PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title: 1.10 MW Solar Rooftop Project of Kayaar Exports Private Limited

Version 1.0

Date 20/06/2023

First CoU Issuance Period: 10 years, 0 months

Date: 29/03/2019 to 28/03/2029

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

BASIC INFORMATION	
Title of the project activity	1.10 MW Solar Rooftop Project of Kayaar Exports Private Limited
Scale of the project activity	Small Scale
Completion date of the PCN	20/06/2023
Project participants	First Climate (India) Private Limited (AGGREGATOR) Kayaar Export Private Limited (DEVELOPER)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I.F.:"Renewable electricity generation for captive use and mini-grid", Version 05.0 Standardized Methodology : Not Applicable
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of total GHG emission reductions	1754 CoUs (1754 tCO2eq)

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

BASIC INFORMATION	
Title of the project activity	1.10 MW Solar Rooftop Project of Kayaar Exports Private Limited
Scale of the project activity	Small Scale
Completion date of the PCN	20/06/2023
Project participants	First Climate (India) Private Limited (AGGREGATOR) Kayaar Export Private Limited (DEVELOPER)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I.F.:"Renewable electricity generation for captive use and mini-grid", Version 05.0 Standardized Methodology : Not Applicable
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of total GHG emission reductions	1754 CoUs (1754 tCO2eq)

SECTION A. Description of project activity

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

The project "**1.10 MW Solar Rooftop Project of Kayaar Exports Private Limited**" is located in Village K.R.Nagar, Tehsil Kovilpatti, District Thoothukudi, State Tamil Nadu, Country India.

The details of the registered project are as follows:

Purpose of the project activity:

The project activity is an installation of a rooftop 1.10 MW solar power plant on roof of the project developer to generate clean electricity utilizing solar energy. The electricity generated from project activity is evacuated to the industry for own captive consumption, thus replacing the equivalent amount of electricity, generated from the operation of existing grid connected power plants (mostly fossil fuel based).

The project activity is implemented on the rooftop of Kayaar Exports Private Limited, situated at Thoothukudi district of Tamil Nadu in India. The main purpose of the project activity is to generate electrical energy through sustainable means using solar power resources, thus the generated green electricity will contribute to climate change mitigation efforts. The Project activity comprising of 1.10 MW solar rooftop project was commissioned on 29.03.2019 by M/s. Kayaar Exports Private Limited (Project Developer).

In absence of the project activity, equivalent amount of electricity which is imported by the project developer for own consumption would have been imported from the grid by fossil fuel based power plant connected to this grid. The project activity is expected to supply approximately 1948 MWh of renewable power to the consumer facility each year. Hence, the project activity is expected to reduce the anthropogenic emission by 1754 t-CO2e/Yr.

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

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

Social benefits:

- The installation and commissioning activity of this solar power project provides employment which further contributes to economic development.
- Such project promotes green jobs and having sustainability at its core, employees also discover a sense of meaning and purpose of their jobs and value their collective and individual contributions in building a sustainable future. This in turn promotes happiness and harmony in the employees.
- The occupational hazards associated with the coal mining industry is serious and impairs the healthy living of the miners. By promoting green energy, the use of coal (which is the choice of fuel in supplying electricity to the grid) is discouraged and thereby coal mining industry is discouraged. This abates the exposure of people to such dangerous working conditions.

Environmental benefits:

- As this project generates renewable energy, it replaces the use of coal (the most common fuel of choice for generating electricity) in the grid and promotes greenhouse gas emission avoidance in the course.
- By avoiding global warming (from using fossil fuels for electricity which would have otherwise occurred in absence of the project activity), the project owner is avoiding further catastrophic impacts on the global climate due to global warming. Events such as melting ice caps, increase in sea levels, changes in global rainfall patterns and its subsequent impact on agriculture, health and diseases, food security and economy are gargantuan problems that can be reduced with avoidance of global warming.

