# PROJECT CONCEPT NOTE (PCN)

CARBON OFFSET UNIT (CoU) PROJECT

**Title: 2.7MW Captive Solar Power Project GARL, Gujarat**

Version 1.0

Date 16/08/2023

**1st CoU Issuance Period**: 25/11/2020 to 31/12/2022 (**02 years 01 months 05 days)**

**1st Monitoring Period**: 25/11/2020 to 31/12/2022 (**02 years 01 months 05 days)**

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

| BASIC INFORMATION | |
|---|---|
| Title of the project activity | 2.7MW Captive Solar Power Project GARL, Gujarat |
| Scale of the project activity | Small Scale |
| Completion date of the PCN | 16/08/2023 |
| Project participants | **Project Proponent**: Gokul Agro Resources Limited (GARL) |
| Host Party | India |
| Applied methodologies and standardized baselines | **Type I** (Renewable Energy Projects)<br><br>**UNFCCC Methodology Category** AMS-I.F. Small-scale Methodology, *Renewable electricity generation for captive use and mini-grid*" Ver 05<br><br>**UCR Protocol Standard Baseline Emission Factor** |
| Sectoral scopes | 01 Energy industries (Renewable/NonRenewable Sources) |
| Estimated amount of total GHG emission reductions per year | **3817** CoUs/yr (**3817** $tCO_{2eq}$/yr) |

## SECTION A. Description of project activity

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

The project activity titled, **2.7 MW Captive Solar Power Project GARL, Gujarat,** is located at Survey No: 76/01/P-1, 80, 89 and 91, Village: Meghpar Borichi, Taluka: Anjar, District: Bhuj, State: Gujarat (370110), Country: India.

This is a single project activity of total installed capacity 2.7 MW, which is a ground mounted captive solar power generation activity by **M/s Gokul Agro Resources Limited** (GARL, Project Proponent or PP). The PP is one of the leading FMCG companies in India with international presence in the edible and non-edible oils industry. GARL is engaged in the manufacturing and exports of industrial products viz. castor oil of various grades and its derivatives.

The PP has the full ownership of the project activity. This project is an operational activity with continuous reduction of GHGs, currently being applied under "Universal Carbon Registry" (UCR), which rewards solar programs with carbon credits as an incentive for positive climate action in the Global South, as opposed to carbon finance in other international voluntary carbon programs. It's now widely accepted that the world needs to ramp up clean technologies by 2030 to prevent permanent climate disaster, and carbon incentive policies, such as the UCR CoU program, will be key to such efforts. India is aiming for 450 GW of renewables and 500 GW of non-fossil capacity by 2030. With 110 GW already installed (as of 2021-22), the nation needs to deploy 340 GW of new renewable energy capacity (on average, 42.5 GW of renewable energy per year for the next eight years) to meet the 2030 target and offer the world some hope in combating climate change. That would require the country's solar capacity to rise fivefold to 280 GW from 54 GW during this period. This translates to 29 GW of new solar capacity additions every year on average until the end of this decade – a far faster pace than the nation's record annual addition of 15 GW renewable energy (14 GW of solar and 1 GW wind) in fiscal 2021-22.

**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, for captive use. The project activity of 2.7 MW is the installation and operation of a solar power plant in Bhuj district in the state of Gujarat are per the details listed below:

| Village | District | Type | Total installed capacity kW | Commissioning date |
|---|---|---|---|---|
| Meghpar Borichi | Bhuj | Ground mounted-Captive | 2700 kWp (DC)/ 2200 KVA | 25/11/2020 |

As per the ex-ante estimate, this project will generate approximately **4241 MWh** of renewable electricity per annum considering an average PLF of 20%. The project activity uses Poly Crystalline solar photovoltaic technology to generate clean energy.

