MONITORING REPORT

CARBON OFFSET UNIT (CoU) PROJECT

Title	**:**	Large Scale Solar Power Project in Rajasthan
Version	**:**	2.0
MR Date	**:**	10/05/2024
First CoU Issuance Period	**:**	3 Years 11 Months
First Monitoring Duration	**:**	01/02/2019 - 31/12/2022

Monitoring Report (MR)

CARBON OFFSET UNIT (CoU) PROJECT

BASIC INFORMATION

Title of the project activity	Large Scale Solar Power Project in Rajasthan
UCR Project Registration Number	356
Version	2.0
Completion date of the MR	10/05/2024
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: (first and last days included (01/02/2019 to 31/12/2022)
Project participants	Creduce Technologies Private Limited (Project Aggregator) M/s RSWM Ltd (Project Proponent)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: ACM0002: Large – Scale Consolidated methodology : Grid-connected electricity generation from renewable sources --- Version 21.0 Standardized Methodology: Not Applicable.
Sectoral Scope	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of GHG emission reductions for this monitoring period	2019 : 17871 CoUs (17871 tCO_2e) 2020 : 22821CoUs (22821tCO_2e) 2021 : 25837CoUs (25837 tCO_2e) 2022 : 26432 CoUs (26432tCO_2e)
Total:	92961 CoUs (92961 tCO_2e)

SECTION - A - Description of project activity

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

The proposed project titled under UCR is "Large Scale Solar Power Project in Rajasthan" which is a grid-connected solar power project. M/s RSWM Ltd is a solar power producer. The promoter of the project activity is 'M/s RSWM Ltd' (hereinafter called as Project Proponent or PP). PP has the full ownership of the project activity. This project is an operational activity with continuous reduction of GHG, currently being applied under the "Universal Carbon Registry" (UCR).

A.1.1 Purpose of the project activity:

The project activity aims to harness Solar radiation of sun which is a renewable source, to generate electricity. The net generated electricity from the project activity is consumed by the manufacturing facility of the PP. The promoter of the project activity is 'M/s RSWM Pvt Ltd.' (herein after called as Project Proponent or PP). PP has the 100% ownership of the project activity. In pre-project scenario the State utility was importing the required electricity from the NEWNE grid to meet its requirement of electrical energy. Currently, NEWNE grid is connected to large numbers of fossil fuel-based power plants. Hence, project activity is displacing the gross electricity generation i.e., 103292.2473

MWh from the NEWNE grid, which otherwise would have been imported from the grid. The project activity doesn't involve any GHG emission sources.

The annual and the 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:

The project activity involves Multicrystalline Photovoltaic (PV) Plant having aggregated installed capacity of 15.642 MW. The project activity uses multicrystalline solar photovoltaic technology to generate clean energy. Solar radiation is converted directly into electricity by solar cells (photovoltaic cells). In such cells, a small electric voltage is generated when light strikes the junction between a metal and a semiconductor (such as silicon) or the junction between two different semiconductors. Photovoltaic module consists of several photovoltaic cells connected by circuits and sealed in an environmentally protective laminate, which forms the fundamental building blocks of the complete PV generating unit. Several PV panels mounted on a frame are termed as PV Array.

A.1.3 Relevant dates for the project activity (e.g., construction, commissioning, continued operation periods, etc.)

The duration of the crediting period corresponding to the monitoring period is covered in this monitoring report. Here the start date of generation has been considered as 01/02/2019.

UCR Project ID	:	**356**
Start Date of Crediting Period	:	01/02/2019

State	District	Type	Total installed capacity in AC kWp	Commissioning date
Rajasthan	Bhilwara	Ground-mounted	6.75 MW	03/01/2019
	Bhilwara	Rooftop mounted	0.092 MW	15/07/2019
	Banswara	Ground-mounted	8.80 MW	27/05/2019

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 Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	01/02/2019
Carbon credits claimed up to	31/12/2022
Total ERs generated (tCO_2e)	92961tCO_2e
Leakage Emission	0
Project Emission	0

A.1.5 Baseline Scenario

As per the approved consolidated methodology ACM0002., version 21, 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".**

