

PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title : 990 kW rooftop solar project by M/S R&B Denim Ltd

Version : 2.0

PCN Date : 18/10/2023

CoU Issuance Period: 19 Years and 03 Months

Monitoring

: 01/10/2021 to 31/12/2040

Duration



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

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	BASIC INFORMATION
Title of the project activity	990 kW rooftop solar project by M/S R&B
	Denim Ltd
Scale of the project activity	Small Scale
Completion date of the PCN	18/10/2023
Project participants	Creduce Technologies Private Limited (Aggregator)
	M/S R&B Denim Ltd. (Project Proponent)
Host Party	India
Applied methodologies and	Applied Baseline Methodology:
standardized baselines	AMS-I. F: "Renewable electricity generation for captive use and mini-grid, Version 05.0"
	use and mini-grid, version 05.0
	Standardized Methodology: Not Applicable.
Sectoral scopes	01 Energy industries
	(Renewable/Non-Renewable Sources)
Estimated amount of total	To be estimated during verification
GHG emission reductions	[An ex-ante estimate is 1561 CoUs per year]

SECTION - A - Description of project activity

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

This project activity is of capacity 1000 kW (AC) which is solar PV power generation project in the state of Gujarat in India. The renewable electricity generated by the project activity will be used for captive purpose at the project proponent's premise. The promoter of the project activity is 'M/S R&B Denim Ltd (herein after 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 "Universal Carbon Registry" (UCR).

A.1.1 Purpose of the project activity:

The purpose of the proposed project activity is to generate electricity using a clean and renewable source of energy i.e., solar radiation. The proposed bundled project activity of 1000 kW (AC) is installation and operation of solar power plant in the state of Gujarat, India

The project activity was commissioned on 01/10/2021 by Apollo Solar Power.

Below are the details of the capacity of project:

Name of the Entity	Capacity (AC)	Date of Commissioning
M/S R&B Denim Ltd	1000 kW	30/09/2021

The estimated annual average and the total CO₂e emission reduction by the project activity is expected to be 1862 tCO₂e, whereas actual emission reduction achieved during the first CoU period shall be submitted as a part of the first monitoring and verification.

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

A.1.2 Project's Contribution to Sustainable Development

This project is a greenfield activity where grid power is the baseline. The Indian grid system has been predominantly dependent on fossil fuel-powered plants. Renewable power generation is gradually contributing to the share of clean & green power in the grid; however, the grid emission factor is still on the higher side which defines the grid as a distinct baseline.

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:

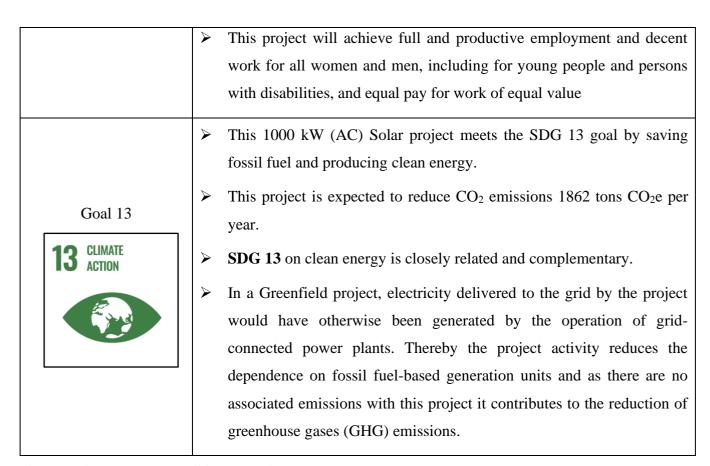
Social well-being: There has been good employment opportunities created for the local workforce during the project construction phase. The project after implementation has also continued to provide employment opportunities for the local populace in a sustained manner and the same would be continued over the project life time. The employment opportunities created will contribute towards alleviation of poverty in the surrounding area throughout the lifetime of the project activity.

Economic well-being: The project is a clean technology investment decided based on carbon revenue support, which signifies flows of clean energy investments into the host country. The project activity requires temporary and permanent, skilled and semi-skilled manpower at the project location; this will create additional employment opportunities in the region. The electricity replaced in grid will be available for nearby area which directly and indirectly improves the economy and life style of the area. In addition, success of these kind of project will provide new opportunities for industries and economic activities to be setup in the area. Apart from getting better employment opportunities, the local people will get better prices for their land, thereby resulting in overall economic development.

Technological well-being: The successful operation of project activity would lead to promotion of solar based power generation and would encourage other entrepreneurs to participate in similar projects. Increased interest in solar energy projects will further push R&D efforts by technology providers to develop more efficient and better machinery in future. The project activity leads to the promotion and demonstrates the success of solar projects in the region which further motivate more investors to invest in solar power projects. Hence, the project activity leads to technological well-being.

