MONITORING REPORT

CARBON OFFSET UNIT (CoU) PROJECT

Title	**:**	11 MW bundle of Small-Scale Hydro Power project by M/s. Balaji Energy Pvt. Ltd.
Version	**:**	2.0
MR Date	**:**	04/04/2024
Second CoU Issuance Period	**:**	01 Year
Second Monitoring Duration	**:**	01/01/2022 to 31/12/2022

	Monitoring Report (MR) **CARBON OFFSET UNIT (CoU) PROJECT**
BASIC INFORMATION	
Title of the project activity	11 MW bundle of Small-Scale Hydro Power project by M/s. Balaji Energy Pvt. Ltd.
UCR Project Registration Number	115
Version	2.0
Completion date of the MR	04/04/2024
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 02 Duration of this monitoring Period: 01 Year (First and last days included (01/01/2022 to 31/12/2022)
Project participants	Creduce Technologies Private Limited (Aggregator) M/s Balaji Energy Pvt. Ltd. (Developer)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I. D: "Grid connected renewable electricity generation", version 18
Sectoral Scope	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of GHG emission reductions for this monitoring period	2022 **:** 45,808 CoUs (45,808 tCO_2e)
Total:	45,808 CoUs (45,808 tCO_2e)

SECTION - A - Description of project activity

A.1 Purpose and General description of Carbon offset Unit (CoU) 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.1.1 Purpose of the project activity:

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 M/S Pushpit Steel Private Limited and M/S Viki Industries Private Limited through wheeling agreement with APSPDCL. i.e., Andhra Pradesh Southern Power Distribution Company Limited, 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., 50,899 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 total CO_2e emission reduction by the project activity over the defined monitoring period is as per **Annexure I.**

A.1.2 Description of the installed technology and equipment:

This project envisages a generation of total 11 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.

A.1.3 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 4 units of hydro Turbine and Generators with an aggregated installed capacity of 11 MW. The project activity has been commissioned for commercial operation as on 29/11/2017 for 8 MW (2X4 MW) capacity which was later amended to 11 MW as mentioned in the amended PPA agreement document and on 07/11/2017 for 3 MW (2X1.5 MW) which was later amended to 11 MW as mentioned in the amended PPA agreement document.

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

UCR Project ID	:	**115**
Start Date of Crediting Period	:	01/01/2022

The hydro turbines are commissioned as per the below table:

Project	Total Installed Capacity	Commissioning date	Start date of Crediting Period
Somasila S.H.P. (2X4 MW)	8 MW	29/11/2017	01/01/2022
Somasila NFC Mini Hydro Electric Project (2X1.5 MW)	3 MW	07/11/2017	01/01/2022

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

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

Summary of the projec8t activity and ERs generated for the monitoring period	
Start date of this Monitoring Period	01/01/2022

Carbon credits claimed up to	31/12/2022
Total ERs generated (tCO_2e)	45,808 tCO_2e
Leakage Emission	0
Project Emission	0

