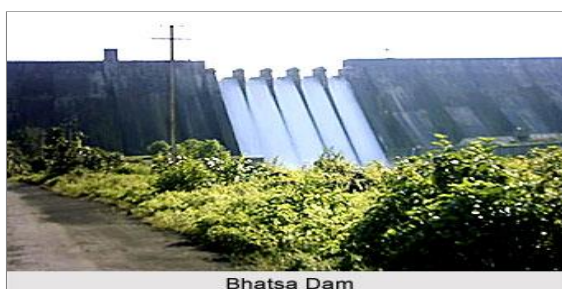




Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT



Bhatsa Dam

Title: Bundled Hydro Projects in Maharashtra & Karnataka
Version 1.0

~~Version 1.0~~

Date 26/10/2022

First CoU Issuance Period: 8 years 3 months

Monitoring Period: 01/01/2014 to 31/03/2022



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

Monitoring Report

Title of the project activity	Bundled Hydro Projects in Maharashtra & Karnataka
UCR Project Registration Number	198
Version	01
Completion date of the MR	26/10/2022
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: <u>first and last days included</u> 01/01/2014 to 31/03/2022 <u>(8 years 3 months)</u>
Project participants	1. Krishna Valley Power Private Limited (KVPPL) 2. Sahyadri Renewable Energy Private Limited (SREPL) 3. Vijayalaksmi Hydro Power Pvt Ltd 4. SRM Power Pvt Ltd
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I.D.: "Grid connected renewable electricity generation", version 18.0 Standardized Methodology: Not Applicable
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	01/01/2014 – 31/12/2014: 16,536 CoUs (16,536 tCO ₂ eq)
	01/01/2015 – 31/12/2015: 25,731 CoUs (25,731 tCO ₂ eq)
	01/01/2016 – 31/12/2016: 20,265 CoUs (20,265 tCO ₂ eq)

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	tCO2eq) 01/01/2017 – 31/12/2017: 22,899 CoUs (22,899 tCO2eq) 01/01/2018 – 31/12/2018: 25,281 CoUs (25,281 tCO2eq) 01/01/2019 – 31/12/2019: 23,508 CoUs (23,508 tCO2eq) 01/01/2020 – 31/12/2020: 27,218 CoUs (27,281 tCO2eq) 01/01/2021 – 31/12/2021: 30,423 CoUs (30,423 tCO2eq) 01/01/2022 – 31/03/2022: 30,423 CoUs (4,634 tCO2eq)
Total:	196,495 CoUs (196,495 tCO2eq)

SECTION A. Description of project activity

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

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

The proposed project activity involves construction and operation of 4 Small Scale Hydro Power Projects (HPP) in the state of Maharashtra and Karnataka in India.

The project activity has been essentially conceived to generate clean energy by utilizing the hydro potential of the flowing water. It causes total minimum environmental impacts and in turn will lead to actual emission reduction of 196,495 tCO₂ emissions per year.

Total cumulative installed capacity of the project would be 10.7 MW with an annual gross energy generation of 218,331 MWh. The Small-Scale hydel projects, developed by Gilada groups, will deliver electricity to the buyer, through National transmission network.

The details of

Project	IPP	Capacity	Location	Annual Net Generation	Emission Reduction	Commissioned Date
VAJRA II	Krishna Valley Power Private Limited (KVPPL)	1.5 MW	Khutghar, Maharashtra	58,303 MWh	52,472 tCO ₂ e/yr	20/11/2012
VAJRA III	Sahyadri Renewable Energy Private Limited (SREPL)	1.5 MW	Khasgaon, Maharashtra	66,036 MWh	59,432 tCO ₂ e/yr	24/02/2015
Hebbakvadi Mini Hydel Scheme Unit 3	Vijayalaksmi Hydro Power Pvt Ltd	1.7 MW	Hebbakvadi, Karnataka	18,732 MWh	16,858 tCO ₂ e/yr	27/02/2002
Somvathi Mini Hydel Scheme	SRM Power Pvt Ltd	6.0 MW	Samshe, Karnataka	75,260 MWh	67,734 tCO ₂ e/yr	24/10/2011

Proposed HPP has evolved as a result of the policies of Government of India and Government of Maharashtra and Karnataka, which encourages energy development from renewable sources. These policies have given fresh impetus to hydroelectric power generation. Also, by virtue of being a hydro power plant, the proposed plant can be instantly started, stopped and quickly adjusted for power generation corresponding to variations in water releases.

The electricity produced by the project is directly contributing to climate change mitigation by reducing the anthropogenic emissions of greenhouse gases into the atmosphere by displacing an equivalent amount of power at grid.