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. Several PV panels mounted on a frame are termed as PV Array. 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 yearly $CO_{2e}$ emission reduction by the project activity is expected to be **3817 $tCO_{2e}$/yr**, whereas actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification process. 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 scenario. The 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 large majority of solar mini-grids in India no longer work. Decentralized solar infrastructure — including panels on roofs, electric water pumps and streetlights and local distribution networks — has been touted as a way to electrify the poorest areas and augment the country's transition away from fossil fuels. But maintaining these solar systems has proved to be more than the government can handle, leaving deserted panels and batteries far and wide (source). This is where the UCR CoU program can help mitigate the cost for O&M of such projects.

Youngsters Anurag Da and Amit Barla, residents of Barbera village in Simdega District, charge their cellphones by hooking them up to the out-of-service solar mini-grid. (Arko Datto for The Washington Post)

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

**Social well-being:**

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 activity is a clean technology investment and avoids CO2 emissions from the grid, hence is entitled to carbon incentives in the form of CoUs as carbon incentive 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 the nearby areas which directly and indirectly improves the economy and life style of the area. In addition, success of these kind of projects will provide new opportunities for industries and economic activities to be setup in the area and also provide carbon incentives to upgrade or expand capacities as the world seeks to limit a 1.5 degree centigrade rise by 2030. 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 leads to the 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 the 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.

The project activity will generate power through solar PV technology and displace equivalent amount of power from the regional grid, thereby contributing towards the reduction in greenhouse gas emission due to generation of electricity in the regional grids in India. If the world needs to ramp up clean technologies by 2030 to prevent permanent climate disaster, carbon incentive policies, such as the UCR CoU program, are key to such efforts.

**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 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:**

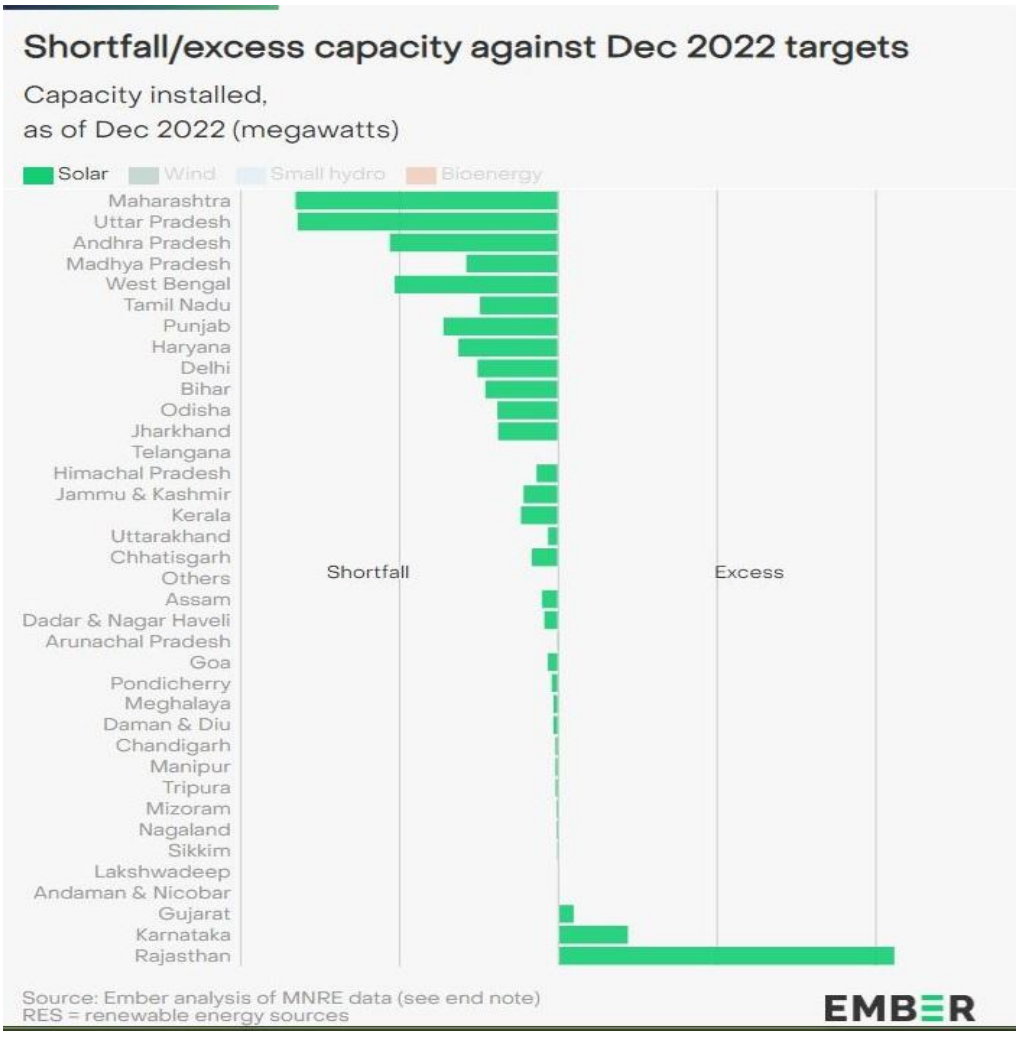
Social criteria reflect on the company's business relationships, qualitative employment, working

