



PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT



Title: Small Scale Bundled Solar Power Generation, Solapur

Version 1.0

Date: 06/12/2022

First CoU Issuance Period: 5 years, 09 months

Issuance Period: 20/03/2016 to 31/12/2021



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

BASIC INFORMATION

Title of the project activity	Small Scale Bundled Solar Power Generation, Solapur
Scale of the project activity	Small Scale
Completion date of the PCN	06/12/2022
Project participants	Project Owner Representative: Chirag Thothala UCR Aggregator: Progressive Management Consultants
Host Party	India
Applied methodologies and standardized baselines	Type I (Renewable Energy Projects) Category AMS I.D.: “Grid connected renewable electricity generation”, Version18 Sectoral Scope: 01 UCR Protocol Standard Baseline
Sectoral scopes	01 Energy industries (Renewable/NonRenewable Sources)
Estimated amount of total GHG emission reductions per year	1628 CoUs/yr (1628 tCO _{2eq} /yr)

SECTION A. Description of project activity

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

The project **Small Scale Bundled Solar Power Generation, Solapur** is located across various locations in the city of Solapur, located in the south-western region State: Maharashtra, Country: India.

The details of the registered project are as follows:

Purpose of the project activity:

This UCR Project, “**Small Scale Bundled Solar Power Generation, Solapur**” (hereafter referred to as Project Activity) involves the installation and bundling of 88 small scale grid connected solar power plants in the city of Solapur, State: Maharashtra, with the objective to contribute and promote generation of renewable energy in India by supplying green energy to the local state grid maintained and operated by Maharashtra State Electricity Distribution Co. Ltd (MSEDCL). Power Purchase Agreements (PPAs) have been signed for the same between all the individual project owners and MSEDCL.

This project is an operational activity with continuous avoidance of GHG emissions, currently being applied under “Universal Carbon Registry” (UCR).

This project activity is a voluntary initiative implemented by all the project owners. Power is generated using solar energy involving solar only and not PV Hybrid systems combining solar and other renewable sources which are not part of this project activity.

The electricity generated from grid connected solar power plants in each of the small scale project activities is supplied to the regional grid and thereby displaces equivalent generation from grid connected thermal power plants. The project activities are connected to the grid i.e. at 11 / 22 Kv bus bar level of substation of MSEDCL.

The project activity, post implementation, has resulted in the avoidance of GHG emissions from fossil powered plants connected to the regional grid. Maharashtra experiences 250 to 300 days of bright sunshine annually, thus on an average it witnesses up to four to six kilowatt hour (kWh) per square metre. (source: <https://www.punekarnews.in/climate-change-could-impact-maharashtras-renewable-energy-potential-study/>). Metering for all the installations in the project activity are at 11 / 22 kV level substation of MSEDCL.

In absence of the project activity, equivalent power would have been generated by the existing grid connected power plants and addition of new generation sources. The baseline to the project activity is therefore the electricity generated by the operation of existing grid-connected power plants and by the addition of new generation sources to the grid.

Solar energy gathered by photovoltaic solar panels, intended for delivery to a power grid, must be conditioned, or processed for use, by a grid-connected inverter. Fundamentally, an inverter changes the DC input voltage from the PV to AC voltage for the grid. This inverter sits between the solar array and the grid, draws energy from each, and may be a large stand-alone unit or may be a collection of small inverters, each physically attached to individual solar panels. The inverter monitors grid voltage, waveform, and frequency.

There are no National or sectoral policies which gave any competitive advantages to solar power generation which have been implemented prior to 11 November 2001 and neither has there been any policies which provide any advantage to more emission intensive technologies which have been implemented after 11 December 1997.

Source MNRE

P&C Division													
State-wise installed capacity of Renewable Power as on 30.09.2022.													
S. No.	STATES / Uts	Small Hydro Power	Wind Power	Bio-Power					Solar Power				
				BM Power/Bagasse Cogen.	BM Cogen. (Non-Bagasse)	Waste to Energy	Waste to Energy (Off-grid)	Bio Power Total	Ground Mounted Solar	Rooftop	Solar Component in Hybrid	Off Grid Solar	Solar Power Total
		(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)
1	Maharashtra	381.08	5012.83	2568.00	16.40	12.59	39.43	2636.42	2089.10	1202.44	0.00	100.09	3391.63
													11421.96

[India has installed 42.3 GW of cumulative grid-connected solar capacity, with additions led by Karnataka \(7,409 MW\), Rajasthan \(6,581 MW\), and Gujarat \(5,132 MW\).](#) India has installed 96.95 GW of cumulative grid-interactive renewable energy capacity (excluding large hydro) as of June 30, 2021, in the country, against the ‘175 GW by 2022’ target.

