PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (Co_2U) PROJECT

Title: 2 MW Solar Power Plant by Subburaj Spinning Mills Pvt Ltd, Tuticorin District,Tamil Nadu.
Version 1.0
Date 30th June 2023
First Co_2U Issuance Period: 30th September 2022 to 30th Sep 2023
First Monitoring Period: 30th September 2022 to 30th Sep 2023
Date: 30th September 2022 to 30th Sep 2023
1st Crediting Period: 1 year 0 months

Project Concept Note (PCN)
CARBON OFFSET UNIT (Co_2U) PROJECT

BASIC INFORMATION	
Title of the project activity	2 MW Solar Power Plant by Subburaj Spinning Mills Pvt Ltd, Tuticorin, Tamil Nadu.
Scale of the project activity	Small Scale
Completion date of the PCN	30th June 2023
Project participants	Project Proponent (PP): Subburaj Spinning Mills Private Limited. UCR Aggregator: eClouds Energy LLP. UCR ID: 980949808
Host Party	INDIA
Applied methodologies and standardized baselines	Type I (Renewable Energy Projects) UNFCCC Methodology Category AMS I.D.: "Grid connected renewable electricity generation" Version 18 UCR Protocol Standard Baseline EF
Sectoral scopes	01 Energy industries (Renewable/Non Renewable Sources)
The estimated amount of total GHG emission reductions	3420 Co_2Us (3420 tCO_{2eq}) / per year from Solar power generation of 38,00,000 units.

SECTION A. Description of project activity

A.1. Purpose and general description of Carbon offset Unit (Co_2U) project activity :

The project **M/s. Subburaj Spinning Mills Private Limited** is located in SF.NO.487(1) Village: Nedunkulam ,Taluk: Sathankulam , District: Tuticorin, State: Tamil Nadu, Country: India.

The details of the registered project are as follows:

Purpose of the project activity:

Solar energy can significantly contribute to ecological well-being as an alternative energy option. Unlike fossil fuels, solar energy generates zero carbon emissions, making it an essential component in promoting environmental friendliness. By reducing reliance on conventional energy sources, solar power has the potential to mitigate the adverse effects of climate change and foster a sustainable future.

The proposed project activity of 2.0 MW (i.e.,2000 kW) is the installation and operation of a solar power plant in Nedunkulam Village, Sathankulam Taluk, Tuticorin District., Tamil Nadu.

Village	District	Type	Total installed capacity kW	Commissioning date
Nedunkulam	Tuticorin	Ground mounted	2000	30th September 2022

Based on the ex-ante estimate, this project is expected to generate approximately 38,00,000 units of power annually, assuming an average Plant Load Factor (PLF) of 20%. The project employs Mono Crystalline solar photovoltaic technology to produce clean energy. Solar photovoltaic power generation is considered a clean technology because it does not involve the burning of fossil fuels or the release of greenhouse gases during the process. The basic building block of the entire PV system is the photovoltaic module, which consists of multiple solar cells connected by circuits and protected by an environmentally sealed laminate. A group of PV panels installed on a frame is referred to as a "PV Array." By replacing electricity generated from fossil fuels on the local grid, the project activity effectively reduces greenhouse gas (GHG) emissions. The specific technological details can be found in Section A.4 of the project documentation.

It is anticipated that the project activity will result in an average annual reduction of 3420 tCO_2e (metric tons of carbon dioxide equivalent) in CO_2 emissions. The actual emission reduction achieved during the first period of Certified Emission Reductions (CERs) will be presented as part of the initial monitoring and verification process.

Since the project activity utilizes solar energy, a clean and renewable energy source, there are no adverse environmental effects associated with it. This contributes to the global efforts in combating climate change and promoting sustainability.

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

There are social, environmental, economic, and technological benefits that contribute to sustainable development.

Social Benefits:

The implementation of this project has created employment opportunities for close to 10 people in that locality during the construction phase, yielding positive outcomes. Furthermore, ongoing employment prospects have been provided to the local community, ensuring sustained benefits. This trend of job creation will continue throughout the project's lifespan, contributing to poverty reduction in the surrounding region. The availability of consistent job opportunities will have a lasting impact on improving the livelihoods of the local population.

