



PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title: 1 MW CERA Solar Project in Mehsana, Gujarat

Version 1.0

Date 01/12/2021

First CoU Issuance Period: 7 years, 4 months, 6 days

Date: 24/07/2014¹ to 30/11/2021

¹ Considered from the date of commissioning of the first phase of the project.



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

BASIC INFORMATION

Title of the project activity	1 MW CERA Solar Project in Mehsana, Gujarat
Scale of the project activity	Small Scale (Choose Accordingly)
Completion date of the PCN	01/12/2021
Project participants	Creduce Technologies Private Limited (Aggregator) CERA Sanitaryware Limited (Owner)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I.D : “Grid connected renewable electricity generation”, version 18.0 Standardized Methodology: Not Applicable.
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of total GHG emission reductions	To be estimated during verification [An ex-ante estimate is 1,495 CoUs per year]

SECTION A. Description of project activity

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

The project titled “1 MW CERA Solar Project in Mehsana, Gujarat” is located in GIDC area of Kadi, Mahesana district, of Gujarat (India), is a GHG project currently being applied under “Universe Carbon Registry” (UCR).

Purpose of the project activity:

The project activity is a renewable power generation activity CERA Sanitaryware Limited (“CSL”) is leader in manufacturing of sanitaryware, developing 1 MWp roof-top Solar PV power project based on polycrystalline technology at its premises in GIDC, Kadi, Mahesana, Gujarat in India. The project activity involves the installation and operation of a green field solar photovoltaic (PV) power plant at its manufacturing facility in Mahesana district of Gujarat. The proposed project activity has been implemented in 2 phases (500 kW each), Phase-I was commissioned on 24th July 2014 and Phase-II has been commissioned on 30th Sep 2014.

The purpose of the project activity is to utilize the solar energy source for clean electricity generation. The net generated electricity from the project activity will be used in the manufacturing facility of CERA for its captive consumption. The proposed project has been synchronized with the regional grid (which is a part of unified Indian grid now).

The project activity has been designed with an estimated annual net electricity generation of about 1600 MWh for captive consumption which otherwise would have been imported from the grid. In the absence of the project activity an equivalent amount of electricity would have been generated from the connected/new power plants in the integrated the Indian grid system, which is predominantly based on fossil fuels. On the contrary the operation of solar modules is emission free throughout the lifetime of the project activity. The project activity doesn’t involve any GHG emission sources.

Project’s Contribution to Sustainable Development

This project is a greenfield activity where grid power is the baseline. Indian grid system has been predominantly dependent on power from fossil fuel powered plants. The renewable power generation is gradually contributing to the share of clean & green power in the grid, however grid emission factor is still on higher side which defines grid as distinct baseline.

The Government of India has stipulated following indicators for sustainable development in the interim approval guidelines for such projects which are contributing to GHG mitigations. The Ministry of Environment and Forests, has stipulated economic, social, environment 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 adding more employment opportunities as compared to regular employees, such as during the construction and operation phases of the solar rooftop plant. Since the project is a rooftop facility, there is no other impact on nearby region.

Also, the project activity directly contributes to the development of renewable infrastructure in the region which will motivate other fellow industries in the region to adopt solar technology for green power.

Economic well-being: The project is a clean technology investment decided based on carbon revenue support, which signifies flows of clean energy investments into the host country. The project activity requires temporary and permanent, skilled and semi-skilled manpower at the solar project location; this will create additional employment opportunities in the region. The generated electricity will be utilised for captive consumption, thereby reducing the demand from the grid.

Technological well-being: The successful operation of project activity would lead to promotion of solar based power generation and would encourage other entrepreneurs to participate in similar projects. Increased interest in solar energy projects will further push R&D efforts by technology providers to develop more efficient and better machinery in future.

Environmental well-being: The project activity will generate power using zero emissions solar based power generation facility at the rooftop which helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities. Also, being a renewable resource, use of solar energy to generate electricity contributes to resource conservation. It reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Thus the project causes no negative impact on the surrounding environment contributing to environmental well-being.

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 project proponent, 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 relating to any environmental risks of the company which might face and how the company is managing those risks. Here, due to the solar project 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 look at the company's business relationships, qualitative employment, working conditions show high regard for its employees' health and safety, other stakeholders' interests taken into account etc. With respect to this project, the Project Proponent 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, the Project Proponent practices a good governance practices with transparency, accountability, adherence to local and national rules & regulations etc.

