



PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT



Title: 9.62 MW Bundled Solar Power Project by Panoli Intermediates (India) Pvt Ltd. in Gujarat, India

Version 1.0

Date 04/07/2024

First CoU Issuance Period: 05 Years

Date: 15/06/2019 to 30/06/2024



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

BASIC INFORMATION

Title of the project activity	9.62 MW Bundled Solar Power Project by Panoli Intermediates (India) Pvt Ltd. in Gujarat, India
Scale of the project activity	Small Scale
Completion date of the PCN	04/07/2024
Project participants	Advait Greenergy Private Limited (Representator) M/s. Panoli Intermediates (India) Pvt Ltd. (Developer)
Host Party	India
Applied methodologies and standardized baselines	Applied Methodologies: UNFCCC Approved Small Scale Methodology “AMS-I.D, Grid connected renewable electricity generation”, Version – 18.0 Standardized Baselines: N/A
Sectoral scopes	01 Energy industries (Renewable/NonRenewable Sources)
Estimated amount of total GHG emission reductions	15,168 CoUs (15,168 tCO _{2eq})

SECTION A. Description of project activity

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

The project **9.62 MW Bundled Solar Power Project by Panoli Intermediates (India) Pvt Ltd. in Gujarat, India** is located in Rupnagar Village, Sami Taluka, Patan District, Sarod Village, Jambusar Taluka, Bharuch District and Kadachala Village, Halol Taluka, Panchmahal District of Indian State Gujarat. 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 purpose of the project activity is to generate electricity using a clean and renewable source of energy i.e., solar energy. The project activity of 9.62 MW (3.75 MW 4.07 MW) was installed and operated of solar power plant in Patan, Bharuch and Panchmahal districts in the state of Gujarat are per details listed below:

Project Developer	Capacity (MW_{AC})	Commissioning Date	Location
M/s. Panoli Intermediates (India) Pvt. Ltd.	3.74	15-Jun-19	Rupnagar, Sami Taluka, Patan District
	4.07	30-Sep-22	Sarod, Jambusar Taluka, Bharuch District
	1.8	21-Jun-23	Kadachala, Halol Taluka, Panchmahal District

As per the ex-ante estimate, the project will generate approximately 16,854.24 MWh of electricity per annum. The net generated electricity from the project activity is being wheeled to manufacturing facility of project proponent (PP) in Gujarat for captive consumption through the Indian grid (previously known as NEWNE grid) as per wheeling agreement signed between Madhya Gujarat Vij Company Limited (MGVCL) & Dakshin Gujarat Vij Company Limited (DGVCL) and PP. The generation of power from solar photovoltaic is a clean technology as there is no fossil fuel fired or no GHG gases are emitted during the process. 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. Thus, project activity leads to reduce the GHG emissions as it displaces power from fossil fuel-based electricity generation in the regional grid. The technological details have been provided in Section A.4.

The estimated annual average and the total CO_{2e} emission reduction by the project activity is expected to be 15,168 tCO_{2e}, whereas actual emission reduction achieved during the first CoU period shall be submitted as a part of 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 contributes to climate change mitigation efforts.

Project’s Contribution to Sustainable Development

This project is a greenfield activity where grid power is the baseline. Indian grid system has been predominantly dependent on power from fossil fuel powered plants. 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 (MoEFCC), 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:

There have 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. 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 SO_x, NO_x, 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.

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 PP, 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 which 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, 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 PP 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, the Project Proponent 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. Also, the project activity is a solar power project owned and managed by the PP for which all required NOCs and approvals are received. 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 from the project and hence no mitigations measures are applicable.

Rational: As per ‘Central Pollution Control Board (MoEFCC, 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 project activity >>

Project Proponent	M/s. Panoli Intermediates (India) Pvt Ltd.		
Project Capacity (MW _{AC})	3.75	4.07	1.8
Country	India	India	India
District	Patan	Bharuch	Panchmahal
Village	Rupnagar	Sarod	Kadachala
Tehsil	Sami	Jambusar	Halol
State	Gujarat	Gujarat	Gujarat
Code	384240	392180	389350

The representative location map is included below:

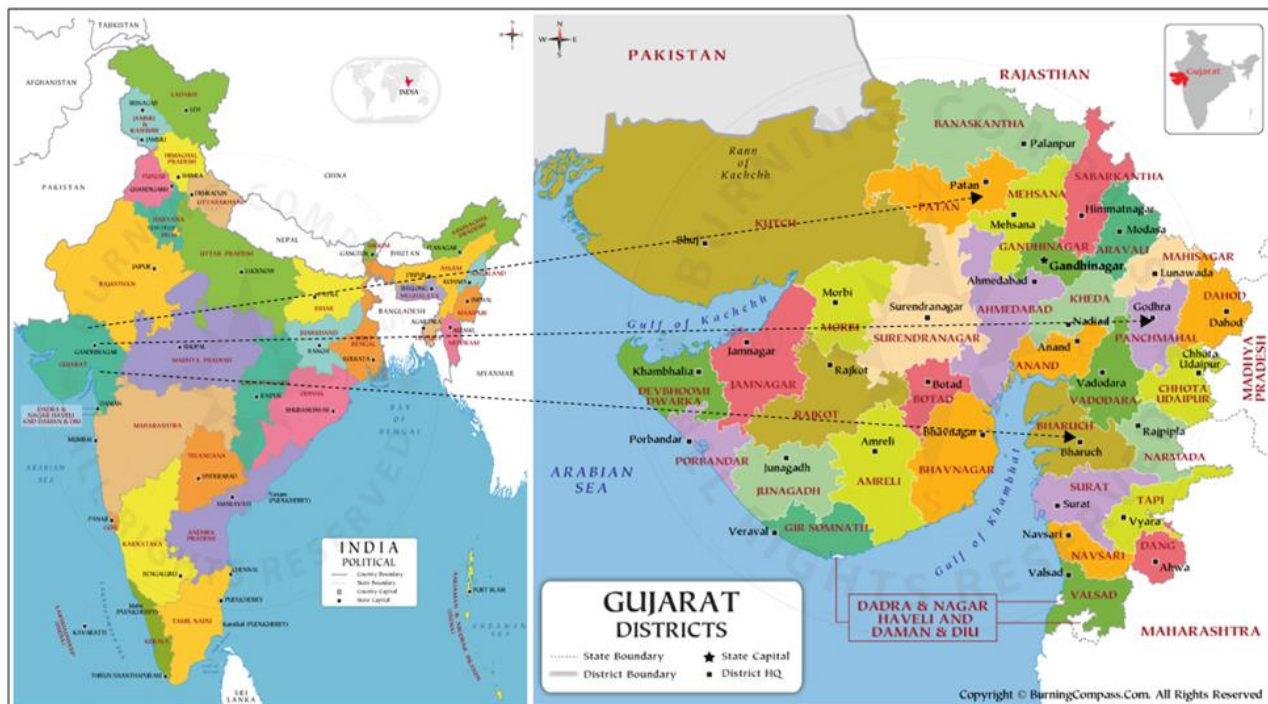


Figure 1: Project Location
(Courtesy: google images, www.burningcompass.com)

A.4. Technologies/measures >>

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 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 to ensure that an environmentally safe and sound technology is only being implemented in the proposed project activity leading to the GHG reduction.

The technical arrangement of the project activity is as provided below:

Project Developer	M/s. Panoli Intermediates (India) Pvt. Ltd.	
Capacity (kW_{DC})	3997.5	3.750
Capacity (kW_{AC})	4999.57	4070
SPV Module Type	Polycrystalline	Monocrystalline
SPV Module Make	Renewsys	Renewsys
Nos. of PV Modules/ Rating	12300/ 325 Wp	22/ 185 kW
Inverter Make	Hitachi	Huawei
Inverter Type	String	String
ABT Meter Make	Secure	Secure

A.5. Parties and project participants >>

Party (Host)	Participants
Government of India	Advait Greenergy Private Limited (Representator) M/s. Panoli Intermediates (India) Pvt Ltd. (Developer)

A.6. Baseline Emissions>>

Project activity installs the solar power project at a barren land. Project activity is the installations of green field energy production with the installation of 9.62 MW solar project capacity.

In the absence of the project activity the equivalent amount of electricity would have been generated from the connected/ new power plants in the Indian grid, which are/ will be predominantly based on fossil fuels¹, hence baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario. Since the project activity involves power generation from solar, it does not emit any emissions in the atmosphere.

Project activity will harness solar radiations as a source of energy production which is environmentally safe and sound technology. There is no GHG emission through project activity. Before installation, the project activity confirms all the relevant code of safety and standards mandatory for setting up solar projects.

