Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: 10 MW Toss Small Hydro Electric Project in Kullu District of Himachal Pradesh, India.
Version 1.0

Date 25/02/2022

First CoU Issuance Period: 08 Years

Monitoring Period: 01/01/2014 to 31/12/2021

Monitoring Report (MR)
CARBON OFFSET UNIT (CoU) PROJECT

Monitoring Report	
Title of the project activity	10 MW Toss Small Hydro Electric Project in Kullu District of Himachal Pradesh, India.
UCR Project Registration Number	069
Version	1.0
Completion date of the MR	25/02/2022
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: (first and last days included (01/01/2014 to 31/12/2021)
Project participants	Creduce Technologies Private Limited (Representator) Toss Mini Hydel Power Project (Project Proponent)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I.D.: "Grid connected renewable electricity generation", version 18
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	2014: 37,494 CoUs (37,494 tCO2eq)
	2015: 31,242 CoUs (31,242 tCO2eq)
	2016: 48,710 CoUs (48,710 tCO2eq)
	2017: 45,929 CoUs (45,929 tCO2eq)
	2018: 46,083 CoUs (46,083 tCO2eq)
	2019: 44,156 CoUs (44,156 tCO2eq)
	2020: 45,912 CoUs (45,912 tCO2eq)
	2021: 46,728 CoUs (46,728 tCO2eq)
Total:	3,46,253 CoUs (3,46,253 tCO2eq)

SECTION A. Description of project activity

A.1. Purpose and general description of project activity >>

The proposed project activity with title under UCR "10 MW Toss Small Hydro Electric Project in Kullu District of Himachal Pradesh, India", is a grid connected Hydro Electric Power project located in Kullu 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). This project is a run-of river project.

a) Purpose of the project activity and the measures taken for GHG emission reductions >>

The project activity aims to harness kinetic energy of water (renewable source) to generate electricity. The net generated electricity from the project activity is sold to state electricity board i.e., Himachal Pradesh State Electricity Board (HPSEB) under the Power Purchase Agreement (PPA) signed between the Project Proponent (PP) and the utility.
In pre-project scenario the PP was importing the required electricity from the state utility i.e., HPSEB (is a part of regional grid, earlier known as NEWNE grid) to meet its captive requirement of electrical energy. Currently, NEWNE grid is connected to large numbers of fossil fuel-based power plants. Hence, project activity is displacing the gross electricity generation i.e., 3,84,726 MWh from the NEWNE grid, which otherwise would have been imported from the NEWNE grid.
The project activity doesn't involve any GHG emission sources. The annual and the total CO2e emission reduction by the project activity over the defined monitoring period is as per **Annexure I.**

b) Brief description of the installed technology and equipment>>

The project activity involves 2 numbers of Hydro Turbine Generators of Pelton Wheel Horizontal type (5000 kW each) with internal electrical lines connecting the project activity with local evacuation facility. The project activity can operate in the frequency of 50 Hz and the voltage of 3.3 kV. The average life time of the generator is around 35 years as per the equipment supplier specification. The other salient features of the technology are:

The Project activity comprises of the following different civil structures, combinedly known as hydro power plant. The kinetic energy of water flowing from river is converted into mechanical energy using hydraulic turbine, which is then converted into electrical energy using generator. The water used in this process is again diverted to the river stream through proper arrangements.
Below is the description of different components of a hydro power plant.

1. **Diversion structure (trench weir):** A diversion structure is required across the khad for diverting its water for power generation. The khad bed consists of pebbles, gravels and boulders. Keeping in view the availability of material the trapezoidal trench weir is proposed to be provided. Such weirs are also suited for mountainous streams.
2. **Intake/Power Channel:** The water fed from Desilting tank is led to tunnel inlet portal through a Rectangular R.C.C channel also known as Intake or Power Channel.
3. **Desilting Tank:** A Desilting chamber is considered necessary to remove silt particles to minimize the abrasion effects on the turbine runners.
4. **Power Tunnel:** It is a free flow tunnel designed in the same way as that of Power Channel. It is a part of water conducting system.