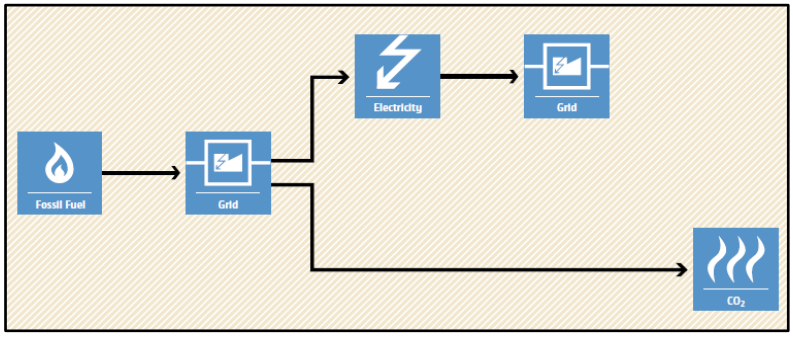


Figure 1 Baseline Scenario

A.2 Location of Project Activity

Project Name	Village	District	State	Project location
RSWM (6.842 MW) (6.75 MW + 0.092 MW)	Kharigram, Gulabpura	Bhilwara	Rajasthan	25°53'21.3"N 74°38'01.7"E
RSWM (8.80 MW)	Mordi	Banswara	Rajasthan	23°37'38"N 74°21'41"E

The representative location map is included below:

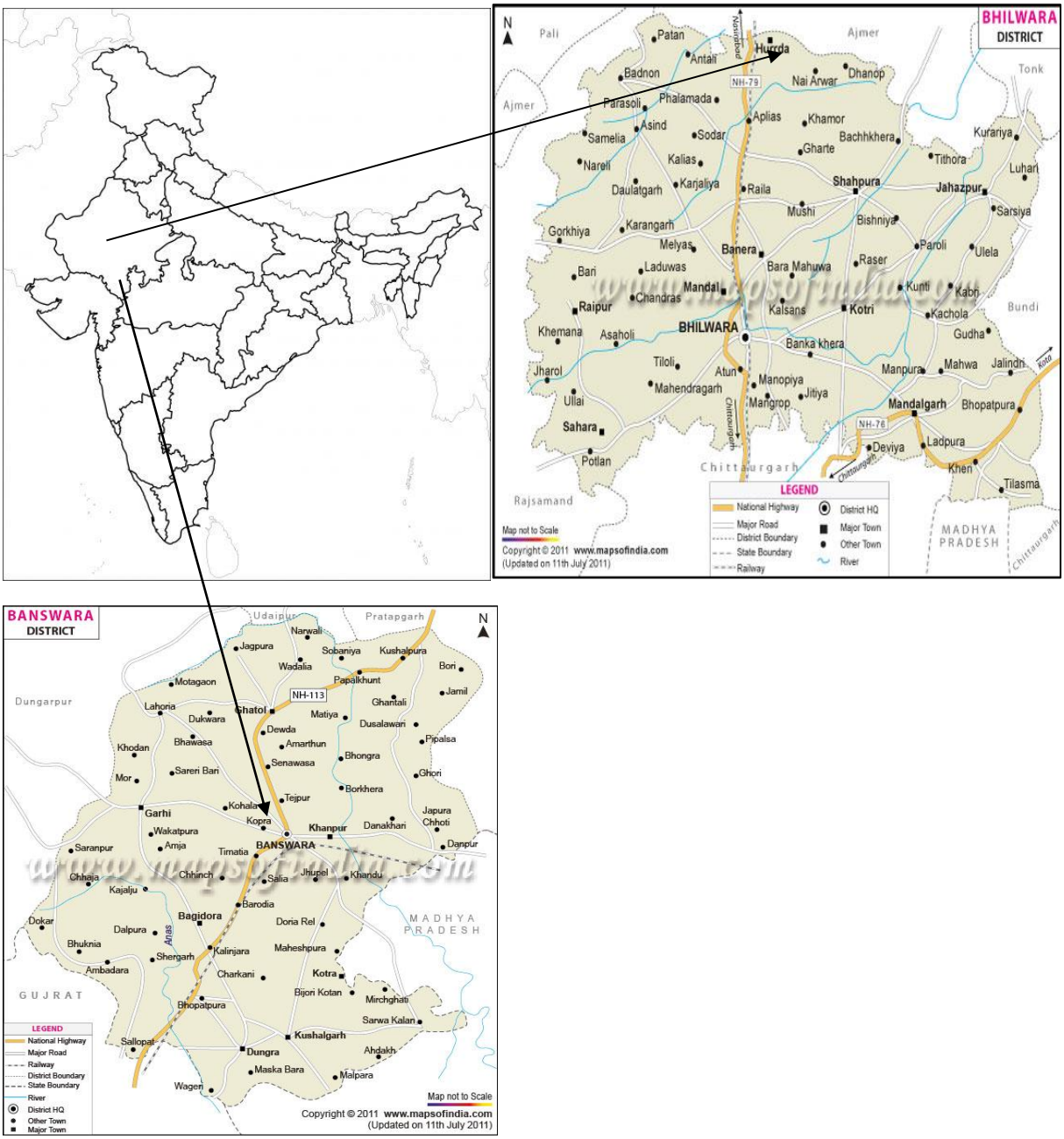


Figure-1- Location of the project activity (courtesy: google images and www.mapofindia.com)

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 RSWM Ltd (Project Owner)** Address: Kharigram, P.B No.28, P.O Gulabpura- 311 021, Distt. Bhilwara, Rajasthan

A.4 Methodologies and standardized baselines

Sectoral Scope : 01 Energy industries (Renewable/Non-Renewable Sources)

Type : Renewable Energy Projects

Category : ACM0002. (Title: Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, Ver 21.0)

A.5 Crediting period of project activity

Start date of the crediting period: 01/02/2019

Crediting period corresponding to this monitoring period: 01/02/2019 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 project consists of Ground mounted fitted Photo Voltaic solar Plant along with a rooftop solar plant with aggregated installed capacity of 15.642 MW. The plant was commissioned on different date by the respective authority of Government of Rajasthan. Here the start date of generation will be called as commissioning date, and project vise commissioning date has been mentioned in Section A.2. The project generates clean energy by utilizing the Solar Radiations.

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

The project activity is using clean renewable solar energy to produce electricity. The applied technology is considered to be one of the most environmentally friendly technologies available as the operation of the Solar photovoltaic does not emit any GHGs or any other harmful gases, unlike the operation of conventional power plants.

The photovoltaic module consists of photovoltaic cells connected by circuits and sealed in an environmentally protective laminate, which forms the fundamental building blocks of the complete PV-generating unit. Several PV panels mounted on a frame are termed as PV Array. The project activity has used reliable and proven technology to ensure that an environmentally safe and sound technology is only being implemented in the proposed project activity leading to the GHG reduction.

In the absence of the project activity, the equivalent amount of electricity imported from the NEWNE grid would have been generated from the NEWNE grid, which is predominantly based on fossil fuels[1], hence baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario.

Salient features of the 6.75 + 0.092 MW plant

Parameter	Description
Total number of Photovoltaic Modules	19560 + 3305
Rating of Photovoltaic Module	345 Wp and 340 Wp
Source of module installed of each type	REC
Technology	Multicrystalline

[1] http://www.cea.nic.in/executive_summary.html

No. of PCU installed	3 (2MVA EACH), 14 (12Nos 66KVA & 2 Nos 25 KVA)
Invertor make	Schneider Electric India pvt ltd Baroda

Salient features of 8.80 MW:

Parameters	Description
Total number of Photovoltaic Modules	28690 (8340+20350)
Rating of Photovoltaic Module	345 Wp , 350 Wp
Source of module installed of each type	REC
Technology	Multicrystalline
No. of PCU installed	4 (2.2 MVA EACH)
Invertor make	Schneider Electric India pvt ltd Baroda

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)', final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), it has been declared that Solar project activity falls under the "White category". White Category projects/industries do not require any Environmental Clearance such as 'Consent to Operate' from PCB as such project does not lead to any negative environmental impacts. Additionally, as per Indian Regulation, Environmental and Social Impact Assessment is not required for Solar 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 project would help in generating direct and indirect employment benefits accruing out of ancillary units for installing and maintenance during operation of the project activity. It will lead to the 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.

