PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title: 30 MW Solar Power Project TKSPL, Tamil Nadu, India.

Version 1.0

Date: 15/03/2024

First CoU Issuance Period: 07 years, 08 months

Date: 31/03/2016 to 31/12/2023

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

BASIC INFORMATION	
Title of the project activity	30 MW Solar Power Project TKSPL, Tamil Nadu, India.
Scale of the project activity	Large Scale
Completion date of the PCN	15/03/2024
Project participants	**Project Proponent**: IndiGrid Limited. Mumbai, Maharashtra-400098, India. **UCR ID**: 310768132
Host Party	India
Applied methodologies and standardized baselines	Type I (Renewable Energy Projects) UNFCCC Methodology Category, "ACM0002: Grid-connected electricity generation from renewable sources - Version 21.0 UCR Protocol Standard Baseline Emission Factor
Sectoral scopes	01 Energy industries (Renewable / Non-renewable Sources)
Estimated amount of total GHG emission reductions	**46,249** CoUs/year (**46,249** tCO2eq/year)

SECTION A. Description of project activity

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

The project activity 30 MW Solar Power Project TKSPL, Tamil Nadu, India is located in Village Alliyandal, Taluka Chengam, District Tirunannamalai, Tamil Nadu, India.

The details of the registered project are as follows:

The Terralight Kanji Solar Pvt. Ltd. (TKSPL) Solar Power Project is a ground-mounted solar energy generation facility located in Village Alliyandal, Tamil Nadu, India. The project has a total installed capacity of 30 MW of Solar PV plant and utilizes photovoltaic (PV) technology to harness solar energy for electricity generation. The project contributes to India's renewable energy targets and aims to mitigate carbon emissions by displacing fossil fuel-based electricity generation with clean, renewable solar power.

The project is promoted by Terralight Kanji Solar Private Limited (TKSPL), which belongs to INDIGRID also called the Project Proponent or PP. INDIGRID is India's first and largest Infrastructure Investment Trust (InvIT) in the power transmission sector. INDIGRID owns, operates, and manages power transmission networks and renewable energy assets that deliver reliable power throughout India. IndiGrid's Portfolio Assets consists of thirty-five power projects comprising of 15 operational transmission projects, 1 greenfield transmission project and 18 solar generation projects located across 20 states and 1 union territory in India. M/s Terralight Kanji Solar Pvt. Ltd. (TKSPL) is one of the solar generation projects situated in Tirunannamalai, State Tamil Nadu. The Project activity is a new facility (Greenfield) and the electricity generated by the project will be exported to the Indian electricity grid. The project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. In the Pre- project scenario the entire electricity, delivered to the grid by the project activity, would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources.

The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source. The project is a bundled project activity which involves installation of 30 MW solar projects.

TKSPL is engaged in the business of setting up, generating and selling of renewable power from its ground mounted solar power plants located at Tiruvannamalai, Tamil Nadu. TKSPL had entered into a PPA with TANGEDCO for implementation of 36.00 MWp (30.00 MW AC) solar photovoltaic power generation unit in the State of Tamil Nadu, to sell electricity for a period of 25 years from COD.
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.

As of March 2023, India has made significant progress in the field of renewable energy. The installed renewable energy capacity has increased from 115.94 GW in March 2018 to 172.00 GW in March 2023, which is approximately 1.48 times higher. During the year 2022-23, a total of 365.60 billion units (BU) of electricity were generated from renewable energy sources across the country1. Globally, India ranks fourth in installed capacity of renewable energy according to the Renewable Energy Statistics 2023 released by the International Renewable Energy Agency (IRENA) 1.

India's ambitious target is to achieve about 450 GW of installed renewable energy capacity by 2030, with over 60% of this capacity expected to come from solar energy. According to the International Energy Agency (IEA), India's installed renewable energy capacity is projected to reach 174 GW in 2023, accounting for approximately 37% of the country's total energy supply 2.

This remarkable growth reflects India's commitment to sustainable energy and its transition towards cleaner and greener power sources. Carbon incentive policies, exemplified by programs like the UCR CoU, will play a pivotal role in achieving this goal.