This can be further referred from the company's annual report. Also, the project activity is a standalone rooftop system owned and managed by the proponent, 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 proponent ensures good credentials under ESG.

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

There were 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 (29/02/2016), 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 (as described under section 5.2 below) Environmental and Social Impact Assessment is not required for Solar Projects.

Nevertheless, a stakeholders' consultation process was conducted (on 03/07/2014 at project site Kadi, Mehsana, Gujarat (manufacturing facility of the PP) to understand, discuss, record all possible concerns related environment and socio-economic aspects of the project so that as per requirements mitigation measures can be taken. The feedback and inputs received from stakeholders confirm that no negative impact is foreseen by the stakeholders.

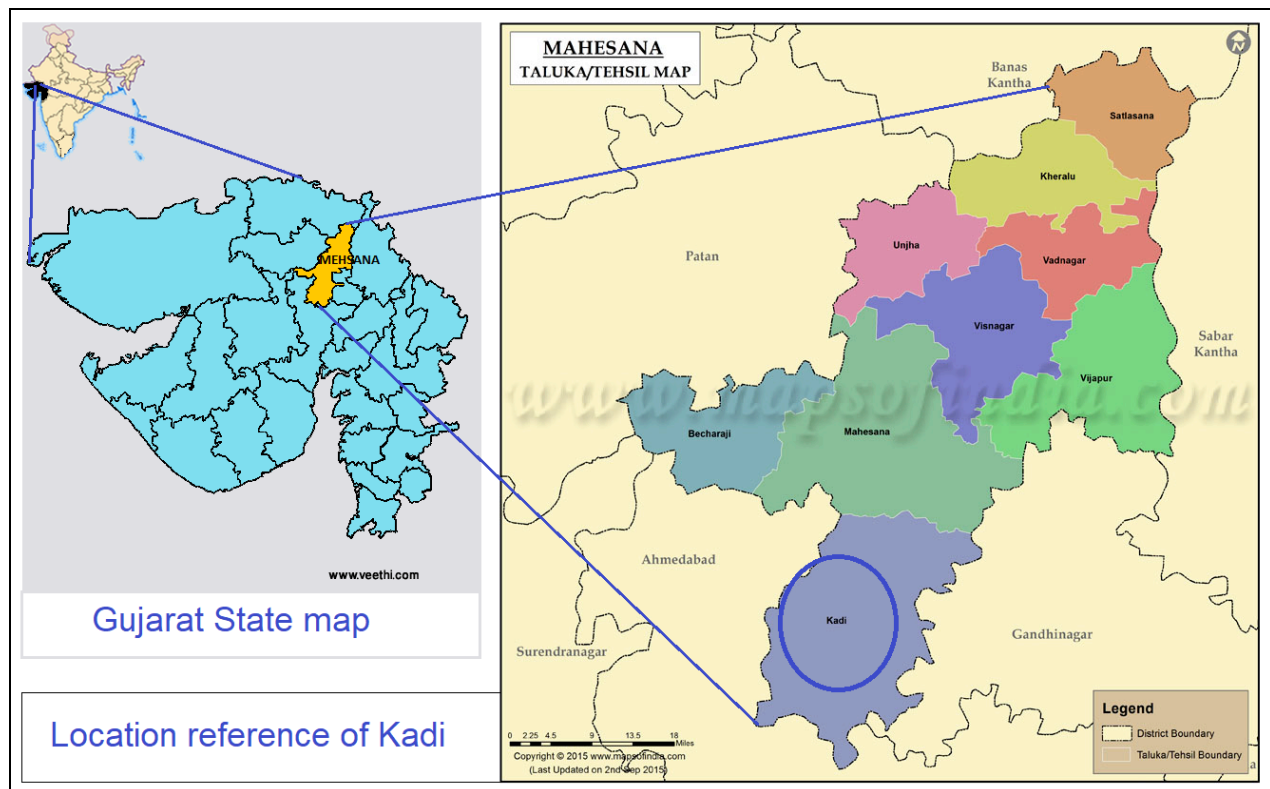
Additionally, there are social, environmental, economic and technological benefits which contribute to sustainable development. The key details are discussed in the previous section.

A.3. Location of project activity >>

Country : India
District : Mehsana
Village : Kadi GIDC
Tehsil : Kadi
State : Gujarat
Pin code : 382 715

Latitude : 23° 03' 7.87" N
Longitude : 73° 3' 21.56"

The representative location map is included below:



(Courtesy: google map and images)

A.4. Technologies/measures >>

The project activity involves “Solar PV system” as the technology. It includes a total of 1 MW solar power project based on polycrystalline solar PV technology. The major components of the solar project are:

- The solar modules,
- The module mounting structures,
- The transformer etc.

