipment, include diagrams, where appropriate

The project activity involves 2 numbers hydro turbine generators of Pelton Horizontal type (1000 KW each) with internal electrical lines connecting the project activity with local evacuation facility i.e., a sub-station at Lahru. The generators generate power at 3.3kV, which can further be stepped up to 33 KV. The project activity can operate in the frequency of 50Hz (± 3%) and in the voltage range of 3.3kV ± 10%. The average life time of the generator is around 35years as per the equipment supplier specification. The other salient features of the technology are: implemented in the proposed project activity leading to the GHG reduction.

The other salient features of the technology are:

Design Discharge	0.71 cumecs
Gross Head	348.8 m
Net Head	337.0 m
Diversion Weir	
Type	Trench weir (R.C.C)
Shape	Trapezoidal
Length	13.5 m
Design Discharge	14.31 cumecs including flushing
Feeder Channel	
Length	150 m
Shape / Material	Rectangular / R.C.C (cut and cover)
Size	Bed width 580 mm Height 1160 mm
Max. Discharge capacity	1.06 m^3/sec

Desilting Tank	
Total Length	27.0 m
Width	5.30 m
Full supply depth	2.00 m
Free board	0.20 m
Type / Material	R.C.C
Power Channel	
Length	4825 m
Shape / Material	Rectangular / R.C.C (cut and cover)
Size	1200 mm × 600 mm × 500 mm
Max. Discharge capacity	0.85 cumces
Forebay Tank	
Total Length	5.25 m
Width	2.00 m
Full supply depth	4.75 m
Free board	0.50 m
Type / Material	R.C.C
Penstock	
Number	One
Diameter – Main pipe	500 mm (I.D.)
Thickness for main pipe	6 mm - 12 mm
Length	610 m
Design Discharge	0.85 m^3/sec
Material	Mild Steel
Power House	
Type	Surface - R.C.C
Size	29.0 m x 11.5 m x 6.5 m
Capacity	2 x 1000 kW
Gross head	348.8 m

Net head	337.0 m
Electromechanical Equipment	
Turbine type	Pelton Horizontal
Turbine number	02 Nos.
Capacity of each turbine	1650 kW
Type of generators	Synchronous, 3.3kV, 3 phase
Tail Race	
Shape	Rectangular
Size	1200 mm x 600 mm (free board of 500 mm)
Length	30 m
Power	
Installed capacity	2 x 1000 kW
No. of unit generated @ 75% load factor	14.022 MU

B.2 Do no harm or impact test of the project activity

There was no harm identified from the project and hence no mitigation measures are applicable.

Rational: as per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)', final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), it has been declared that hydro project activity falls under the "White category". White Category projects/industries do not require any Environmental Clearance such as 'Consent to Operate' from PCB as such project does not lead to any negative environmental impacts. Additionally, as per Indian Regulation, Environmental and Social Impact Assessment is not required for small Hydro Projects.

[1]

The Government of India has stipulated the following indicators for sustainable development in the

[1] https://pib.gov.in/newsite/PrintRelease.aspx?relid=137373

interim approval guidelines for such projects which are contributing to GHG mitigations. The Ministry of Environment, Forests & Climate Change, has stipulated economic, social, environmental, and technological well-being as the four indicators of sustainable development. It has been envisaged that the project shall contribute to sustainable development using the following ways:

Social well-being: The project would help in generating direct and indirect employment benefits accruing out of ancillary units for manufacturing of the hydro turbine generator and for maintenance during operation of the project activity. It will lead to development of infrastructure around the project area in terms of improved road network, etc. and will also directly contribute to the development of renewable infrastructure in the region.

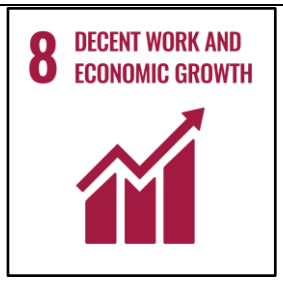
Environmental well-being: The project utilizes hydro energy for generating electricity which is a clean source of energy. The project activity will not generate any air pollution, water pollution or solid waste to the environment which otherwise would have been generated through fossil fuels. Also, it will contribute to reduction GHG emissions. Thus, the project causes no negative impact on the surrounding environment contributing to environmental well-being.

Economic well-being: Being a renewable resource, using hydro energy to generate electricity contributes to conservation precious natural resources. The project contributes to the economic sustainability through promotion of decentralization of economic power, leading to diversification of the national energy supply, which is dominated by conventional fuel based generating units. Locally, improvement in infrastructure will provide new opportunities for industries and economic activities to be setup in the area. Apart from getting better employment opportunities, the local people will get better prices for their land, thereby resulting in overall economic development.