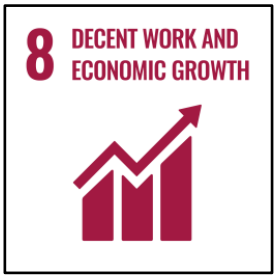
Environmental well-being: The project utilizes Solar energy for generating electricity which is a clean source of energy. The project activity will not generate any air pollution, wind pollution or solid waste to the environment which otherwise would have been generated through fossil fuels. Also, it 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 Solar energy to generate electricity contributes to the conservation of precious natural resources. The project contributes to economic sustainability through the promotion of decentralization of economic power, leading to the

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 15.642 MW power generation project into the region and will promote practice for industries to reduce the dependence on carbon intensive grid supply to meet the captive consumption 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 103292.2473 MWh of clean energy, which with increased shared will increase the affordability at a cheaper rate to end user. ➢ The project activity will utilize Solar energy (renewal resource) to generate power. The project activity will increase the share of renewable resource-based electricity to global mix of energy consumption.
Goal 8 	➢ Decent work and economic growth. ➢ This project activity generates additional employment for skilled and unskilled, also the project situated in a remote area will provide employment opportunities to unskilled people from villages. Training on various aspects including safety, operational issues, and developing skill sets will also be provided to employees.

Goal 13 	➢ This 15.642 MW ground mounted solar power projects meets the SDG 13 goal by saving fossil fuel and producing clean energy. ➢ This project has avoided 92961 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.

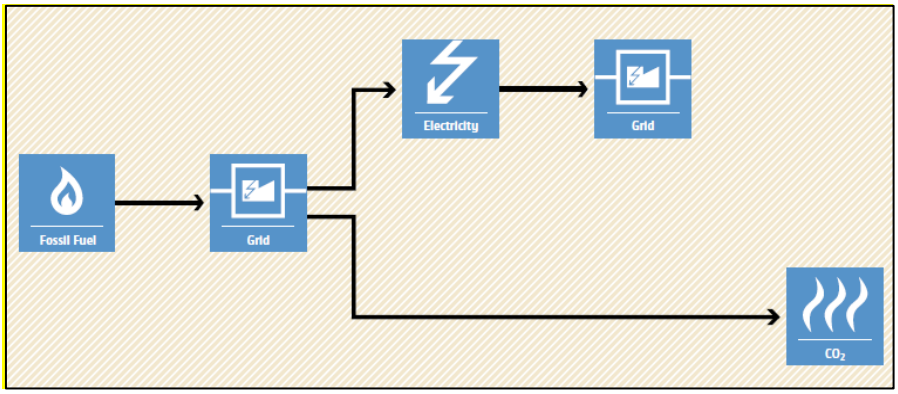
B.3 Baseline Emissions

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

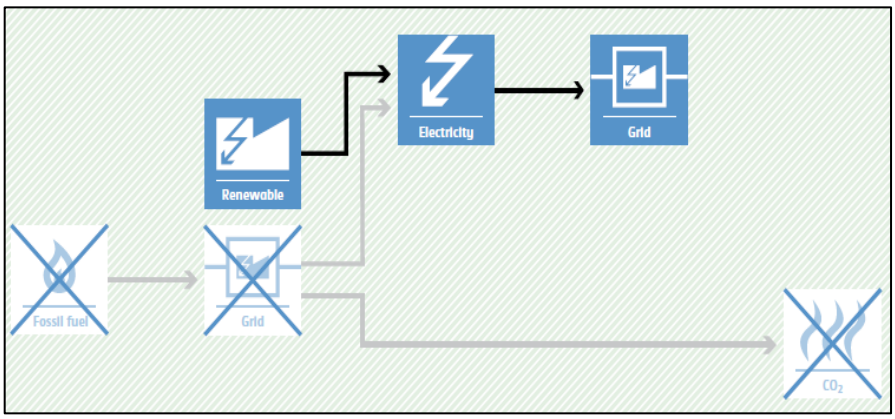
In the absence of the project activity, the equivalent amount of electricity would have been imported from the grid (which is connected to the unified Indian Grid system (NEWNE Grid)), which is carbon intensive due to being predominantly sourced from fossil fuel-based power plants. Hence, the baseline 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 Project Proponent 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 a 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
Category	:	ACM0002. (Title: Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, Ver 21.0)

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 Solar Power based project for captive consumption.