A.1.5 Baseline Scenario

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

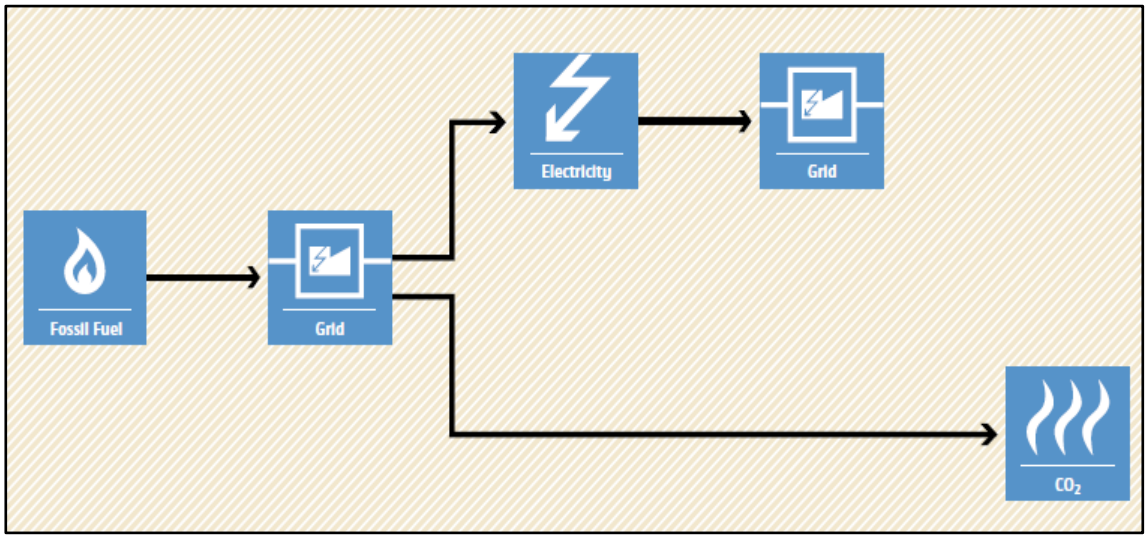


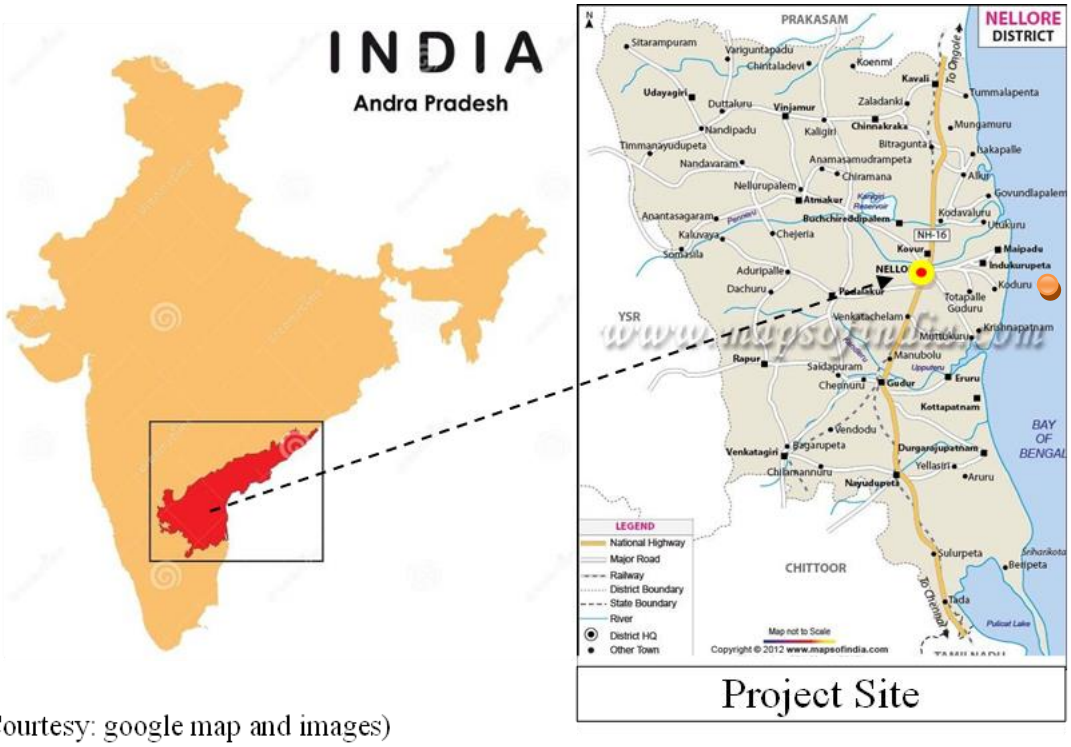
Figure 1 Baseline Scenario

A.2 Location of Project Activity

The project location site is well connected by district and village roads to the nearest town. The geographic coordinates and details of the project location have been provided below.

Country	State	District	Town/Village	Co-ordinates
India	Andra Pradesh	Nellore	Somasila (2X4 MW)	Latitude: 14°29'15.0"N, Longitude: 79°18'25.0"E.
India	Andra Pradesh	Nellore	Somasila (2X1.5 MW)	Latitude: 14°29'15.0"N, Longitude: 79°18'25.0"E.

