PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title: Modification and retrofitting of the existing 34 MW hydropower plant at Bhandardara -2 (project activity) in Maharashtra state in India by Dodson – Lindblom Hydro Power Private Limited (DLHPPL).

Version: 1.0

Date: 14/04/2025

CoU Issuance Period: 15 Years

Date: 01/01/2021 to 31/12/2035

Project Concept Note (PCN)
CARBON OFFSET UNIT (CoU) PROJECT

BASIC INFORMATION	
Title of the project activity	Modification and retrofitting of the existing 34 MW hydropower plant at Bhandardara -2 (project activity) in Maharashtra state in India by Dodson – Lindblom Hydro Power Private Limited (DLHPPL).
Scale of the project activity	Large Scale
Completion date of the PCN	14/04/2025
Project participants	Creduce Technologies Private Limited (Representator) Dodson – Lindblom Hydro Power Private Limited - (DLHPPL) (Project Proponent)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: ACM0002: "Grid-connected electricity generation from renewable sources", Version 22.0 Standardized Methodology: Not Applicable.
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of total GHG emission reductions	45,900 CoUs (45,900 tCO_2e which is an estimated value per year)

SECTION A. Description of project activity

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

The proposed project tile under UCR is "Modification and retrofitting of the existing 34 MW hydropower plant at Bhandardara (project activity) in Maharashtra state in India by Dodson – Lindblom Hydro Power Private Limited (DLHPPL).", which is a grid connected Hydro Electric Power project located in Ahmednagar district in the state of Maharashtra (India). The project is an operational activity with continuous reduction of GHG, currently being applied under "Universal Carbon Registry" (UCR).

Purpose of the project activity:
The proposed project activity is promoted by Dodson – Lindblom Hydro Power Private Limited (DLHPPL) (herein after called as project proponent 'PP'). The proposed project activity is installation and operation of one vertical Francis type hydraulic turbine Generators having individual capacity of 34.00 MW in District - Ahmednagar, Maharashtra state of India.

The Upper Pravara River Basin Water Management System envisions a comprehensive development of the water resource potential of the area and includes several multipurpose dams and reservoirs. The system is currently operated and maintained by Government of Maharashtra Water Resources Department, hereinafter referred to as GOMWRD. Several key elements of the system are already in place and others are being implemented or are slated for construction in the near future. The project activity has been commissioned on 19/12/2006. The project activity has been registered with "UNFCCC with project ID 2173" [1]on 18/03/2009 with a renewable crediting period. Thus, the project is an operational activity with continuous reduction of GHG, currently being applied under "Universal Carbon Registry" (UCR).

The water released for irrigation can be fully utilized by powerhouses further downstream, with irrigation releases currently controlled from this dam. Bhandardara Power House No. 1 (BH-1) draws water from the Bhandardara reservoir and operates as a single hydro-generating station with a capacity of 12 MW. Bhandardara Power House No. 2 (BH-2), located 10 km downstream from BH-1, sources its water from a small reservoir formed by Randha Weir. Further downstream, 20 km from BH-2, the Nilwande Dam will collect irrigation releases from the Bhandardara reservoir along with runoff from the catchment area between the Bhandardara reservoir and Nilwande. Once partially completed, the dam will help regulate irrigation releases to the downstream command area and will also include intake facilities for both power generation and irrigation purposes.

BH-2 has been operating intermittently since year 1999 and uses water discharged from both BH-1 and directly from the Bhandhardara dam. BH-2 was designed to operate as a peaking station, but has essentially been operating as a base-load station at approximately 50% of its rated capacity. Severe limitations resulting from irrigation release criteria and the lack of availability of a balancing storage mechanism have significantly impaired the operation of BH-2 as originally envisioned by GOMWRD. These restrictions have forced GOMWRD to operate the project whenever possible barely at its technical limits. In addition, several technical problems at the plant over the years have further affected normal operations of this facility.

Lack of funds with the GOMWRD have limited their ability to partially construct the required downstream balancing storage facility as well as to make the necessary improvements in a timely and technically requisite manner to allow proper operations of the BH-2 plant. The Government of

[1] https://cdm.unfccc.int/Projects/DB/BVQI1218641019.49/view

Maharashtra decided to privatize the operation of the BH-2 plant on a lease, own, operate and transfer basis. It is envisaged that the funds received from this effort would be utilized to fund the construction of the balancing storage facility that would permit the efficient utilization of scarce water resources in the region. The rehabilitation and operation of BH-2 was awarded on a lease, own, operate and transfer basis to Dodson Lindblom Hydro Power Private Limited (DLHPPL) on December 31, 2004.