Schematic diagram showing the baseline scenario:

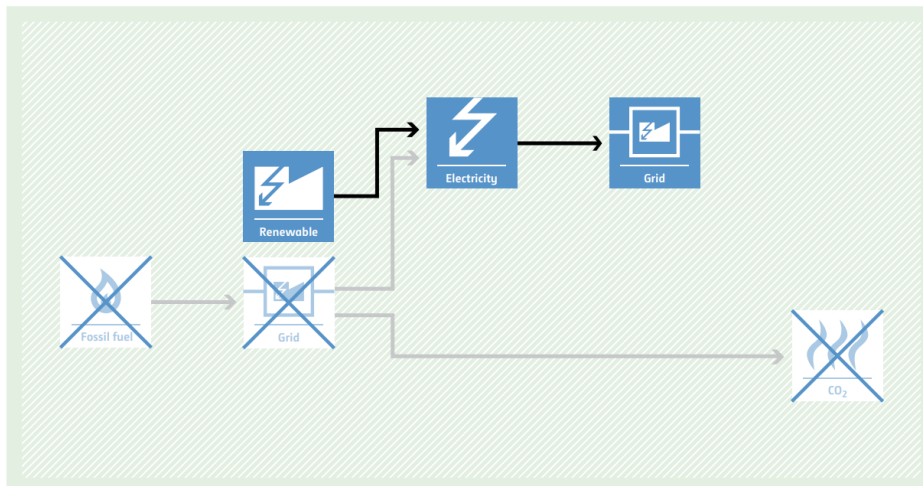


Figure 2: Project Scenario

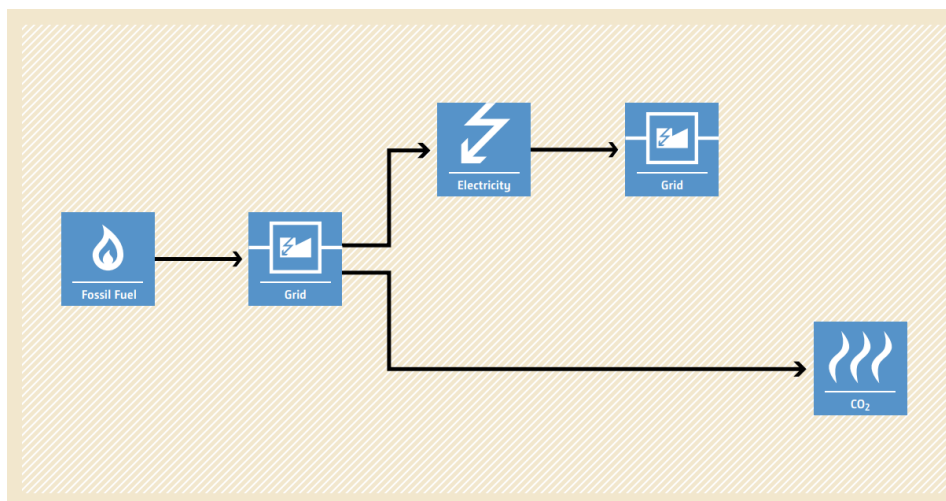


Figure 3: Baseline Location

¹ http://www.cea.nic.in/installed_capacity.html

A.7. 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: AMS-I.D, Grid connected renewable electricity generation, Version 18²

B.2. Applicability of methodologies and standardized baselines >>

The project activity is solar based renewable energy source, zero emission power project connected to the Gujarat state grid, which forms part of the Indian grid. The project activity will displace fossil fuel-based electricity generation that would have otherwise been provided by the operation and expansion of the fossil fuel-based power plants in Indian grid.

The project activity has installed capacity of 9.62 MW which will qualify for a small-scale project activity under Type-I of the Small-Scale methodology. The project status is corresponding to the methodology AMS-I.D., version 18 and applicability of methodology is discussed below:

Applicability Condition	Justification
1. This methodology is applicable to project activities that: a) Install a Greenfield plant; b) Involve a capacity addition in (an) existing plant(s) c) Involve a retrofit of (an) existing plant(s) d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or e) Involve a replacement of (an) existing plant(s).	The project activity involves installation of greenfield solar power generation plant. Hence the methodology is applicable to the project activity.
2) Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: a) The project activity is implemented in 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/m ² ; c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m ² .	The project activity is NOT a hydro power project. Hence the condition does not apply.
3) If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The project activity only has renewable component (i.e. solar power) of 9.62 MW and hence meets the applicability condition.