The representative location map is included below:



(Courtesy: google map and images)

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

A.3 Parties and project participants

Party (Host)	Participants
India	**Creduce Technologies Private Limited (Aggregator)** **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 Methodologies and standardized baselines

Sectoral Scope	:	01 Energy industries (Renewable/Non-Renewable Sources)
Type	:	Renewable energy projects
Category	:	AMS-I. D: "Grid connected renewable electricity generation", Version 18

A.5 Crediting period of project activity

Start date of the crediting period: 01/01/2022

Crediting period corresponding to this monitoring period: 01 Year

01/01/2022 to 31/12/2022 (Both dates are inclusive)

A.6 Contact information of responsible persons/entities

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

SECTION - B - Implementation of project activity

B.1 Description of implemented registered project activity

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

The projects were commissioned by Directorate of Energy, Government of Andhra Pradesh on the dates mentioned below 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
Somasila S.H.P. (2X4 MW)	8 MW	29/11/2017
Somasila NFC Mini Hydro Electric Project (2X1.5 MW)	3 MW	07/11/2017

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

The project activity involves 4 hydro turbine generators of vertical full Kaplan turbine with vertical shaft synchronous generator. Capacity of installed turbine is of 4000 kW of 2 hydro turbine generators & 1500 kW of 2 hydro turbine generators and aggregated installed capacity of the hydro power project is 11 MW.

The other salient features of the technology are as follows:

Specification	Somasila S.H.P (2 x 4 MW)
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	2 x 4 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

Specification	**Somasila NFC Mini Hydro Electric Project (2X1.5 MW)**
Power scheme	
Type of Project	Dam toe based Low head Project
Source of water system	Water flowing into the north feeder canal from head regulator
Hydrology	
Source of water	Pennar river
Number of drops	Water level difference of Somasila dam & FSL of NFC
Maximum (Gross)	19 m
Design head (Gross)	17 m
Rated head (Net)	15 m
Power draft	22 Cumecs
Rated Flow Per unit	11 Cumecs
Maximum flow per unit	12 Cumecs
Flow availability	8 months from September to April in a water year based on cropping pattern
Intake attached to existing 2 Nos vents	
Diameter	3.2 m
Length including forked tubes	20 m
Surgepool	
Internal diameter	12 m
Bottom of Surge Pool	76.50 m
Top of Surge Pool	105 m
No. of outlets to Surge Pool	4

Penstock (PS)	
Main Penstock Diameter	2.3 m
Length	18 m
Subsequent PS Diameter	1.7 m
Length of Subsequent PS	4 m each
Design discharge	21.86 Cumecs
Maximum discharge	24 Cumecs
Velocity	5 m/s
Power house	
Type	Surface Type Power house
Length	22.69 m
Width	19.28 m
Generator floor level	EL 76.82 m
Generator floor size	10.10m x 11.82m
Service bay size	16.66m x 6.77m
Elevation of service bay	87.05 m
Auxiliary bay size	18.82m x 6m
Number of intake gates	2
Number of DT gates	2
Tail race channel	
Length	110m
Bed width	5.8m
Side Slope	0.25:1
Bed fall	1 in 2350
Design Discharge	21.33 Cumecs
Power Potential	
Install capacity	3000 kW with 20 % continuous over load
Number of units	2
Rated capacity of each unit	1500 kW
Max capacity of each unit	1800 kW
Turbine	
Type of Turbine	Horizontal Full Kaplan Turbine
Number of units	Two
Runner Diameter	1350mm
Center line of Runner	77.82m
Bottom level of draft tube	74.22m
Center level of BF valve	77.82m
Generator	
Type	Horizontal synchronous induction generator
Rate capacity	1500 KW with 20% continuous overload
KVA Rating	1660 KVA
Voltage	3.3 KV
Frequency	50 Hz
Power house crane	
Type	EOT
Capacity	15 tons
Switch Yard	
Size	12 x 20m
Elevation of SY ground	85.60m
Transformer capacity	2.5 MVA

Voltage	3300/33000 Volts

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

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

Rational: as per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)', the final document on the revised classification of Industrial Sectors under Red, Orange, Green, and White Categories (07/03/2016), has been declared that hydro power 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 the project does not lead to any negative environmental impacts. Additionally, as per Indian Regulations, Environmental, and Social Impact Assessment is not required for hydro power projects.