conditions with regard to its employees' health and safety, interests of other stakeholders, etc. With respect to this project activity, 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 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. Also, the project activity is a solar power project owned and managed by the proponent 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.

Majority of Indian states, including several currently facing power crisis due to coal shortage, have not even met half of their renewable energy targets for December 2022. Large power consuming states across India, have a lot to catch up to meet India's renewable energy target, hence the flow of UCR carbon incentives will provide a boost to setup similar projects at scale and speed to avert the 2030 climate tragedy that is predicted by the IPCC.



Gujarat State installed capacity of captive solar power plants in industries having demand of 1 MW & above (2022) is **131.8 MW** (source). Wind and solar made up 92% of India's power generation capacity additions in 2022.

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

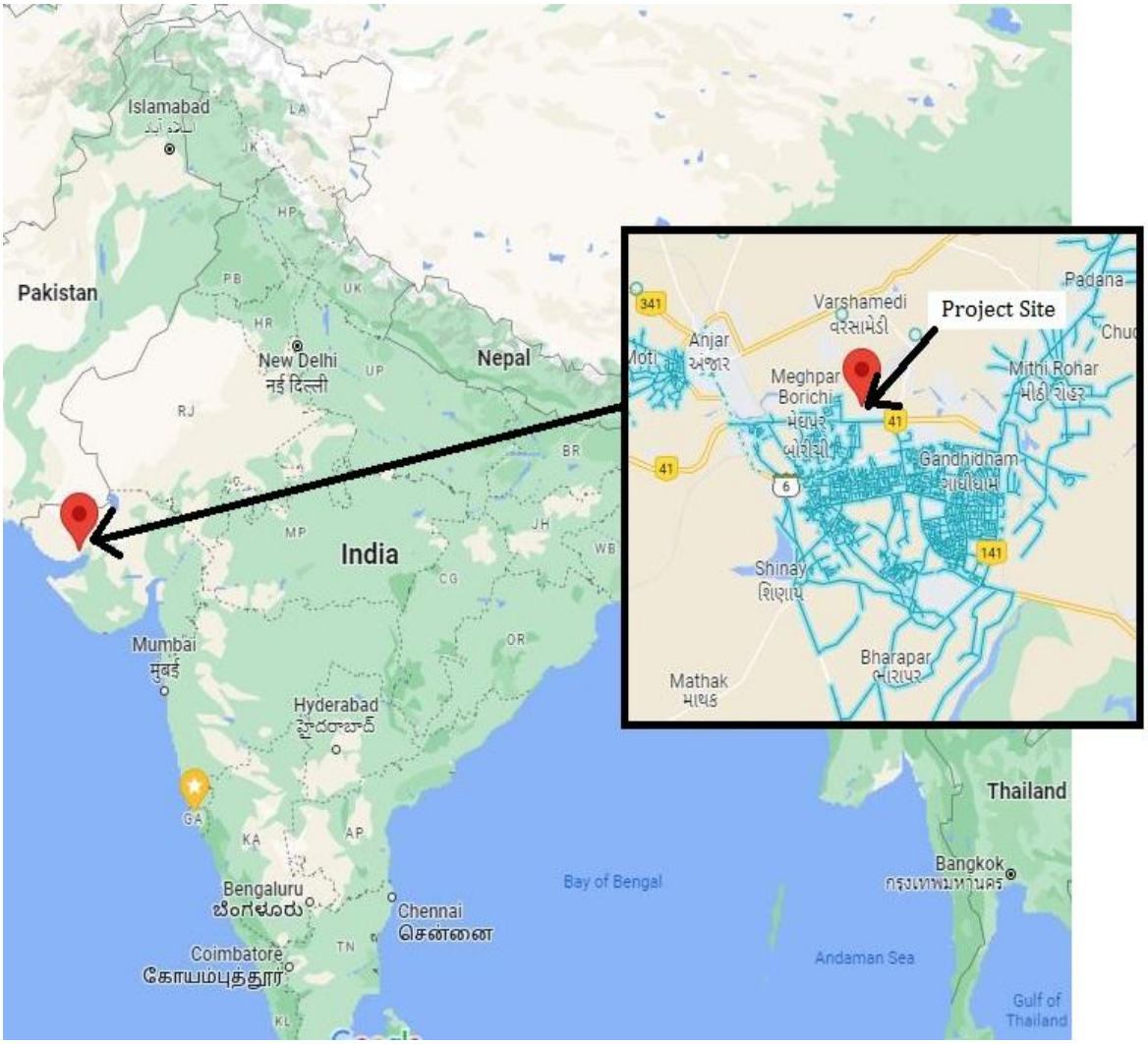
- Rational: As per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)', final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), it has been declared that solar project activity falls under the "White 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 small-scale 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. Provides employment to local communities through construction and maintenance of units.