Technological well-being: The project activity leads to the promotion of 2.00 MW hydro turbine generators into the region and will promote practice for small scale industries to reduce the dependence on carbon intensive grid supply to meet the captive requirement of electrical energy and also increasing energy availability and improving quality of power under the service area. Hence, the project leads to technological well-being.

The project activity contributes to the following SDGs;

SDG	Description
Goal 7 	➢ The project activity has generated 63423 MWh of clean energy, which with increased shared will increase the affordability at a cheaper rate to end user. ➢ Hydropower provides a renewable source of energy that can help reduce dependence on fossil fuels. By generating electricity with minimal carbon emissions, it contributes to increasing the share of renewable energy in the global energy mix.
Goal 8	➢ Decent work and economic growth.

	➢ This project activity generates additional employment for skilled and unskilled, also the project situated in a remote area will provide employment opportunities to unskilled people from villages. Training on various aspects including safety, operational issues, and developing skill sets will also be provided to employees.
Goal 13 	➢ This project has avoided 57077 tons of CO_2 emissions during this monitoring period. ➢ **SDG 13** on clean energy is closely related and complementary. ➢ By producing electricity with little to no direct carbon emissions, hydropower helps mitigate climate change. Reducing reliance on fossil fuels for energy generation supports efforts to lower greenhouse gas emissions.

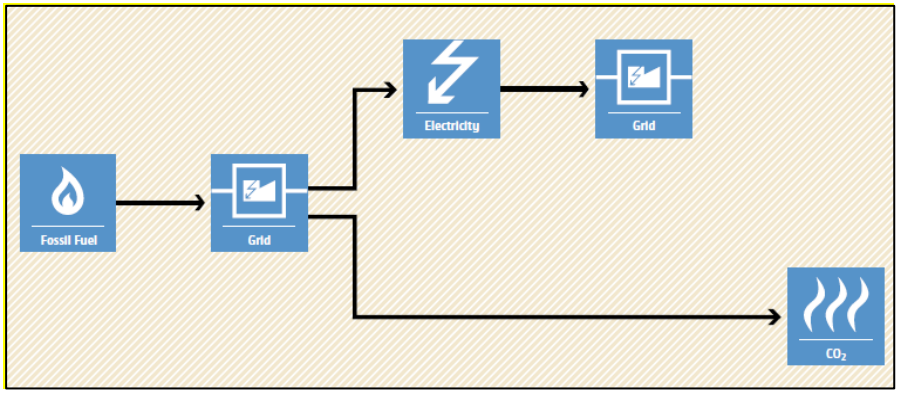
B.3 Baseline Emissions

The baseline scenario identified at the MR stage of the project activity is:

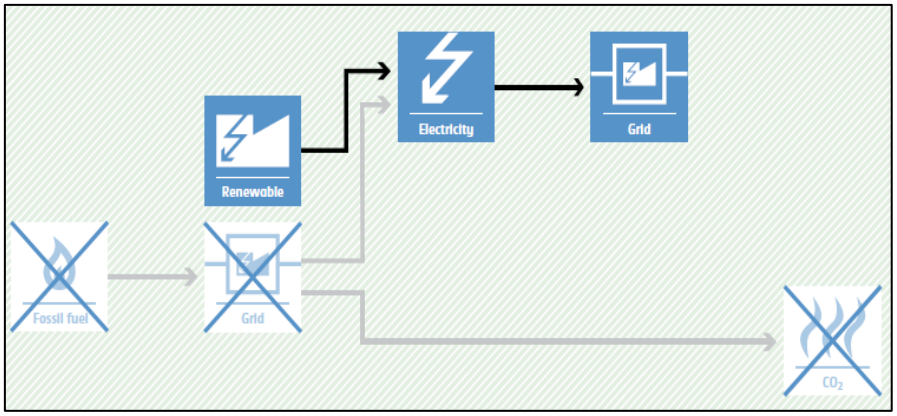
The project activity involves setting up of a new SHEP plant to harness the green power from Hydrel energy and to supply the produced power to the Indian grid system. In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel fired plants. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

Schematic diagram showing the baseline scenario:

Baseline Scenario:



Project Scenario:



Thus, this project activity was a voluntary investment that replaced an equivalent amount of electricity from the Indian grid. The project proponent was not bound to incur this investment as it was not mandatory by national and sectoral policies. Thus, the continued operation of the project activity would continue to replace fossil fuel-based power plants and fight against the impacts of climate change. The Project Proponent hopes that revenues from the carbon credits generated will help repay the loans and help in the continued maintenance of this project activity.