The solar modules are mounted on the module mounting structures. The solar module is a packaged, connected assembly of solar cells which uses the incident photons from the sun light and

converts it into electricity. The solar module generates DC power which is converted to AC power with the help of inverters.

The main technological specifications of the project are listed below:

Specification	Value
Nominal Power	1.00 MW
No. of modules	1680
Module make	Photovoltaic Module
Module Type	5BB
Rated Voltage	45.6 V
Rated Current	8.39 Amp
Mounting structure	Fixed structure
Tilt angle (slope) of module	21°
Inverter type	String Inverter
Average lifetime of the project	Technical life of 25 years
Design plant load factor	18.25% (as per assessment)

A.5. Parties and project participants >>

Party (Host)	Participants
India	<p>Creduce Technologies Private Limited (Aggregator) Address: 2-O-13,14 Housing Board Colony, Banswara, RJ, India 327001</p> <p>CERA Sanitaryware Limited (Owner) Address: 9, GIDC Industrial Estate, Kadi 382715, Dist. Mehsana, GJ, India</p>

A.6. Baseline Emissions>>

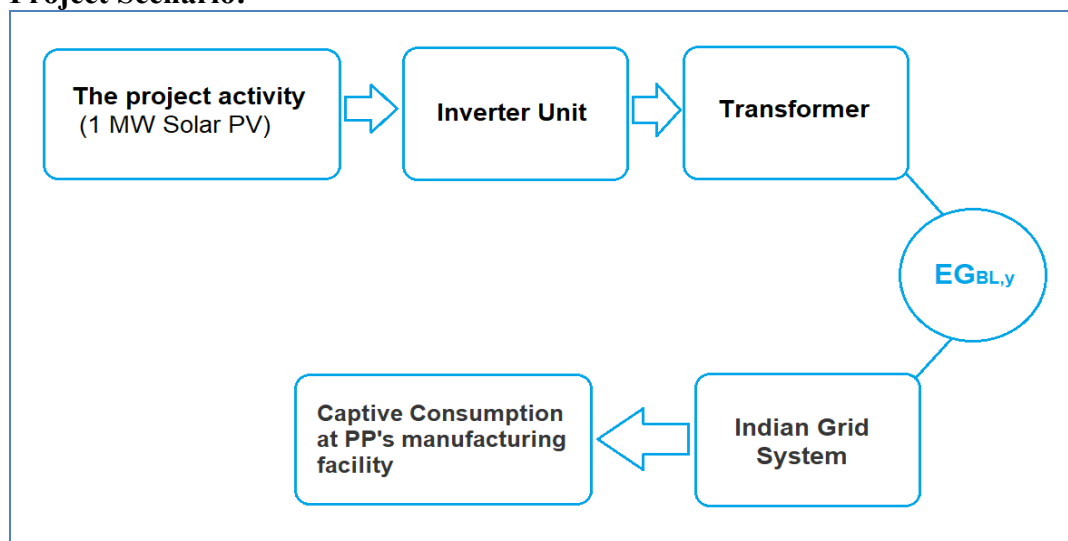
The baseline scenario identified at the PCN stage of the project activity is:

- Grid

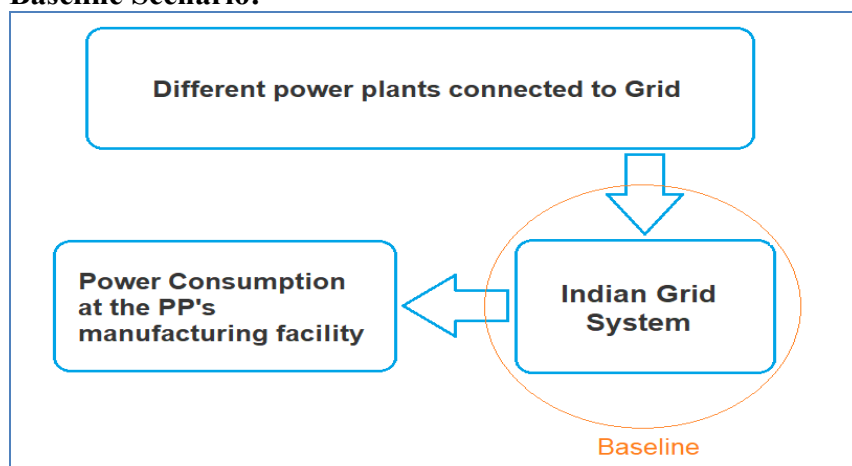
In the absence of the project activity the equivalent amount of electricity would have been imported from the regional grid (which is connected to the unified Indian Grid system), which is carbon intensive due to predominantly sourced from fossil fuel based power plants. Hence baseline scenario of the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