Economic benefits:

- The more the renewable energy is adopted, the more shall this industry flourish- reducing the marginal cost of the next installation. Over time, there shall be a sizeable reduction in cost of installation of such projects due to economies of scale.
- A prosperous renewable energy generation industry helps in creating new and promising avenues for employment and investment of capital. This in turn shall lead to economic prosperity.

Technological benefits:

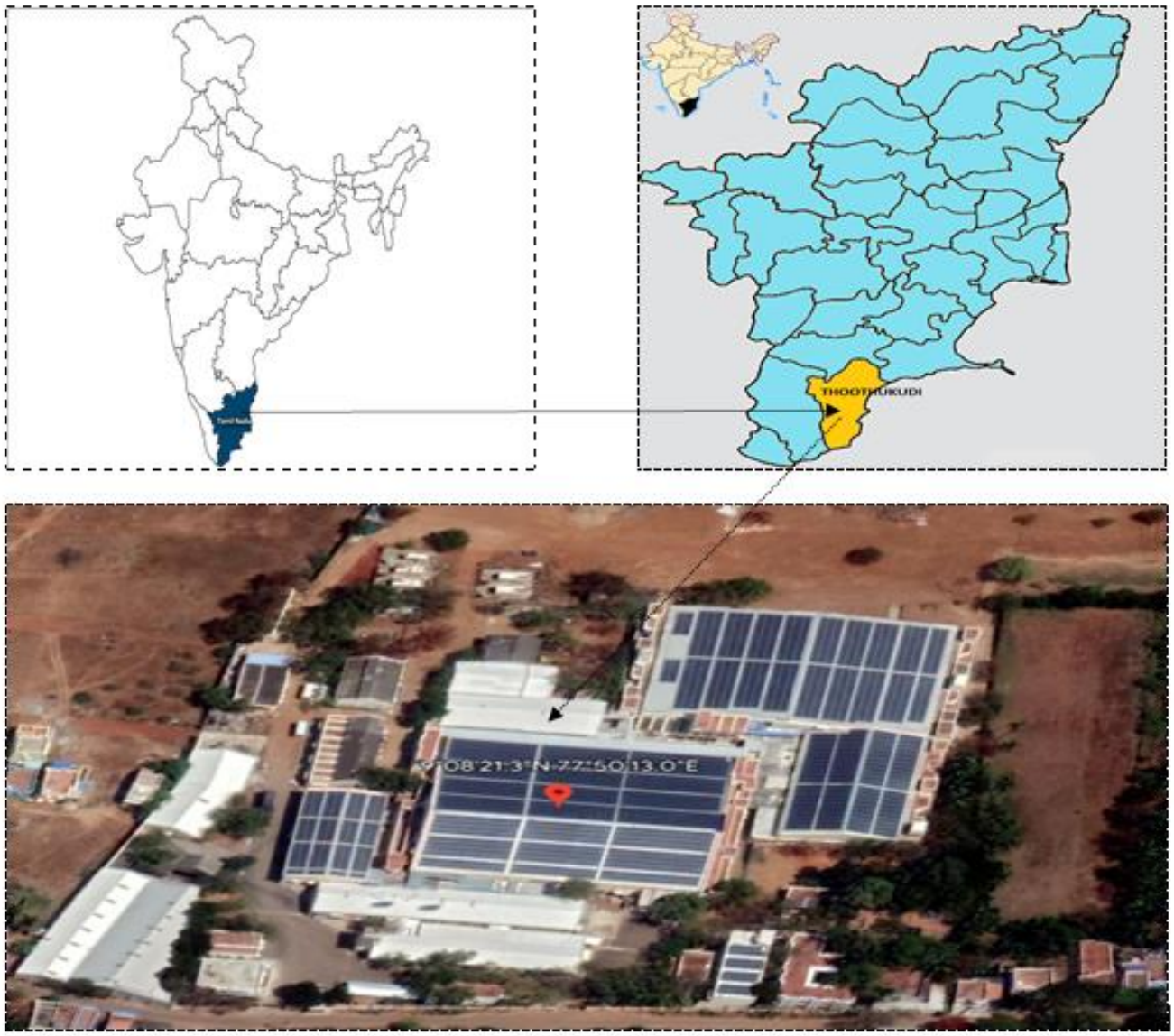
- Adoption and implementation of renewable energy generation projects promote more investment of men, capital and resources into the research and development of better and more efficient technologies in this domain.
- When the technology becomes rampant, it is easier to locate for spare parts, qualified service staff, etc., promoting continued and sustained use of the renewable technology equipment.

