

Monitoring Report CARBON OFFSET UNIT (CoU) PROJECT

Solar Project - 4.5 MW Bundled Solar Ground Mounted Power Project at Vejpur Gujarat



Title: 4.5 MW Bundled Solar Ground Mounted Power Project at Vejpur Gujarat Version 1.0 Date: 23/02/2023 First CoU Issuance Period: 7 years, 7 months Monitoring period: 27/05/2022 to 31/12/2022



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

Monitoring Report		
Title of the project activity	4.5 MW Bundled Solar Ground Mounted Power Project at Vejpur Gujarat	
UCR Project Registration Number	pending	
Version	1.0	
Completion date of the MR	23/02/2023	
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: (first and last days included (27/05/2022 to 31/12/2022)	
Project participants	M/s. Agarwal Roadlines M/s. Maharashtra Gujarat Transport Services M/s. Agarwal Tanks & Allied Works M/s. Sanjivani Industries Aggregator – Impel Enterprise(UCR ID : 551443447)	
Host Party	INDIA	
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I.D.: "Grid connected renewable electricity generation", version 18 Standardized Methodology: Not Applicable	
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)	
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	2022: 3121 CoUs (3121 tCO2eq)	
Total:	3121 CoUs (3121 tCO2eq)	

SECTION A. Description of project activity

A.1. Purpose and general description of project activity >>

This is a project activity of capacity 4.5 MW, which is Solar Ground Mounted grid connected solar power generation project in the District Vadodara, in the state of Gujarat, in India. The purpose of this plant installation and power generation is for captive consumption and Interconnection agreement is signed between the Project owner and Madhya Gujarat Vij Company Limited (MGVCL). The promoters of these project activity are M/s. Agarwal Roadlines , M/s. Maharashtra Gujarat Transport Services , M/s. Agarwal Tanks & Allied Works and M/s. Sanjivani Industries (herein after called as Project Proponent or PP). PP has the full ownership of the project activity. This project is an operational activity with continuous reduction of GHG, currently being applied under "Universal Carbon Registry" (UCR).

a) Purpose of the project activity and the measures taken for GHG emission reductions >>

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 of 4.5 was installed in one phase. Operation of solar power plant in Vadodara district in the state of Gujarat are per details listed below:

Sr	Owner	Туре	Location	District	State	Date of	Capacity
no						Commission	in MW
1	Agarwal	Ground	Vejpur	Vadodara	Gujarat	27/05/22	1.122
	Roadlines	mounted					
2	Maharashtra	Ground	Vejpur	Vadodara	Gujarat	27/05/22	1.122
	Gujarat	mounted					
	Transport						
	Services						
3	Agarwal Tanks	Ground	Vejpur	Vadodara	Gujarat	27/05/22	1.122
	& Allied Works	mounted					
4	Sanjivani	Ground	Vejpur	Vadodara	Gujarat	27/05/22	1.122
	Industries	mounted					
							4.488

As per the ex-ante estimate, this project will generate approximately 7,444 MWh of electricity per annum considering an average PLF of 20%. The project activity uses Mono Crystalline Vertex PERC Half Cut solar photovoltaic technology to generate clean energy. The generation of power from solar photovoltaic is a clean technology as there is no fossil fuel fired or no GHG gases are emitted during the process. 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. Thus, project activity leads to reduce the GHG emissions as it displaces power from fossil fuel-based electricity generation in the regional grid. The technological details have been provided in Section A.4.

The estimated annual average and the total CO_2e emission reduction by the project activity is expected to be 6,700 tCO2e, whereas actual emission reduction achieved during the first CoU period is 3121 tCO2e.

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.

The annual and the total CO_2e emission reduction by the project activity over the defined monitoring period is as per **Annexure I.**

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

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 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.

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

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

UCR Project ID	: 306
Start Date of Crediting Period	: 27/05/2022
Project Commissioned	: 27/05/22

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

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

Summary of the Project Activity and ERs Generated for the Monitoring Perio	
Start date of this Monitoring Period	27/05/2022
Carbon credits claimed up to	31/12/2022
Total ERs generated (tCO _{2eq})	3121 tCO2eq
Leakage	0

e) Baseline Scenario>>

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

In the absence of the project activity, the equivalent amount of electricity would have been imported from the regional grid (which is connected to the unified Indian Grid system), which is carbon intensive due to predominantly sourced from fossil fuel-based power plants. Hence, baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario.