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

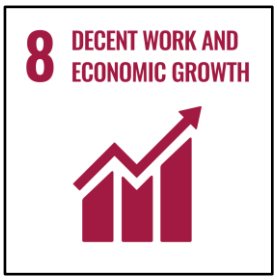
Social well-being: The projects would help in generating direct and indirect employment benefits accruing out of ancillary units for implementation of the Hydro plant and for maintenance during operation of the project activity. It will lead to development of infrastructure around the project area in 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 the reduction of 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 set up 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.

The project activity contributes to the following SDGs.

SDG	Description
Goal 7 	➢ The project activity has generated 50,899 MWh of clean energy, which with increased shared will increase the affordability at a cheaper rate to end user. ➢ The project activity will utilize hydel energy (renewal resource) to generate power. The project activity will increase the share of renewable resource-based electricity in global mix of energy consumption.
Goal 8 	➢ Decent work and economic growth. The project activity generates additional employment for skilled and unskilled, also the project situated in a remote area will provide employment opportunities to rural population. Training on various aspects including safety, operational issues, and developing skill sets will also be provided to employees.
Goal 13 	➢ This 11 MW hydro power project meets the SDG 13 goal by saving fossil fuel and producing clean energy. ➢ This project has avoided 45,808 tons of CO_2 emissions during this monitoring period. ➢ **SDG 13** on clean energy is closely related and complementary. ➢ In a greenfield project, electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants. Thereby the project activity reduces the dependence on fossil fuel-based generation units and as there are no associated emissions with this project it contributes to the reduction of greenhouse gases (GHG) emissions.