A.3. Location of project activity >>

Country: India
District: Thoothukudi
Village: K.R.Nagar
Tehsil: Kovilpatti
State: Tamil Nadu
Code: 628503

The project site is well connected by district and village roads to the nearest town. The geographic co-ordinates of the project location are:

Name of the Project	Geo-coordinates of the Project
1.10 MW Solar Rooftop Project of Kayaar Exports Private Limited	Latitude: 9.1392°N (9°08'21.3"N) Longitude: 77.8369°E (77°50'13.0"E)



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 specifications of the key components that are used for baseline calculations or methodology selection limits as follows:

Specification	Value
Solar PV Module make	Canadian Solar
Total Number of PV Modules	4494
Rating of PV Module	325 Wp
Solar PV Module Technology	Poly Crystalline Silicon PV Module
Inverter Make	Fimer PVS-100-TL (Formerly known as ABB)
Type of Inverter	String Inverter
Total Number of Inverters	15
Rating of Inverter	ABB 100 KW – 10 Nos. ABB 50 KW – 1 No. ABB 27 KW – 2 Nos. ABB 20 KW – 2 Nos.
DC bus System Voltage	1000 V
Tilt of Solar	10°
Module Mounting Structure Type	Premises Roof Sheds
PV Module Mounting Structure Specification	Al Roof Top Mounting Rail

A.5. Parties and project participants >>

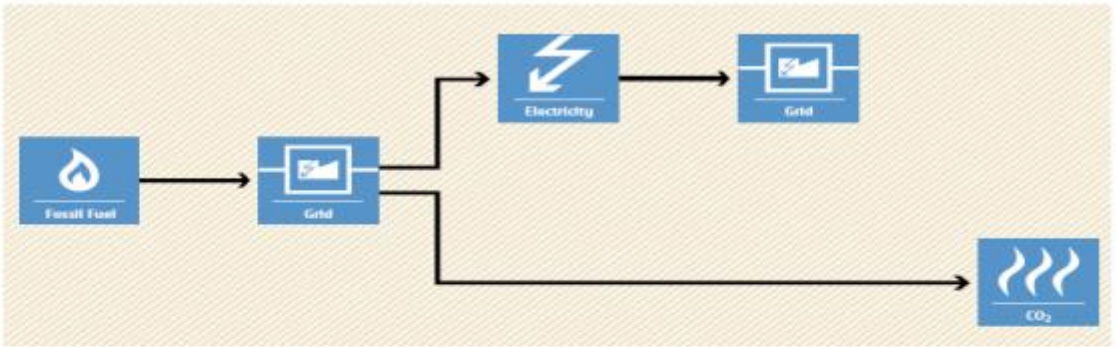
Party (Host)	Participants
India	First Climate India Pvt. Ltd. (AGGREGATOR) Contact Person: Partha P Chaudhuri Mobile: +91 9831012824 Address: 903 ERGO Tower, Plot No. A1-4, Block EP & GP, Sector V, Salt Lake, Kolkata - 700 091, India Kayaar Exports Pvt. Ltd. (DEVELOPER) Address: Railway Feeder Road, K.R. Nagar, Kovilpatti - 628503, Tamil Nadu, India