Schematic diagram showing the baseline scenario:



A.2. Location of project activity>>

Country	: India
Village	: Vejpur
Taluka	: Disar

District : Vadodara

The project site is in village Vejpur of Vadodara district, Gujarat. The project site is well connected from airport and railway station. The geographic co-ordinates of the project location have been given below:

Latitude : 22° 44' 42" Longitude : 73° 22' 37.1994"

The representative location map is included below:



A.3. Parties and project participants >>

Party (H	ost) Participants
	Impel Enterprise (Representator)
	UCR Id : 551443447
	Contact person: Vatsal Makadia Mobile: +91 9428866081 Address: 101-102,SNS Atria,Vesu , Surat, India-395007
India	M/s. Agarwal Roadlines (Developer) – Address : 27, G.I.D.C., Ranoli, Dist. Vadodara, Gujarat - 391350, India
	M/s. Maharashtra Gujarat Transport Services (Developer) – Address : 27, G.I.D.C., Ranoli, Dist. Vadodara, Gujarat - 391350, India
	M/s. Agarwal Tanks & Allied Works (Developer) – Address : 17, G.I.D.C., Ranoli, Dist. Vadodara, Gujarat - 391350, India
	M/s. Sanjivani Industries (Developer) –
	Address : 27, G.I.D.C., Ranoli, Dist. Vadodara, Gujarat - 391350, India

A.4. References to methodologies and standardized baselines >>

SECTORAL SCOPE:

01, Energy industries (Renewable/Non-renewable sources)

TYPE:

I - Renewable Energy Projects

CATEGORY:

AMS. I.D. (Title: "Grid connected renewable electricity generation", version 18)

A.5. Crediting period of project activity >> Start date of the crediting period: 27/05/2022 Crediting period corresponding to this monitoring period: 27/05/2022 to 31/12/2022 (Both dates are inclusive)

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

Impel Enterprise (Representator)

UCR Id : 551443447

Contact person: Vatsal Makadia Mobile: +91 9428866081 Address: 101-102,SNS Atria,Vesu , Surat, India-395007

SECTION B. Implementation of project activity

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

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

The project consists of a ground-mounted solar photovoltaic plant with an aggregated installed capacity of 4.5 MW. The plant was commissioned on 27/05/2022. The project generates clean energy by utilizing solar radiation.

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

The 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 PV Array. The project activity has used reliable and proven technology from the supplier to ensure that an environmentally safe and sound technology is only being implemented in the proposed project activity leading to the GHG reduction.

Technical details for the solar power project installed at village Vejpur with a capacity of 4.5 MW are as follows:

Parameters	Value
Total number of Photovoltaic Modules	2040 nos. x 4 projects
Rating of Photovoltaic Module	545 - 550 Wp
Module Make	Trina
Technology	Vertex Mono PERC Half Cut
No. of Inverter	5 nos. x 4 projects
Invertor Capacity	185 kW x 3 , 160 kW x 2
Invertor make	Huawei
Optimizer	No optimizers

B.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)', the final document on the 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 the such project does not lead to any negative environmental impacts. Additionally, as per Indian Regulations, Environmental and Social Impact Assessment is not required for Solar Projects.

The Government of India has stipulated the following indicators for sustainable development in the interim approval guidelines for such projects which are contributing to GHG mitigations. The Ministry of Environment, Forests & Climate Change, has stipulated economic, social, environmental, and technological well-being as the four indicators of sustainable development. It has been envisaged that the project shall contribute to sustainable development using the following ways:

Social well-being: The project would help in generating direct and indirect employment benefits accruing out of ancillary units for installation and maintenance during the operation of the project activity. It will lead to the development of infrastructure around the project area in terms of improved road network etc. and will also directly contribute to the development of renewable infrastructure in the region.

Environmental well-being: The project utilizes solar energy for generating electricity which is a clean source of energy. The project activity will not generate any air pollution, wind pollution, or solid waste to the environment which otherwise would have been generated through fossil fuels. Also, it will contribute to the reduction of GHG emissions. Thus, the project causes no negative impact on the surrounding environment contributing to environmental well-being.

Economic well-being: Being a renewable resource, using solar energy to generate electricity contributes to the conservation of precious natural resources. The project contributes to economic sustainability through the promotion of decentralization of economic power, leading to the diversification of the national energy supply, which is dominated by conventional fuel-based generating units. Locally, improvement in infrastructure will provide new opportunities for industries and economic activities to be set up in the area. Apart from getting better employment opportunities, the local people will get better prices for their land, thereby resulting in overall economic development.

Technological well-being: The project activity leads to the promotion of 4.5 MW PV power generation project in the region and will promote practice for small-scale industries to reduce the dependence on carbon-intensive grid supply to meet the captive consumption requirement of electrical energy and also increase energy availability and improving quality of power under the service area. Hence, the project leads to technological well-being.