Hence, project activity is displacing the estimated annual net electricity generation i.e., 51,000 MWh from the Indian grid system, which otherwise would have been generated by the operation of fossil fuel-based grid-connected power plants. The estimated annual CO2e emission reductions by the project activity are expected to be 45,900 tCO_2e.

The estimated annual average and the total CO_2e emission reductions by the project activity is expected to be 45,900 tCO_2e, whereas actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification.

Project's Contribution to Sustainable Development

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 basicelectricity 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 guidelines 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 social well-being is assessed by contribution to improvement in living standards of the local community. Bhandardara is a remote village in an industrially backward area. The implementation of the project activity will provide job opportunities to the local community, contribute in poverty alleviation of the local community and development of basic amenities to the community, leading to improvement in living standards. Thus, the project activity will contribute to social well-being. The project facilitates partially the construction of the Nilwande Dam, which in turn results in several social benefits. The construction of the dam would result in the improvement and optimal implementation of the water management system in the region, which in turn would facilitate more water for the people in the vicinity for irrigation and potable use.

Economic well-being: The project activity has created direct and indirect job opportunities to the local community during construction and shall provide permanent job opportunities during operation. During operation of the project activity, about 25 persons would be employed directly, apart from indirect employment. Economic well-being refers to additional investment consistent with the needs of the local community. Also, the project activity would result in more reliable electricity supply which would in turn provide economic benefits to industries that utilize the power.
Due to the construction of the dam, there would be increased water supply for irrigation, which in turn would result in better farming and revenue generation. These activities will contribute to the

economic well-being of the local community.

Technological well-being: Efficient operation and maintenance of the power plant would ensure the durability and availability of the power plant. DLHPPL proposes to refurbish the existing power plant and operate the plant at its optimum capacity. In addition, the repairs and proposed automation will improve the reliability of the plant resulting in lower down times and thereby contributing to technological well-being.

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.

With regards to ESG credentials:

At present specific ESG credentials have not been evaluated, however, the project essentially contributes to various indicators which can be considered under ESG credentials. Some of the examples are as follows:

Under Environment:

The following environmental benefits are derived from the project activity:

- Produces renewable electricity without any GHG emissions.
- Run-of-river hydro power plant with negligible impact on the surrounding ecology.
- No increase in volume of reservoir and no land inundation, hence no disturbance to the natural habitat.

For the PP, energy sale pattern is now based on renewable energy due to the project and it also contributes to GHG emission reduction and conservation of depleting energy sources associated with the project baseline. Hence, project contributes to ESG credentials.

Under Social:

The social well-being is assessed by contribution to improvement in living standards of the local community. The project activity is located in remote villages of industrially backward state of Maharashtra. The implementation of the project activity would provide job opportunities tothe local community; contribute in poverty alleviation of the local community and development of basic amenities to community leading to improvement in living standards of the community.

Under Economics:

Economic well-being refers to additional investment consistent with the needs of the local community. The project activity is associated with a significant investment (nearly INR 784 million). This investment is quite significant in a rural area. These activities would contribute to the economic well-being of the local community. The project activity has also provided direct and indirect job opportunities to the local community during construction and shall provide permanent job opportunities during operation and also by improving power scenario & tourism potential in Maharashtra. During operation of the project activity, many persons has been employed directly, apart from indirect employment, which would augur well for the economic well-being of the community

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

There was no harm identified form the project and hence no mitigations measures are applicable.

Rational: as per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)'[2], final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (11/07/2024), 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 notrequired for small Hydro 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.

Additionally, there are social, environmental, economic and technological benefits which contribute to sustainable development. The key details have been discussed in the previous section.

A.3. Location of project activity >>

Country	: India
State	: Maharashtra
District	: Ahmednagar
Taluka	: Akola
Village	: Bhandardara

The project is located near the village of Bhandardara in the Ahmednagar district of Maharashtra. The nearest railway station is Igatpuri Railway Station, approximately 40 kilometers from the site. The nearest big town is Ghoti, which is 36 kilometers from the project activity and is on busy Mumbai–Agra national highway number 3. The project site is about 140 kilometers from Mumbai, which has the nearest international airport with connections to major cities worldwide. The geographic coordinates of the project//t location are 19°33'15" N and 73°45'0" E.