A.6. Baseline Emissions>>

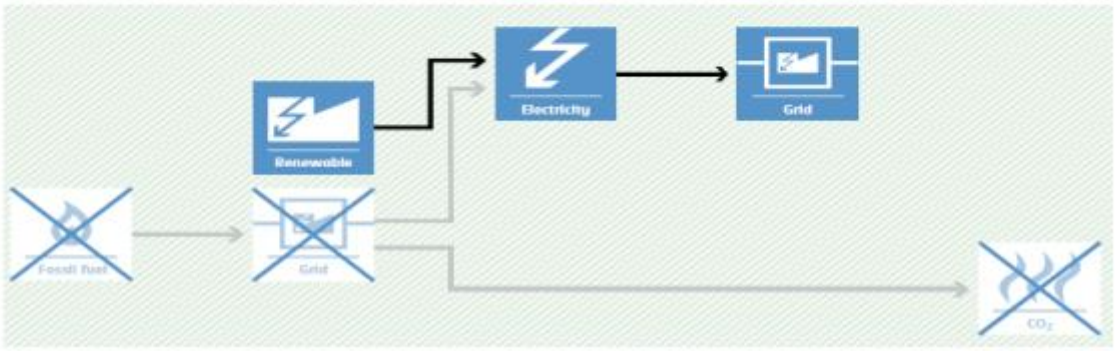
The baseline scenario identified at the PCN stage of the project activity is:

- The scenario existing prior to the implementation of the project activity, is electricity delivered to the facility by the project activity that would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources. This is a green field project activity. There was no activity at the site of the project participant prior to the implementation of this project activity. Hence pre-project scenario and baseline scenario are the same.

Baseline Scenario:



Project Scenario:



A.7. Debundling>>

This **1.10 MW Solar Rooftop Project of Kayaar Exports Private Limited** project 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.F.: Renewable electricity generation for captive use and mini-grid - Version 05.0

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

The project activity is an installation of a rooftop 1.10 MW solar power plant on roof of the project developer to generate clean electricity utilizing solar energy. The electricity generated from project activity is evacuated to the industry for own captive consumption. The project is in line with the Type-I of the Small Scale Methodology, corresponding to methodology AMS-I.F., Version 05.0 and the applicability of the methodology is discussed below:

<table>
<tr><th>Applicability of the Project</th><th>Project case</th></tr>
<tr><td>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 one or more sources listed below:
a) A national or a regional grid (grid hereafter);
b) A fossil fuel fired captive power plant;
c) A carbon intensive mini-grid</td><td>The project activity involves the installation of a solar rooftop project for renewable electricity generation for captive use. The generated electricity is being evacuated to the existing LV side of the textile mill (consumption facility). In absence of the project activity, equivalent amount of electricity would have been sourced from the fossil fuel dominated national grid.

Hence it satisfies this applicability criteria.</td></tr>
<tr><td>Illustration of respective situations under which each of the methodology (“AMS-I.D.: Grid connected renewable electricity generation”, “AMS-I.F.: Renewable electricity generation for captive use and mini-grid” and “AMS-I.A.: Electricity generation by the user”) applies is included in table below:

Applicability of AMS-I.D, AMS-I.F and AMS-I.A based on project types:

<table>
<tr><th>Sl. Nos.</th><th>Project type</th><th>AMS-I.A</th><th>AMS-I.D</th><th>AMS-I.F</th></tr>
<tr><td>1</td><td>Project supplies electricity to a</td><td></td><td>√</td><td></td></tr>
</table>
</td><td>The project activity applies methodology, AMS
I.F and the detailed scenario has been explained.

Generated electricity from the solar power plant would primarily deliver renewable electricity to its own facility for captive consumption and thereby displacing the fossil fuel dominated grid electricity. This resembles the scenario listed at S.I nos. 2 of the table and hence the methodology, AMS IF is applied appropriately.</td></tr>
</table>

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

This methodology is applicable to project activities that: a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the	The proposed project activity is a green field solar rooftop plant and before commissioning of this project activity there was no renewable power project implemented.

