Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

12 MW Small Scale Mini Hydel Power Project

Title: 12 MW Small Scale Mini Hydel Power Project by M/S Balaji Energy Pvt. Ltd.

Version 2.0

Date 20/08/2022

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	12 MW Small Scale Mini Hydel Power Project by M/S Balaji Energy Pvt. Ltd.
UCR Project Registration Number	149
Version	2.0
Completion date of the MR	11/07/2022
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: 08 Years First and last days included (01/01/2014 to 31/12/2021)
Project participants	Creduce Technologies Private Limited (Representator) M/S Balaji Energy Pvt. Ltd. (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: 43,309 CoUs (43,309 tCO2eq)
	2015: 17,009 CoUs (17,009 tCO2eq)
	2016: 43,057 CoUs (43,057 tCO2eq)
	2017: 25,594 CoUs (25,594 tCO2eq)
	2018: 25,309 CoUs (25,309 tCO2eq)
	2019: 24,397 CoUs (24,397 tCO2eq)
	2020: 46,769 CoUs (46,769 tCO2eq)
	2021: 57,223 CoUs (57,223 tCO2eq)
Total:	2,82,667 CoUs (2,82,667 tCO2eq)

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The proposed project activity involves construction and operation of Small-Scale hydel project in the state of Andhra Pradesh in India. The project activity generates clean energy by utilizing the hydro potential of the water flowing in the Somasila irrigation channel. It causes minimum environmental impacts and will reduce dependence on fossil fuels. The project is an operational activity with continuous reduction of GHG, currently being applied under "Universal Carbon Registry" (UCR). This is run-of river type project.

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

The proposed bundled project activity is promoted by M/S Balaji Energy Pvt. Ltd. (herein after called as project proponent PP). 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. M/S Balaji Energy Pvt. Ltd. sells generated electricity to the state electricity department under the Power Purchase Agreement (PPA) signed between the Project Proponent (PP) and the utility. In pre-project scenario, electricity delivered to the grid by the project activity would have otherwise been generated by the operation of fossil fuel-based grid-connected power plants and by the addition of new fossil fuel-based generation sources in the grid. Hence, project activity is displacing the gross electricity generation i.e., 3,14,079 MWh 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

This project envisages a generation of total 12 MW of power from small hydroelectric project (SHEP) by utilizing the available head and discharge from respective stream. The Project activity comprises of the following different civil structures, combinedly known as hydro power plant. The kinetic energy of water flowing from stream 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 stream through proper arrangements.
Below is the description of different components of a hydro power plant.

1. **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.

2. **Desilting Tank:** A Desilting chamber is considered necessary to remove silt particles to minimize the abrasion effects on the turbine runners.

3. **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.

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 stream through the separate tailrace channel.

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

The proposed project activity is installation and operation of Small-Scale Hydel Power Project comprising of 2 units of hydro Turbine and Generators with an aggregated installed capacity of 12 MW. The project activity has been commissioned for commercial operation as on 02/01/2006 for 10 MW capacity which was later amended to 12 MW as mentioned in the amended PPA agreement document which was made after the approval was given by the APERC Letter no:
APERC/JD(PPP)/DD(PPP)/F.No.E-523 (Vol.VI)/D.No.205/2020, Dt. 18-03-2020.

The duration of the crediting period corresponding to the monitoring period is covered in this monitoring report.

UCR Project ID : 149

Project	Total Installed Capacity	Commissioning date	Start date of Crediting Period
Balaji Phase-I	6 MW	02/01/2006	01/01/2014
Balaji Phase-II	6 MW	02/01/2006	01/01/2014

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})	2,82,667 tCO_{2eq}
Leakage Emission	0
Project Emission	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".**