## A.3. Location of project activity >>

Country: India
Survey No: 76/01/P-1, 80, 89 and 91,
Village: Meghpar Borichi,
Taluka: Anjar,
District: Bhuj
State: Gujarat - 370110

Latitude: 23.10
Longitude: 70.09

The representative location map is included below:




**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 a number 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.
Each power production unit will in general constitute the following equipment:

1. Solar Photovoltaic modules
2. Inverters
3. Transformers
4. Circuit breakers
5. Mounting structures
6. Cables and hardware.
7. Junction box and distribution boxes.
8. Earthing kit.
9. Control room equipment.
10. System for control and monitoring.
11. Evacuation system

The technology used does not pose any threat to the environment in comparison to the fossil fuel-

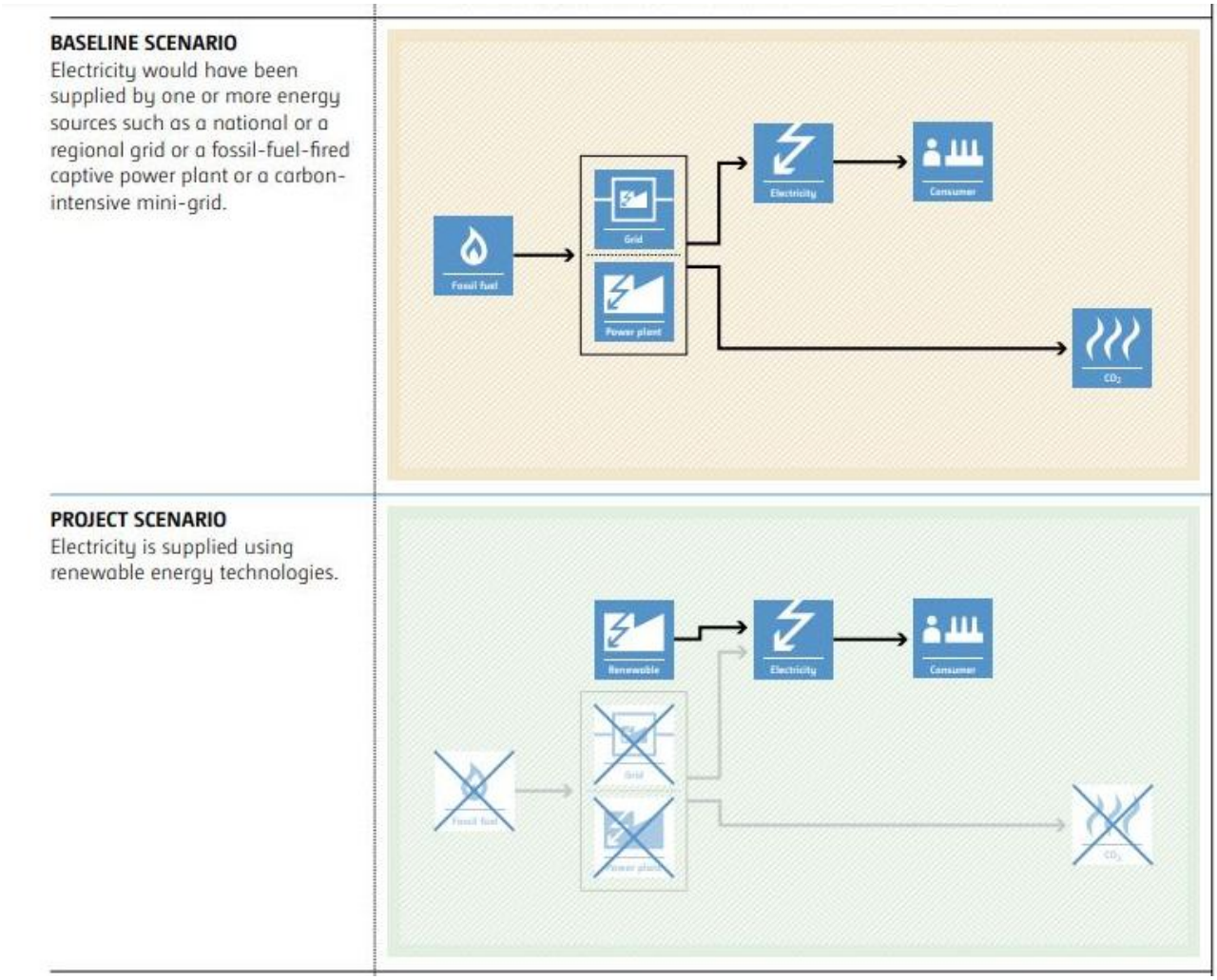
fired power plants. The technology to be applied in the project activity is proven technology and can hence be considered safe and sound technology. The project does not involve any transfer of technology from any Annex 1 country. There is no Public funding (ODA and/ or Annex I countries) for the project activity.

| Parameter | Description |
|---|---|
| Total number of Photovoltaic Modules | 6836 |
| Rating of Photovoltaic Module | 0.395 KWP- Kilo watt peak / 395WP- watt peak |
| Technology | Poly Crystalline Silicon |
| Solar Panel Maker | WAAREE ENERGIES LIMITED |
| Meter Maker | Secure |
| Commissioning Date | 25/11/2020 |

## A.5. Parties and project participants >>

| Party (Host) | Participants |
|---|---|
| India | **Project Proponent**: GOKUL AGRO RESOURCES LTD (GARL), Survey No: 76/01/P-1, 80,89 and 91, Village – Meghpar Borichi, Ta – Anjar, Dist: Bhuj Gujarat - 370110 |

## A.6. Baseline Emissions>>




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

- *The product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor.*

## A.7. Debundling>>

This project activity is not a debundled component of a larger carbon or GHG registered 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.F. – Renewable electricity generation for captive use and mini-grid*, ver 05**

This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s). The project activity will displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit, i.e. in the absence of the project activity, the users would have been supplied electricity from:

*(a) A national or a regional grid (grid hereafter)*

**Methodology key elements**

| | |
|---|---|
| **Typical project(s)** | Production of electricity using renewable energy technologies such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s) |
| **Type of GHG emissions mitigation action** | Renewable energy:<br>Displacement of electricity that would be provided to the user(s) by more-GHG-intensive means |

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

| |
|---|
| This project is included within the UCR Standard Positive List of technologies and are within the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of: (a) renewable electricity generation technologies of installed capacity up to 15 MW, (b) Solar technologies (photovoltaic and solar thermal electricity generation); |
| Project activity involves installation of captive use solar photovoltaic power generation with capacity 2.7 MW which is less than 15MW. |
| The project activity involves installation of Solar PV (SPV). Hence, the activity is not a hydro power project or combined heat and power (co-generation) systems. |
| Project displaces grid electricity consumption (e.g. grid import). |
| The project activity is a new installation, it does not involve any retrofit measures nor any replacement. |
| Landfill gas, waste gas, wastewater treatment and agro-industries projects are not relevant to the project activity. No biomass is involved, the project is only a solar power project. |
| The technology/measure allowed under the grid connected Solar PV based generation systems displace equivalent quantity of electricity from the regional grid in India. The testing/certifications; all the equipment of the solar project activity will be complying with applicable national/ international standards. The above details may be verified from one or more of the following documents:<br>□ Technology Specification provided by the technology supplier<br>□ Purchase order copies<br>□ EPC contracts<br>□ Power purchase agreement<br>□ Project commissioning certificates |
| The project activity is a voluntary coordinated action |

| |
|---|
| As per the Ministry of Environment and Forest (MoEF), Govt. of India Office Memorandum dated 13/05/2011, it had received specific clarification regarding the applicability of EIA Notification, 2006 in respect of Solar Photo Voltaic (PV) Power plants. It was further clarified in the above memorandum that both Solar PV power projects are not covered under the ambit of EIA Notification, 2006 and no environment clearance is required for such projects under provisions thereof. |
| This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s). Hence this methodology is applicable and fulfilled for the solar project activity. |
| The project activity involves installation of new power plants at listed sites where there was no renewable energy power plant operating prior to implementation of project. |
| Project and leakage emissions from biomass are not applicable. |

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

The renewable electricity units are digitally monitored with unique energy meters located within the project activity boundary. The project activity will not apply to India's NDC carbon ecosystem/market and has not been registered under any other GHG mechanism for carbon offsets/credits in the past.

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

The spatial extent of the project boundary includes industrial, commercial facilities consuming energy generated by the system and encompasses the physical, geographical site of the solar power plant and the energy metering equipment.

| | Source | GHG | Included? | Justification/Explanation |
|---|---|---|---|---|
| Baseline | Grid-connected electricity | $CO_2$ | **Included** | Major source of emission |
| | | $CH_4$ | Excluded | Excluded for simplification. This is conservative |
| | | $N_2O$ | Excluded | Excluded for simplification. This is conservative |
| Project Activity | Greenfield solar power project | $CO_2$ | Excluded | Excluded for simplification. This is conservative |
| | | $CH_4$ | Excluded | Excluded for simplification. This is conservative |
| | | $N_2O$ | Excluded | Excluded for simplification. This is conservative |

Net GHG Emission Reductions and Removals

Thus, ERy = BEy – PEy – LEy Where:

ERy = Emission reductions in year y (tCO2/y)

BEy = Baseline Emissions in year y (t CO2/y)

PEy = Project emissions in year y (tCO2/y)
Project Emissions (PEy) for the following categories of project activities, including relevant definitions, shall be considered following the procedure described in the ACM0002:

- Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption);
- Emissions from water reservoirs of hydro power plants.
- For the other types of renewable energy projects, PEy = 0

Hence PEy = 0

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

**B.5. Establishment and description of baseline scenario (UCR Protocol) >>**

The baseline scenario identified at the PCN (ver 1.0) stage of the project activity is:

- *The product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor.*

Total Capacity: 2.7 MWh

Commissioning Date of first installation: 25/11/2020

**Estimated Annual Emission Reductions**: $BE_y = EG_{BL,yl} \times EF_{,CO2,GRID,y}$

$BE_y$ = Emission reductions in a year y.

where:

$EG_{BL,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the UCR project activity in year y (MWh)

$EF_{Grid,CO2,y}$ = $CO_2$ emission factor of the grid in year y (t $CO_2$/MWh) as determined by the UCR Standard.