Environmental Benefits:

The project's power generation relies on solar energy, which emits zero greenhouse gases (GHG) and specific pollutants like SOx, NOx, and SPM that are commonly associated with conventional thermal power generation. By harnessing clean and renewable solar energy, the project actively contributes to reducing environmental emissions. Additionally, the use of solar energy for electricity generation promotes resource conservation, reducing dependence on fossil fuels and preserving rapidly depleting natural resources. The project has minimal impacts on land, water, air, and soil, ensuring negligible negative effects on the surrounding environment and actively contributing to its overall well-being.

Economic Benefits:

The construction of this project in the Tuticorin district brings significant economic advantages. Firstly, it generates employment opportunities throughout the project lifecycle, including construction, operations, and maintenance. This not only fosters economic growth but also ensures income stability for the local community. Moreover, the solar plant contributes to the energy sector by expanding power supply in Tamil Nadu, reducing reliance on conventional energy sources, and enhancing energy security. As a result, electricity prices stabilize, and industrial, commercial, and residential consumers can rely on a dependable source of clean energy. Furthermore, the development of solar infrastructure attracts investments and stimulates the growth of related industries such as solar equipment manufacturing and installation services. Overall, these economic effects lead to increased tax revenue, improved infrastructure development, and enhanced business prospects, positioning the Tuticorin district as an attractive destination for renewable energy investments.

A.3. Location of project activity >>

Country: India.
District: Tuticorin.
Village: Nedunkulam.
Taluk: Sathankulam.
State: Tamil Nadu.
Latitude: 8.472360 N
Longitude: 77.888565E

Map showing the location of the project activity:

A.4. Technologies/measures :

The project utilizes renewable solar energy to generate power, distinguishing it from traditional power plants. Among the environmentally beneficial technologies currently available, solar photovoltaic systems stand out as they produce no greenhouse gases during operation. The primary components of the entire photovoltaic generating unit are photovoltaic modules, which consist of multiple solar cells interconnected by circuits and enclosed in a protective laminate. A "PV Array" refers to a collection of PV panels installed on a frame. To ensure environmental safety, the project has carefully selected and implemented reliable and well-tested technology.

Each power production unit will in general constitute the following equipment:

- Solar Photovoltaic modules
- Inverters
- Transformers Circuit breakers
- Mounting structures
- Cables and hardware.
- Junction box and distribution boxes.
- Grounding kit.
- Control room equipment.
- System for control and monitoring.
- Evacuation system

Parameter	Description
Total number of Photovoltaic Modules	4816
Rating of Photovoltaic Module	Yingli 540Wp
No. of Inverter	10
Inverter Capacity	2 MW
Invertor make	HUAWEI SUN 2000-200KTL-H2
Power Transformer	Padmavahini Transformer
Make	Padmavahini Transformer
Rating	2500KVA
Auxiliary Transformer	Alco Elecs
Make	Alco Elecs
Rating	15KVA

A.5. Parties and project participants >>

Party (Host)	Participants/Aggregator
India	**Project Owner: M/s.Subburaj Spinning Mills Private Limited** is located in SF.NO.487(1) Village: Nedunkulam ,Taluk: Sathankulam , District: Tuticorin, State: Tamil Nadu, Country: India. **Project Aggregator: eClouds Energy LLP,** #81 West Venkatasamy Road, R.S.Puram, Coimbatore 641002, Tamil Nadu INDIA Email: nocarbon@ecloudsenergy.com