5. **Forebay Tank:** The Forebay is provided to ensure supply of immediate water demand on starting the generating units and to meet the demand in emergency like breach of power channel.
6. **Penstock:** Water from Forebay is being taken to the Powerhouse to run hydraulic turbine through pressurized penstock pipe running from Forebay tank.
7. **Power House Building:** Power house building is a simple structure housing the generating units, auxiliary equipment, control panels and suitable outlet for tail water discharge.
8. **Tail Race Channel:** Turbine discharge shall be disposed to river through the separate tailrace channel.

c) 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.

UCR Project ID		:	069
Start Date of Crediting Period		:	01/01/2014
Project Commissioned	PHASE-I	:	26/12/2008
	PHASE-II	:	11/08/2009

d) 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 is as follows:

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_{2eq})	3,46,253 tCO2eq
Leakage	0

e) 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".

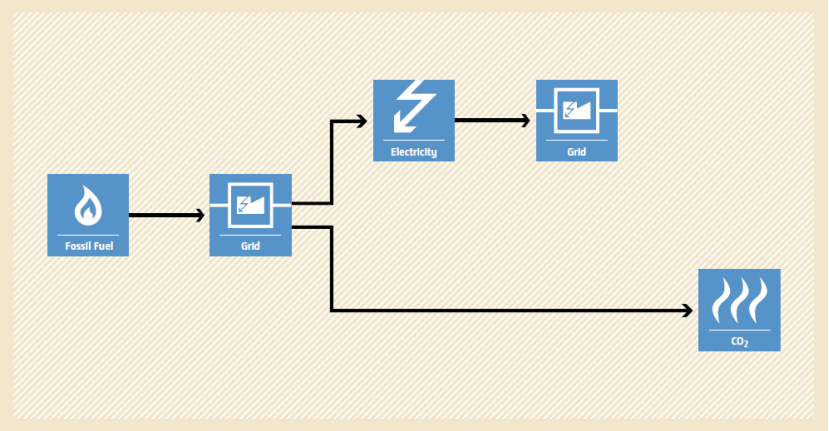


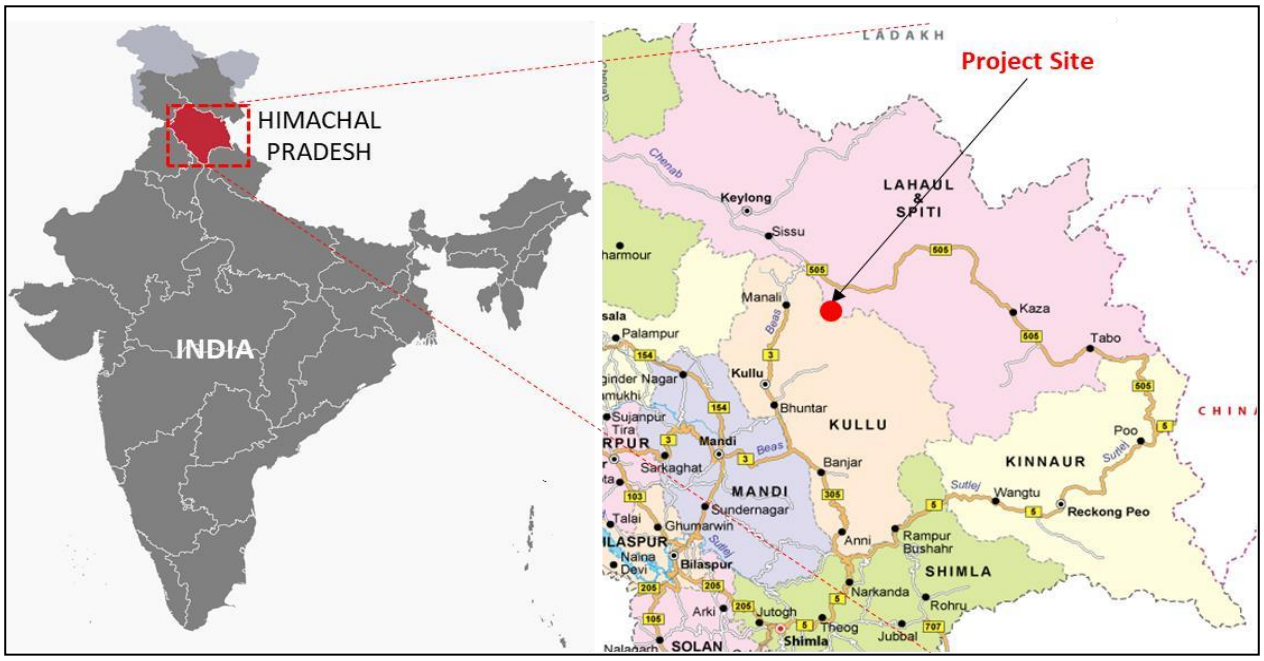
Figure 1 Baseline Scenario

A.2. Location of project activity>>

Country	:	India
State	:	Himachal Pradesh
District	:	Kullu
Village	:	Toss

The project location is situated near village Toss of Kullu district in the state of Himachal Pradesh and harnesses hydro power potential through weir constructed on the streams of Toss khad, a tributary of Parbati river. The project site is connected to Shimla-Kullu-Manikaran road which makes site 263 kms from Shimla and 20 kms from Manikaran. The nearest airport is at Bhuntar which is 165 kms. The nearest rail head is Joginder Nagar, which is about 437 kms from the project site. The geographic co-ordinate of the project locations is 77°24' to 77°41' E and 32°32' to 32°14' N

The representative location map is included below:



A.3. Parties and project participants >>

Party (Host)	Participants