The project activity contributes to the following SDGs:

SDG Goals	Description
7 AFFORDABLE AND CLEAN ENERGY	➤ The project activity will generate clean energy, which with increased shared will increase the affordability at a cheaper rate to end user.
	The project activity will utilize solar energy (renewal resource) to generate power. The project activity will increase the share of renewable resource-based electricity to global mix of energy consumption
8 DECENT WORK AND ECONOMIC GROWTH	 Decent work and economic growth. This project activity generates additional employment for skilled and unskilled, also the project situated in a remote area will provide employment opportunities to unskilled people from villages. Training on various aspects including safety, operational issues, and developing skill sets will also be provided to employees.
	➤ This project will 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
13 CLIMATE ACTION	➤ This 4.5 MW Solar power project meets the SDG 13 goal by saving fossil fuel and producing clean energy.
E Com	 This project is expected to reduce CO₂ emissions by 6,700 ton per year. SDG 13 on clean energy is closely related and complementary.
	➤ In a Greenfield project, electricity delivered to the grid by the project would have otherwise been generated by the operation of grid- connected power plants. Thereby the project activity reduces the dependence on fossil fuel-based generation units and as there are no associated emissions

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 PP, 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 PP has 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 PP practices a good governance practice with transparency, accountability and adherence to local and national rules & regulations etc. This can be further referred from the company's annual report. 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 proponent ensure good credentials under ESG.

B.3. Baseline Emissions>>

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

In the absence of the project activity, the equivalent amount of electricity would have been imported from the regional grid (which is connected to the unified Indian Grid system), which is carbon intensive due to predominantly sourced from fossil fuel-based power plants. Hence, baseline scenario of the project activity is the grid-based electricity system, which is also the pre-project scenario.

Schematic diagram showing the baseline scenario:

Baseline Scenario:



B.4. Debundling>>

This project is not a debundled component of a larger project activity.

SECTION C. Application of methodologies and standardized baselines

C.1. References to methodologies and standardized baselines >> SECTORAL SCOPE:

01. Energy industries (Renewable/Non-renewable sources)

TYPE:

I - Renewable Energy Projects

CATEGORY:

AMS. I.D. (Title: "Grid connected renewable electricity generation", version 18)

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

This project activity involves generation of grid connected electricity from the construction and operation of a new solar power-based power project. The project activity has installed capacity of 4.544 MW which will qualify for a small-scale project activity under Type-I of the Small-Scale methodology. The project status is corresponding to the methodology AMS-I.D., version 18 and applicability of methodology is discussed below:

Applic	cability Criterion	Project Case
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:		The project activity is a Renewable Energy Project i.e., wind power project which sell its energy to the
1.	(a) Supplying electricity to a national or a regional grid; or	grid and falls under applicability criteria option 1 point (a).
2.	(b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	Thus, this project activity fulfil this criterion.
2. This	s methodology is applicable to project activities that:	
1.	(a) Install a Greenfield plant;	
2.	(b) Involve a capacity addition in (an) existing	The option (a) of applicability
	plant(s);	criteria 2 is applicable as project is
3.	(c) Involve a retrofit of (an) existing plant(s);	project activity meets the given
4.	(d) Involve a rehabilitation of (an) existing	applicability criterion.
	<pre>plant(s)/unit(s); or</pre>	
5.	(e) Involve a replacement of (an) existing	

plant(s).		
3. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:		
(a) The project activity is implemented in existing reservoir, with no change in the volume of the reservoir; or		
2. (b) The project activity is implemented in existing reservoir, where the volume of the reservoir(s) is increased and the power density as per definitions given in the project emissions section, is greater than 4 W/m2.	installation of Solar PV (SPV); hence, this criterion is not applicable.	
 3. (c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m2 		
4. If the new unit has both renewable and non- renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The proposed project is 4.5 MW Wind power project, i.e., only component is renewable power project below 15MW, thus the criteria is not applicable to this project activity.	
5. Combined heat and power (co-generation) systems are not eligible under this category	The project activity is wind power project thus the criterion is not applicable to this project activity.	
6. In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct1 from the existing units.	The proposed project is a greenfield 4.5 MW wind power project. As no capacity addition is taking place thus the criterion is not applicable to this project activity.	
7. In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	The proposed project is a greenfield 4.5 MW wind power project. As this does not involve retrofit, rehabilitation or replacement, thus the criterion is not applicable to this project activity.	
8. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid, then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or	The proposed project is a greenfield 4.5 MW wind power project; hence, this criterion is not applicable to this project activity.	

cogeneration other applicable Type-I methodologies such as "AMS- I.C.: Thermal energy production with or without electricity" shall be explored.	
9. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	No biomass is involved, the project is only a wind power project and thus the criterion is not applicable to this project activity.

C.3 Applicability of double counting emission reductions >>

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

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

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

As per applicable methodology AMS-I.D. Version 18, "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 PV system and the Indian grid system.