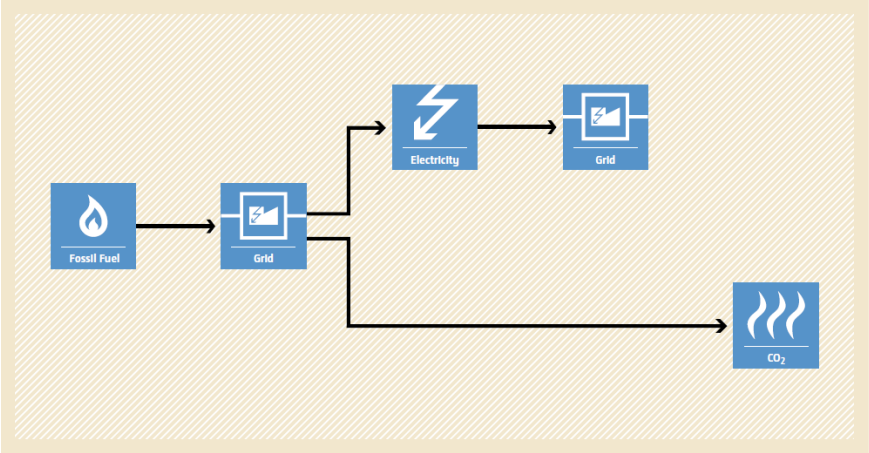


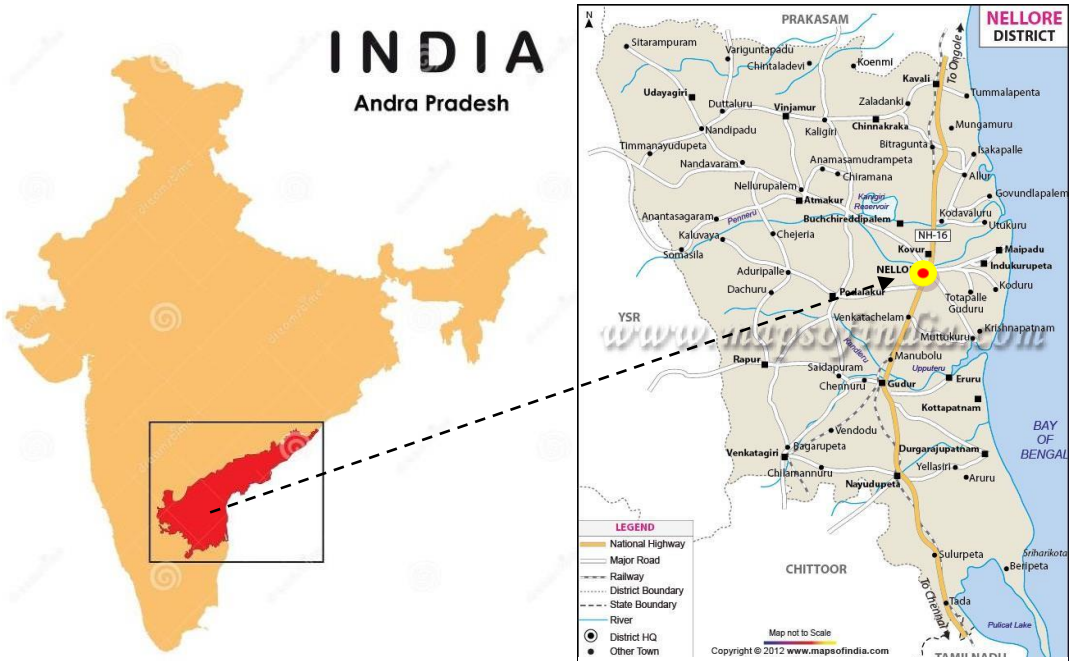
Figure 1 Baseline Scenario

A.2. Location of project activity>>

Country	:	India
State	:	Andhra Pradesh
District	:	Nellore
Village	:	Somasila

The Project is located near Somasila village about 90 kms north of Nellore on Nellore – Tisa – Bairagarh highway in Nellore district of Andhra Pradesh. The geographic co-ordinate of the project locations is Latitude: 14°29'15.0"N, Longitude: 79°18'25.0"E.

The representative location map is included below:



(Courtesy: google map and images)

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. **M/S Balaji Energy Pvt. Ltd. (Developer)** Address: 5-9-19, Ist Floor Laxmi Narsinh Estate, Secretariat Road Saifabad Hyderabad Pin Code-600063, 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

Project	Total Installed Capacity	Start date of Crediting Period
Balaji Phase-I	6 MW	01/01/2014
Balaji Phase-II	6 MW	01/01/2014

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 projects were commissioned by Directorate of Energy, Government of Andhra Pradesh on the dates mentioned bellow in the table. M/S Balaji Energy Pvt. Ltd. is the promoter of this project. The project generates clean energy by utilizing the kinetic energy of flowing water from the river.

Project	Total installed capacity	Commissioning date
Balaji Phase-I	6 MW	02/01/2006
Balaji Phase-II	6 MW	02/01/2006

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

The project activity involves 2 hydro turbine generators of vertical full Kaplan turbine with vertical shaft synchronous generator. Capacity of each installed turbine is of 6000 kW and aggregated installed capacity of the hydro power project is 12 MW.