[Rooftop solar adoption has not gathered the desired momentum in India despite the government push. Major reasons are policy conundrums, ill-designed institutional and governance structures, distorted market mechanisms, and technical challenges such as those](#) involving grid connectivity. Most of the state regulations on net metering set the maximum capacity limit at 1 MW per metering point for rooftop solar systems to be connected to the distribution grid, which hinders large-scale deployment. Often this capacity ceiling is imposed based on the poor financial health of the distribution utilities. These arbitrary caps impede the uptake of rooftop PV.

Rooftop solar systems require bottom-up approaches focusing on intense consumer engagement, the current policy and regulatory regime is designed based on a top-down approach with a uniform set of policies and regulations that lack flexibility. The most recent evidence of such policy-level obstruction is the withdrawal of net metering policies in certain states for commercial and industrial consumers. There is no adequate understanding of how the existing intervention types perform in varying policy, regulatory, and governance environments. A solar roof is currently an expensive option as it requires more components, and customers who intend to set up this system must have a new roof exclusively for installation or must invest in a raised structure for installation.

The purpose of the proposed project activity is to generate electricity using a clean and renewable source of energy i.e., solar radiation. The proposed project activity consists of an installed capacity of 0.914 MW (i.e., 914 kW) as per details listed below:

City/State	Total installed capacity kW	Commissioning date
Solapur, Maharashtra	914	20/03/2016

Maharashtra currently ranks among the top states in terms of installed renewable energy capacity (10.78 GW) with Wind power capacity of 5.01 GW and solar power capacity of 2.75 GW contributing the most, that includes being second on the race on decentralised renewable energy (DRE). As of 30th June 2022, renewable energy contributes 24.36% percentage to Maharashtra’s power mix.

As per the ex-ante estimate, this project activity will generate approximately **1850 MWh** of electricity per annum considering an average PLF of 20%. The estimated annual average and the total CO₂e emission reduction by the project activity is expected to be **1628 tCO₂e**, whereas actual

emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification. Since the project activity generates electricity through solar energy, a clean renewable energy source it will not cause any negative impact on the environment and thereby contributes to climate change mitigation efforts.



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 project activity has led to employment generation during installation as well as operation phase of the project activity. Direct & indirect employment is generated for the project implementation & management.
- The success of this project will encourage more businesses to develop and encourage other owners with rooftops and open spaces to install such systems and earn discounts from carbon revenue earning of the technology provider.
- Technology providers will now be able to offer further discounts to the installation of the panels and thereby promote solar panels in the region with faster payback periods for owners. This lack of solar rooftop installation information is further compounded by the high upfront capital cost to deploy these systems, as these are often not within reach of the larger section of the society. Although there has been a dramatic reduction in the rooftop solar system cost in recent years, the initial cost continues to be a major hurdle even for small projects.

- **Environmental benefits:**

- The project contributes to the general wellbeing of the region and is in line with the sustainable development policies of India.
- Solar energy sector in India has emerged as a significant player in the grid connected power generation capacity over the years. It supports the government agenda of sustainable growth, while, emerging as an integral part of the solution to meet the nation's energy needs and an essential player for energy security.
- Clean and renewable source of energy.

- **Economic benefits:**

- Grid interconnection of photovoltaic (PV) power generation systems has the advantage of effective utilization of generated power because there are no storage losses involved.
- Helps in scaling up of grid connected solar power projects from 20,000 MW by the year 2021-22, to 1,00,000 MW by the year 2021-22 under India's National Solar Mission. Provides employment to local communities through construction and maintenance of units.
- Out of the total rooftop solar installations in the country, the residential sector has been the worst performer, at 16%, compared to other competing sectors such as industrial and commercial. Hence revenues from carbon credits will help faster adoption of such projects in the rooftop residential sector.
- Banks and financial institutions are reluctant to lend funding for these projects due to their small scale. Traditionally, banks charge a high interest rate to developers (10%–12%, or up to 14%) depending upon the associated risks, nature of the project, and the borrower's credit rating. Solar financing is still a very complicated procedure in India and isn't very widely available. Barring a few nationalized banks, no other banks have a dedicated vertical for the solar plant. Often, private banks in the country overlook the ROI aspect of the plant and assess the asset purely based on the creditworthiness of the client. Carbon revenue will help alleviate such issues.