² [2P7FS6ZQAR84LG3NMKYUH50WI9ODBC \(unfccc.int\)](https://unfccc.int/2P7FS6ZQAR84LG3NMKYUH50WI9ODBC)

4) Combined heat and power (co-generation) systems are not eligible under this category.	The project activity is a greenfield solar power generation project and hence this condition does not apply.
5) In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project activity is a greenfield project and NOT a capacity addition project. Hence the condition does not apply.
6) In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	The project activity is a greenfield project. Hence the condition does not apply.
7) In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS-I.C.: Thermal energy production with or without electricity” shall be explored.	The project activity is a solar power project. Hence the condition does not apply.
8) In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply.	The project activity is Neither a fossil fuel switch project nor a biomass fired power plant. Hence the condition does not apply.

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 consumption point for project developer

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

As per applicable methodology AMS-I.D, Grid connected renewable electricity generation, Version 18, “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 PV systems 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 ₂ O	NO	Minor emission source
		Other	NO	No other GHG emissions were emitted from the project
Project	Greenfield Solar 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 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 baseline scenario (UCR Standard or Methodology) >>

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

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

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

The project activity involves setting up of a new solar power plant to harness the green power from solar energy and to use for captive purpose via grid interface through wheeling arrangement. 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) which 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 2014-2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Also, for the vintage 2021, the combined margin emission factor calculated from CEA database in India results into 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 (tCO₂/y)
 BE_y = Baseline Emissions in year y (t CO₂/y)
 PE_y = Project Emissions in year y (t CO₂/y)
 LE_y = Leakage Emissions in year y (t CO₂/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:

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

Where;

- BE_y = Baseline Emissions in year y (t CO₂)
 $EG_{PJ,y}$ = 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)

Project Emissions

As per paragraph 39 of AMS-I.D, Grid connected renewable electricity generation, Version 18, 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 solar power project, project emission for renewable energy plant is nil.

Thus, $PE_y = 0$.

Leakage Emissions

As per paragraph 42 of AMS-I.D, Grid connected renewable electricity generation, Version 18, '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, $LE_y = 0$.

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 (BE_y)

$$\begin{aligned} BE_y &= 16,854.24 \text{ MWh/year} \times 0.9 \text{ tCO}_2/\text{MWh} \\ &= 15,168 \text{ tCO}_2/\text{year (i.e., 15,168 CoUs/year)} \end{aligned}$$

B.6. Prior History>>

The project activity is a small scale solar project and this project was never applied under any other GHG mechanism prior to this registration with UCR. Also, the capacities or the total project as a

whole has not been applied for any other environmental crediting or certification mechanism. Hence project will not cause double accounting of carbon credits (i.e., CoUs).

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

The crediting period under UCR has been considered from the date of commissioning of the project, i.e., 15/06/2019.

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

Not applicable.

B.9. Monitoring period number and duration>>

First Issuance Period: 05 years – 15/06/2019 to 30/06/2024

B.8. 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	UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf (rackcdn.com)
Value(s) 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

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

Data / Parameter:	EG_{PJ,y}
Data unit:	MWh
Description:	Net electricity supplied to the Indian grid facility by the project activity
Source of data:	Generation Statements/ SLDC Certificates/ Joint Meter Readings
Measurement procedures (if any):	Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Archiving Policy: Electronic Calibration frequency: Once in 5 years (considered as per provision of CEA India). The Net electricity generation by the solar power plant is recorded by the project proponent in the record logs. At the end

	of every month, Energy bill is generated based on the total monthly electricity exported to the grid.
Monitoring frequency:	Monthly
Value applied	16,854.24 (Ex-ante estimate)
QA/QC procedures:	Continuous monitoring, hourly measurement monthly recording. Tri-vector (TVM)/ABT energy meters with accuracy class 0.2s
Purpose of data:	Calculation of baseline emissions
Any comment:	<p>Data will be archived electronically for a period of 36 months beyond the end of crediting period.</p> <p>Since the renewable power generated from the project is used for captive consumption via wheeling, hence during the monitoring and verification the provision of the wheeling agreement may be referred.</p>