The representative location map is included below:

[2] https://cpcb.nic.in/openpdffile.php?id=TGF0ZXN0RmlsZS9fMTczNzYxMzk2OV9tZWRpYXBob3RvMTEzODMucGRm

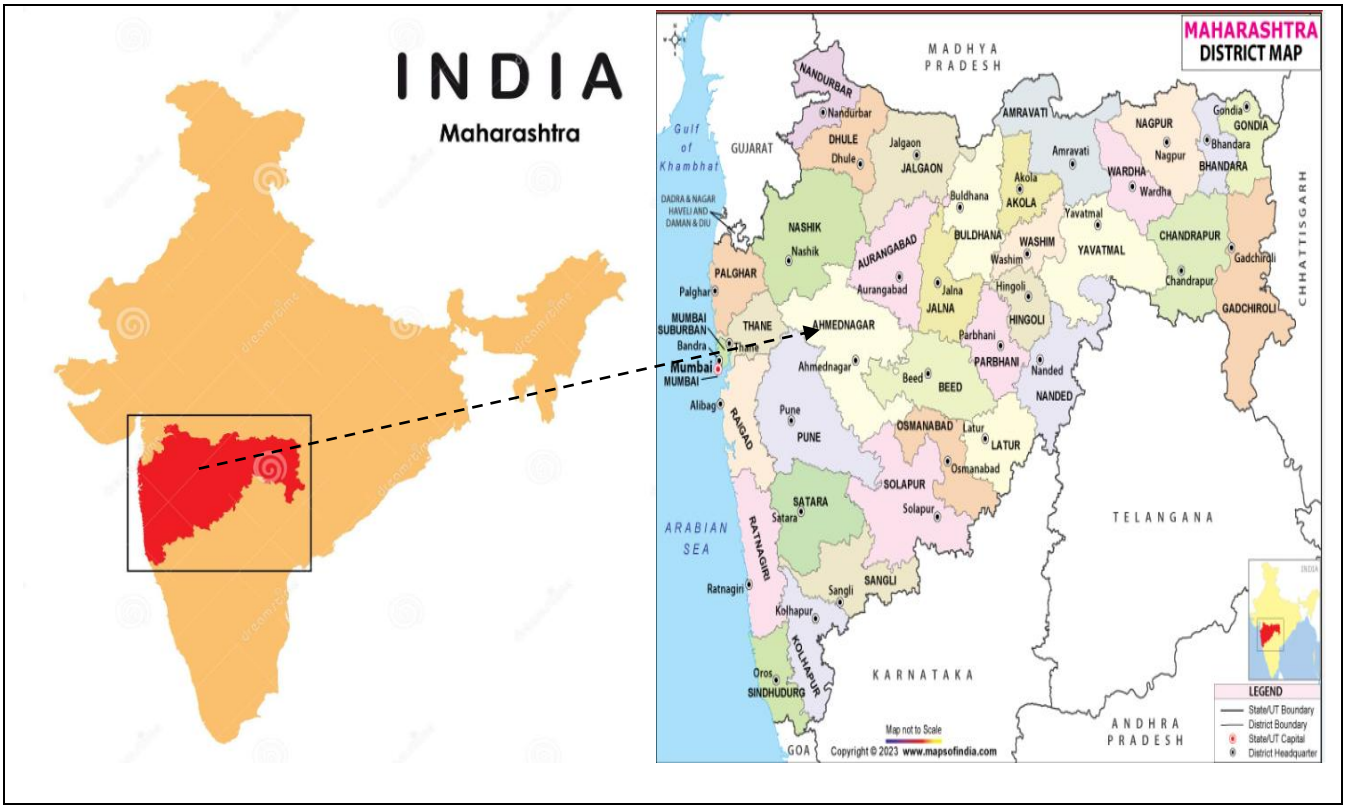

Figure-1- Location of the project activity (courtesy: google images and www.mapofindia.com)

Technologies/measures >>

The project activity involves a Francis hydro turbine generator of vertical type with internal electrical lines connecting the project activity with local evacuation facility. Water at a head of 59.5 meters is jetted on to turbines, which causes the turbines to rotate. The rotation of turbines causes rotation of connected generators, thereby producing electricity. One unit of 34000 kW of vertical Francis type hydraulic turbines is installed. The turbines are designed for 10 % overloading capacity for the highest efficiency and suitably selected to avoid pitting due to cavitations. The other salient features of the technology are:

Randha pick up weir	
Gross storage	1.42 Mm^3
Live storage for power	0.87 Mm^3
Water conductor	
Number	1
Type	Tunnel excavated in rock
Design discharge	77 m^3 /s
Size	6 m dia
Length	1112 m
Surge shaft	Non-spilling type
Intake	
Full supply level	668.35 m
Minimum draw down level for power	666.45 m
Power house	
Type	Well, excavated into rock
Size	21 m dia
Floor level	Service bay 646 m

Level of CL of turbine	607.3 m
Capacity of OH crane	150/30 tonnes
Generation unit	
Max gross head	59.5 m
Net design head	50 m
Type of generating unit	Vertical, Francis, umbrella
Number	1
Excitation	Static
Connection to grid	
Transformer capacity	132kV, 37 MVA, 3 phase, ONAN
Connection point	BH-2 switchyard
Protection System	Multi functional digital relay system
Control & monitoring operation	Computer based c/w interface for remote operation
Circuit Breakers	SF6

In the absence of the project activity the equivalent amount of electricity would have otherwisebeen generated by the operation of fossil fuel-based grid-connected power plants and fed into unified India grid system, hence baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario as discussed in the previous section.

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 **Dodson – Lindblom Hydro Power Private Limited (DLHPPL) (Developer)** Address: Street/P.O.Box: Ro.No.5, Building - 6, Shiv-Watsu, Tejpal Scheme, Vile Parle (East), Mumbai, Maharashtra, 400057, India

A.4. Baseline Emissions>>

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

- Grid

In the absence of the project activity, the equivalent amount of electricity would have been generated by the operation of fossil fuel-based grid-connected power plants and fed into Indian grid system, which is carbon intensive due to use of fossil fuels. Hence, 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:

Project Scenario:

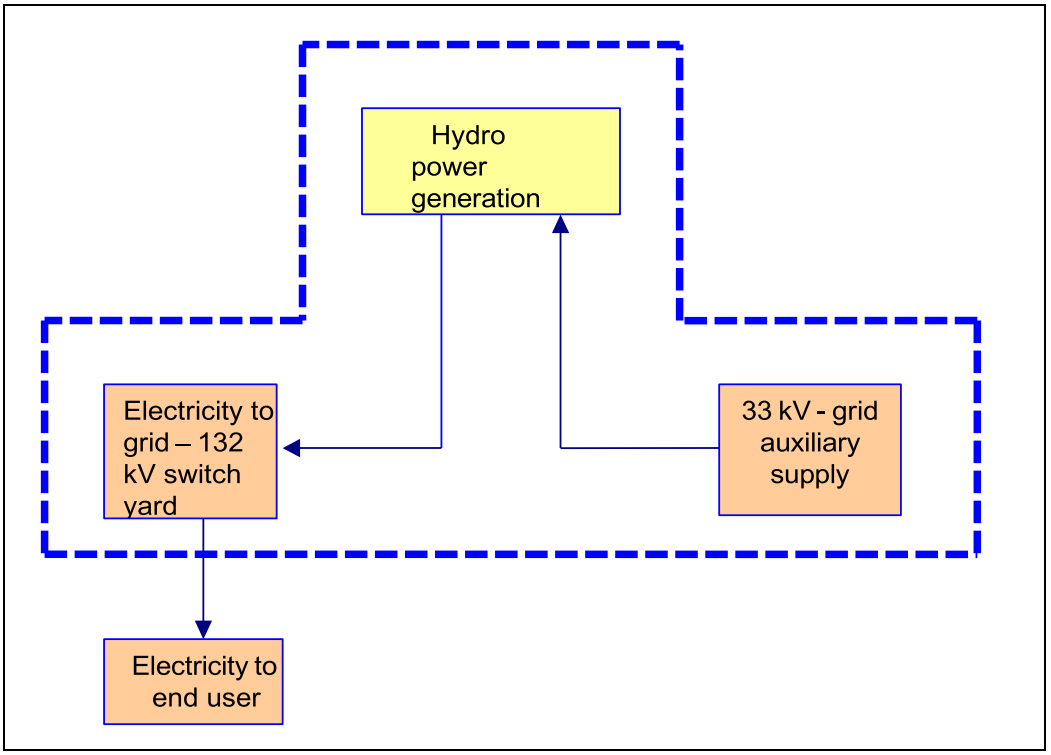

Figure -2: Project Boundary of the project activity

Baseline Scenario:

As per the approved consolidated methodology ACM0002. Version 22, 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".