B.4. De-bundling

This project activity is not a debundled component of a larger project activity.

SECTION - C - Application of methodologies and standardized baselines

C.1 References to methodologies and standardized baselines

Sectoral scope	:	01, Energy industries (Renewable/Non-renewable sources)
Type	:	I-Renewable Energy Projects
Category	:	AMS. I.D. (Title: "Grid connected renewable electricity generation", version 18)

C.2 Applicability of methodologies and standardized baselines

The project activity involves generation of grid connected electricity from the construction and operation of a new hydro power-based power project. The project activity has installed capacity of 2.00 MW which will qualify for a small-scale project activity under Type-I of the Small-Scale methodology. The project status is corresponding to the methodology AMS-I.D., version 18 and applicability of methodology is discussed below:

Applicability Criterion	Project Case
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid; or **(b)** Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project activity involves setting up of a renewable energy (hydro) generation plant that exports (sale) electricity to the fossil fuel dominated electricity grid (Indian Grid system). Thus, the project activity meets this applicability conditions.
2. Illustration of respective situations under which each of the methodology (i.e., AMS-I.D: Grid connected renewable electricity generation", AMS-I.F: Renewable electricity generation for captive use and mini-grid" and AMS-I.A: Electricity generation by the user) applies is included in Table 2	According to the point 1 of the Table 2 in the methodology – "Project supplies electricity to a national/ regional grid" is applicable under AMS I.D. As the project activity supplies the electricity to Indian Grid system grid which is a regional grid, the methodology AMS-I.D. is applicable.
3. This methodology is applicable to project activities that:	The Project activity involves the installation of new power plant at a site
(a) Install a Greenfield plant; (b) Involve a capacity addition in (an)	where there was no renewable energy power plant

existing plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s); or (e) Involve a replacement of (an) existing plant(s).	operating prior to the implementation of the project activity. Thus, Project activity is a Greenfield plant and satisfies this applicability condition (a).
4. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: (a) The project activity is implemented in existing reservoir, with no change in the volume of the reservoir; or (b) The project activity is implemented in existing reservoir, where the volume of the reservoir(s) is increased and the power density as per definitions given in the project emissions section, is greater than 4 W/m2. (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/m2	As the project activity is a run-off river type hydro power plant, this criterion is not relevant for the project activity.
5. 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 rated capacity of the project activity is 2.00 MW hydro power project. i.e. only component is renewable power project below 15 MW, thus this criterion is not applicable to this project activity.
6. Combined heat and power (co-generation) systems are not eligible under this category	This is not relevant to the project activity as the project involves only hydro power generating units.
7. 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.	There is no other existing renewable energy power generation facility at the project site. Therefore, this criterion is not applicable.
8. In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement power plant/unit shall not exceed the limit of 15 MW.	The project activity is a new installation, it does not involve any retrofit measures nor any replacement and hence is not applicable for the project activity.
9. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered	This is not relevant to the project activity as the project involves only hydro power generating units.

methane emissions are eligible under a relevant Type III category. If the recovered methane is used for 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.	
10. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	This is not relevant to the project activity as the project involves only hydro power generating units.

C.3 Applicability of double counting emission reductions

The project was not applied under any other GHG mechanism. Hence the project will not cause double accounting of carbon credits (i.e., CoUs).

C.4 Project boundary, sources, and greenhouse gases (GHGs)

As per applicable methodology AMS-I.D. Version 18.0, "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system."

Thus, the project boundary includes the Hydro Turbine Generator and the Indian grid system.

Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected electricity generation	**CO_2**	**Yes**	**CO2 emissions from electricity generation in fossil fuel fired power plants**
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
		Other	No	No other GHG emissions were emitted from the project
Project	Greenfield Hydro Power Project Activity	CO_2	No	No CO_2 emissions are emitted from the project
		CH_4	No	Project activity does not emit CH_4
		N_2O	No	Project activity does not emit N_2O
		Other	No	No other emissions are emitted from the project

C.5 Establishment and description of the baseline scenario

As per the approved consolidated methodology AMS-I.D. Version 18, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

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

The bundled project activity involves setting up three new hydro power plant to harness the green power from hydro energy and to use for sale to national grid i.e., India grid system through PPA arrangement. 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. The power produced at grid from the other conventional sources which are predominantly fossil fuel based. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

A "grid emission factor" refers to a CO_2 emission factor (tCO_2/MWh) that will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO_2/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 are to be selected as the most conservative estimate between the national electricity/power authority published data set and UCR default of 0.9 tCO2/MWh.

