Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: 2 MW Solar Power Plant by Subburaj Spinning Mills Pvt Ltd,

Tuticorin District,Tamil Nadu.

Version 1.0

Date 01st Dec 2023

First CoU Issuance Period: 30th September 2022 to 30th Sep 2023
First Monitoring Period: 30th September 2022 to 30th Sep 2023
1st Crediting Period: 1 year 0 months

Monitoring Report (MR)
CARBON OFFSET UNIT (CoU) PROJECT

Monitoring Report	
Title of the project activity	2 MW Solar Power Plant by Subburaj Spinning Mills pvt ltd, Tuticorin, Tamil Nadu.
UCR Project Registration Number	342
Version	Version:01
Completion date of the MR	01/12/2023
Monitoring period number and duration of this monitoring period	Monitoring Period Number:01 Duration of this monitoring Period: (first and last days included (30/09/2022 to 30/09/2023)
Project participants	Project Proponent (PP): Subburaj Spinning Mills Pvt Ltd 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" Ver 18 UCR Protocol Standard Baseline Emission Factor
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources).
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	3420 CoUs (3420 tCO_{2eq}) from Solar power generation of 38,00,000 units.

SECTION A. Description of project activity

A.1. Purpose and general description of 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:

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 3,800,000 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.

b) Brief description of the installed technology and equipment>>

The project activity entails a single ground-mounted PV Plant with a total installed capacity of 2 MW. According to the equipment supplier, the typical lifetime of a photovoltaic panel is roughly 20 years. Solar cells (photovoltaic cells) convert solar energy directly into electricity. When light contacts the junction of a metal and a semiconductor (such as silicon) or the junction of two distinct semiconductors, a small electric potential is created. A photovoltaic module is made up of multiple solar cells connected by circuits and sealed in an environmentally friendly laminate, and it serves as the essential building element of the entire PV-generating unit. PV Array refers to a grouping of PV panels installed on a frame.

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

The duration of the crediting period corresponding to the monitoring period is covered in this monitoring report.

UCR Project ID :342
Start Date of Crediting Period: 30/09/2022
Project Commissioned: 30/09/2022

d) Total GHG emission reductions achieved or net anthropogenic GHG removals by sinks achieved in this monitoring period>>

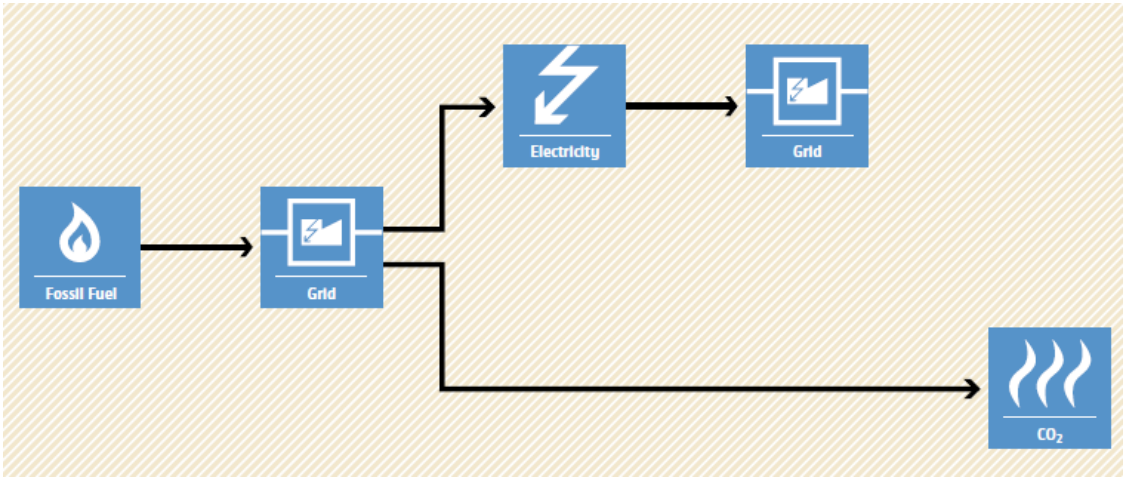
The total GHG emission reductions achieved in this monitoring period is as follows:

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	30/09/2022
Carbon credits claimed up to	30/09/2023
Total ERs generated (tCO_{2eq})	3186 tCO_{2eq}
Leakage	0