With regards to ESG credentials:

At present specific ESG credentials have not been evaluated, however, the project essentially contributes to various indicators which can be considered under ESG credentials. Some of the examples are as follows:

Under Environment: Environmental criteria may include a company's energy use, waste, pollution, natural resource conservation, and treatment of animals, etc. For the PPs, energy use pattern is now based on renewable energy due to the project and it also contributes to GHG emission reduction and conservation of depleting energy sources associated with the project baseline. Also, the criteria can be further evaluated on the basis of any environmental risks which the company might face and how those risks are being managed by the company. Here, as the power generation will be based on solar power, the risk of environmental concerns associated with non-renewable power generation and risk related to increasing cost of power etc. are now mitigated. Hence, project contributes to ESG credentials.

Under Social: Social criteria reflect on the company's business relationships, qualitative employment, working conditions with regard to its employees' health and safety, interests of other stakeholders, etc. With respect to this project activity, the PPs have robust policies in place to ensure equitable employment, health & safety measures, local jobs creation etc. Also, the organizational CSR activities directly support local stakeholders to ensure social sustainability. Thus, the project contributes to ESG credentials.

Under Governance: Governance criteria relates to overall operational practices and accounting procedure of the organization. With respect to this project activity, the PPs practice good governance practices with transparency, accountability and adherence to local and national rules & regulations etc. Also, the project activity is a solar power project owned and managed by the proponents for which all required NOCs and approvals are received. The electricity generated from the project can be accurately monitored, recorded and further verified under the existing management practice of the company. Thus, the project and the proponents ensure good credentials under ESG.

There was no harm identified from the project and hence no mitigations 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 is not required for small-scale Solar Projects. Additionally, there are social, environmental, economic and technological benefits which contribute to sustainable development. The key details have been discussed in the previous section.

A.3. Location of project activity >>

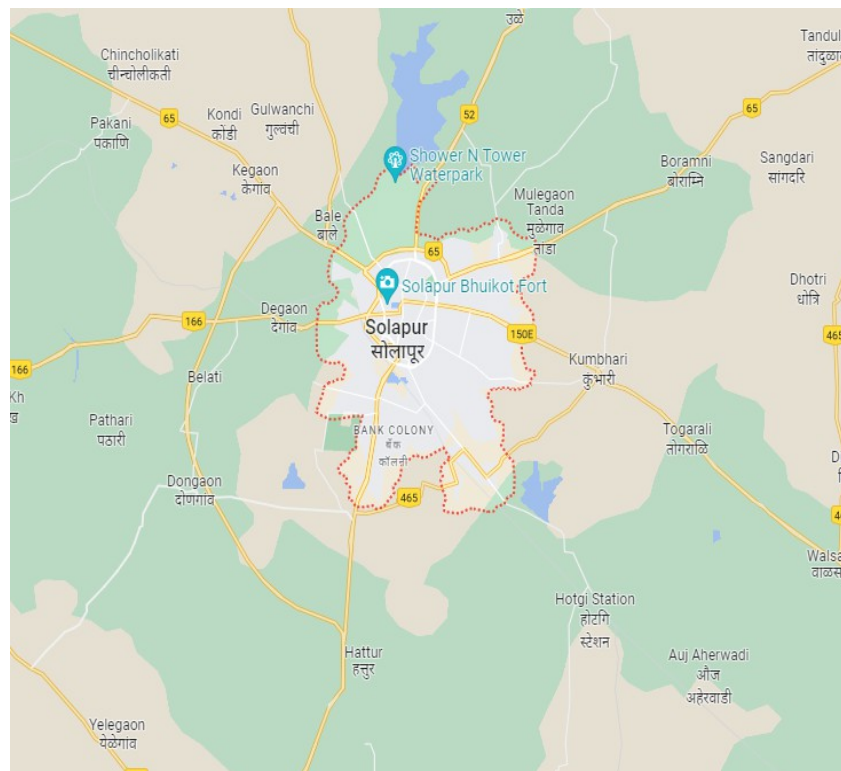
Country: India.