Source	GHG	Included?	Justification/Explanation
	CO_2	YES	Main emission source
Grid	CH_4	NO	Minor source of emission
connected	N ₂ O	NO	Minor source of emission
electricity generation	Other	NO	No other GHG emissions were emitted from the project
	CO ₂	NO	No CO2 emissions are emitted from the project
Greenfield	CH ₄	NO	Project activity does not emit CH4
Power	N ₂ O	NO	Project activity does not emit N2O
Project Activity	Other	NO	No other emissions are emitted from the project

C.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 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 wind power plant to harness the green power from wind energy. 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 CO_2 emission factor (t CO_2/MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 t CO_2/MWh for the 2014- 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.

Net GHG Emission Reductions and Removals

Thus, ERy Where:

ERy BEy PEy LEy

 $=BE_y - PE_y - LE_y$

= Emission reductions in year y (tCO₂/y) = Baseline Emissions in year y (t CO₂/y) = Project emissions in year y (tCO₂/y) = Leakage emissions in year y (tCO₂/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:

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

Where,

 BE_y = Baseline emissions in year y (t CO₂)

[©] Universal CO2 Emission And Offset Registry Private Ltd

 $EG_{PJ,y}$ = 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)

 $EF_{grid,y}$ = UCR recommended emission factor of 0.9 tCO₂/MWh has been considered. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

Project Emissions

As per Paragraph **39** of AMS-I.D. version-18, only emission associated with the fossil fuel combustion, emission from operation of geo-thermal power plants due to release of non-condensable gases, emission from water reservoir of Hydro should be accounted for the project emission. Since the project activity is a wind power project, project emission for renewable energy plant is nil.

Thus, PE = 0

Leakage

As per paragraph **42** of AMS-I.D. version-18, 'If the energy generating equipment is transferred from another activity, leakage is to be considered.' In the project activity, there is no transfer of energy generating equipment and therefore the leakage from the project activity is considered as zero.

Hence, LE = 0

*EG*_{*PJ*,*y*} Total Energy Generated during crediting period :

Month	Generation in MWh					
May - 2022	82.472					
June - 2022	591.996					
July - 2022	410.408					
August - 2022	420.365					
September - 2022	420.282					
October - 2022	469.839					
November - 2022	521.07					
December - 2022	551.847					
Quantity of net electricity supplied to the grid as a result of the implementation of the project activity	3468.279					

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

Estimated annual baseline emission reductions (BEy) = **3468.279** MWh/year * 0.9 tCO2/MWh = **3,121.4511** tCO2/year (i.e. 3,121.4511 CoUs/year)

C.6. Prior History>>

The project activity is a small-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 credits (i.e., COUs).

C.7. Monitoring period number and duration>>

The start date of crediting under UCR is considered as 27/05/2022 and no GHG emission reduction has been claimed so far.

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

No changes

C.9. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

Not Applicable

C.10. Monitoring plan>>

Data and Parameters available at validation (ex-ante values):

Data/Parameter	UCR recommended emission factor
Data unit	tCO2 /MWh
Description	A "grid emission factor" refers to a CO ₂ emission factor (tCO ₂ /MWh) which will be associated with each unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO ₂ /MWh for the 2014- 2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
Source of data	https://a23e347601d72166dcd6- 16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.c om//Documents /UCRCoUStandardAug2022updatedVer6_0908222201 27104470.pdf

Value(s) 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
Additional Comments	The combined margin emission factor as per CEA database (current version 16, Year 2021) results into higher emission factor. Hence for 2021 vintage UCR default emission factor remains conservative.

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

Data / Parameter:	EG _{PJ,facility, y}
Data unit:	MWh
Description:	Quantity of net electricity supplied to the grid as a result of the implementation of the project activity in year 2022 (MWh)
Source of data:	Monthly Joint Meter Readings (JMRs)
Measurement procedures (if any):	Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually Archiving Policy: Paper & Electronic Calibration frequency: 5 years (as per CEA provision)
Monitoring frequency:	Monthly
Value applied	3468.279 MWh
QA/QC procedures:	Calibration of the Main meters will be carried out once in five (5) years as per National Standards (as per the provision of CEA, India) and faulty meters will be duly replaced immediately as per the provision of power purchase agreement. Cross Checking:

	Quantity of net electricity supplied to the grid will be cross checked from the invoices raised by the project participant to the grid.
Any comment:	Data will be archived electronically for a period of 36 months beyond the end of crediting period.

ANNEXURE I (Emission Reduction Calculation)

4.5 MW Bundled Solar Ground Mounted Power Project at Vejpur Gujarat													
					IVIOI	nth - wise Ene	ergy Delivered	to Grid (in IV	iwn)	-		-	-
Year	January		February	March	April	May	June	July	August	September	October	November	December
2	022	0	0	0	0	82.472	591.996	410.408	420.365	420.282	469.839	521.07	551.847
Year - wise Emmission reduction calculation for project activity													
Year		Total electricity delivered in MWh		Emmission factor			Total COU generated						
	202	2				346	8.279			0.9		312	1.4511