Since the project activity will generate electricity through hydro energy, a clean renewable energy source, it will not cause any negative impact on the environment and thereby contributes to climate change mitigation efforts.

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

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 Nallah for diverting its water for power generation. The Nallah bed consists of pebbles, gravels and boulders.
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. Penstock: Water from Forebay is being taken to the Powerhouse to run hydraulic turbine through pressurized penstock pipe running from Forebay tank.
5. 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.
6. 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.)>>

UCR Project ID or Date of Authorization: 198

Start Date of Crediting Period: 01/01/2014 to 31/03/2022

Project Commissioned:

Project	Commissioned Date
VAJRA II	20/11/2012
VAJRA III	24/02/2015
Hebbakvadi Mini Hydel Scheme Unit 3	27/02/2002
Somvathi Mini Hydel Scheme	24/10/2011

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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	31/03/2022
Total ERs generated (tCO _{2eq})	196,495 tCO _{2eq}

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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”.

A.2. Location of project activity>>

The projects are located in India in the state of Maharashtra and Karnataka.

	VAJRA II HPP	VAJRA III HPP	Hebbakvadi Mini Hydel Scheme	Somvathi Mini Hydel Scheme
Country	India	India	India	India
District	Thane	Thane	Mandya	Chikkamagaluru
Village	Khutghar	Khasgaon	Hebbakvadi	Samshe
Tehsil	Shahapur	Shahapur	Malavalli	Mudigere
State	Maharashtra	Maharashtra	Karnataka	Karnataka
Code	400601	400601	571478	577132
Latitude	19° 25' 57.0828" N	19° 28' 15.312" N	12°26'53.8"N	13°11'05.3"N
Longitude	73° 20' 36.078" E	73° 23' 40.596" E	76°33'58.6" E	75°18'46.1"E



Project Location
1. Bhatsa River



Project Location
1. Chikamagalur
2. Mandya

A.3. Parties and project participants >>

Party (Host)	Participants
India	Krishna Valley Power Private Limited
India	Sahyadri Renewable Energy Private Limited
India	Vijayalakshmi Hydro Power Pvt Ltd
India	SRM Power Pvt Ltd

A.4. 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)

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 10.7 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 18.0 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	All the project activities involve setting up of a renewable energy (hydro) generation plant that exports electricity to the fossil fuel dominated electricity grid (Indian Grid system). Thus, the project meets this applicability conditions “a”.
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.
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); or (e) Involve a replacement of (an) existing plant(s)	The Project activity involves the installation of new power plant at a site where there was no renewable energy power plant 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:	As the project activity is a run-off river type hydro power plant, this criterion is not relevant for the project activity.

(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.	
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.	Not relevant as there is no non-renewable components involved in the project.
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.
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.
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 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	This is not relevant to the project activity as the project involves only hydro power generating units.
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.

A.5. Crediting period of project activity >>

Length of the crediting period corresponding to this monitoring period: 8 years 3 months
01/01/2014 – 31/03/2022

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

UCR ID – 198
Kosher Climate India Private Limited
Name: Narendra Kumar
Email ID – narendra@kosherclimate.com

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>>

VAJRA II

Electrical power produced by 1500 KW generator at 3.3 kV, will be stepped up to 22 kV through power transformer. The 3 phase, 3.3 KV/22, 2200 kVA, Ynd1 oil filled transformer will be outdoor type and located in 22KV switchyard adjacent to powerhouse.

The VAJRA II Project was commissioned on 20/11/2012.

In order to feed the plant auxiliaries, powerhouse essential and non- essential loads, one (1) no. of auxiliary transformer will be provided. This transformer will be connected to 22 kV supply on HV side tapped off from 22KV bus in switchyard and its LV winding feeding 415V Station Auxiliary distribution board.

Specification	Value
Design Discharge	25 Cumecs
Gross Head	6.25
Net Head	5.85
Diversion Weir	
Type	Gated Weir
Thickness	750mm
Turbine	Vertical Full Kaplan
Generator	Vertical synchronous generator

VAJRA III

The project activity started operation on 24/02/2015.