Purpose of the project activity:
The objective of the proposed project is to generate electricity using a clean and renewable source of energy i.e., solar radiation. The project activity displaces grid electricity consumption (e.g. grid import) at the user end. The project activity of 36 MWh total capacity involves the installation and operation of a solar power plant in Tirunannamalai district in the state of Tamil Nadu are per the details listed below:

Village	Taluka	District	State	Type	Total installed capacity MW	Commissioning date
Alliyandal	Chengam	Tirunannamalai	Tamil Nadu	Ground mounted	30	26.03.2016

Based on the ex-ante estimate, this project is expected to produce approximately **51,389 MWh** of renewable electricity annually, assuming an average PLF (Plant Load Factor) of 19.55%. The project utilizes Polycrystalline solar photovoltaic technology to generate environmentally friendly energy.

Solar photovoltaic power generation is inherently clean, as it does not involve the combustion of fossil fuels or the emission of greenhouse gases (GHGs). Solar photovoltaic (PV) power generation involves converting sunlight directly into electricity using photovoltaic cells. These cells, typically made of silicon, absorb sunlight and generate direct current (DC) electricity. When interconnected, these cells form solar panels or modules. The working principle is simple: sunlight excites electrons in the cells, creating an electric current. This DC electricity can be used directly or converted into alternating current (AC) using inverters for grid integration.

A solar PV system comprises several components:

PV Panels: These capture sunlight and produce electricity.
Inverters: They convert DC electricity from panels into AC electricity compatible with the grid.
Mounting Structures: These secure panels in place.
Wiring and Cables: Connect panels, inverters, and other components.
Balance of System (BoS): Includes junction boxes, combiners, and protection devices.

When multiple PV panels are mounted on a frame, they form what is known as a PV Array. By displacing fossil fuel-based electricity generation in the regional grid, this project contributes to reducing GHG emissions. Solar PV offers clean, renewable energy, low operating costs, and job creation. It's a crucial part of our transition to a sustainable energy future.

The technological details have been provided in Section A.4.

TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LTD

From
Er.M.Noormohamed, B.E., MIE.,
Superintending Engineer,
TEDC/Thiruvannamalai

To
M/s Shapoorji Pallonji Solar PV Pvt Ltd,
Alliyandal Village,
Chengam Taluk,
Thiruvannamalai Dt.,

Lr.No. SE/TEDC/T.V.malai/AEE/Dev/AE/Solar/D.No.320/16,dt, 29 .03.2016.

Sir,

Sub: TEDC- Solar EHT SC.No.001-Commissioning on 26.03.2016 intimation – Reg.

Ref: 1. Memo.No.DIR/GEN/CE/NCES/SE/Solar/EE/SCB/AEE2/FMS Shapoorji/D.254/16,dt,24.03.2016.

2. Lr.No.EE/O&M/CGM/DM/.Solar/D.No.334/16,dt,26.03.2016

3. Lr.No.EE/O&M/CGM/DM/F.Test Report/D.No.339/15-16, dt,26.3.16.

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30MW Capacity Solar Power Plant of M/s Shapoorji Pallonji Solar PV Pvt Ltd, at Alliyandal Village, Chengam Taluk, Thiruvannamalai has been commissioned on 26.03.2016. the Particulars of Generation are as below.

Sl.No,	Villlage	Capacity	HT SC No. & Date of Commissioning
1	Alliyandal Village Chengam Taluk Thiruvannamalai Dt	30 MW	TVM Solar EHT SC No. 001 Dt, 26.03.2016.

29/3/16

Superintending Engineer,
TEDC/Thiruvannamalai.

Copy to the Executive Engineer/O&M/Chengam.
Copy to the Assistant Executive Engineer/O&M/Pudupalayam
Copy to the Deputy Financial Controller/Central Office/T.malai & Accounts Officer / Rev/ CO/T.Malai.