project activity (Greenfield plant); b) Involve a capacity addition, c) Involve a retrofit of (an) existing plant(s); d) Involve a replacement of (an) existing plant(s).	Therefore, it confirms to the said criteria.
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.	It is a greenfield project activity and does involve the addition of renewable energy generation units at an existing renewable power generation facility. Hence this criterion is not applicable.
In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	This project activity is not a modification/ retrofit measure in an existing power plant. Hence this criterion is not applicable.
If the unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	This project activity is solely renewable energy project with 1.1 MW capacity and has no non-renewable component is associated with this project. Hence criterion is not applicable.
Combined heat and power (co-generation) systems are not eligible under this category.	The project activity is a solar PV rooftop project and does not involve cogeneration. Hence it satisfies the applicability criteria.
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/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.	Project activity instances does not include hydro power generation. Hence, this criterion is not applicable.
If electricity and/or steam/heat produced by the project activity is delivered to a third party, i.e. another facility or facilities within the project	This is a greenfield solar power rooftop project activity and the electricity generated is being evacuated to the existing LV side of

boundary, a contract between the supplier and consumer(s) of the energy will have to be entered that ensures that there is no double counting of emission reductions.	the textile mill (consumption facility). No third-party sale is applicable for this project activity. Hence, this criterion is not applicable.
In the case the project activities utilizes biomass, the "TOOL16: Project and leakage emissions from biomass" shall be applied to determine the relevant project emissions from the cultivation of biomass and the utilization of biomass or biomass residues.	The project activity is a solar power rooftop project and is not a biomass power plant. Hence the criterion is not applicable

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

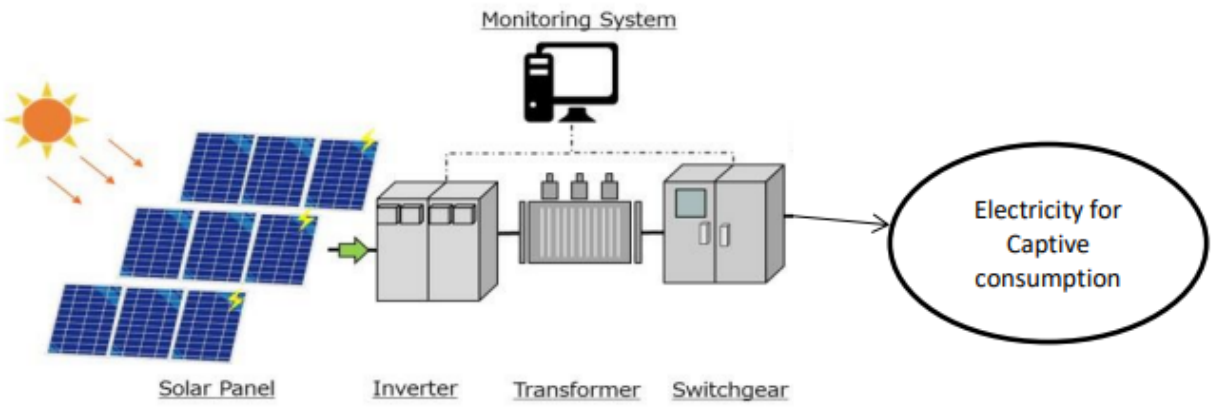
The project**, 1.10 MW Solar Rooftop Project of Kayaar Exports Private Limited,** located at Railway Feeder Road, K.R. Nagar, Kovilpatti - 628503, Tamil Nadu, India. There is no double accounting of emission reductions in the project activity due to the following reasons:

No other registered project is located in the same location. This project is not a component of any registered large scale project or PoA.
Project has dedicated commissioning certificate and connection point,
Project has obtained dedicated consent to establish certificate from relevant authorities

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

As per applicable methodology AMS-I.F., Version 05.0, para 18, "The spatial extent of the project boundary includes industrial, commercial facilities consuming energy generated by the system. In the case of electricity generated and supplied to distributed users (e.g. residential users) via mini/isolated grid(s) the project boundary may be confined to physical, geographical site of renewable generating units".

Project boundary of this project is illustrated below:



The project boundary includes the physical, geographical site(s) of:

The table below provides an overview of the emissions sources included or excluded from the project boundary for determination of baseline and project emissions.