Environmental well-being: The project activity will generate power using zero emissions solar based power generation facility which helps to reduce GHG emissions and specific pollutants like SOx, NOx, and SPM associated with the conventional thermal power generation facilities. The project utilizes solar energy for generating electricity which is a clean source of energy. Also, being a renewable resource, use of solar energy to generate electricity contributes to resource conservation. It reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. The impact on land, water, air and soil is negligible. Thus, the project causes no negative impact on the surrounding environment contributing to environmental well-being.

SDG Goals Description The project activity will generate clean energy, which with increased Goal 7 shared will increase the affordability at a cheaper rate to end user. AFFORDABLE AND The project activity will utilize solar energy (renewal resource) to **CLEAN ENERGY** generate power. The project activity will increase the share of renewable resource-based electricity to global mix of energy consumption Decent work and economic growth. Goal 8 This project activity generates additional employment for skilled and **DECENT WORK AND ECONOMIC GROWTH** unskilled, also the project situated in remote area will provide employment opportunities to unskilled people from villages. The training on various aspect including safety, operational issues and developing skill set will also be provided to employees



A.1.3 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:

Environmental criteria may include a company's energy use, waste, pollution, natural resource conservation, and treatment of animals, etc. For the project proponent, the energy use 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. Also, the criteria can be further evaluated on the basis of any environmental risks that the company might face and how those risks are being managed by the company. Here, as the power generation will be based on solar power, the risk of environmental concerns associated with non-renewable power generation and risk related to increasing cost of power, etc. are now mitigated. Hence, the project contributes to ESG credentials.

• Under Social:

Social criteria reflect on the company's business relationships, qualitative employment, working conditions with regard to its employees' health and safety, interests of other stakeholders' etc. With respect to this project, the project proponent has robust policies in place to ensure equitable employment, health & safety measures, local jobs creation etc. Also, the organizational CSR activities directly support local stakeholders to ensure social sustainability. Thus, the project contributes to ESG credentials.

• Under Governance:

Governance criteria relates to overall operational practices and accounting procedure of the organization. With respect to this project activity, the PP practices a good governance practice with transparency, accountability and adherence to local and national rules & regulations etc. This can be further referred from the company's annual report. The electricity generated from the project can be accurately monitored, recorded and further verified under the existing management practice of the company. Thus, the project and the proponent ensure good credentials under ESG.

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)', 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.

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 the project activity

Country	:	INDIA
State	:	Gujarat
District	:	Surat
Town/Village	:	Palsana
Co-Ordinates	:	21°05'19.0"N 72°58'11.3"E

The project sites are well connected from airport and railway station. The geographic co-ordinates of the project locations are given below:

The representative location map is shown below

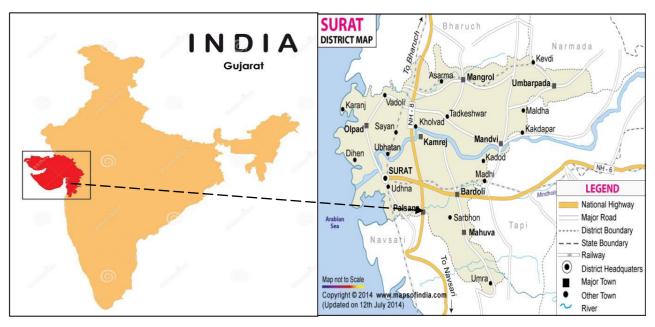


Figure-1- Location of the project activity (courtesy: google images and www.mapofindia.com)

A.4 Technologies/measures

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. The project activity has used the reliable and proven technology from supplier to ensure that an environmentally safe and sound technology is only being implemented in the proposed project activity leading to the GHG reduction.

Technical details of the 1000 kW (AC) Rooftop Mounted solar power plant installed are mentioned below:

Parameters	Description
Total number of Photovoltaic Modules	2384 Nos.
Rating of Photovoltaic Module	495 & 500 Wp
Modules make	Trina Solar
Technology	Monocrystalline
No. of Inverter	10
Invertor Capacity	100 kW
Invertors make	ABB-Fimer
PV Connectors	MC4

The project activity is using clean renewable solar energy to produce electricity. The applied technology is considered to be one of the most environment 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.

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 the 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, hence baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario.

A.5 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. R & B Denims Limited in Gujarat, India (Project Owner) Address: Block No. 467, Sachin Palsana Road, Surat-394315, Gujarat, India.