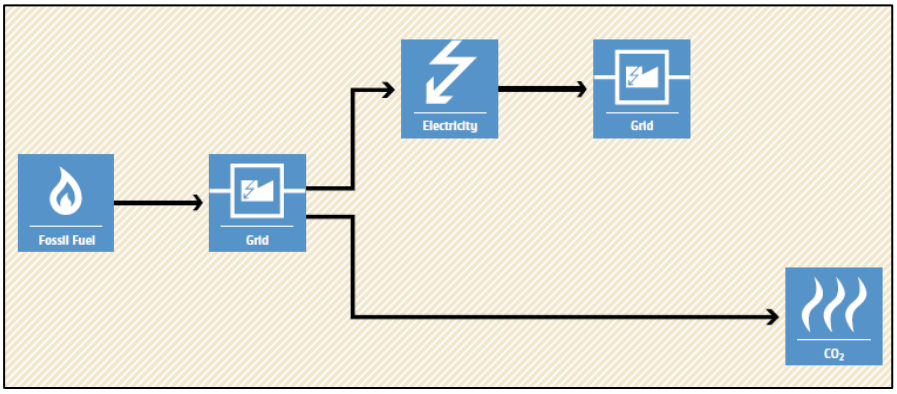
B.3 Baseline Emissions

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

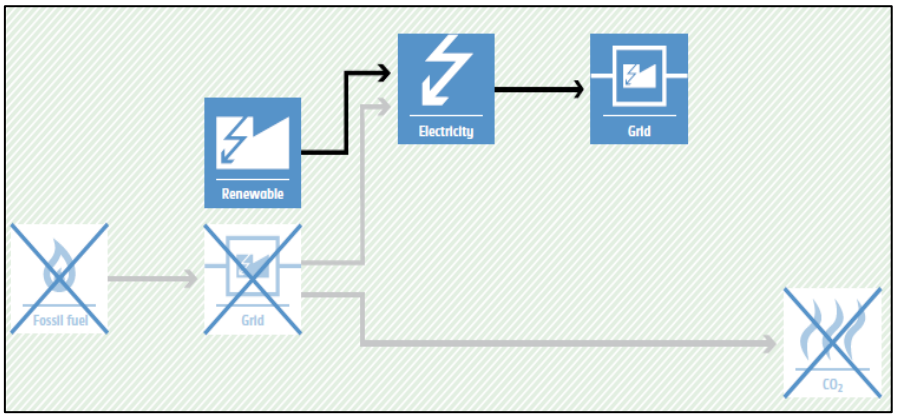
In the absence of the project activity, the equivalent amount of electricity would have been imported from the grid (which is connected to the unified Indian Grid system (NEWNE Grid)), which is carbon intensive due to being predominantly sourced from fossil fuel-based power plants. Hence, the baseline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

Schematic diagram showing the baseline scenario:

Baseline Scenario:



Project Scenario:



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

B.4. De-bundling

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

SECTION - C - Application of methodologies and standardized baselines

C.1 References to methodologies and standardized baselines

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

C.2 Applicability of methodologies and standardized baselines

The project activity involves the generation of grid-connected electricity from the construction and operation of a new hydro power-based project for captive consumption. A wheeling agreement is signed between M/s Balaji Energy Pvt. Ltd. and Andhra Pradesh Southern Power Distribution Company Limited (APSPDCL) i.e., state utility.

The project activity has an installed capacity of 11 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 the applicability of the 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 (b) i.e., "Supplying electricity to a national or a regional grid". Hence the project activity meets the given applicability criterion 1 (b).
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 11 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 11 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 11 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 11 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 the project will not cause double accounting of carbon credits (i.e., CoUs).

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

As per applicable methodology AMS-I.D. Version 18, "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 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.

Source		Gas	Included?	Justification/Explanation
Baseline	Grid-connected electricity generation	CO_2	Yes	Main emission source
		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 Electric Power project Activity	CO_2	No	No CO_2 emissions are emitted from the project
		CH_4	No	Project activity does not emit CH_4
		N_2O	No	Project activity does not emit N_2O
		Other	No	No other emissions are emitted from the project

C.5 Establishment and description of the baseline scenario

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

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

The bundled project activity involves setting up new hydro power plant to harness the green power from hydro energy and to use for sale to national grid i.e., India grid system through PPA arrangement. In the absence of the project activity, the equivalent amount of power would have been generated by the operation of grid-connected fossil fuel-based power plants and by the addition of new fossil fuel-based generation sources into the grid. The power produced at grid from the other conventional sources which are predominantly fossil fuel based. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

A "grid emission factor" refers to a CO_2 emission factor (tCO_2/MWh) that will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO_2/MWh for the 2013 - 2020 years as a conservative estimate for Indian projects not previously verified under any GHG program. Also, for the vintage 2021-2022, the combined margin emission factor calculated from the CEA database in India results in higher emissions than the default value. Hence, the same emission factor has been considered to calculate the emission reduction under a conservative approach.

C.5.1 Net GHG Emission Reductions and Removals

Thus, $ER_y = BE_y – PE_y – LE_y$

Where:

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

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

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

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

- **Baseline Emissions**

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

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

BE_y = Baseline emissions in year y (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 the CDM project activity in year y (MWh)

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

Hence

Baseline Emissions Calculation				
Sr.No	Year	EG_{py} (MWh)	$EF_{grid,y}$	BE_y
1	2022	50,899.00	0.9	45808
2	BE (tCO_2e) for the period of 2022			45808

Estimated annual baseline emission reductions (BE_y)

= 50,899 MWh *0.9 tCO_2/MWh

= 45,808 tCO_2

- **Project Emissions**

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

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

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

As per paragraph 41 of AMS-I.D. version-18 - In case biomass is sourced from dedicated plantations, the procedures in the tool "Project emissions from cultivation of biomass" shall be used.

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

Thus, PE = 0

- **Leakage Emission**

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

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

LE = 0

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

Hence, LE = 0

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

Hence Net GHG emission reduction, = 45,808-0-0 = 45,808 tCO_2 (i.e., 45,808 CoUs)

C.6 Prior History

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

C.7 Changes to the start date of crediting

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

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

Not applicable.