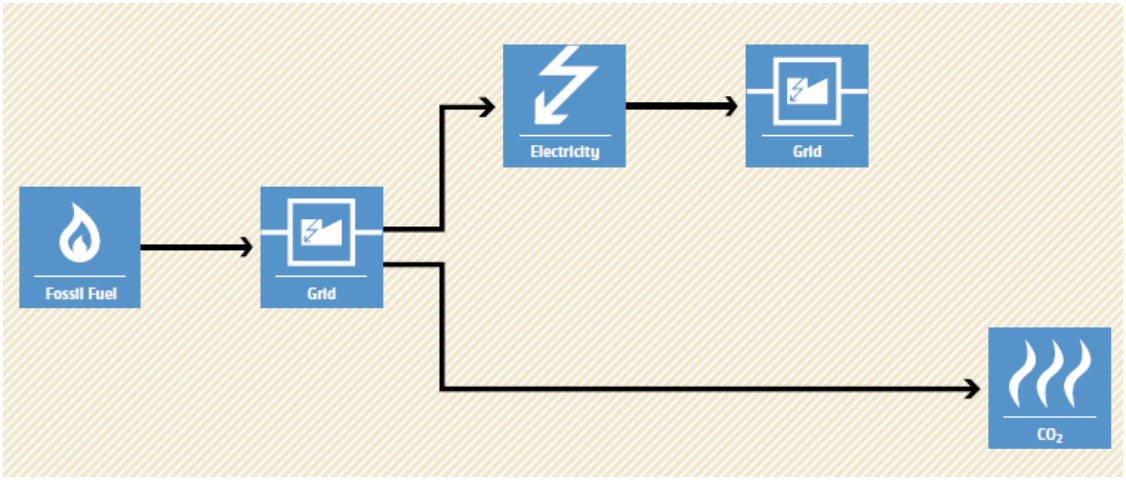
A.6. Baseline Emissions>>

- Grid

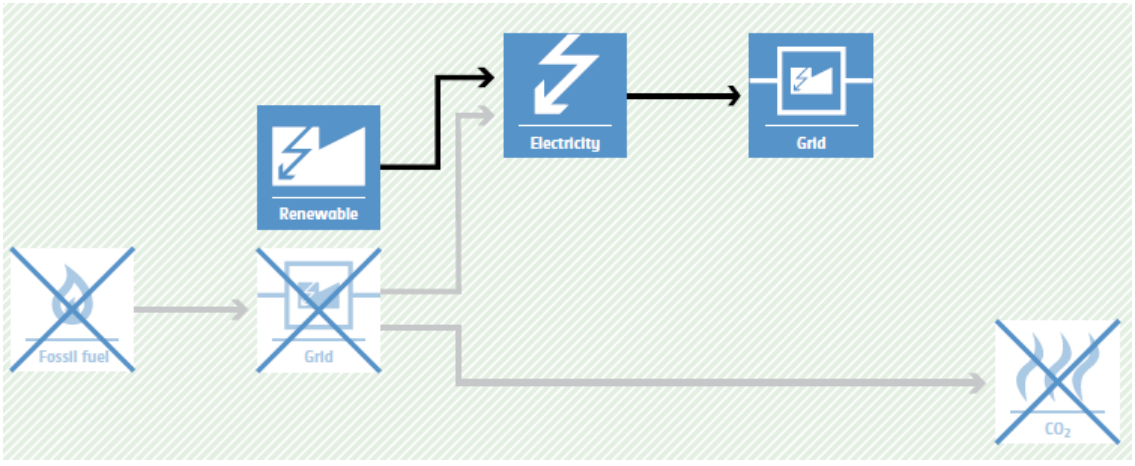
The same quantity of electricity would have been generated from the National grid (which is connected to the unified Indian Grid system) in the absence of the project activity, which is carbon intensive because it is primarily produced from fossil fuel-based power plants.

Schematic diagram showing the baseline scenario:

Baseline Scenario:



Project Scenario:



A.7. Debundling:

This project activity is not a 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. (Title: "Grid connected renewable electricity generation", version 18)

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

This project involves the construction and operation of a new solar power facility designed to supply electricity to the grid. With an installed capacity of 2.0 MW, the project falls under the small-scale category as per Type-I classification of the Small-Scale approach. In accordance with the AMS-I.D., version 18 methodology, the project's eligibility status aligns with the prescribed requirements.

Applicability Criterion	Project Case
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project activity involves setting up of a grid connected renewable energy (solar) generation plant for selling it to the grid. Therefore, it meets both the requirement point (a & b) of criteria 1.
2. 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 option (a) of applicability criteria 2 is applicable as project is a Greenfield plant /unit. Hence the project activity meets the given applicability criterion.