Specification	Value
Design Discharge	30 cumecs
Gross Head	5.79 m
Net Head	5.67 m
Diversion Weir	
Type	Gated Weir
Length	212 m
Power House	
Type	Surface1
Size	8.8 m X 7.4 m

Capacity	1500kWe
Turbine	Vertical Full Kaplan
Generator	Vertical synchronous generator

Hebbakvadi Mini Hydel Scheme Unit 3

The project activity got commissioned on 27/02/2002. It is a canal based small scale hydel project that involves various technologies of hydro turbine generators with internal electrical lines connecting the project activity with local evacuation facility. The project activity consists of Turbines, Generators, Control Equipment's, Oil Pumping systems, etc. The turbine uses a horizontal shaft full Kaplan with adjustable guide vanes and runner blades. It is also proposed to use 2 numbers of 850kw, 11kV, 3 phase synchronous generator with a brushless excitation system. As it is a full Kaplan Turbine with synchronous generator an electronic governor is proposed. Project-wise Technical Specifications can be referred in the below table:

Specification	Value
Turbine	
Type	Horizontal S type Full Kaplan
Number	2
Capacity	1.7 MW
Generator	
Type	Horizontal Synchronous
Excitation system	Brushless
Regulation system	AVR

Somvathi Mini Hydel Scheme

The project activity was commissioned on 24/10/2011. It involves 2 hydro turbine generators of Horizontal Francis (3000 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 Meter used is an electronic trivector meter of 0.2% accuracy class. The other salient features of the technology are:

Specification	Value
Turbine	Horizontal Francis Turbine
No. of units	2
Rated capacity	3000kw
Generator	Synchronous
No. of Units	2
Rated Output	3000kW
Rated Speed	750 rpm

The Crediting period as per the PCN is 8 years & 2 months which is updated in the MR to be 8 years & 3 months. The emission reduction has been calculated for the period of 8 years and 3

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| months.

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

Salient Features of Vajra-III



Location	110 Km from Mumbai on NH-3 near Shahapur Taluk Thane, Maharashtra
Installed Capacity	1500 MW
Power House	RCC Structure/ Surface
Gated Weir	212 m along wire axis Power House
Turbine	Vertical Full Kaplan Turbine
Generator	Vertical Synchronous, Brushes excited, open ventilated

Development type Power generation from fixed release made from Bhatsa Dam for meeting the drinking Water Supply scheme of Brihanmumbai Municipal Corporation (BMC) and free catchments yield available up to Khasgaon Village.

Annual Energy 12 MUs

Somavathi Mini Hydel Project



Salient Features:

Location	: Karnataka
District	: Chickamagalur
Taluka	: Mudigere
Village	: Shamse
River basin	: Somavathi tributary of Bhadra
Installed Capacity	: 2 X 3000 KW = 6.00 MW
Power House	: RCC Structure / Surface
Turbine	: Horizontal Francis Turbine
Generator	: Synchronous
Annual Energy	: 18.52 MU
Commissioning	: July 2011

| Unit-II Salient Feature:



Location	: Karnataka
District	: Mandya
Taluka	: Malavalli
Village	: Hebbakavadi
Development type	: Canal based Project
Installed Capacity	: 1* 850 KW
Power House	: RCC Structure/ Surface
Turbine	: Vertical Semi Kaplan Turbine
Generator	: Synchronous
Annual Energy	: 2.62 MU
Commissioned on	: July 2002

| Unit-III Salient Feature



Location	: Karnataka
District	: Mandya
Taluka	: Malavalli
Village	: Hebbakavadi
Development type	: Canal based Project
Installed Capacity	: 1* 850 KW
Power House	: RCC Structure/ Surface
Turbine	: Vertical Semi Kaplan Turbine
Generator	: Synchronous
Annual Energy	: 2.62 MU
Commissioned on	: July 2002

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

There was no harm identified from the project and hence no mitigations 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 Hydro Projects.

Nevertheless, PP had conveyed about project activity before implementation at respective village of Maharashtra and Karnataka, India to understand, discuss, record all possible concerns related to environment and socio-economic aspects of the project so that as per requirements, the mitigation measures can be taken. The feedback and inputs received from local stakeholders confirm that no negative impact and all issues were resolved by them.

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:

There are social, environmental, economic and technological benefits which contribute to sustainable development.