City: Solapur

State: Gujarat

Latitude: 17° 39' 38.3796" N

Longitude: 75° 54' 44.1576" E

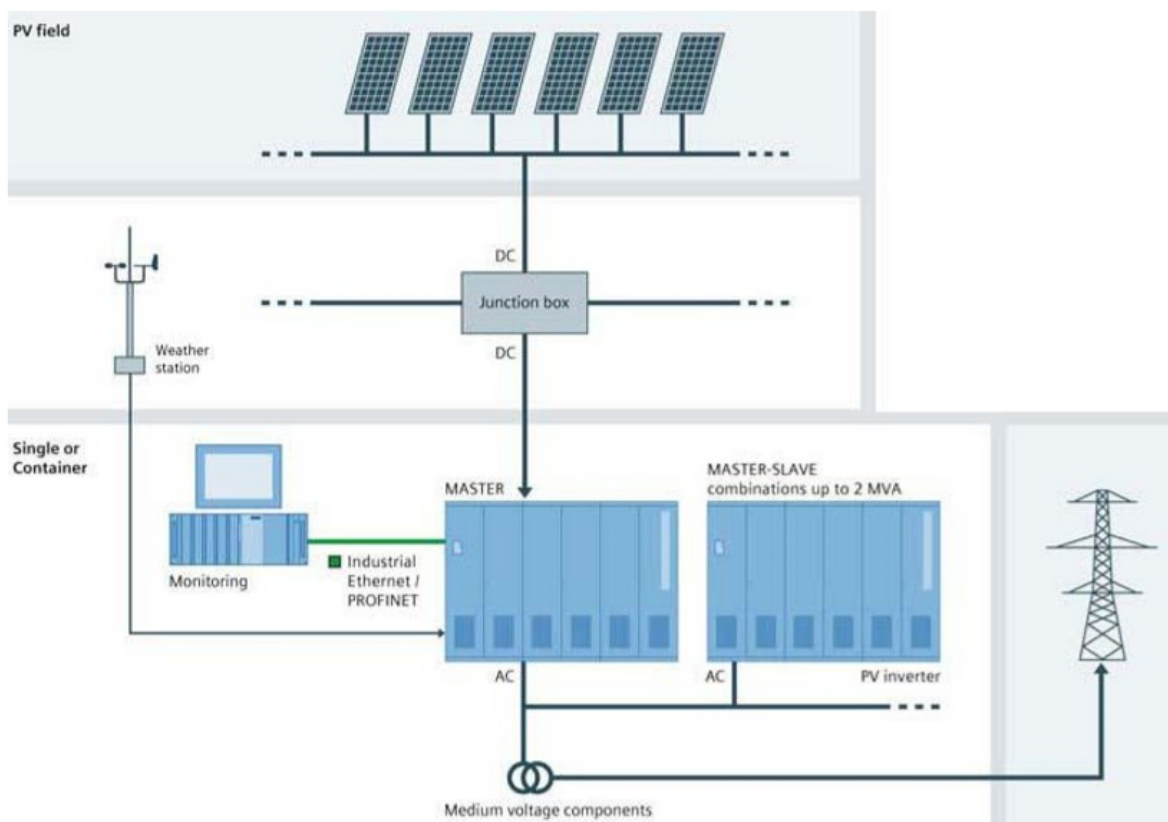


A.4. Technologies/measures >>

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. Crystalline or thin film type PV modules or a combination of both shall be used. Inverter, Switchgear Cubicle for Grid Connection, Circuit Breaker and Transformer of suitable capacity are installed; details of the same would be provided during the verification of the project activity by the individual owners.

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

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



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

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

Name	Address	KW Installed Capacity	Date of installation
Nikhil Sports	MIDC Akkalkot Road, Solapur	7	20/03/2016
Nityanand Gavkar	Adarsh nagar, Solpaur	4	12/05/2016
Bahubali Shirshad	Ghongade Vasti, Solapur	4	22/05/2016
Shahbuddin Bagwan	Old Kasegaon, pandharpur, solapur	2	26/07/2016
Nanakram Nagdev	Gurunanak Nagar, Solapur	5	02/08/2016
Gautam Gentyal	Gentyal Talkies, MIDC Road, Solapur	5	21/05/2017
Nagnath Vallakati	Karnik Nagar, Solapur	13	25/06/2017
Uphar Provision	Karnik Nagar, Solapur	10	25/06/2017
Narsih Pujari	Shivaji Chowk, Pandharpur	9	25/07/2017
Narayan Gundeti	Karnik Nagar, Solapur	5	05/09/2017
Chanappa Karimungi	Ravivar Peth, Solapur	5	05/11/2017
Somayya Yangandul	Vidi gharkul, solapur	2	14/11/2017
Janardan Goli	Ashok Chowk, Solapur	13	01/02/2018
Ramesh Guda	Saibaba Chowk Solapur	5	01/02/2018
Govinda Bolabattin	Daji Peth, Solapur	5	12/02/2018
Sanjay Shinde	Jule Solapur, Solapur	4	09/02/2019
Sagar Malani	Nakoda Residency, Solapur	19	10/03/2019
Dr. Pramod Patil	Main Road, Mohol, Solapur	5	16/03/2019
Hotel Sonai	Opp Omerga Bypass, Omerga	40	25/03/2019