The other salient features of the technology are:

Approach channel	
Length	49 m
Bed Width	12 m
Bed Level	+77 m
Intake Structure	
Type	10.95 m diameter, Octagonal Structure with trash rack and vertical intake shaft
Floor Level	+77 m
Top Level	+84 m
Head Race Tunnel	
Shape	Circular/Horse Shoe, RCC lined
Diameter	4.75 m
Length	243 m
Gate Shaft	
Diameter	6.60 m, RCC Lined
Top Level	+108 m
Surge Shaft	
Type	Restricted Orifice Type, RCC Lined
Diameter	17.60 m
Orifice diameter	3.85 m
Top Level	+108 m
Steel Lined Pressured Tunnel	4.75 m Diameter 13 m long bifurcated to 2.80 m diameter 26 m long

Power House	
Units	2X6 MW, Vertical full Kaplan Turbine with Vertical Shaft synchronous Generator
Size	38.88 m X 18 m X 41.60 m high- Main 38.88 m X 7.75 m X 4.80 m high- Auxiliary Bay; Pit type power house
Tail Pool	
Size	20 m X 20 m X 35 m deep
Tail Race Tunnel	
Shape	Horse Shoe, RCC lined
Diameter	4.75 m
Length	376 m
Construction Shaft	
Diameter	7.40 m, Unlined
Tail Race Channel	
Bed Width	8 m
Length	483 m
Bed slope	1 in 1250
Switch Yard	
(11/33 kV)	
Size	25 m X 40 m

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 projects would help in generating direct and indirect employment benefits accruing out of ancillary units for implementation of the Hydro plant 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.

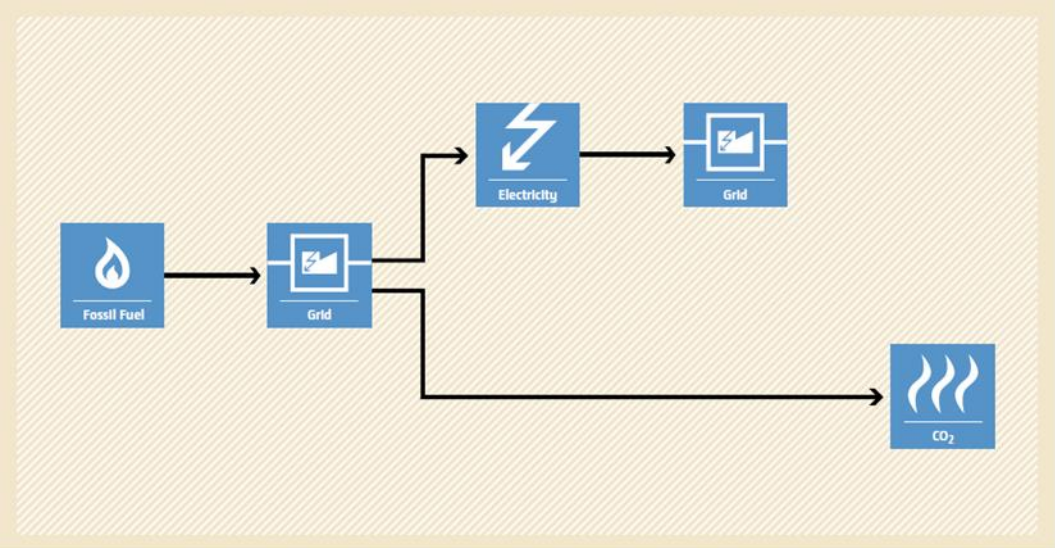
Economic well-being: Being a renewable resource, using Hydro energy to generate electricity contributes to conservation precious natural resources. The project contributes to the economic sustainability through promotion of decentralization of economic power, leading to diversification of the national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

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., Andhra Pradesh Transmission Corporation (APTRANSCO) under the Power Purchase Agreement (PPA) signed between the Project Proponent (PP) and the utility. The project activity has installed capacity of 12 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 Bundled 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 1 (a).
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 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) 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.	This Small-Scale Hydro power project is implemented on an irrigation channel of an existing reservoir with no change in the volume of the reservoir. Thus, point (a) of the criteria 3 is applicable.
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 bundled project is 12 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 and 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 distinct from the existing units.	The proposed project is a greenfield 12 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 12 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 12 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.	No biomass is involved, the project is only a Hydro Power Project and thus the criterion is not applicable to this project activity.