C.5.1 Net GHG Emission Reductions and Removals

Thus, $ER_y = BE_y – PE_y – LE_y$

Where:

ER_y = Emission reductions in year y (tCO_2/y)

BE_y = Baseline Emissions in year y (t CO_2/y)

PE_y = Project emissions in year y (tCO_2/y)

LE_y = Leakage emissions in year y (tCO_2/y)

- ***Baseline Emissions***

Baseline emissions include only CO_2 emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,y}$$

BE_y = Baseline emissions in year y (t CO_2)

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

$EF_{grid,y}$ = UCR recommended emission factor of 0.9 tCO_2/MWh has been considered. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

Hence

Baseline Emissions Calculation				
Sr.No	Year	EGpy (MWh)	EFgrid,y	BEy
1	2014	1082.1	0.9	973
2	2015	8250.6	0.9	7425
3	2016	5601.01	0.9	5040
4	2017	7590.54	0.9	6831
5	2018	5190.22	0.9	4671
6	2019	6059.22	0.9	5453
7	2020	9081.4	0.9	8173
8	2021	6755.57	0.9	6080
9	2022	5603.45	0.9	5043
10	2023	8209.13	0.9	7388
	BE (tCO2e) for the period of 2014 to 2023			57077.00

Estimated annual baseline emission reductions (BE_y)

= 63423MWh *0.9 tCO_2/MWh

= 57077 tCO_2e

- ***Project Emissions***

As per paragraph 39 of AMS-I.D. version-18, "For most renewable energy project activities, PE_y = 0. However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of "ACM0002: Grid-connected electricity generation from renewable sources":

1. Emissions related to the operation of geothermal power plants (e.g., noncondensable gases, electricity/fossil fuel consumption);
2. Emissions from water reservoirs of hydro power plants.

As per paragraph 40 of AMS-I.D. version-18 - CO2 emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion".

As per paragraph 41 of AMS-I.D. version-18 - In case biomass is sourced from dedicated plantations,

the procedures in the tool "Project emissions from cultivation of biomass" shall be used.

This is a hydro power project, there is no project emission occurring from biomass and fossil fuel consumption.

Thus, PE = 0

- ***Leakage Emission***

  As per paragraph 42 of AMS-I.D. version-18, General guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues.

  Hence, all projects other than Biomass projects have zero leakage.

  Hence, LE = 0

The actual emission reduction achieved during the first CoU period is calculated below:

Hence Net GHG emission reduction, = 57077-0-0 = 57077 tCO_2 (i.e., 57077 CoUs)

C.6 Prior History

PP had applied the version 16 of the methodology as the project is a CDM registered project under the ID 5504 with the version 15 of the applied methodology. The project was registered at CDM on 13 December 2011 with fixed crediting period of 10 years (from 13 December2011 to12 December 2021). After the completion of crediting period PP has not renewed the project on CDM mechanism. Hence, for UCR latest version of methodology i.e., version 18 is being considered for emission reduction calculation.

C.7 Changes to the start date of crediting

The crediting period under UCR has been considered from the date of the generation of electricity. There is no change in the start date of crediting period.

C.8 Permanent changes from MR monitoring plan, applied methodology, or applied standardized baseline

Not applicable.

C.9 Monitoring period number and duration

Total Monitoring Period: 9 years 2 month 15 days

Date: 17/10/2014 to 31/12/2023 (inclusive of both dates).

C.10 Monitoring Plan

The bundled project activity essentially involves generation of electricity from water, the employed Hydro Power Plant can only convert Hydro energy into electrical energy and cannot use any other input fuel for electricity generation, thus no special ways and means are required to monitor leakage from the project activity. The recording of the electricity fed to the state utility grid is carried out jointly at the incoming feeder of the state power utility (HPSEB).

Data and Parameters available:

Data / Parameter	UCR recommended emission factor
Data unit	tCO_2 /MWh
Description	As per UCR CoU Standard Aug 2022 (Updated Ver.6), Clause – Emission Factors "The UCR recommends an emission factor of 0.9 tCO2/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 are to be selected as the most conservative estimate between the national electricity/power authority published data set and UCR default of 0.9 tCO2/MWh."
Source of data	https://cea.nic.in/wp-content/uploads/baseline/2024/04/User_Guide__Version_19.0.pdf https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf
Value applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Fixed parameter
Purpose of Data	For the calculation of Emission Factor of the grid
Additional Comment	The combined margin emission factor as per CEA database (current version 19, December 2023) results into higher emission factor. Hence for 2023 vintage UCR default emission factor remains conservative.