Commissioning Certificate

The anticipated annual average and total yearly reduction in CO_2e emissions resulting from the project activity are estimated to be 46,249 tCO_2e/yr. The actual emission reduction achieved during the initial CoU (crediting period) will be submitted as part of the first monitoring and verification process. As the project generates electricity using solar energy, a clean and renewable source, it has no adverse impact on the environment and actively contributes to climate change mitigation efforts.

Project's Contribution to Sustainable Development

This project represents a greenfield initiative, with grid power serving as the baseline scenario. India's electricity grid has historically relied heavily on fossil fuel-based plants. While renewable energy generation is gradually increasing its share of clean and green power, the grid's emission factor remains relatively high, defining it as a distinct baseline.

The Government of India has outlined specific indicators for sustainable development in the interim approval guidelines for projects contributing to greenhouse gas (GHG) mitigation. These indicators encompass economic, social, environmental, and technological well-being. It is envisioned that this project will actively contribute to sustainable development through the following means:

Social well-being:

During the construction phase of the project, significant employment opportunities were generated for the local workforce. These opportunities not only supported the project's development but also had a positive impact on the community. Importantly, even after the project's implementation, it has continued to provide sustained employment for the local population. This ongoing support contributes to poverty alleviation in the surrounding area, ensuring that economic benefits extend throughout the project's lifetime.

Economic well-being:

The project represents a strategic investment in clean technology, effectively mitigating CO_2 emissions from the grid. As a result, it qualifies for carbon incentives in the form of CoUs (Certified Emission Reduction Units), signifying an influx of clean energy investments into the host country. The project's operations necessitate both temporary and permanent skilled and semi-skilled manpower at the project site, thereby creating additional employment opportunities within the region.

By replacing grid-based electricity, the project ensures that surplus power is available for nearby areas. This direct and indirect benefit contributes to local economic growth and enhances overall quality of life. Furthermore, the success of such projects can catalyze new industrial ventures and economic activities in the area. As the world strives to limit global warming to a 1.5-degree Celsius increase by 2030, these initiatives also offer carbon incentives for capacity upgrades or expansions.

Beyond improved employment prospects, local communities stand to gain better land prices, fostering comprehensive economic development.

Technological well-being:

The successful operation of this project promotes solar-based power generation and serves as an encouragement for other entrepreneurs to engage in similar ventures. As interest in solar energy projects grows, it will drive research and development efforts by technology providers, leading to the creation of more efficient and advanced machinery in the future. By showcasing the success of solar projects in the region, this initiative motivates additional investors to participate in solar power projects. Consequently, the project contributes to technological well-being.

Environmental well-being:

The proposed project aims to generate electricity using a zero-emission solar-based power generation facility. By harnessing solar energy, the project avoids greenhouse gas (GHG) emissions and specific pollutants like SOx, NOx, and SPM associated with conventional thermal power plants. Solar power is a clean and renewable energy source, contributing to resource conservation. It reduces reliance on fossil fuels and helps preserve natural resources that are at risk of depletion.

Importantly, the project has minimal impact on land, water, air, and soil, ensuring a positive environmental footprint.

Through solar photovoltaic (PV) technology, the project displaces an equivalent amount of power from the regional grid. This displacement directly contributes to reducing GHG emissions associated with electricity generation in India's regional grids. As the world strives to prevent permanent climate disaster by ramping up clean technologies by 2030, carbon incentive policies like the UCR CoU program play a crucial role.

With regards to ESG credentials:

At present, the project has not undergone a formal assessment of its Environmental, Social, and Governance (ESG) credentials. Nevertheless, the project inherently supports several indicators that are in line with ESG principles. Here are a few examples:

Under Environment:

Environmental criteria encompass various aspects of a company's practices, including energy consumption, waste management, pollution control, natural resource preservation, and treatment of animals. In the case of the PP project, the energy usage pattern has shifted toward renewable sources, contributing to both greenhouse gas (GHG) emission reduction and the conservation of depleting energy resources associated with the project's baseline.

Additionally, environmental criteria can be further assessed based on any risks the company may encounter and how it manages those risks. Notably, since the project relies on solar power generation, environmental concerns related to non-renewable energy sources and the risk of escalating power costs are now mitigated. As a result, the project significantly contributes to ESG credentials.