- **Social benefits:**

- 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 benefits:**

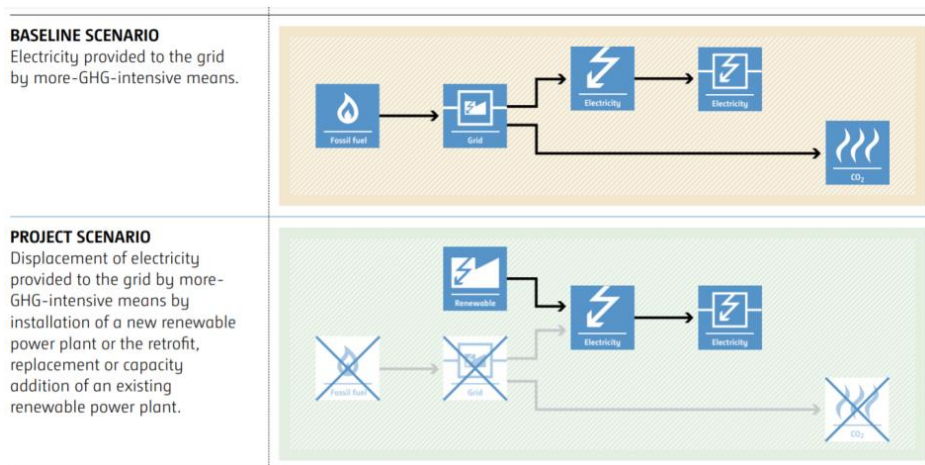
- The project utilizes hydro energy for generating electricity which is a clean source of energy. The project activity will not generate any air pollution, water pollution or solid waste to the environment which otherwise would have been generated through fossil fuels. Also, it will contribute to reduction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

- **Economic benefits:**

- 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.

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), which is carbon intensive due to predominantly sourced from fossil fuel-based power plants. Hence, baseline scenario of the project activity is the grid-based electricity system, which is also the pre project scenario.



B.4. Debundling>>

This project is a small-scale project and it is not de-bundled component of any larger project.

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 3 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	All the project activities involve setting up of a renewable energy (hydro) generation plant that exports electricity to the fossil fuel dominated electricity grid (Indian Grid system). Thus, the project meets this applicability conditions “a”.
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.
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); or (e) Involve a replacement of (an) existing plant(s)	The Project activity involves the installation of new power plant at a site where there was no renewable energy power plant 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	As the project activity is a run-off river type hydro power plant, this criterion is not relevant for the project activity.

given in the project emissions section, is greater than 4 W/m ² . (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 ²	
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.	Not relevant as there is no non-renewable components involved in the project.
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.
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.
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 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	This is not relevant to the project activity as the project involves only hydro power generating units.
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 >>

There is no double counting of emission reductions for the project activities, VAJRA II, VAJRA III & Somvathi Mini Hydel Scheme due to the following reasons:

- Project is uniquely identifiable based on its location coordinates,

- Project has dedicated commissioning certificate and connection point.
- Project is associated with energy meters which are dedicated to the consumption point for project developer

The Hebbakvadi Mini Hydel Scheme Unit 3 project is registered under CDM (Reference Number: 1012 with an expired 7 years Renewable Crediting Period 20/07/2002 – 19/07/2009). PP will request for issuance of carbon offsets in UCR for the post completion of the crediting period under CDM (ie, 20/07/2002 – 19/07/2009) i.e., crediting period will start from 01/01/2014. Hence, there will be no double counting with CDM.

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 that the project power plant is connected to.”

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

Scenario	Source	GHG	Included?	Justification/Explanation
Baseline	Electricity generation in fossil fuel fired power that is dispatched due to the project activity	CO2	Yes	Main emission source
		CH4	No	Not identified in the baseline methodology
		N2O	No	Not identified in the baseline methodology
Project Activity	Electricity generation in the project activity	CO2	No	Zero-emissions grid connected electricity generation from renewable energy
		CH4	No	Zero-emissions grid connected electricity generation from renewable energy
		N2O	No	Zero-emissions grid connected electricity generation from renewable energy

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. 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 CO₂ emission factor (tCO₂/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO₂/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 higher emission than the default value. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.

Net GHG Emission Reductions and Removals

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y (tCO₂/y)

BE_y = Baseline Emissions in year y (t CO₂/y)

PE_y = Project emissions in year y (tCO₂/y)

LE_y = Leakage emissions in year y (tCO₂/y)

Baseline Emissions

Baseline emissions include only CO₂ 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 CO₂)

$EG_{PJ,y}$ = 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 tCO₂/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)

Project Emissions

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As per paragraph 39 of AMS-I.D. (version 18, dated 28/11/2014), for most renewable energy project activities emission is zero. Since, all the projects are run of river project and does not involve any reservoir, the project emission is zero.

Hence, $PE_y = 0$

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Leakage

As per paragraph 22 of AMS-I.D. version-18, 'If the energy generating equipment is transferred from another activity, leakage is to be considered.' In the project activity, there is no transfer of energy generating equipment and therefore the leakage from the project activity is considered as zero.