India	**Creduce Technologies Private Limited (Representator)** Contact person: Shailendra Singh Rao Mobile: +91 9016850742, 9601378723 Address: 2-O-13,14 Housing Board Colony, Banswara, Rajasthan - 327001, India. **Toss Mini Hydel Power Project (Developer)** Address: Sai Bhawan Building, Sector-IV, New Shimla - 171009, Himachal Pradesh, India

A.4. References to 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: 01/01/2014
Length of the crediting period corresponding to this monitoring period: 08 Years
01/01/2014 to 31/12/2021 (Both the dates are included)

A.6. Contact information of responsible persons/entities >>

Name : Shailendra Singh Rao
Contact No : +91 9016850742, 9601378723
E-Mail : shailendra@creduce.tech

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity >>

a) Provide information on the implementation status of the project activity during this monitoring period in accordance with UCR PCN>>

The project consists of 2 Hydro turbines which were installed in 2 Phases. Phase-I (5 MW) was implemented on 26/12/2008 and Phase-II (5 MW) was implemented on 11/08/2009. The project was commissioned by Directorate Power House Electrical (HPSEB) Sundernagar, Government of Himachal Pradesh at Toss village of District Kullu, Himachal Pradesh. Toss Mini Hydel Power Project is the promoter of this project. The project generates clean energy by utilizing the kinetic energy of flowing water from the river Parbati.

b) For the description of the installed technology, technical process and equipment, include diagrams, where appropriate>>

The project activity involves 2 numbers of Hydro Turbine Generators of Pelton Wheel Horizontal type (5000 kW each) with internal electrical lines connecting the project activity with local evacuation facility. The generators generate power at 3.3 kV, which can further be stepped up to 33 kV. The project activity can operate in the frequency of 50 Hz and the voltage of 3.3 kV. The average life time of the generator is around 35 years as per the equipment supplier specification. The other salient features of the technology are:

Design Discharge	15.00 cumecs
Gross Head	185.44 m
Net Head	173.75 m
Diversion Weir	
Type	Trench weir
Shape	Trapezoidal
Length	15 m
Feeder Channel	
Length	135.63 m
Shape / Material	D-shaped / R.C.C (cut and cover)
Size	Dia. 3.60 m
Design Discharge	15 cumecs + 50% flushing
Intake Tank	
Type	R.C.C.
Shape	Oval
Size	27 m × 7.73 m × 3.75 m
Flow velocity	0.682 m/sec
Head Race Tunnel	
Shape & size	Circular & 1.80 m dia.
Length	130.04 m
Design Discharge	15 cumecs + 25% flushing
Desilting Tank	
Type	Hopper Type Surfaced
Total Length	48.00 m
Width	22.68 m
Full supply depth	9.00 m
Type / Material	R.C.C

Velocity of flow	0.19 m/sec
Penstock	
Number	Two
Diameter – Main pipe	1500 mm (I.D.)
Thickness for main pipe	12 mm & 16 mm
Length	900 m
Diameter of Branched penstock	1200 mm & 20 mm thickness
Material	Steel
Power House	
Type	Surfaced Power House (R.C.C structure)
Size	52.65 m × 16.47 m × 19.4 m
Capacity	2 × 5000 kW
Gross head	185.44 m
Net head	173.75 m
Electromechanical Equipment	
Turbine type	Pelton Horizontal
Turbine number	02 Nos.
Rated Capacity of each turbine	5372 kW
Turbine normal speed	500 rpm
Type of generators	Synchronous
Generator Normal Speed	500 rpm
Generator Rated voltage	3.3kV
Tail Race	
Shape	Rectangular
Length	45 m
Size	3.60 m × 2.70 m
Power	
Installed capacity	2 × 5000 kW
No. of unit generated @ 75% dependable	52.19 MU

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

Indian economy is highly dependent on "Coal" as fuel to generate energy and for production processes. Thermal power plants are the major consumers of coal in India and yet the basic electricity needs of a large section of population are not being met. This results in excessive demands for electricity and places immense stress on the environment.

Changing coal consumption patterns will require a multi-pronged strategy focusing on demand, reducing wastage of energy and the optimum use of renewable energy (RE) sources. This project is a greenfield activity where grid power is the baseline. The renewable power generation is gradually contributing to the share of clean & green power in the grid; however, grid emission factor is still on higher side which defines grid as distinct baseline.

The Government of India has stipulated following indicators for sustainable development in the interim approval guide lines for such projects which are contributing to GHG mitigations. The Ministry of Environment, Forests & Climate Change, has stipulated economic, social, environment 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 towers for erection 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.

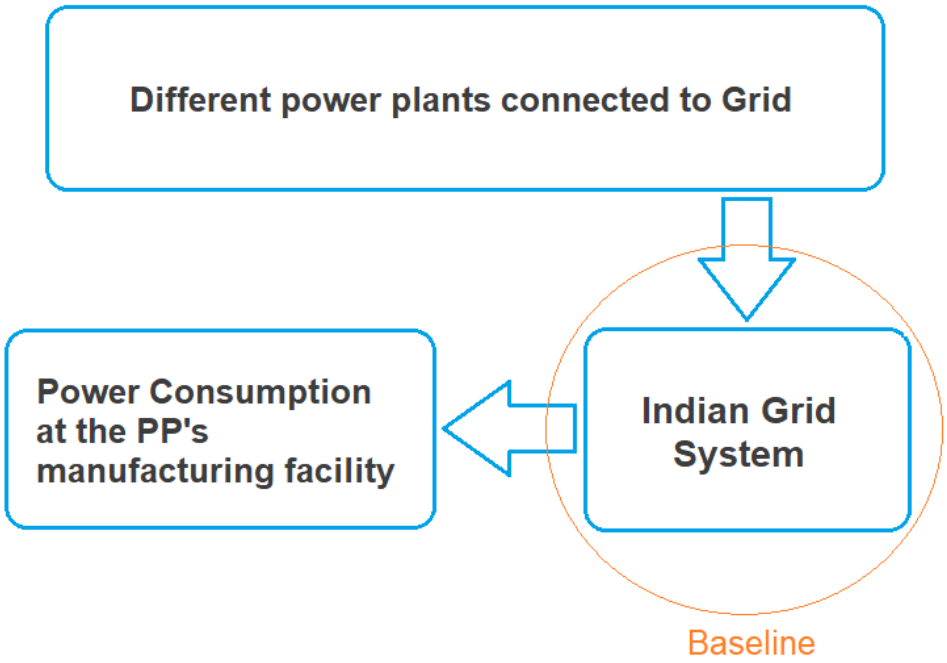
Economic well-being: Being a renewable resource, using Hydro energy to generate electricity contributes to conservation precious natural resources. The project contributes to the economic sustainability through promotion of decentralization of economic power, leading to diversification of the national 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 10 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.