**Estimated annual baseline emission reductions ($BE_y$)** = 3817 CoUs (3817 $tCO_{2eq}$)
**$ER_y$** = Emission reductions in year y ($tCO_2$/y) = 3817 CoUs (3817 $tCO_{2eq}$)

**B.6. Prior History>>**

The project activity is a ground mounted small-scale solar project and this project was never applied under any other GHG mechanism prior to this registration with UCR. Also, the capacity 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 offset units or credits (i.e., CoUs).

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

There are no changes to the start date of the 1st crediting period.

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

This is PCN version 1.0 and hence there are no changes applicable.

**Applied Methodology**

***AMS-I.F. – Renewable electricity generation for captive use and mini-grid*, ver 05**

This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s).

## B.9. Monitoring period number and duration>>

Monitoring Period No: 01

1st Issuance Period: 25/11/2020-31/12/2022

1st Monitoring Period: 25/11/2020 to 31/12/2022

**1st Crediting Period: 02 years 01 months 05 days**

## B.8. Monitoring plan>>

Key Data Monitored: • Quantity of net electricity generated per year

1. **Monitoring Plan Objective and Organization**

PP is the project implementer and monitors the electricity generated by the project activity. The data is already archived electronically and is stored since 25/11/2020.

To ensure that the data is reliable and transparent, the PP has established Quality Assurance and Quality Control (QA&QC) measures to effectively control and manage data reading, recording, auditing as well as archiving data and all relevant documents. The data is monitored on a daily basis and is submitted to PP on a daily basis.

PP has implemented QA&QC measures to calibrate and ensure the accuracy of metering and safety aspects of the project operation. The metering devices are calibrated and inspected properly and periodically, according to state electricity board's specifications and requirements to ensure accuracy in the readings.

| Data / Parameter: | ***EGy*** |
|---|---|
| Data unit: | MWh |
| Description: | Quantity of net electricity displaced in year y |
| Source of data: | Main Meter Unit Readings, Direct measurement. |
| Measurement procedures (if any): | Daily : Direct measurement using electricity meters |
| Monitoring frequency: | Continuously, aggregated at least annually<br>Calibration Frequency: The calibration will be done following the relevant applicable National Guidelines updated from time to time during the operation of the project activity.<br>Entity responsible: Aggregator |
| QA/QC procedures: | Monitoring frequency: Continuous<br>Measurement frequency: Hourly<br>Recording frequency: Monthly<br>The electricity meter will be subject to regular maintenance and testing in accordance with the stipulation of the meter supplier or national requirements. The calibration of meters, including the frequency of calibration, should be done in accordance with national standards or requirements set by the meter supplier. The accuracy class of the meters should be in accordance with the |

| | |
|---|---|
| | stipulation of the meter supplier or national requirements. If these standards are not available, and meter supplier does not specify, calibrate the meters every 3 years and use the meters with at least 0.5 accuracy class (e.g. a meter with 0.2 accuracy class is more accurate and thus it is accepted).<br><br>In case of missing data due to meter failure or other reasons for a certain period of time, the following options to estimate electricity consumption may be applied: (a) A conservative value based on rated capacity and full operational hours (8760 hours) |
| Purpose of Data | -Calculation of baseline emissions |

| Data/Parameter | EF, *CO2, GRID, y* |
|---|---|
| Data unit | tCO2 /MWh |
| Description | Fixed 2020-2022 -Ex-Ante |
| of data<br>Value(s) applied | UCR Standard Protocol<br>As per Standard |
| Measurement methods and procedures | Fixed |
| Monitoring frequency | NA |
| Purpose of data | To estimate baseline emissions |