Hence, $LeE_y = 0$

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The actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification. However, for the purpose of an ex-ante estimation, following calculation has been submitted:

VAJRA II

Estimated annual baseline emission reductions (BE_y)

= 58,303 MWh/year $\times$ 0.9 tCO₂/MWh
= 52,472 tCO₂/year (i.e., 52,472 CoUs/year)

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VAJRA III

Estimated annual baseline emission reductions (BE_{ey})

= 66,036 MWh/year $\times$ 0.9 tCO₂/MWh
= 59,432 tCO₂/year (i.e., 59,432 CoUs/year)

Hebbakvadi Mini Hydel Scheme Unit 3

Estimated annual baseline emission reductions (BE_y)

= 18,732 MWh/year $\times$ 0.9 tCO₂/MWh
= 16,858 tCO₂/year (i.e., 16,858 CoUs/year)

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Somvathi Mini Hydel Scheme

Estimated annual baseline emission reductions (BE_y)

= 75,260 MWh/year $\times$ 0.9 tCO₂/MWh
= 67,734 tCO₂/year (i.e., 67,734 CoUs/year)

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Project	Generation (MWh)	Emission Factor	Emission Reduction (tCO ₂)
VAJRAII	58,303	0.9	52,472
VAJRAIII	66,036	0.9	59,432

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Hebbakvadi Mini Hydel Scheme Unit 3	18,732	0.9	16,858
Somvathi Mini Hydel Scheme	75,260	0.9	67,734
Total	218,331	0.9	196,497

Yearly emission reductions calculation for the monitoring period is given in the table below.

Monitoring Period	Net Energy Export (kWh)					Grid Emission Factor	Emission Reduction (tCO ₂)
	VAJRAII	VAJRAIII	Hebbakvadi Mini Hydel Scheme Unit 3	Somvathi Mini Hydel Scheme	Total		
01-01-2014 to 31-12-2014	8,074	0	2,837	7,463	18,374	0.90	16,536
01-01-2015 to 31-12-2015	5,925	12,227	2,346	8,092	28,590	0.90	25,731
01-01-2016 to 31-12-2016	5,349	8,190	1,057	7,921	22,517	0.90	20,265
01-01-2017 to 31-12-2017	7,672	8,283	1,125	8,364	25,444	0.90	22,899
01-01-2018 to 31-12-2018	7,525	8,293	2,688	9,584	28,090	0.90	25,281
01-01-2019 to 31-12-2019	6,992	5,302	2,653	11,173	26,120	0.90	23,508
01-01-2020 to 31-12-2020	8,038	8,696	2,624	10,885	30,243	0.90	27,218
01-01-2021 to 31-12-2021	6,977	12,857	2,691	11,279	33,804	0.90	30,423
01-01-2022 to 31-03-2022	1,751	2,188	711	499	5,149	0.90	4,634
				Total	218,331		196,495

C.6. Prior History>>

The Hebbakvadi Mini Hydel Scheme Unit 3 project is registered with CDM Reference Number: 1012 with an expired 7 years Renewable Crediting Period 20/07/2002 – 19/07/2009. As the Crediting period has already expired, there will be no double counting of emission reductions.

There is no double counting of emission reductions for the project activities VAJRA II, VAJRA III & Somvathi Mini Hydel Scheme as they are not registered under any other GHG mechanism.

C.7. Monitoring period number and duration>>

First Issuance Period: 8 years, 3 months – 01/01/2014 – 31/01/2022

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

There is no change in the start date of crediting period.

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>>

Data and Parameters available at validation (ex-ante values):

Data/Parameter	UCR recommended emission factor
Data unit	tCO ₂ /MWh
Description	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. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
Source of data	https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com/Documents/UCRStandardNov2021updatedVer2_301121081557551620.pdf
Value(s) applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of data	For the calculation of Emission Factor of the grid

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

Data / Parameter:	EG BL, y
Data unit:	MWh/year
Description:	Quantity of net electricity supplied to the grid as a result of the implementation of the project activity in year y (MWh)
Source of data:	Monthly Joint Meter Readings (JMRs)
Value(s) applied:	218,331 MWh
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 Archiving Policy: Paper & Electronic Calibration frequency: 5 years (as per CEA provision)
Monitoring frequency:	Monthly
QA/QC procedures:	Calibration of the Main meters will be carried out once in five (5) years as per National Standards (as per the provision of CEA, India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement. Cross Checking: Quantity of net electricity supplied to the grid will be cross checked from the invoices raised by the project participant to the grid.
Any comment:	-

Data / Parameter:	CO ₂ emissions
Data unit:	tCO ₂ /year
Description:	GHG emission reductions (tCO ₂ /year)
Source of data:	Calculated
Value(s) applied:	196,495 tCO ₂ /year
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 Archiving Policy: Paper & Electronic Calibration frequency: 5 years (as per CEA provision)
Monitoring frequency:	Yearly
QA/QC procedures:	Monitored data will be stored and archived till the end of the crediting period
Any comment:	-