C.9 Monitoring period number and duration

Total Monitoring Period: 01 Year

Date: 01/01/2022 to 31/12/2022 (inclusive of both dates).

C.10 Monitoring Plan

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

Data and Parameters available:

Data / Parameter	UCR recommended emission factor
Data unit	tCO_2 /MWh
Description	As per UCR CoU Standard Aug 2022 (Updated Ver.6), Clause – Emission Factors "The UCR recommends an emission factor of 0.9 tCO2/MWh for the 2013-2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Emission factors for the post 2020 period are to be selected as the most conservative estimate between the national electricity/power authority published data set and UCR default of 0.9 tCO2/MWh."
Source of data	https://cea.nic.in/wp-content/uploads/baseline/2023/01/Approved_report_emission__2021_2

	2.pdf https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf
Value applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Fixed parameter
Purpose of Data	For the calculation of emission factor of the grid
Additional Comment	The combined margin emission factor as per the CEA database (current version 18, December 2022) results into a higher emission factor. Hence for 2022 vintage UCR default emission factor remains conservative.

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

Data / Parameter	$EG_{PJ,facility,y}$
Data unit	MWh
Description	Net electricity supplied to the NEWNE grid facility by the project activity between 01/01/2022 to 31/12/2022.
Source of data	Energy Generation Report/Monthly Energy Invoices/Joint Metering Report
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) 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.

<table>
<tr><td></td><td>
<table>
<tr><td>Meter no</td><td>Make</td><td>Calibration date</td></tr>
<tr><td>APX01609</td><td>SECURE(P)300</td><td>30/08/2018</td></tr>
<tr><td>APX01084</td><td>SECURE(P)300</td><td>31/08/2018</td></tr>
</table>
</td></tr>
<tr><td>Measurement Frequency:</td><td>Monthly</td></tr>
<tr><td>Value applied:</td><td>59,316 (Ex-post estimate)</td></tr>
<tr><td>QA/QC procedures applied:</td><td>Calibration frequency: 5 years (as per CEA provision)

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

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

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

Point 2, (iii) Energy Accounting and Audit Meters: Energy Accounting and Audit Meters shall be tested at site through accredited test laboratory at least once in five years or whenever the accuracy is suspected or whenever the readings are inconsistent with the readings of other meters, e.g., Check Meters, Standby Meters and defective meters shall be recalibrated, if required: Provided that the testing shall be carried out without removing the Instrument Transformers connection.”</td></tr>
<tr><td>Purpose of data:</td><td>The Data/Parameter is required to calculate the baseline emission.</td></tr>
<tr><td>Any comment:</td><td>Data will be archived electronically for a period of 36 months beyond the end of crediting period.</td></tr>
</table>

ANNEXURE I (Emission Reduction Calculation)

Somasila S.H.P. (2X4 MW)												
Month - Wise Energy Delivered to Grid (in kWh)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	50,60,400	46,48,300	31,400	16,75,700	25,77,400	22,22,100	21,82,400	26,68,000	44,53,400	50,31,800	49,29,700	55,95,700

Year-Wise Emission reduction calculation for the project activity			
Year	Total No. of Electricity delivered in MWh	Recommended emission factor	Total CoUs generated
2022	41076	0.9	36,968
Total CoUs to be issued for the first monitoring period (Year: 2022)			36,968

Somasila NFC Mini Hydro Electric Project (2X1.5 MW) 3MW												
Month - Wise Energy Delivered to Grid (in kWh)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	14,13,300	15,96,000	13,43,900	5,55,500	4,04,100	0	0	0	0	13,18,000	16,74,700	15,17,200

Year-Wise Emission reduction calculation for the project activity			
Year	Total No. of Electricity delivered in MWh	Recommended emission factor	Total CoUs generated
2022	9823	0.9	8,840
Total CoUs to be issued for the first monitoring period (Year: 2022)			8,840

Total CoUs to be issued for the first monitoring period (Year: 2022)	45,808