In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel fired plants. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

A.5. Debundling>>

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

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines >>

SECTORAL SCOPE:
01, Energy industries (Renewable/Non-renewable sources)

TYPE:
I - Renewable Energy Projects

CATEGORY:
ACM0002: (Title: "Grid-connected electricity generation from renewable sources"[3], Version 22.0)

B.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 34 MW which will qualify for a large-scale project activity of the Large-Scale methodology. The project status is corresponding to the methodology ACM0002, Version 22.0 and applicability of methodology is discussed below:

Applicability Criterion	Project Case
1. This methodology is applicable to grid-connected renewable energy power generation project activities that: a) Install a greenfield plant b) Involve a capacity addition to (an) existing plant(s) c) Involve a retrofit of (an) existing operating plant(s)/units d) Involve a rehabilitation of (an) existing plant(s)/unit(s) e) Involve a replacement of (an) existing plant(s)/unit.	The project activity consists of installation of Greenfield power plant at a site where no renewable power plant was in operation prior to the implementation of the project activity. Thus, it fulfills the point (a) of criteria 1.
2. In case the project activity involves the integration of a BESS, the methodology is applicable to grid-connected renewable energy power generation project activities that - a) Integrate BESS with a Greenfield power plant b) Integrate a BESS together with implementing a capacity addition to an existing solar photovoltaic or wind power plant(s)/unit(s) c) Integrate a BESS to (an) existing solar photovoltaic or wind power plant(s)/unit(s) without implementing any other changes to the existing plant(s) d) Integrate a BESS together with implementing a retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s).	This criterion is not applicable as the project activity is Hydro power generation.

[3] https://cdm.unfccc.int/UserManagement/FileStorage/R0IJ1X9LQ7W2GOYHSMBFCPE3VKZ685

3. The methodology is applicable under the following conditions: a) Hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit. b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity. c) In case of Greenfield project activities applicable under paragraph 2 (a) above, the project participants shall demonstrate that the BESS was an integral part of the design of the renewable energy project activity (e.g.by referring to feasibility studies or investment decision documents). d) The BESS should be charged with electricity generated from the associated renewable energy power plant(s). Only during exigencies may the BESS be charged with electricity from the grid or a fossil fuel electricity generator. In such cases, the corresponding GHG emissions shall be accounted for as project emissions. The charging using the grid or using fossil fuel electricity generator should not amount to more than 2 per cent of the electricity generated by the project renewable energy plant during a monitoring period. During the time periods (e.g.week(s), months(s)) when the BESS consumes more than 2 per cent of the electricity for charging, the project participant shall not be entitled to issuance of the certified emission reductions for the concerned periods of the monitoring period.	The project activity is hydro power project without reservoir, Hence a) of this criterion is applicable to the project activity.
4. In case of hydro power plants, one of the following conditions shall apply: a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, is greater than 4 W/m^2 c) The project activity results in new single or multiple reservoirs and the power density, is greater than 4 W/m^2 d) The project activity is an integrated hydro power project involving multiple reservoirs, where the	The project is implemented on existing reservoir and power density is greater than 4 W/m^2 , hence this criterion is applicable to the project activity.

power density for any of the reservoirs is lower than or equal to 4 W/m^2, all of the following conditions shall apply: • The power density calculated using the total installed capacity of the integrated project, is greater than 4 W/m^2 • Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; • Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m^2 shall be: a) Lower than or equal to 15 MW b) Less than 10 per cent of the total installed capacity of integrated hydro power project.	
5. In the case of integrated hydro power projects, project participants shall: a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (a) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum of five years prior to the implementation of the CDM project activity.	The project activity is a run-of-river hydropower project implemented in an existing reservoir (Randha Weir) with no increase in the reservoir volume. Therefore, the project meets condition (a) as specified above.
6. The methodology is not applicable to – a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; b) Biomass fired power plants/units.	This condition is not applicable since the project activity is not an integrated hydro project.
7. In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance.	Project activity does not involve retrofitting, rehabilitations or replacements hence this criterion is not applicable to the project activity.
8. In addition, the applicability conditions included in the tools referred to above apply.	Applicability conditions of the applied tool is justified.