Source		GHG	Included?	Justification/Explanation
Baseline	Grid connected electricity generation	CO_2	Included	Major source of emission
		CH_4	Excluded	Minor source of emission
		N_2O	Excluded	Minor source of emission
Project Activity	Greenfield Solar power project Activity	CO_2	Excluded	No CO_2 emissions are emitted from the project
		CH_4	Excluded	Project activity does not emit CH_4
		N_2O	Excluded	Project activity does not emit N_2O

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 paragraph 20 of AMS.I.F. Version 05.0, "Baseline emissions for other systems are the product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor."

Baseline Emissions:

As per applied methodology, AMS I.F, Version 5.0, baseline emission is the product of Quantity of net electricity generated as a result of the implementation of the CDM project activity multiplied by the combined margin CO2 emission factor for grid connected power generation. The baseline emissions are to be calculated as follows:

$$BEy = EG\text{BL, y} \times EF\text{CO2, y}$$

Where:

BE_y = Baseline emissions in year y (tCO2)

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

$EF_{CO2, y}$ = Emission factor (tCO_2/MWh) = 0.9 [UCR recommended emission factor of 0.9 tCO_2 /MWh has been considered.]

Estimated annual baseline emission reductions (BEy)

= 1948 Mwh/year × 0.9 tCO_2/MWh
= 1754 tCO_2e/year

Project Emissions:

As per the approved consolidated Methodology AMS-I.F. (Version 05.0) para 26, PEy= 0.

As the project activity is the installation of a new grid-connected solar power generation and does not involve any project emissions thus,

PEy = 0 tCO2/year

Leakage Emissions:

This project activity is a grid connected solar power generation. As there is no energy generating equipment being transferred from another activity to this project activity, there is no leakage emission from the project activity. Hence,

LEy = 0 tCO2/year

Net GHG Emission Reductions and Removals:

Emission reductions are calculated as follows:

$$ERy = BEy - PEy - LE$$

Where,

ERy= Emission Reduction in tCO2/year

BEy = Baseline emission in tCO2/year

PEy = Project emissions in tCO2/year

LEy = Leakage Emissions in tCO2/year

Therefore,

Emission Reduction: $ER_y = BE_Y – PE_Y - LE_Y$		
BE_y (Baseline emission)	tCO_{2e}/Year	**1754**
PE_y (Project emission)	tCO_{2e}/Year	**0**
Le_y (Leakage emission)	tCO_{2e}/Year	**0**
ER_y (Emission reduction)	tCO_{2e}/Year	**1754**

Estimated Annual or Total baseline emission reductions (BEy) = 1754 CoUs /year (1754 tCO2eq/yr)

B.6. Prior History>>

The project activity has not applied to any other GHG program for generation or issuance of carbon offsets or credits.
Hence project will not cause double accounting of carbon credits (i.e. COUs).

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

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

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

There are no permanent changes from registered PCN monitoring plan and applied methodology.

B.9. Monitoring period number and duration>>

First Issuance Period: 10 years, 0 months – 29/03/2019 to 28/03/2029

B.8. Monitoring plan>>

Following parameters being used in emission reductions determination (Fixed Ex-Ante)

Data/Parameter	$EF_{CO2,\,y}$ (UCR recommended emission factor)
Data unit	tCO2/MWh
Description	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 2013-2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Emission factors for the post 2020 period is to be selected as the most conservative estimate between the national electricity/power authority published data set and UCR default of 0.9 tCO2/MWh.
Source of data	https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com//Documents/UCRCoUStandardAug2022updatedVer6_090822220127104470.pdf
Value applied	0.9
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of data	For the calculation of Emission Factor of the grid

Data / Parameter:	EGBL, y
Data unit:	Mwh
Description:	Net electricity supplied to Project Developer's facility by the project activity.
Source of data:	Energy Meter records and/or generation statement
Values Applied	Annualized average value has been considered here for an ex-ante estimation only, whereas this is an-ex post parameter hence actual value shall be applied during monitoring and verification
Measurement procedures (if any):	Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Archiving Policy: Paper & Electronic Calibration frequency: Once in 5 years (as per CEA India provision).
Monitoring frequency:	Monthly
QA/QC procedures:	Not required
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	-