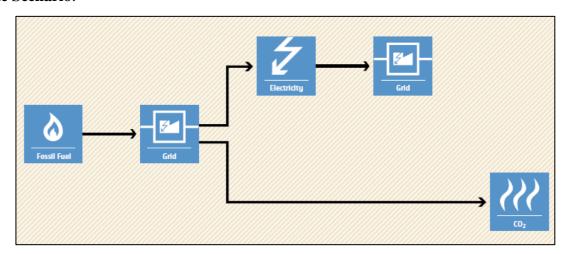
A.6 Baseline Emissions

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

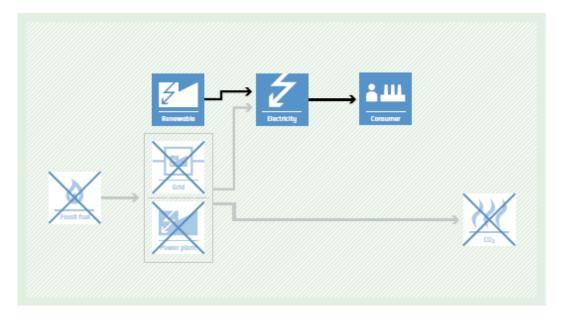
In the absence of the project activity, the equivalent amount of electricity would have been imported from the grid (which is connected to the unified Indian Grid system (NEWNE Grid)), which is carbon intensive due to being predominantly sourced from fossil fuel-based power plants. Hence, the baseline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



A.7 De-bundling

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

SECTION - B - Application of methodologies and standardized baselines

B.1 Reference to methodologies and standardized baselines

Sectoral scope : 01, Energy industries (Renewable/Non-renewable sources)

Type : I-Renewable Energy Projects

Category

AMS. I.F. (Title: Renewable electricity generation for captive use and

: mini-grid, Version 05.0)

B.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 has an installed capacity of 1000 kW (AC) 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.F., Version 05, and the applicability of the methodology is discussed below:

Applicability Criterion Project Case The project activity is a Renewable Energy 1. This methodology comprises renewable energy Project i.e., a Rooftop Mounted solar power generation units, such as photovoltaic, hydro, projects which falls under applicability criteria tidal/wave, wind, geothermal and renewable option 1 (a) i.e., "Consuming electricity biomass that supply electricity to user(s). The generated and supplying excess to an identified project activity will displace electricity from an consumer facility via national/regional grid electricity distribution system that is or would through a contractual arrangement such as have been supplied by at least one fossil fuel wheeling". fired generating unit, i.e., in the absence of the project activity, the users would have been Hence the project activity meets the given supplied electricity from one or more sources applicability criterion. listed below: (a) A national or a regional grid (grid hereafter); (b) A fossil fuel fired captive power plant; (c) A carbon intensive mini-grid. This methodology is applicable for project The option (a) of applicability criteria 2 is activities that: applicable as project is a Greenfield plant/Unit. Hence the project activity meets the given (a) Install a new power plant at a site where there applicability criterion. was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) Involve a capacity addition, (c) Involve a retrofit of (an) existing plant(s); or

- (d) Involve a replacement of (an) existing plant(s).
- 3. Illustration of respective situations under which each of the methodology ("AMS-I.D.: Grid connected renewable electricity generation", "AMS-I.F.: Renewable electricity generation for captive use and mini-grid" and "AMS-I.A.: Electricity generation by the user") applies is included -

a) Project supplies electricity to a national/regional grid

- b) Project displaces grid electricity consumption (e.g., grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)
- c) Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)
- d) Project supplies electricity to a mini grid system where in the baseline all generators use exclusively fuel oil and/or diesel fuel
- e) Project supplies electricity to household users (included in the project boundary) located in off grid areas

4. 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.

5. Combined heat and power (co-generation) systems are not eligible under this category.

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.

Option (a) and option (b) are applicable to AMS-1. F. methodology.

The proposed project is 1000 kW (AC) Rooftop Mounted solar power projects, i.e., only component is renewable power project below 15 MW, thus the criterion is not applicable to this project activity.

This is not relevant to the project activity as the project involves only solar power generating units.

The proposed project is a greenfield 1000 kW (AC) Rooftop Mounted solar power projects, i.e., the only component is a renewable power project below 15 MW, thus the criterion is not applicable to this project activity.

7. In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.

This is a green field project and no expansion and retrofitting were carried out. Hence this criterion is not applicable.

8. If the unit added 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 unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.

The proposed project is a greenfield 1000 kW (AC) Rooftop Mounted solar power projects; hence, this criterion is not applicable to this project activity.

9. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:

The project is a Rooftop Mounted solar power projects and thus the criterion is not applicable to this project activity.

- (a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir:
- (b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m2;
- (c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m2.

10. If electricity and/or steam/heat produced by the project activity is delivered to a third party, i.e., another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered that ensures that there is no double counting of emission reductions.