C.3 Applicability of double counting emission reductions

The project was not applied under any other GHG 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 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 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 bundled project activity involves setting up 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 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 (tCO_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,

Baseline Emission Calculation				
Sr. No.	Year	EGpy (MWh)	EFgrid,y	BEy (tCO2eq)
1	2014	48121.62	0.9	43309
2	2015	18899.02	0.9	17009
3	2016	47842.20	0.9	43057
4	2017	28438.40	0.9	25594
5	2018	28121.60	0.9	25309
6	2019	27108.10	0.9	24397
7	2020	51966.00	0.9	46769

Sr. No.	Year	EGpy (MWh)	EFgrid,y	BEy (tCO2eq)
8	2021	63582.00	0.9	57223
9	BE (tCO2eq) for the period of 2014 to 2021			282667

BE = 2,82,667 tCO2eq

Project Emissions

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

Hence,

PE = 0

Leakage Emissions

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

Hence,

LE = 0

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

Hence,

ER = 2,82,667 – 0 – 0 = 2,82,667 CoUs

C.6. Prior History

The project activity was applied for the registration in CDM with Project ID: 1201, titled "10 MW Somasila Hydro Power Project for a grid system by Balaji Energy Pvt.Ltd.". The latest update can be found on the below mentioned link.

https://cdm.unfccc.int/Projects/DB/DNV-CUK1182338073.37/view

No credits were issued as the project was rejected by the CDM authorities. Reason for which is explained on the above given link. So, the first monitoring period in case of UCR will be 01/01/2014. Hence project will not cause double accounting of carbon credits (i.e., COUs).

C.7. Monitoring period number and duration

Name of individual project activity	Start date of Monitoring Period
Balaji Phase-I	01/01/2014
Balaji Phase-II	01/01/2014

First Monitoring Period : 08 Years

01/01/2014 to 31/12/2021 (inclusive of both dates)

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

Name of individual project activity	Crediting period start date
Balaji Phase-I	01/01/2014
Balaji Phase-II	01/01/2014

No changes have been made to the start date of crediting period. Crediting period for the bundled project is from 01/01/2014 to 31/12/2021 (inclusive of both dates).

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

No changes have been made to PCN.

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 i.e., Ananthasagaram Sub-station of the state power utility (APTRANSCO).

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 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/UCRS tandardJan2022updatedVer3_180222035328721166.pdf
Value 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
Additional Comment	The combined margin emission factor as per CEA database (current version 16, Year 2021) results into higher emission factor. Hence for 2021 vintage UCR default emission factor remains conservative.

Data/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 (MWh).
Source of data Value(s) applied	JMR
Procedures	The Net electricity generation by the Hydro power Plant is recorded by the Sub-Station in the record logs. At the end of every month, JMR report 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)

12 MW Small Scale Mini Hydel Power Project by M/S Balaji Energy Pvt. Ltd.

Month - Wise Energy Delivered to Grid (in kWh)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	74,33,406	67,27,449	70,74,657	20,00,533	43,36,509	52,60,091	40,58,994	25,38,273	5,52,746	11,14,977	32,67,139	37,56,848
2015	41,49,000	51,68,286	42,91,733	8,13,500	1,81,722	5,59,645	5,06,000	4,76,133	2,75,967	24,667	5,067	24,47,300
2016	72,48,733	70,49,433	66,04,133	22,64,100	29,52,600	43,25,800	38,36,500	17,99,300	21,23,700	8,80,400	36,74,000	50,83,500
2017	62,01,400	50,52,600	41,89,300	10,71,700	-50,000	-43,400	-42,000	-43,400	-43,000	-30,500	56,92,900	64,82,800
2018	60,99,300	39,90,100	8,20,100	-27,300	-21,000	3,32,200	8,03,500	17,49,200	21,21,700	11,51,300	46,77,100	64,25,400
2019	55,51,900	35,75,000	13,92,100	-18,500	-31,300	-24,600	-23,700	3,24,000	32,61,200	41,96,100	41,33,700	47,72,200
2020	38,15,500	65,40,400	38,65,700	20,26,400	62,04,200	54,91,200	45,75,800	30,87,300	17,42,900	53,34,800	46,20,400	46,61,400
2021	70,23,900	62,09,600	59,37,400	26,04,700	53,79,500	56,20,200	45,76,400	53,68,900	51,95,700	66,35,500	30,62,600	59,67,600

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	4,81,21,623	0.9	43,309
2015	1,88,99,020	0.9	17,009
2016	4,78,42,200	0.9	43,057
2017	2,84,38,400	0.9	25,594
2018	2,81,21,600	0.9	25,309
2019	2,71,08,100	0.9	24,397
2020	5,19,66,000	0.9	46,769
2021	6,35,82,000	0.9	57,223
Total CoUs to be issued for the first monitoring period (Year: 2014 to 2021)			2,82,667