Dattatray Godse	Aadarsh Nagar, Solapur	6	16/04/2019
Jayantilal Mujrani	Gurunanak Nagar, Solapur	5	22/04/2019
Parmanand Pamnani	Gurunanak Nagar, Solapur	5	23/04/2019
Raju Punjal	Vidi gharkul, solapur	2	06/06/2019
Ramesh Jagyani	Antolika Nagar, Solpaur	5	07/08/2019
Bhimrao Rathod	Samarth Nagar, Jule Solapur, Solapur	6	12/08/2019
Dr. Vijaykumar Arkal	Karnik Nagar, Solapur	12	30/08/2019
Shobha Belure	Kadgaon road, Omerga, Solapur	5	26/09/2019
Ravindra Arkal	Karnik Nagar, Solapur	8	10/10/2019
Rajesh Pamnani	Gurunanak Nagar, Solapur	5	16/10/2019
Basav Sangolagi	Sangolgi, Akkalkot, Solapur	5	29/10/2019
Suresh Nagdev	Gurunanak Nagar, Solapur	6	01/11/2019
Kashish Silk Sarees	Chatti Galli main Road, Solapur	8	04/11/2019
Abhinav Market	Indira Nagar, Vijapur road, solapur	5	05/01/2020
Yogesh Rawlani	Gurunanak Nagar, Solapur	8	23/01/2020
Uphar Cake shop	WIT Road, Solapur	40	26/01/2020
Vivek Gogia	Basaveshwar Nagar, Solapur	12	29/04/2020
Devendra Hotwani	Karnik Nagar, Solapur	7	09/05/2020
Dr. Suresh Hotwani	Gurunanak Nagar, Solapur	6	10/05/2020
Krishnal Sarda	Samrat Chowk, Solapur	5	30/06/2020
Dipaklal Sharma	Gurunanak Nagar, Solapur	6	15/07/2020
Vijaykumar Mhamane	Near Solapur Airport, Solapur	6	17/07/2020
Buwaji Medical	70ft road, MIDC road, Solapur	5	03/08/2020
Sohan Haswani 2	Gurunanak Nagar, Solapur	4	19/08/2020
Shivling Shingshetty	Balaji Society, Hotgi Road, Solapur	6	28/09/2020
Murlidhar wadhwani	Antolika Nagar, Solpaur	5	07/10/2020
Yashwant Mulik	Goldfinch Peth, Solapur	4	12/10/2020
Dhanraj Pamnani	Gurunanak Nagar, Solapur	5	15/10/2020

Kishor Ambure	Sakhar peth, Solapur	5	16/10/2020
Aarkal Ravindra R.	Karnik Nagar, Solapur	5	19/10/2020
Vyankatesh Arkal	Karnik Nagar, Solapur	5	19/10/2020
Satyanarayan Arkal	Karnik Nagar, Solapur	5	19/10/2020
Ramchandra Panjwani	Gurunanak Nagar, Solapur	5	30/10/2020
Tirupati Agency	Kountam Chowk, Solapur	7	28/12/2020
Deepak Adwani	Sai Vihar, Vijapur road, Solapur	12	12/01/2021
Pradip Pamnani	Navi Peth, Solapur	5	13/01/2021
j. v. square (jayant holepatil)	gentyal chouk , solapur	10	20/01/2021
Sohan Haswani	Gurunanak Nagar, Solapur	5	25/01/2021
jayantilal Murjani	Gurunanak Nagar, Solapur	5	06/02/2021
Jayant Holepatil 2	Infront of WIT, Ashok Chowk, Solapur	10	12/02/2021
bhimrao rathod	Samarth Nagar, Jule Solapur, Solapur	6	21/02/2021
Suresh Sutar	Mudra Suncity, Akkalkot raod, Solapur	3	09/03/2021
Satish Sakhalkar	Near Saiful, Vijapur road, Solapur	4	21/03/2021
vishal mhamane	bharat nagar ,hotgi road	6	25/03/2021
Alpesh Sabu	Chatti Galli main Road, Solapur	11	02/04/2021
Ishwarlal Tharwani	Antolika Nagar, Solapur	8	06/04/2021
Naresh Gurbani	Gurunanak Nagar, Solapur	12	03/05/2021
Bhimashnkar Ankaram	Kanna Chowk, Solapur	6	23/05/2021