Data and Parameters to be monitored (ex-post monitoring values):

Data / Parameter	$EG_{PJ,facility, y}$
Data unit	MWh
Description	Net electricity supplied to the grid facility by the project activity during 17/10/2014 to 31/12/2023
Source of data	Monthly energy bill generated though JMR
Measurement procedures (if any):	Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually

<table>
<tr><td></td><td>Archiving Policy: Paper & Electronic

The total electricity generation by the hydro power plant is recorded at the plant facility, at the end of every month.</td></tr>
<tr><td>Measurement Frequency:</td><td>Monthly</td></tr>
<tr><td>Value applied:</td><td>63423 (Ex-post estimate)</td></tr>
<tr><td>QA/QC procedures applied:</td><td>Calibration frequency: 5 years (as per CEA provision)

Based on the joint meter reading certificates/credit notes, and energy generation report.

As per Central Electricity Authority (Installation and Operation of Meters) (Amendment) Regulations, 2019, dated 23rd December, 2019.

Clause 14, point 1, (b) “All Interface Meters shall be tested on-site using accredited test laboratory for routine accuracy testing at least once in five years and recalibrated if required”. And

Point 2, (iii) Energy Accounting and Audit Meters: Energy Accounting and Audit Meters shall be tested at site through accredited test laboratory at least once in five years or whenever the accuracy is suspected or whenever the readings are inconsistent with the readings of other meters, e.g., Check Meters, Standby Meters and defective meters shall be recalibrated, if required: Provided that the testing shall be carried out without removing the Instrument Transformers connection.”
<table>
<tr><td>Meter Number</td><td>Make</td><td>Calibration Date</td><td>Accuracy class</td></tr>
<tr><td>13193420 (main)</td><td>L & T</td><td>24/10/2016</td><td>0.2s</td></tr>
<tr><td>13193496(check)</td><td>L & T</td><td>24/10/2016</td><td>0.2s</td></tr>
<tr><td>13193420(main)</td><td>L & T</td><td>04/05/2022</td><td>0.2s</td></tr>
<tr><td>13193496 (check)</td><td>L & T</td><td>04/05/2022</td><td>0.2s</td></tr>
</table></td></tr>
<tr><td>Purpose of data:</td><td>The Data/Parameter is required to calculate the baseline emission.</td></tr>
<tr><td>Any comment:</td><td>Data will be archived electronically for a period of 36 months beyond the end of crediting period.</td></tr>
</table>

ANNEXURE I (Emission Reduction Calculation)

2 MW Kalm Small Hydro Power project by Sunshine

Month - Wise Energy Delivered to Grid (in KWh)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014										259100	443000	380000
2015	448200	829300	1149900	550500	406000	373700	964400	1199200	952500	846300	358000	172600
2016	193700	304530	786810	209290	148360	95780	1415420	152790	1433730	565760	258520	36320
2017	514870	618870	513100	305400	235700	315700	1099600	1379800	1272900	588700	327300	418600
2018	217000	234100	249600	298500	173400	207200	659900	810700	1321400	264100	464710	289610
2019	323680	1202560	1733570	928360	487690	189940	604950	588470	0	0	0	0
2020	0	680320	1377350	1426920	698480	500540	685690	1451840	1186430	467230	289100	317500
2021	415790	205390	147790	367780	383960	292140	1180240	1497120	902490	705920	362890	294060
2022	550770	0	163040	332990	166290	143080	778080	1150900	351900	1054400	560100	351900
2023	562200	770330	764800	776200	1024400	661600	1165300	935300	43700	624700	536400	344200

Year-Wise Emission reduction calculation for the project activity

Year	Total No. of Electricity delivered in KWh	Recommended emission factor tCO2/MWh	Total CoUs generated
2014	1082100	0.9	973
2015	8250600	0.9	7425
2016	5601010	0.9	5040
2017	7590540	0.9	6831
2018	5190220	0.9	4671
2019	6059220	0.9	5453
2020	9081400	0.9	8173
2021	6755570	0.9	6080
2022	5603450	0.9	5043
2023	8209130	0.9	7388
Total CoUs to be issued for the first monitoring period (Year: 2014 to 2023)			57077.000