Under Social:

Social criteria encompass various aspects related to a company's interactions and impact on society. These include business relationships, the quality of employment, and working conditions that prioritize employee health and safety. Additionally, social criteria consider the interests of other stakeholders.

In the context of this project, the project proponent (PP) has established robust policies to ensure fair employment practices, stringent health and safety measures, and the creation of local jobs. Furthermore, the organization's corporate social responsibility (CSR) initiatives directly benefit local stakeholders, contributing to social sustainability.

Overall, the project significantly enhances its ESG (Environmental, Social, and Governance) credentials through these positive social contributions.

Under Governance:

Governance criteria pertain to an organization's overall operational practices and accounting

procedures. In the context of this project, the project proponent (PP) adheres to sound governance principles, emphasizing transparency, accountability, and compliance with local and national regulations. These practices are well-documented in the company's annual report.

Furthermore, the project itself is a solar power initiative owned and managed by the proponent. It has obtained all necessary NOCs (No Objection Certificates) and approvals. The electricity generated by the project undergoes accurate monitoring, recording, and verification within the existing management framework of the company. As a result, both the project and the proponent demonstrate strong credentials in terms of ESG (Environmental, Social, and Governance).

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

There was no harm identified from the project and hence no mitigation measures are applicable.

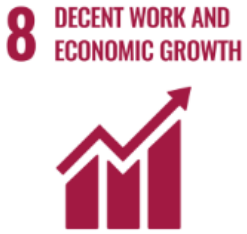
- Rational: As per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)', final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), it has been declared that solar project activity falls under the "White 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 have been exempt from traditional environmental impact assessments, it's crucial to consider social and environmental aspects to ensure sustainable and responsible solar energy development in India. 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.

United Nations Sustainable Development Goals:

The project generates electrical power by harnessing solar energy through photovoltaic cells, effectively replacing non-renewable fossil resources. This transition contributes to sustainable economic and environmental development. Without the project, the equivalent power generation would have relied on fossil fuel-dominated power stations.

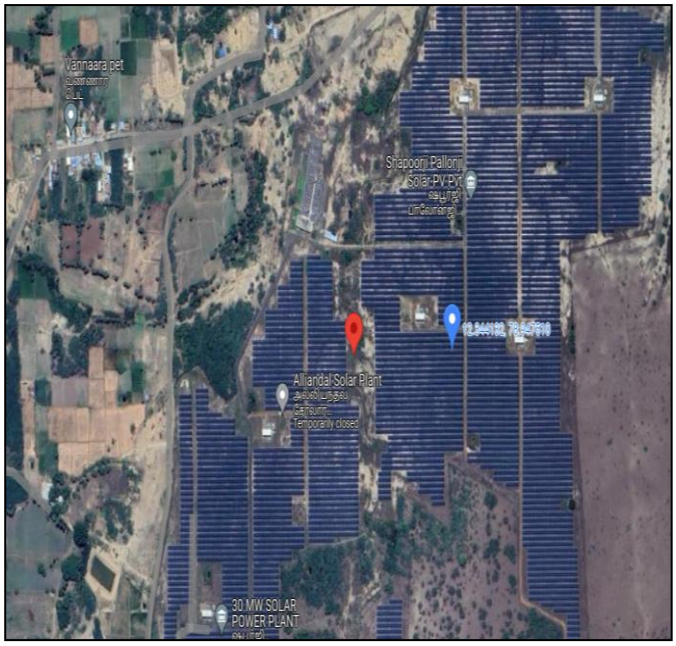
Consequently, the renewable energy generation from the project leads to a reduction in greenhouse gas emissions. Positive contribution of the project to the following Sustainable Development Goals:

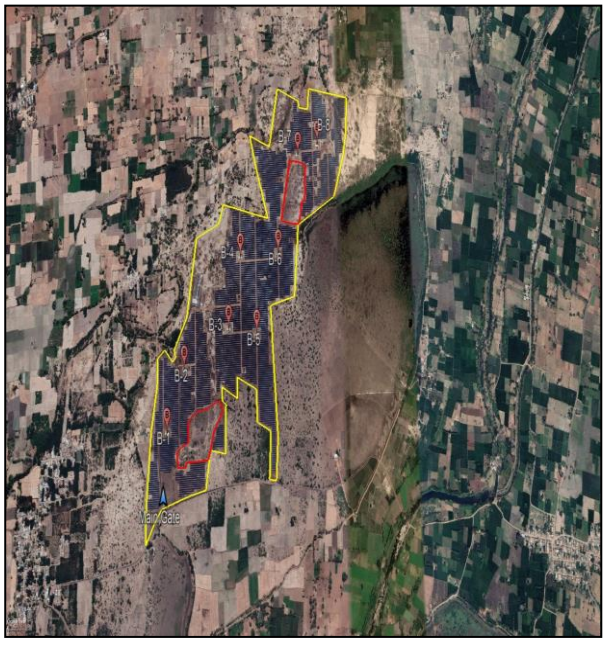
- SDG13: Climate Action
- SDG 7: Affordable and Clean Energy
- SDG 8: Decent Work and Economic Growth

Development Goals	Targeted SDG	Target Indicator (SDG Indicator)
 SDG 13: Climate Action	13.2: Integrate climate change measures into national policies, strategies and planning Target: **46,249** tCO_2 per annum	13.2.1: Number of countries that have communicated establishment or operationalization of an integrated policy/ strategy/ plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)
 SDG 7: Affordable and Clean Energy	7.2: By 2030, increase substantially the share of renewable energy in the global energy mix Target: **51,389** MWh renewable power supplied per annum	7.2.1: Renewable energy share in the total final energy consumption
 SDG 8: Decent Work and Economic Growth	8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value Target: Training, O&M staff	8.5.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities

A.3. Location of project activity >>

Country	: India.
District	: Tirunannamalai
Village	: Alliyandal
Taluka	: Chengam
State	: Tamil Nadu
Latitude	: 12.3441527797 "N
Longitude	: 78.9459970541 E
Project Commissioning Year	: 26.03.2016





A.4. Technologies/measures

The project utilizes clean renewable solar energy for electricity generation, employing a technology widely recognized for its environmental friendliness. Unlike conventional power plants, Solar photovoltaic operations produce no greenhouse gases (GHGs) or other harmful emissions. The project activity is 30 MW solar PV based power generation.

A Photovoltaic module comprises interconnected photovoltaic cells sealed within an environmentally protective laminate, forming the essential components of the complete PV generating unit. When multiple PV panels are mounted on a frame, they form a PV Array. The project has adopted reliable and proven technology to ensure the implementation of environmentally safe practices, ultimately contributing to greenhouse gas reduction.

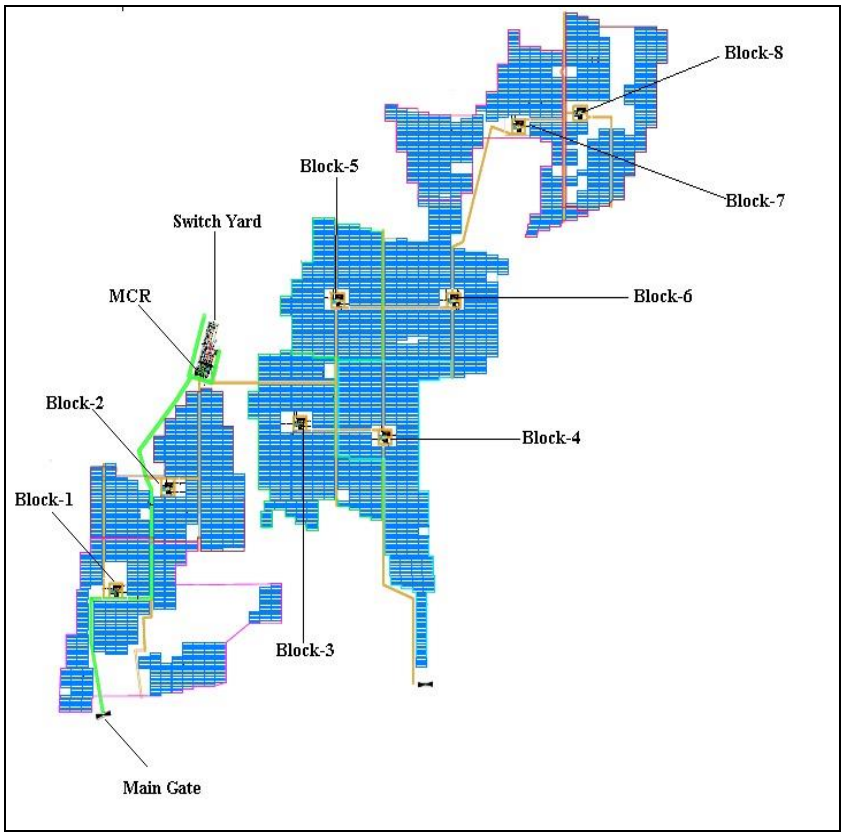
Each power production unit will in general constitute the following equipment:

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

The technology utilized in the project poses no environmental threat when compared to fossil fuel-fired power plants. It is a proven and reliable technology, ensuring safety and effectiveness in its application. Importantly, the project does not involve the transfer of technology from any Annex 1 country, nor does it receive public funding from Official Development Assistance (ODA) or Annex I countries.

Parameter	**Description**
Total number of Photovoltaic Modules	116172
Rating of Photovoltaic Module	310 WP - watt peak
Technology	Poly Crystalline Silicon
Solar Panel Maker	Talesun
Commissioning Date	26.03.2016
Inverter Make	Shilchar Technologies Limited

Array layout



A.5. Parties and project participants >>

Party (Host)	Participants
India	**Project Proponent:** IndiGrid Limited. **Address**: Unit No 101, First Floor, Windsor, Village Kole Kalyan Off CST Road, Vidyanagari Marg, Santacruz (East), Mumbai, Maharashtra - 400098, India. **Contact Person**: Ankur Agarwal - Assistant Manager **Email id**: ankur.agarwal@indigrid.com **UCR ID**: 310768132

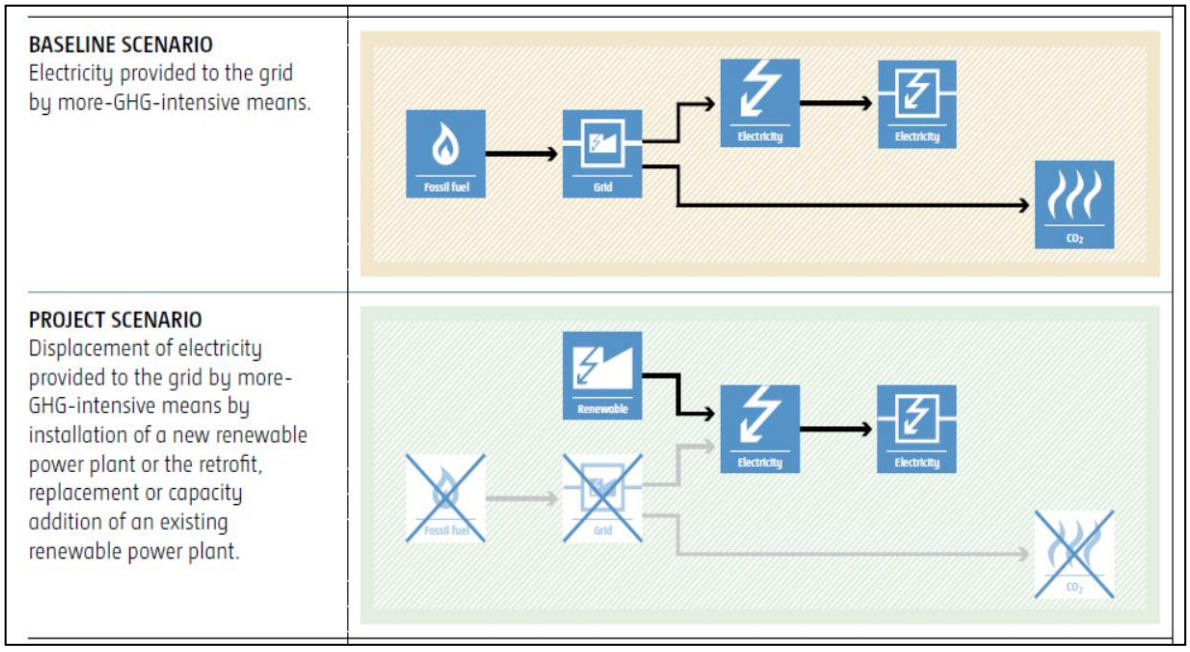
A.6. Baseline Emissions>>

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

In the absence of the project activity, the equivalent amount of electricity would have been imported from the grid. This grid is connected to the unified Indian Grid system, (NEWNE Grid) and relies heavily on fossil fuel-based power plants, making it carbon-intensive. Therefore, the baseline scenario for the project activity aligns with the grid-based electricity system, which also represents the pre-project situation:

Schematic diagram showing the baseline scenario:

Baseline Scenario:



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 - **ACM0002, "(Title: Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, Ver 21.0)**

The project activity involves the generation of grid-connected electricity from renewable solar energy. The project activity has an installed capacity of 30 MW which qualifies for a large-scale project. The project status corresponds to the methodology ACM0002., version 21, and the applicability of the methodology is discussed below:

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

This project activity is included within the UCR Standard Positive List of technologies and is within the large-scale CDM thresholds (e.g. installed capacity is 30 MW). The positive list comprises of the project being a greenfield plant /unit.
Project activity involves installation of a 30 MWh renewable electricity generation plant (solar farm) connected to the regional power grid.
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 is not an activity that involves switching from fossil fuels to renewable energy at the site of the project activity.
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: • Technology Specification provided by the technology supplier. • Purchase order copies • EPC contracts

• Power purchase agreement • Project commissioning certificates, etc
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 >>

Renewable electricity units are meticulously monitored through digital means, utilizing distinct energy meters positioned within the project activity boundary. It's essential to note that the project activity will not participate in India's NDC carbon ecosystem/market and has not been enlisted under any other GHG mechanism for carbon offsets/credits previously.

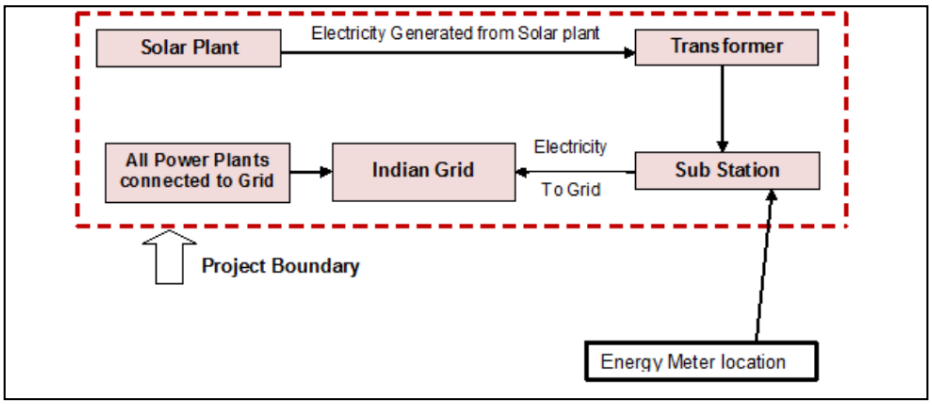
B.4. Project boundary, sources and greenhouse gases (GHGs)>>

The project activity consists of the utilization of the solar radiation as input source of energy. This solar radiation is converted to direct current (DC) through Photovoltaic cell modules and further converted to alternate current (AC) through inverters and fed into the regional grid. There are no sources of gas generation or involvement of gas either as fuel or as exhaust.

As per applicable methodology ACM0002. version - 21, “The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the project power plant is connected to.”

Thus, the project boundary includes the Solar Power Plant and the Indian grid system.

A diagrammatic representation of the project boundary of the project activity is provided:



	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.