B.3. Baseline Emissions>>

In the absence of the project activity, the equivalent amount of electricity would have been imported from the regional grid (which is connected to the unified Indian Grid system (NEWNE Grid)), which is carbon intensive due to predominantly sourced from fossil fuel-based power plants.

Baseline Scenario:



Thus, this project activity was a voluntary investment which replaced 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 carbon revenues from 2014-2021 accumulated as a result of carbon credits generated will help repay the loans and help in the continued maintenance of this project activity.

B.4. Debundling>>

This project activity is not a de-bundled 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

Applied Baseline Methodology: AMS-I.D.: "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 project for selling it to state electricity board i.e., Himachal Pradesh State Electricity Board (HPSEB) under the Power Purchase Agreement (PPA) signed between the Project Proponent (PP) and the utility.
The project activity has installed capacity of 10 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 18and 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 is a Renewable Energy Project which falls under applicability criteria option 1 (a) i.e., "Supplying electricity to a national or a regional grid". Hence the project activity meets the given applicability criterion as well as satisfies the applicability illustration mentioned in Appendix of AMS-ID Table 1 – Scope of AMS-I.D. version 18.
2. This methodology is applicable to project activities that: (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s).	The option (a) of applicability criteria 2 is applicable as project is a Greenfield plant /unit. Hence the project activity meets the given applicability criterion.
3. 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	The project activity is a run of river type of Project, hence no Criteria of point 3. Is applicable here.

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/m^2. (c) (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	
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 proposed project is 10 MW Hydro power project, i.e., only component is renewable power project below 15MW, 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 is Hydro power project. Thus, the criterion is not applicable to this project activity.
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 distinct1 from the existing units.	The proposed project is a greenfield 10 MW Hydro power project, i.e., only component is renewable power project below 15 MW, thus the criterion is not applicable to this project activity.
7. In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	The proposed project is a greenfield 10 MW Hydro power project, i.e., only component is renewable power project below 15 MW, thus the criterion is not applicable to this project activity.
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 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.	The proposed project is a greenfield 10 MW Hydro power project; hence, this criterion is not applicable to this project activity.
9. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	Not biomass is involved, the project is only a wind power project and thus the criterion is not applicable to this project activity.

C.3 Applicability of double counting emission reductions >>

The project activity is a small-scale hydro project and was not applied under any other GHG mechanism prior to this registration with UCR. Also, project has not been applied for any other environmental crediting or certification mechanism. Hence 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, "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 Generators 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 baseline scenario (UCR Protocol) >>

As per para 19 of 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 project activity involves setting up of a 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) which 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 2014-2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Also, for the vintage 2021, the combined margin emission factor calculated from CEA database in India results into same emission factors as that of the default value. Hence, the same emission factor has been considered to calculate the emission reduction.

Net GHG Emission Reductions and Removals

$ERy = BEy – PEy – LEy$

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:

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

Where:

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 this project activity in year y (MWh)
$EF_{grid,y}$	=	UCR recommended emission factor of 0.9 tCO_2/MWh has been considered, this is conservative as compared to the combined margin grid emission factor which can be derived from Database of Central Electricity Authority (CEA), India. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

Hence, BEy = 3,84,726 x 0.9 = 3,46,253 tCO2eq

Project Emissions

As per paragraph 39 of AMS-I.D. (version 18), for most renewable energy project activities emission is zero.

Hence, PEy = 0

Leakage Emissions

As per paragraph 42 of AMS-I.D. (version-18), all projects other than Biomass projects have zero leakage.