pramod pawar	vijapur road	3	21/06/2021
Ashwini Enterprises	Near Omerga bypass, Omerga	15	07/07/2021
Prakashchandra Vaid 2	Chatti Galli main Road, Solapur	8	12/07/2021
Nirmalabai Wadhwani	Gurunanak Nagar, Solapur	5	24/07/2021
Ramchandra Panjwani 2	Gurunanak Nagar, Solapur	5	03/08/2021
Jethanand Bahirwani	Gurunanak Nagar, Solapur	5	12/09/2021
Sunil Hinduja	Gurunanak Nagar, Solapur	8	12/09/2021
K Nagdev Enterprises	Balives, Solapur	13	29/09/2021
Shivanand Kamalpure	Jule Solapur, Solapur	5	09/10/2021
K Nagdev	Balives, Solapur	6	20/11/2021
Kumar Devsani	Datta Nagar, Solapur	5	05/12/2021
Arjun Nagdev	Antolika Nagar, Solapur	10	18/12/2021
janardan sai	m. pachacha peth	10	02/01/2022
Jayant Holepatil	Gentyal Chowk, Solapur	10	11/01/2022
Tanishk Enterprises	Bhogaon, Barshi Road, Solapur	110	15/01/2022
Shambhavi Stone Crusher	Gangewadi, Solapur	66	21/01/2022
Sudhir Gandhi	Old Poona Naka, Solapur	5	22/01/2022
Shree Ice Company	Chincholi MIDC, Chincholi, Solapur	115	19/03/2022
Prakashchandra Vaid	West mangalwar Peth, Solapur	8	16/04/2022
sumitra chavan	sahastrarjun nagar, jule solapur	3	22/05/2022
Total		914	

A.5. Parties and project participants >>

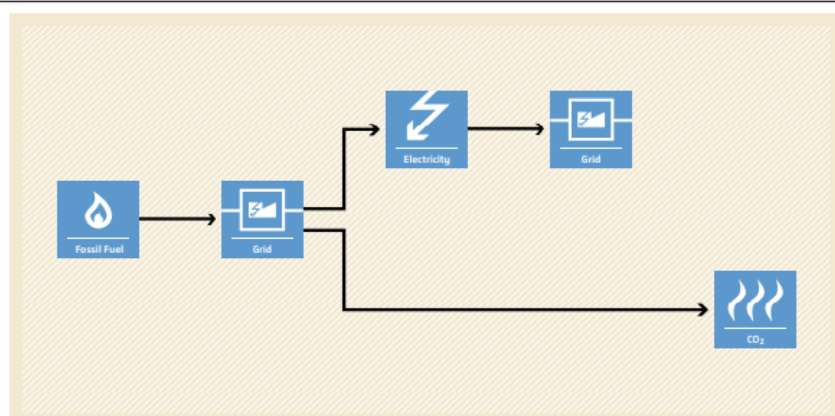
Party (Host)	Participants
India	Project Owner Representative: Chirag Thothala, Bangalore, India 560049 UCR Aggregator: Progressive Management Consultants UCR # 110736904

The project owners are responsible for the construction, operation and maintenance of the project activity and bear the cost and risk, including the required interconnection facilities, in close co-ordination with MSEDCL. All green power generated from the project activity are sold on first priority basis to MSEDCL and not to any third parties.

A.6. Baseline Emissions>>

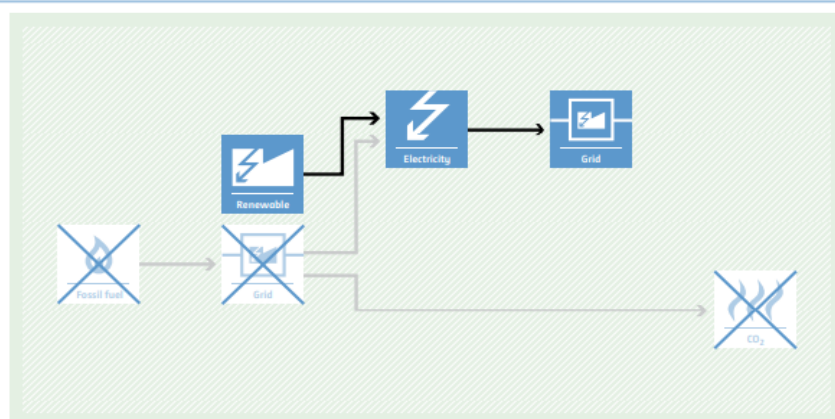
BASILINE SCENARIO

Electricity provided to the grid by more-GHG-intensive means.



PROJECT SCENARIO

Electricity is generated and supplied to the grid using renewable energy technologies.



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

- the electricity delivered to the grid 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 into the grid.