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

As per the approved consolidated methodology ACM0002. version - 21, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

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

Project Activity and Baseline: The project involves establishing a new solar power plant to harness green energy from solar sources. The electricity generated will serve as a captive supply for a specific purpose. In the absence of this project, an equivalent amount of power would have been sourced from the Indian grid, which primarily relies on fossil fuel-fired plants. Therefore, the baseline for the project activity is the same amount of power produced by the Indian grid.

Grid Emission Factor: The term “grid emission factor” refers to the CO2 emission factor (measured in tCO2/MWh) associated with each unit of electricity provided by an electricity system. For Indian projects not previously verified under any GHG program, the UCR recommends using a conservative estimate of 0.9 tCO2/MWh for the years 2013-2020. Additionally, for the vintage 2021-2022, the combined margin emission factor calculated from the CEA database in India indicates higher emissions than the default value. Consequently, the same emission factor has been applied to calculate emission reductions using a conservative approach.

Net GHG Emission Reductions and Removals

Thus, $ER_y = BE_y – PE_y – LE_y$

Where:
ER_y = Emission reductions in year y (tCO_2/y)
BE_y = Baseline Emissions in year y ($t CO_2/y$)
PE_y = Project emissions in year y (tCO_2/y)
LE_y = 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:

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

BE_y = Baseline emissions in year y (tCO_2)
$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EFgrid,y$ = UCR recommended emission factor of 0.9 tCO_2/MWh has been considered.

Estimated annual baseline emission reductions (BEy)
= 51,389 MWh/year *0.9 tCO_2/MWh
= 46,249 tCO_2/year

Project Emissions (PE_y)

As per ACM0002. version - 21, only emissions associated with fossil fuel combustion, emissions from the operation of geothermal power plants due to the release of non-condensable gases, and emissions from a water reservoir of Hydro should be accounted for the project emission. Since the project activity is a solar electric power project, it’s emission from renewable energy plants is nil. Thus, PE = 0

Leakage Emission

As per ACM0002. version - 21, '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, LE = 0

Estimated Emission reductions in year y (ER_y)

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

Hence Net GHG emission reduction, ER_y = 46,249 – 0 – 0
= 46,249 tCO_2/year (i.e., 46,249 CoUs/year)

B.6. Prior History>>

The project activity is a large-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

ACM0002, "(Title: Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, Ver 21.0)

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>>

First Issuance Period : 31/03/2016 to 31/12/2023 (inclusive of both dates).
First Monitoring Period : 31/03/2016 to 31/12/2023
First Crediting Period : 07 years, 08 months

B.10. Monitoring plan>>

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

1. Monitoring Plan Objective and Organization

PP, as the project implementer, oversees and monitors the electricity generated by the project activity. Data pertaining to this is electronically archived and has been stored since 31/03/2016.

To uphold reliability and transparency in the data, PP has instituted Quality Assurance and Quality Control (QA&QC) measures. These measures are designed to efficiently manage and oversee data reading, recording, auditing, as well as the archiving of data and associated documents. Data is monitored on a daily basis and submitted to PP accordingly.

PP has also implemented QA&QC measures to calibrate and ensure the accuracy of metering devices, as well as the safety aspects of project operation. Metering devices are calibrated and inspected regularly and in accordance with specifications and requirements outlined by the state electricity board, thereby ensuring accuracy in readings.

Data/Parameter	$EG_{PJ,facility,\ y}$
Data unit	MWh
Description	Net electricity supplied to the Indian grid facility by the project activity.
Source of data Value(s) applied	Joint meter reading report/Energy generation report.
Measurement methods and procedures	Daily: Direct measurement using electricity meters
Monitoring frequency	Continuously, aggregated at least annually 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.
QA/QC procedures:	Monitoring frequency: Continuous Measurement frequency: Hourly Recording frequency: Monthly 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). 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:	tCO_2 /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. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
Source of data:	UCR Standard Protocol As per Standard
Measurement procedures (if any):	Fixed
Monitoring frequency:	Ex-ante fixed parameter
Purpose of data:	For the calculation of Emission Factor of the grid
Any comment:	-