The electricity generated by the Rooftop solar power plant is consumed by manufacturing facility of PO and injected to the grid of the distribution utility under the mechanism of net metering if any surplus electricity is available after meeting their own consumption.

11. In the case the project activities utilize biomass, the "TOOL16: Project and leakage emissions from biomass" shall be applied to determine the relevant project emissions from the cultivation of biomass and the utilization of biomass or biomass residues.

No biomass is involved, the project is a Rooftop Mounted solar power projects and thus the criterion is not applicable to this project activity.

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

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

As per applicable methodology AMS-I.F. Version 05, "The spatial extent of the project boundary includes industrial, commercial facilities consuming energy generated by the system."

Thus, the project boundary includes the solar power plant and the Indian grid system.

	Source	Gas	Included?	Justification/Explanation
		CO_2	Yes	Main emission source
ine	Grid connected	CH ₄	No	Minor emission source
Baseline	electricity	N ₂ O	No	Minor emission source
	generation	Other	No	No other GHG emissions were emitted from the project
	Greenfield	CO_2	No	No CO ₂ emissions are emitted from the project
lect	Solar Electric	CH ₄	No	Project activity does not emit CH ₄
Project	Power project Activity	N ₂ O	No	Project activity does not emit N ₂ O
		Other	No	No other emissions are emitted from the project

B.5 Establishment and description of the baseline scenario

As per the approved consolidated methodology AMS-I.F. Version 05, 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 generated and supplied to designated user 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 grid connected solar power plant to harness the green power from solar energy and utilize the generated electricity as captive source for PP. 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. The power produced at grid from the other conventional sources which are predominantly fossil fuel based. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

A "grid emission factor" refers to a CO₂ emission factor (tCO₂/MWh) that will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO₂/MWh for the 2013 - 2020 years as a fairly 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.

B.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 (tCO₂/y)

 BE_y = Baseline Emissions in year y (tCO₂/y)

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

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

• Baseline Emissions

Baseline emissions include only CO₂ emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

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

 BE_y = Baseline emissions in year y (tCO₂)

 $EG_{PJ,y}$ = 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 tCO₂/MWh has been considered.

(Reference: General project eligibility criteria and guidance, UCR Standard,

page 4)

Estimated annual baseline emission reductions (BE_y)

= 2069 MWh/year *0.9 tCO2/MWh

 $= 1862 \text{ tCO}_2/\text{year}$

• Project Emissions

As per paragraph 25 of AMS-I.F. version-05, Project emissions for the following categories of project activities, including relevant definitions, shall be considered following the procedure described in the ACM0002:

- a. Emissions related to the operation of geothermal power plants (e.g., no condensable gases, electricity/fossil fuel consumption);
- b. Emissions from water reservoirs of hydro power plants.

Thus, PEy = 0

• Leakage Emission

- As per paragraph 29 of AMS-I.F. Version 05, "For project activities utilizing biomass and/or biomass residues, the TOOL16 shall be applied to determine the leakage.".
- No biomass is involved, the project is a Rooftop Mounted solar power projects and thus the criterion is not applicable to this project activity.

Hence, LE = 0

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

Hence Net GHG emission reduction, = 1,862-0-0 = 1,862 tCO₂/year (i.e., 1,862 CoUs/year)

B.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).

B.7 Changes to the start date of crediting

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

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

The initial application of the CDM Methodology AMS-I. D version 18 was later reassessed through a comprehensive desk review and on-site visit conducted by the verifier. This evaluation resulted in the determination that CDM Methodology AMS-I.F. Version 05 aligns with the project activity. Subsequently, the AMS-I.F. Version 05 methodology was adopted and implemented.

B.9 Monitoring period number and duration

Total Monitoring Period: 19 Year 03 Months

Date: 01/10/2021 to 31/12/2040 (inclusive of both dates).

B.10 Monitoring Plan

Data and Parameters available (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 2013 - 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/baseline/2023/01/Approved_report_emission2021_22.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 the CEA database (current Version 05, December 2022) results in a higher emission factor. Hence for 2022 vintage UCR default emission factor remains conservative.

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

Data / Parameter	EG pJ,facility, y
Data unit	MWh
Description	Net electricity produced for the captive use by the project activity during 01/10/2021 to 31/12/2022.
Source of data	Daily recording of solar electricity generation data in log book and Inverter
Measurement	Data Type: Measured
procedures (if any):	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 total electricity generation by the Solar power plant is recorded at the plant facility, at the end of every month
Measurement Frequency:	Monthly
Value applied:	2,069 (Ex-ante estimate)
QA/QC procedures applied:	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 the power purchase agreement.
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.

Any comment:	Data will be archived electronically for a period of 36 months beyond
Tilly comment.	the end of crediting period.