The project activity involves the generation of grid-connected electricity from the construction and operation of a new solar power-based power project. The project activity has an installed capacity of 15.642 MW which will qualify for a large-scale project. The project status corresponds to the methodology ACM0002., version 21, and the applicability of the methodology is discussed below:

Applicability Criteria	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 option (a) of applicability criteria 1 is applicable as project is a greenfield plant /unit. Hence the project activity meets the given applicability criterion.
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).	The following criteria is not applicable to this project.

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 following criteria is not applicable to this project.

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 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.	The project activity involves installation of Solar PV (SPV). Hence, this criterion is not applicable
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 b) 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	The project activity involves installation of Solar PV (SPV). Hence, this criterion is not applicable

minimum of five years prior to the implementation of the CDM project activity.	
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 project is 15.642 MW capacity solar power project and does not use any biomass. Hence this criterion is not applicable.
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.	The project activity is a new installation, it does not involve any retrofit measures nor any replacement and hence is not applicable for the project activity.

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 ACM0002. version - 21, "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 Solar Photovoltaic Plant and the Indian grid system.

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	CO_2	No	No CO_2 emissions are emitted from the project

Source		Gas	Included?	Justification/Explanation
	Electric solar Power project Activity	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 ACM0002. Ver 21.0, 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 Solar power plant to harness the solar energy and use it for captive consumption i.e., the Indian grid system through wheeling and banking 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 from 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 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 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 (t CO_2)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of 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	2019	19743.868	0.9	17871
2	2020	17346.55	0.9	22821
3	2021	25356.36637	0.9	25837
4	2022	54960.1123	0.9	26432
	BE (tCO_2e) for the period of 2022			92961

Estimated annual baseline emission reductions (BE_y)

= 103292.2473 MWh *0.9 tCO_2/MWh

= 92961 tCO_2

- ***Project Emissions***

As per ACM0002. version - 21, only emissions associated with fossil fuel combustion, emissions from the operation of geothermal power plants due to the release of non-condensable gases, emissions from a water reservoir of Hydro should be accounted for the project emission. Since the project activity is a solar electric power project, it's emission from renewable energy plants is nil.

Thus, PE = 0

- ***Leakage Emission***

As per ACM0002. version - 21, '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 zero.

Hence, LE = 0

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

Hence Net GHG emission reduction, = 92961-0-0 = 92961 tCO_2 (i.e., 92961CoUs)

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: 3 Years 11months

Date: 01/02/2019 to 31/12/2022 (inclusive of both dates).

C.10 Monitoring Plan

The project activity essentially involves generation of electricity from solar radiations, the employed SPV can only convert Solar energy into electrical energy and cannot use any other input fuel for electricity generation, thus no special ways and means are required to monitor leakage from the project activity. The recording of the electricity fed to the state utility grid is carried out jointly at the incoming feeder of the state power utility.

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 tCO_2/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 tCO_2/MWh."
Source of data	https://cea.nic.in/wp-content/uploads/baseline/2023/01/Approved_report_emission__2021_22.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 CEA database (current version 18, December 2022) results into 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 grid facility by the project activity during 01/02/2019 to 31/12/2022.
Source of data	Monthly energy bill
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 The total electricity generation by the Solar power plant is recorded at the plant facility, at the end of every month,

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<tr><td>Measurement Frequency:</td><td>Monthly</td></tr>
<tr><td>Value applied:</td><td>103292.2473</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)

Large Scale Solar Power Project in Rajasthan

Month - Wise Energy Delivered to Grid (in KWh)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	-	927000	113850	1237050	2856051	2482994	2001878	1631804	1684364	2527906	2078099	2316722
2020	2493432	2813588	2163373	749077	1565951	1852974	2223530	1648742	2232083	2720489	2391322	2502889
2021	2410246	2705424	3026184.48	2887805	2600595.8	2378718	1924584	1939773	1889003	2580609.55	2288359	2076665.65
2022	2509450	2696844	2969987.97	2891126	2843449.63	2369369	1683536	1771406	2279972	2541737.5	2492945	2319288.87

Year-Wise Emission reduction calculation for the project activity

Year	Total No. of Electricity delivered in MWh	Recommended emission factor tCO2/MWh	Total CoUs generated
2019	19857.718	0.9	17871
2020	25357.45	0.9	22821
2021	28707.96637	0.9	25837
2022	29369.11294	0.9	26432
Total CoUs to be issued for the first monitoring period (Year: 2019 to 2022)			**92961**