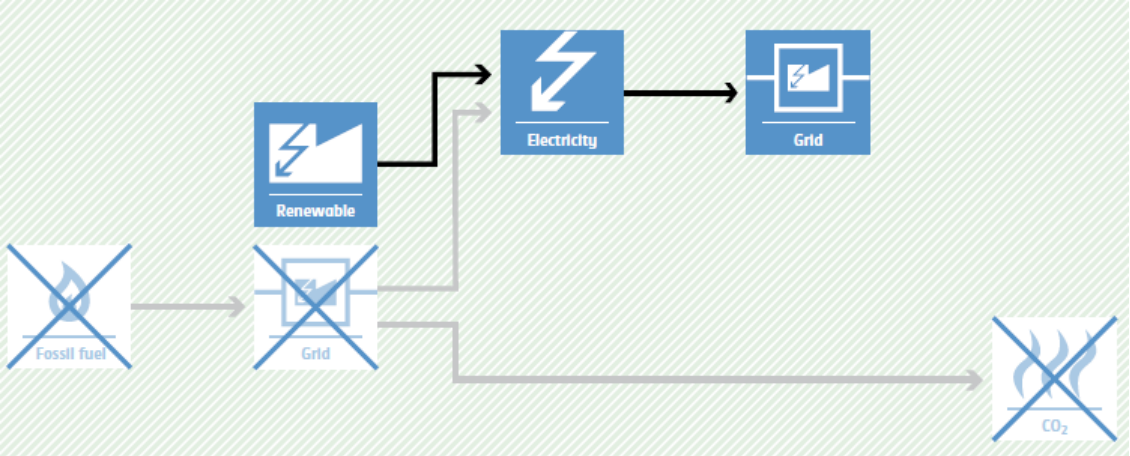
e) Baseline Scenario>>

Schematic diagram showing the baseline scenario:

Baseline Scenario:



Project Scenario:



A.2. Location of project activity>>

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

A.3. Parties and project participants

Party (Host)	Participants
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.4. References to methodologies and standardized baselines >>

SECTORAL SCOPE - 01 Energy industries (Renewable/Non-Renewable Sources)

TYPE - Renewable Energy Projects

CATEGORY- AMS-I. D: “Grid connected renewable electricity generation”, Ver 18.

A.5. Crediting period of project activity >>

Start Date of Crediting Period Subburaj Spinning Mills Pvt Ltd: 30/09/2022.
Length of the crediting period corresponding to this monitoring period: 1 year i.e., 30/09/2022 to 30/09/2023

A.6. Contact information of responsible persons/entities >>

Name: Shamuthira Hari G
Contact No: +91 7397492517
E-Mail: shamuthirahari@gmail.com , nocarbon@ecloudsenergy.com.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity >>

a) Provide information on the implementation status of the project activity during this monitoring period in accordance with UCR PCN>>

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.

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

b) For the description of the installed technology(ies), technical process and equipment>>

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

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

The project did not cause any damage, hence no mitigating actions are necessary.

Social Benefits:

The construction, installation, and ongoing maintenance of the solar plant are creating job opportunities for local residents. This includes roles in construction, engineering, operations, and maintenance. The solar industry is demanding a range of skills, from installation and maintenance to monitoring and management. Local workers are acquiring valuable technical skills that benefit them in their current roles and future employment opportunities. If the solar project involves partnerships with local landowners or property owners, they are receiving lease payments for hosting the solar panels. This additional income is contributing to the local economy and supporting landowners. It is serving as educational resources, providing opportunities for schools and the community to learn about renewable energy technologies and environmental sustainability.

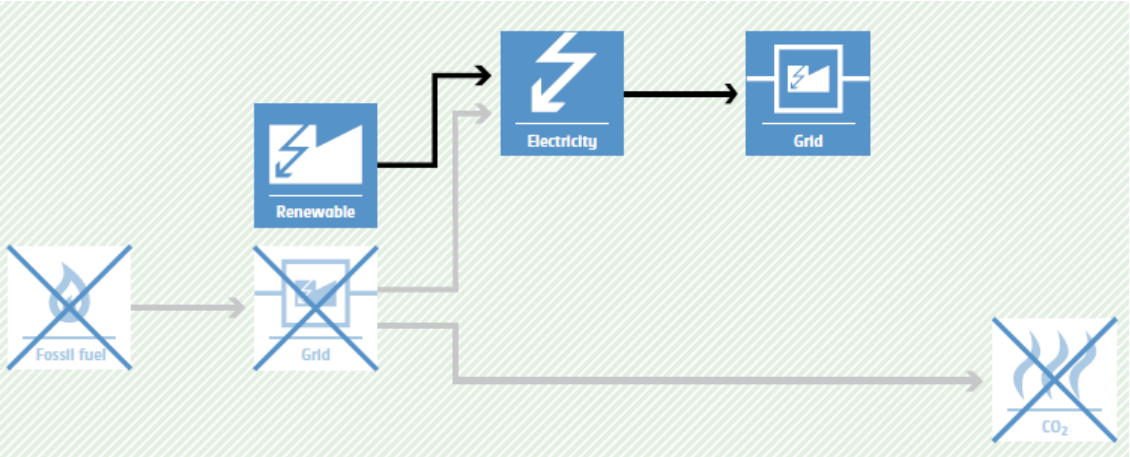
Environmental Benefits:

The endeavor is involving harnessing power from a solar-based facility that is producing no greenhouse gases (GHG) or specific pollutants like SOx, NOx, and SPM, which are typically linked with traditional thermal power generation. Through the adoption of solar energy, a clean and renewable resource, the initiative is significantly aiding in diminishing environmental emissions. Additionally, utilizing solar energy to generate electricity is fostering the conservation of resources, lessening dependency on fossil fuels, and safeguarding rapidly depleting natural reserves. The project's impact on land, water, air, and soil is minimal, ensuring negligible adverse consequences on the surrounding environment and actively contributing to its overall health.

Economic Benefits:

The development, construction, installation, and ongoing operation of a solar power plant are requiring a workforce. This is creating job opportunities for local residents, ranging from construction workers and electricians to engineers and administrative staff. If the solar project involves leasing land or rooftops from local property owners, they are receiving lease payments. This additional income is injecting revenue into the local economy and providing property owners with a new income stream. If the solar power generated by the plant is being utilized within the community, it is offsetting the need to purchase electricity from external sources. This is leading to cost savings for local businesses, homes, and public facilities. Solar power plants have a relatively long operational lifespan, often spanning decades.

B.3. Baseline Emissions>>



As a result of this project activity, an equivalent amount of electricity from the Indian grid was replaced.

As a result, the project activity would continue to replace fossil fuel-based power plants and combat the effects of climate change.

B.4. Debundling>>

This project activity is not a de-bundled component of a larger project activity.

SECTION C. Application of methodologies and standardized baselines

C.1. References to methodologies and standardized baselines >>

Sectoral Scope: 01 Energy industries (Renewable/Non-Renewable Sources)
TYPE I – Renewable Energy Projects
Applied Baseline Methodology: AMS-I.D.: "Grid connected renewable electricity generation", version 18

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

The project activity involves the generation of grid connected electricity from the construction and operation of a new Solar Photovoltaic based project and to use for captive purpose.
The project activity has installed a total of 2 MW grid connected renewable energy project 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 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 the requirement of point (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.	The project activity involves installation of Solar PV (SPV). Hence, this criterion is not applicable.

(c) (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	
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.

C.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.

C.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

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

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 CoU 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)

= 3539 MWh/year × 0.9 tCO_2/MWh

= 3,186tCO_2e/year (i.e., 3,186 CoUs/year)

C.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.

C.7. Monitoring period number and duration>>

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

C.8. Changes to start date of crediting period >>

There is no change in the start date of crediting period.

C.9. 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.

C.10. Monitoring plan>>

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

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 CoU 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) Bilateral meter reading
Procedures	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 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

Emission reduction details:

Subburaj Spinning Mills Private Limited					
PLANT HTSC: 079514700449					
Month	**Import**	**Export**	**Net Generation**	**Emission factor**	**CoUs**
Sep-22				0.90	-
Oct-22	3,456	66,050	62,594	0.90	56.33
Nov-22	1,248	2,18,257	2,17,009	0.90	195.31
Dec-22	1,248	2,56,093	2,54,845	0.90	229.36
Jan-23	1,488	3,33,516	3,32,028	0.90	298.83
Feb-23	1,344	3,12,416	3,11,072	0.90	279.96
Mar-23	1,728	3,53,765	3,52,037	0.90	316.83
Apr-23	1,704	3,18,619	3,16,915	0.90	285.22
May-23	1,656	3,33,290	3,31,634	0.90	298.47
Jun-23	1,704	3,40,535	3,38,831	0.90	304.95
Jul-23	1,776	3,40,495	3,38,719	0.90	304.85
Aug-23	1,824	3,75,999	3,74,175	0.90	336.76
Sep-23	1,824	3,11,908	3,10,084	0.90	279.08
Total			**35,39,943**		**3,186**
Total CoUs = Total Generation * 0.9/1000					
Plant 1 - Total CoUs			**3,186**		
Note: Total Import and Total Export calculated for Net Generation Net Generation is Total Export - Total Import					