Schematic diagram showing the baseline scenario:

Project Scenario:



Baseline Scenario:



A.7. Debundling>>

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

SECTION B. Application of methodologies and standardized baselines

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

SECTORAL SCOPE:

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

TYPE:

I - Renewable Energy Projects

CATEGORY:

AMS. I.D. (Title: “Grid connected renewable electricity generation”, version 18.0)

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

The project activity involves generation of grid connected electricity from the construction and operation of a new rooftop solar power project for captive consumption of the power at the PP’s facility. The project activity has installed capacity of 1 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:

Applicability Criterion	Project Case
1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project activity is a Renewable Energy Project i.e. Solar PV project (SPV) for captive consumption which falls under applicability criteria option 1 (b) i.e., “Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling”. Hence the project activity meets the given applicability criterion as well as satisfies the applicability illustration mentioned in Appendix of AMS-ID Table 1 – Scope of AMS-I.D version 18.
2. This methodology is applicable to project activities that: (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s).	The option (a) of applicability criteria 2 is applicable as project is a Greenfield plant /unit. Hence the project activity meets the given applicability criterion.

<p>3. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <p>(a) The project activity is implemented in existing reservoir, with no change in the volume of the reservoir; or</p> <p>(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.</p> <p>(c) (c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m²</p>	<p>The project is a Solar PV (SPV) rooftop installation, hence this criteria is not applicable.</p>
<p>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.</p>	<p>The proposed project is 1 MW SPV i.e. only component is renewable power project below 15MW, thus the criterion is not applicable to this project activity.</p>
<p>5. Combined heat and power (co-generation) systems are not eligible under this category</p>	<p>The project is SPV project and thus the criterion is not applicable to this project activity.</p>
<p>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 distinct from the existing units.</p>	<p>The proposed project is a greenfield 1 MW SPV i.e. only component is renewable power project below 15MW, thus the criterion is not applicable to this project activity</p>
<p>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.</p>	<p>The proposed project is a greenfield 1 MW SPV i.e. only component is renewable power project below 15MW, thus the criterion is not applicable to this project activity</p>
<p>8. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS-I.C.: Thermal energy production with or without electricity” shall be explored.</p>	<p>The proposed project is a greenfield 1 MW SPV, hence this criterion is not applicable to this project activity.</p>

9. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply.	Not biomass involved, the project is only a SPV project and thus the criterion is not applicable to this project activity.
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B.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

B.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		Gas	Included?	Justification/Explanation
Baseline	Grid connected electricity generation	CO ₂	Yes	Main emission source
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
		Other	No	No other GHG emissions were emitted from the project
Project	Greenfield Solar PV Project Activity	CO ₂	No	No CO ₂ emissions are emitted from the project
		CH ₄	No	Project activity does not emit CH ₄
		N ₂ O	No	Project activity does not emit N ₂ O
		Other	No	No other emissions are emitted from the project

B.5. Establishment and description of baseline scenario >>

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 Solar PV plant to harness the green power from solar energy and to use for captive purpose via grid interface through wheeling arrangement. 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.

The combined margin ($EF_{grid,CM,y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) (having weightage 75%) and build margin (BM) (having weightage 25%). Calculations for this combined margin must be based on data from an official source (where available) and made publically available.

The combined margin of the Indian grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
$EF_{grid,CM,y}$	0.93463 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 14 ² published by Central Electricity Authority (CEA), Government of India.
$EF_{grid,OM,y}$	0.95677 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3 year (2014-15, 2015-16 & 2016-17,) generation-weighted average, sourced from Baseline CO ₂ Emission Database, version 14, published by Central Electricity Authority (CEA), Government of India.
$EF_{grid,BM,y}$	0.86821 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	Baseline CO ₂ Emission Database, Version 14, published by Central Electricity Authority (CEA), Government of India.

² http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf

Net GHG Emission Reductions and Removals

$$\text{Thus, } ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y (tCO₂/y)

BE_y = Baseline Emissions in year y (t CO₂/y)

PE_y = Project emissions in year y (tCO₂/y)

LE_y = Leakage emissions in year y (tCO₂/y)

Baseline Emissions

Baseline emissions include only CO₂ 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 (t CO 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)
$EF_{grid,y}$	=	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO ₂ /MWh)

Project Emissions

As per 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 solar power project, project emission for renewable energy plant is nil.