The project activity comprises of a renewable energy generation through installation of solar photovoltaic modules and displaces electricity from the regional grid either by supplying to the grid itself or by supplying power to an identified consumer through the regional grid.

A.7. Debundling>>

This project activity is not a debundled component of a larger carbon or GHG 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. - “Grid connected renewable electricity generation” Ver 18

This methodology comprises of activities that include the construction and operation of a power plant that uses renewable energy sources and supplies electricity to the grid (Greenfield power plant).

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

This project is included within the UCR Standard Positive List of technologies and are within the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of: (a) The grid-connected renewable electricity generation technologies of installed capacity up to 15 MW, (b) Solar technologies (photovoltaic and solar thermal electricity generation);
The project activity involves installation of grid-connected solar photovoltaic power generation with individual CPA capacities less than or equal to 15 MW. The rated capacity of the power plant(s) is limited to 0.914 MWe
All the solar installations within the project activity are within the geographical boundaries of India. Each solar power generation unit is uniquely defined with GPS coordinates from which the relevant Indian state and the relevant regional grid (NEWNE or Southern grid) can be uniquely identified.
The option (a) of applicability criteria 2 of the methodology is applicable as all the installations in the project activity are considered as Greenfield plants /units. Hence the project activity meets the given applicability criterion.
The technology/measure allowed under PoA is grid connected Solar PV based generation systems which will displace equivalent quantity of electricity from the regional grid in India. The testing/certifications; total capacity of each CPA will not exceed 15MW. All the equipment of each CPA 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
The project activity is a voluntary coordinated action
No biomass, landfill gas, waste gas, wastewater treatment and agro waste are involved, the project is only a solar power project.
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.
The project activity comprises of a renewable energy generation through installation of solar photovoltaic modules and will displace electricity from the regional grid by supplying to the grid itself. Hence this methodology is applicable and fulfilled.
The project activity is not a hydro power plant.
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.
The project activity is not a combined heat and power (co-generation) system.

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

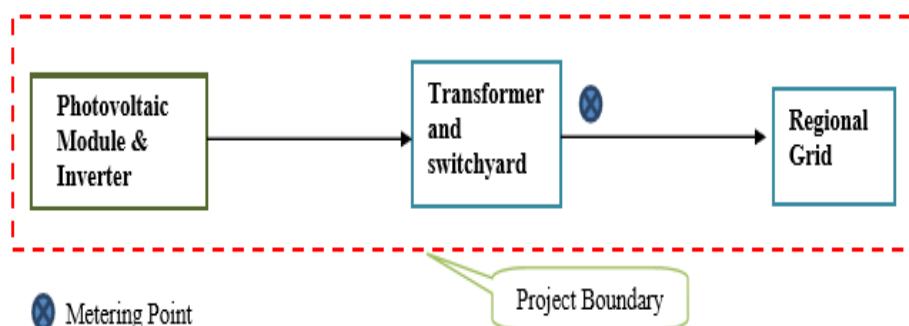
Each of the solar installations bundled within the project activity have unique IDs and meters, which is visible at each of the sites. The Monitoring Report has the details of the end user's name and the location i.e. District, Mandal, village in which it is constructed along with the Unique ID. A database of all the installations are maintained by the project representative and is regularly updated to avoid any double counting.

There is no double accounting of emission reductions in the project activity due to the following reasons:

- Projects are uniquely identifiable based on its location coordinates,
- Projects have dedicated commissioning certificate and connection points,
- Project is associated with energy meters which are dedicated to the consumption point for project developer

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

The project boundary encompasses the physical, geographical site of the solar power plant, the energy metering equipment and the connected regional electricity grid.



	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 ₂ O	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 ₂ O	Excluded	Excluded for simplification. This is conservative

Leakage Emissions is not applicable.

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

This section provides details of emission displacement rates/coefficients/factors established by the applicable methodology selected for the project.

As per para 19 of the approved consolidated methodology AMS-I.D. Version 18, 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”*.

The project activity involves setting up of a new grid connected solar power plants to harness the green power from solar energy and utilize the generated electricity for selling it to grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel fired plants. The power produced at grid from the other conventional sources which are predominantly fossil fuel based. Hence, the baseline for the project activity is the equivalent amount of power produced at the Indian grid.

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. Also, for the vintage 2021, the combined margin emission factor calculated from CEA database in India results into higher emission than the default value. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.

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.

Estimated Annual Emission Reductions: $BE_y = EG_{BL,y} \times EF_{CO_2, GRID, y}$

BE_y = Emission reductions in a year y.

where:

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

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

Estimated yearly total baseline emission reductions (BE_y) = 1628 CoUs/yr (1628 tCO_{2eq}/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.