Hence, LEy= 0

Total Emission reduction by the project for the current monitoring period is calculated as below:

Hence, ERy= 3,46,253 – 0 – 0 = 3,46,253 CoUs

C.6. Prior History>>

The project activity is a small-scale hydro project and was not applied under any other GHG mechanism prior to this registration with UCR. Also, project has not been applied for any other environmental crediting or certification mechanism. Hence project will not cause double accounting of carbon credits (i.e., COUs).
Historically, the project was planned in two phases with 5 MW as phase 1 and then intended to go up to a total capacity of 20 MW under phase 2. This capacity was evaluated in the DPR stage and also received approval. However, during the actual implementation of the project, the 2nd phase was limited to only 5 MW due to financial viability and timeline, whereas 1st phase was installed with total approved 5 MW capacity. Thus, total project capacity was limited to 10 MW.

C.7. Monitoring period number and duration>>

First Monitoring Period: 08 Years
01/01/2014to 31/12/2021 (inclusive of both dates)

C.8. Changes to start date of crediting period >>

Crediting period start date is 01/01/2014.

C.9. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

There are no permanent changes from registered PCN monitoring plan and applied methodology

C.10. Monitoring plan>>

The 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).

Parameter	$EG_{PJ,y}$
Data unit	MWh
Description	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of this project activity in year y.
Source of data Value(s) applied	Joint Meter Reading (JMR) Report
Procedures	The Net electricity generation by the hydro power plant is recorded by the project proponent in the record logs. At the end of every month, Energy bill is generated based on the total monthly electricity exported to the grid.
Monitoring frequency	Monthly
Purpose of data	To estimate Baseline Emission

ANNEXURE I (Emission Reduction Calculation)

10 MW Toss Small Hydro Electric Project in Kullu District of Himachal Pradesh, India

Month - Wise Energy Delivered to Grid (in kWh)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	24,87,000	4,78,500	0	19,72,300	64,30,000	53,38,800	56,97,800	55,34,000	50,61,000	49,01,000	37,59,100	13,75,80
2015	2,14,600	2,09,250	1,48,500	1,85,250	25,15,500	48,30,750	45,81,750	59,34,000	43,20,000	52,61,700	36,78,600	28,33,900
2016	24,97,500	20,24,800	22,31,800	37,99,200	60,86,000	61,10,850	59,68,500	55,56,750	60,01,500	61,71,750	44,76,000	31,97,250
2017	10,29,750	21,53,600	23,16,600	46,87,900	63,59,700	61,81,100	57,03,300	56,37,300	52,90,800	52,97,400	37,42,100	26,32,700
2018	23,20,700	18,43,800	21,80,700	39,14,000	67,18,400	57,89,500	58,76,600	57,78,300	45,99,700	50,20,000	34,53,700	37,07,500
2019	25,85,600	4,77,900	21,97,200	51,11,100	51,65,500	52,44,700	50,77,500	58,19,000	55,32,600	49,08,500	42,27,600	27,15,000
2020	26,23,500	26,06,250	25,80,750	31,23,000	55,89,750	60,03,000	53,80,500	44,10,750	59,62,500	62,48,250	33,18,000	31,67,250
2021	26,52,000	20,60,250	22,32,000	27,09,000	37,78,500	60,09,750	55,41,000	64,98,750	61,62,750	55,51,500	47,73,750	39,50,250

Year-Wise Emission reduction calculation for the project activity

Year	Total No. of Electricity delivered in MWh	Recommended emission factor tCO2/MWh	Total CoUs generated
2014	41,660	0.9	37,494
2015	34,714	0.9	31,242
2016	54,122	0.9	48,710
2017	51,032	0.9	45,929
2018	51,203	0.9	46,083
2019	49,062	0.9	44,156
2020	51,014	0.9	45,912
2021	51,920	0.9	46,728
TOTAL	3,84,726	0.9	3,46,253
Total CoUs to be issued for the first monitoring period (Year: 2014 to 2021)			3,46,253