From the above it is concluded that the project activity meets all the applicability conditions of the

methodology ACM0002 Version 22.0 "Grid connected electricity generation from renewable sources".

B.3. Applicability of double counting emission reductions >>

There is no double accounting of emission reductions in the project activity 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 generation/feeding point with the grid interface.

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

As per applicable methodology ACM0002. Version 22, "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.

Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected electricity generation	**CO_2**	**Yes**	**CO_2 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

B.5. Establishment and description of baseline scenario >>

This section provides details of emission displacement rates/coeffects/factors established by the applicable methodology selected for the project.

As per approved consolidated methodology ACM0002 Version 22.0, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

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

The project activity involves setting up of a new hydro power plant to harness the green power from hydro energy and to use for sale to national grid i.e., India grid system through PPA arrangement. In

the absence of the project activity, the equivalent amount of power would have been generated by the operation of grid-connected fossil fuel-based power plants and by the addition of new fossil fuel-based generation sources into the grid. The power produced at grid from the other conventional sources which are predominantly fossil fuel based. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

A "grid emission factor" refers to a CO_2 emission factor (tCO_2/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO_2/MWh for the 2014-2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Also, for the vintage 2024, 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

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 (tCO_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)

Project Emissions

As per ACM0002 Version 22.0, only emission associated with the fossil fuel combustion, emission

from operation of geo-thermal power plants due to release of non-condensable gases, emission from water reservoir of Hydro should be accounted for the project emission. Since the project activity is a Hydro power project.

Considering ACM0002 methodology paragraph 47 (b) equation 9. The project power density is higher than 10 W/m^2.

Hence, PEy=0

Leakage

As per ACM0002 Version 22.0, '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, LEy= 0

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:

Estimated annual baseline emission reductions (BEy)

= 51000 MWh/year×0.9 tCO2/MWh

= 45900 tCO2/year (i.e., 45,900 CoUs/year)

B.6. Prior History>>

The project activity is a small-scale hydro project, following are the key details under the prior history of the project:

a) The project activity was applied under the Clean Development Mechanism (CDM) of UNFCCC for the generation and issuance of carbon credits under the project ID 2173 and title "Modification and Retrofitting of the Existing 34 MW Hydropower Plant at Bhandardara -2, Maharashtra, India." The project was registered on 18/03/2009.

b) The project was not applied under any other GHG mechanism; also, for the current period of COUs, the CDM verification has also not been initiated. Hence project will not cause double accounting of carbon credits (i.e., COUs).

B.7. Changes to start date of crediting period >>

There is no change in the start date of crediting period.
The start date of crediting under UCR is considered as 01/01/2021, which is the project commissioning date and no GHG emission reduction has been claimed so far.

B.8. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

Not applicable.

B.9. Monitoring period number and duration>>

First Monitoring Period: 04 Years

01/01/2021 to 31/12/2024 (inclusive of both dates)

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://cea.nic.in/wp-content/uploads/2021/03/User_Guide_Version_20.0.pdf https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRStandardAug2024updatedVer7_02082419153479752 6.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 19, Year 2023) results into higher emission factor. Hence for 2024 vintage UCR default emission factor remains conservative.

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

Data / Parameter	$EG_{PJ, y}$
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)

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) Generally, the calculation is done by the Authority/Discom and the project proponent has no control over the authority for the calculation. Therefore, based on the joint meter reading certificates/credit notes, the project shall raise the invoice for monthly payments. In case the monthly JMR provides net export quantity, the same will be directly considered for calculation. However, if the JMR does not directly provide "net electricity" units, then quantity of net electricity supplied to the grid shall be calculated using the parameters reflected in the JMR.
Measurement Frequency:	For example, the difference between the measured quantities of the grid export and the import will be considered as net export: $EG_{PJ,y} = EG_{Export} - EG_{Import}$ Thus, $EG_{PJ,y}$ is the net export which will be either directly sourced from the monthly generation statements (such as JMR) or to be calculated from export and import values reported.
Value applied:	Monthly
QA/QC procedures applied:	To be applied as per actual data (29,860 is am annualized average value has been considered here for an ex-ante estimation only, whereas this is an ex-post parameter hence actual value shall be applied during monitoring and verification)
Purpose of data:	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:	The Data/Parameter is required to calculate the baseline emission. All the data will be archived till a period of two years from the end of the crediting period.