Thus, $PE_y = 0$.

Leakage

As per paragraph 22 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, $LE_y = 0$

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)

= 1600 MWh *0.93463

= 1,495 CoUs /year (i.e. 1495 tCO₂eq/year)

B.6. Prior History>>

The project activity had been applied under Clean Development Mechanism (CDM) of UNFCCC to consider generation or issuance of carbon offsets or credits. In this regard, a 'Prior consider of CDM' was submitted to UNFCCC and CDM DNA in India, which was published in CDM web interface on 29 May 2014. However, project has not been validated further under CDM due to low carbon pricing and higher investment required in the validation and registration process.

Similarly, project was not applied under any other GHG mechanism; hence project will not cause double accounting of carbon credits (i.e. COUs).

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

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

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

Not applicable.

B.9. Monitoring period number and duration>>

The first Monitoring/Issuance Period.

Duration: 7 years, 4 months, 6 days – 24/07/2014 to 30/11/2021

B.8. Monitoring plan>>

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

Data / Parameter	EF _{grid,CM, y}
Data unit	tCO ₂ /MWh
Description	Combined margin emission factor for Indian grid connected power generation in year y calculated using the latest version of "Tool to calculate the emission factor for an electricity system version 07"
Source of data	CO ₂ baseline database (Version 16.0) published by CEA on March 2021, which is the most recent and updated datasets. (https://cea.nic.in/wp-content/uploads/baseline/2021/06/User_Guide_ver_16_2021-1.pdf)
Value applied	0.93463
Measurement methods and procedures	This value is calculated using OM and BM values as per the methodological tool to calculate the emission factor for an electricity system and using data base of CEA.
Monitoring frequency	Ex-ante fixed parameter
Purpose of Data	For the calculation of Emission Factor of the grid

Data / Parameter	$EF_{grid, OM, y}$
Data unit	tCO ₂ /MWh
Description	Simple operating margin emission factor for Indian grid
Source of data	CO ₂ baseline database (Version 16.0) published by CEA on March 2021, which is the most updated datasets.
Value applied	0.95677
Measurement methods and procedures	This value is calculated by taking weighted average of Simple Operating Margin of recent three years for Indian grid as per the “Tool to calculate the emission factor for an electricity system”
Monitoring frequency	Ex-ante fixed parameter
Purpose of Data	For the calculation of Emission Factor of the grid

Data / Parameter	$EF_{grid, BM, y}$
Data unit	tCO ₂ /MWh
Description	Simple build margin emission factor for Indian grid
Source of data	CO ₂ baseline database (Version 16.0) published by CEA on March 2021, which is the most updated datasets.
Value applied	0.86821
Measurement methods and procedures	This value is calculated by taking weighted average of Simple Build Margin of recent three years for Indian grid as per the “Tool to calculate the emission factor for an electricity system”
Monitoring frequency	Ex-ante fixed parameter
Purpose of Data	For the calculation of Emission Factor of the grid

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

Data / Parameter	$EG_{PJ, y}$
Data unit	MWh
Description	Quantity of net electricity supplied by the project plant/unit for the purpose of captive usage via wheeling through the grid in year y
Source of data	Energy Meter records and/or monthly generation statement
Measurement procedures (if any):	<p>Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Archiving Policy: Paper & Electronic Calibration frequency: Once in 5 years (as per provision of CEA).</p> <p>The Net electricity supplied to the grid by the project activity will be calculated as a difference of electricity exported to the grid, electricity imported from the grid (if any);</p> $EG_{PJ, y} = EG_{Export} - EG_{Import}$ <p>If the source of data directly provides the net units, then export and import</p>

	<p>values are not required as input parameters. The directly available value of net export quantity can be used.</p> <p>Cross Checking: Quantity of net electricity supplied to the grid will be cross checked from the monthly bills or invoices.</p>
Measurement Frequency:	Monthly
Value applied:	1,600 (Annualized average value has been considered here for ex-ante estimation purposes)
QA/QC procedures applied:	Not required.
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	<p>Data will be archived electronically for a period of 36 months beyond the end of crediting period.</p> <p>Since the renewable power generated from the project is used for captive consumption via wheeling, hence during the monitoring and verification the provision of the wheeling agreement may be referred.</p>