3. 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 existing reservoir, with no change in the volume of the reservoir; or (b) The project activity is implemented in existing reservoir, where the volume of the reservoir(s) is increased and the power density 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	The project activity involves installation of Solar PV (SPV). Hence, this criterion is not applicable.
4. 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 proposed project is 2.0 MW solar power project, i.e., only component is renewable power project below 15 MW, thus the criterion is not applicable to this project activity.
5. Combined heat and power (co-generation) systems are not eligible under this category	This is not relevant to the project activity as the project involves only solar power generating units.
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 distinct1 from the existing units.	There is no other existing renewable energy power generation facility at the project site. Therefore, this criterion is not applicable.
7. 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 new installation, it does not involve any retrofit measures nor any replacement and hence is not applicable for the project activity.

8. 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.	This is not relevant to the project activity as the project involves only solar power generating units.
9. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	No biomass is involved, the project is only a solar power project and thus the criterion is not applicable to this project activity.

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

Due to the following factors, there is no double acCounting of emission reductions in the project activity:

- Based on its geographic location, the project may be uniquely identified.
- The project has a specific connection point and commissioning certificate.
- The project is linked to energy meters that are devoted to the project developer's consumption point.

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

The physical location of the solar power plant, the energy metering hardware, and the associated local electrical infrastructure are all included in the project perimeter.

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_2O	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_2O	No	Project activity does not emit N_2O
		Other	No	No other emissions are emitted from the project

B.5. Establishment and description of baseline scenario (UCR Standard or Methodology**) :**

Net GHG Emission Reductions and Removals
Thus, **ERy = BEy – PEy – LEy**
Where:
ERy = Emission reductions in year y (tCO_2/y)
BEy = Baseline Emissions in year y ($t\ CO_2/y$)
PEy = Project emissions in year y (tCO_2/y)
LEy = 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:
BEy = EGPJ,y × EFgrid,y

Where,
BEy = Baseline emissions in year y ($t\ CO_2$)
EGPJ,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)
EFgrid,y = UCR recommended emission factor of 0.9 CO_2/MWh has been considered. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4).

Project Emissions:

Since the project activity is a solar power project, project emission for renewable energy plants is nil.

Thus, PEy =0.

Leakage:

As per paragraph 42 of AMS-I.D. 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 zero.

Hence, LEy= 0

The actual emission reduction achieved during the first Co_2U period shall be submitted as a part of The first is monitoring and verification. However, for an ex-ante estimation, the following calculation has been submitted:

Estimated annual baseline emission reductions (BEy)

= 3800 MWh/year × 0.9 tCO_2/MWh

= 3,420 tCO_2e/year (i.e., 3,420 Co_2Us/year)

B.6. Prior History:

The project activity is a utility-scale ground-mounted solar project, and it has never been registered with UCR or under any other GHG mechanism.

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

There has been no claim of a reduction in greenhouse gas emissions as of the commencement date of crediting under UCR, which is 02nd February 2023.

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

The implemented technique and registered PCN monitoring plan have not undergone any long-term alterations.

B.9. Monitoring period number and duration>>

First Issuance Period: 1year, 0 months – 30/Sep/2022 to 30/Sep/2023

B.10. Monitoring plan>>

The amount of net electricity supplied to the grid is one of the key metrics tracked.

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) 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 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 a conservative approach.
Source of data	UCR CO_2U Standard Aug 2022 (Updated Ver.6)
Value applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of Data	For the calculation of the Emission Factor of the grid

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

Parameter	$EG_{PJ,y}$
Data unit	MWh
Description	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of this project activity in year y (MWh).
Source of data Value(s) applied	Joint Meter Reading (JMR), Actual meter reading(AMR)
Procedures	The Net electricity generation by the solar power plant is recorded by the project proponent in therecord logs. At the end of every month, Energy bills generated based on the total monthly electricity exported to the grid.
Monitoring frequency	Monthly
Purpose of data	To estimate Baseline Emission
Energy Meter Make	L&T , L&T
Energy Meter S No	22005785 , 22005786
Energy Meter Class	0.2s , 0.2s