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 this PCN, monitoring plan and applied methodology

B.9. Monitoring period number and duration>>

Monitoring Period: 01

Monitoring Duration: 20/03/2016 to 31/12/2021

First Issuance Period: 20/03/2016 to 31/12/2021

B.10. Monitoring plan>>

Key Data Monitored: • Quantity of net electricity supplied to the grid

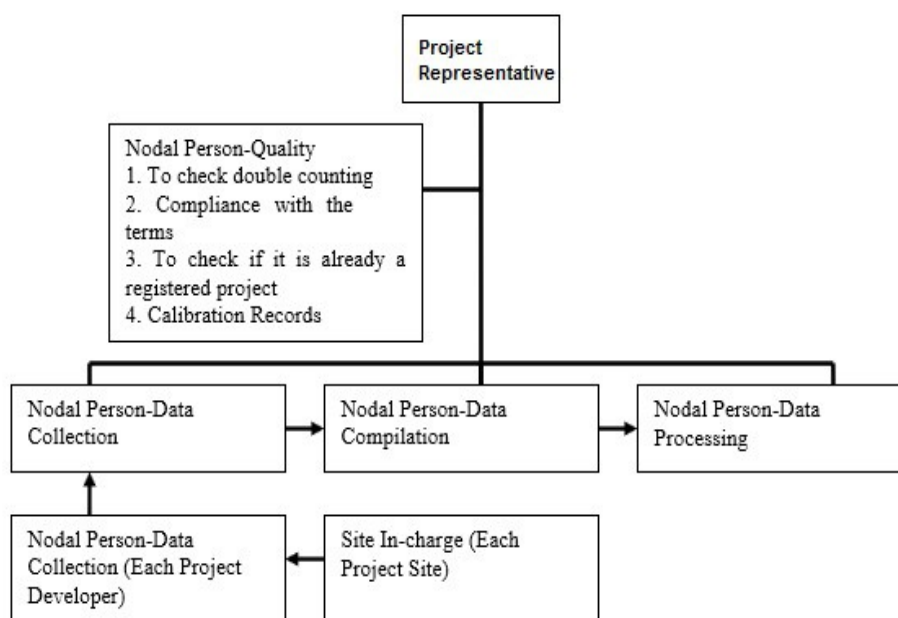
1. Monitoring Plan Objective and Organization

Project Representative is the project implementer and monitors the electricity delivered to the electricity grid by the respective project owners and thier solar installations. The data is already archived electronically and is stored since 2016.

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

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

The record keeping system follows the hierarchy given below:



Data / Parameter:	EGy
Data unit:	MWh
Description:	Quantity of net electricity supplied by all the installations in the project activity to the grid in year y
Source of data:	Statement of net export of power to the grid issued Monthly by State Electricity Board or any other competent authority as applicable
Measurement procedures (if any):	JMR (Joint Meter Readings)
Monitoring frequency:	The net energy exported to the grid is measured every month using calibrated energy meter by the State Electricity Board authorities in the presence of the project implementer or its representatives. The meter/s shall be jointly inspected, and sealed by authorised representatives of the company and the state utility. Measuring procedure: Will be measured by an export-import energy meter. The net electricity exported by the project plant would either be directly sourced as a measured parameter or be calculated by deducting the amount of imported electricity from the total amount of exported electricity. Accuracy class of energy meter: As per Power Purchase Agreement (PPA) or relevant National standards amended/modified from time to time. Calibration Frequency: As per the Central Electricity Authority the testing and calibration frequency should be minimum once in five years. However, the calibration will be done following the relevant applicable National Guidelines updated from time to time during the operation of the CPAs. Entity responsible: Project Aggregator/Representative
QA/QC procedures:	Monitoring frequency: Continuous Measurement frequency: Hourly Recording frequency: Monthly The electricity meter/s record both export and import of electricity from the solar Power plant and the readings with regard to net electricity generated will be used for calculation of emission reductions. The net electricity supplied to the grid will be cross checked with the monthly invoices. The meter/s would be checked for accuracy and the meters will be calibrated as per the procedures of State Electricity Board as per the national or international standards. Measurement results shall be cross checked with records for sold electricity (i.e. invoice).
Purpose of Data	-Calculation of baseline emission

Data/Parameter	EF_{CO2, GRID, y}
Data unit	tCO ₂ /MWh
Description	Fixed Ex-Ante
of data Value(s) applied	UCR Standard Protocol As per Standard
Measurement methods and procedures	Fixed
Monitoring frequency	NA
Purpose of data	To estimate baseline emissions

