



Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT



Title: 7.676 MW Bundled Solar Power Project by Sudiva Spinners Private Limited

Version 1.0

Date 01/04/2022

First CoU Issuance Period: 04 years 11 months

Monitoring Period: 23/02/2017 to 31/12/2021



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

Monitoring Report	
Title of the project activity	7.676 MW Bundled Solar Power Project by Sudiva Spinners Private Limited
UCR Project Registration Number	50
Version	1.0
Completion date of the MR	01/04/2022
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: 23/02/2017 to 31/12/2021 (first and last days included)
Project participants	Creduce Technologies Private Limited (Representator) Sudiva Spinners Private Limited (Project Proponent)
Host Party	India
Applied methodologies and standardized baselines	Applied Baseline Methodology: AMS-I.D: "Grid connected renewable electricity generation", version 18
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	2017: 1,393 CoUs (1,393 tCO ₂ eq)
	2018: 2,323 CoUs (2,323 tCO ₂ eq)
	2019: 3,631 CoUs (3,631 tCO ₂ eq)
	2020: 8,567 CoUs (8,567 tCO ₂ eq)
	2021: 10,125 CoUs (10,125 tCO ₂ eq)
Total:	26,039 CoUs (26,039 tCO ₂ eq)

SECTION A. Description of project activity

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

The proposed project activity with title under UCR “7.676 MW Bundled Solar Power Project by Sudiva Spinners Private Limited”, is a grid connected renewable power generation activity which incorporates installation and operation of Solar Photovoltaic power generation project at Project Proponents premise, District Bhilwara, in the State of Rajasthan, in India. There are multiple power plants installed at the location as per the details mentioned in the below table. The project is an operational activity with continuous reduction of GHG, currently being applied under “Universal Carbon Registry” (UCR).

Village	District	AC Capacity	DC Capacity of Plant	Rooftop/ Ground Mount	Commissioning date	Operation Type
Dhunwalia	Bhilwara	1100 kW	1274.93 kW	Rooftop	23-02-2017	Owned
Dhunwalia	Bhilwara	400 kW	463 kW	Rooftop	03-10-2017	Owned
Dhunwalia	Bhilwara	1608 kW	1710.54 kW	Rooftop	13-05-2019	Outsourced
Dhunwalia	Bhilwara	4128 kW	4815.08 kW	Rooftop	20-12-2019	Outsourced
Dhunwalia	Bhilwara	440 kW	557.90 kW	Rooftop	06-07-2021	Owned

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

The project activity aims to harness Solar radiation of sun which is a renewable source, to generate electricity. The net generated electricity from the project activity is being consumed by the facility of Project Proponent (PP), hence displacing an equivalent amount of electricity from the NEWNE grid with renewable electricity.

In pre-project scenario the PP was importing the required electricity from the state utility i.e., Ajmer Vidyut Vitran Nigam Limited (is a part of regional grid, earlier known as NEWNE grid) to meet its captive requirement of electrical energy. Currently, NEWNE grid is connected to large numbers of fossil fuel-based power plants. Hence, project activity is displacing the gross electricity generation i.e., 28,932 MWh from the NEWNE grid, which otherwise would have been imported from the NEWNE grid. The project activity doesn't involve any GHG emission sources.

The annual and the total CO₂e 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 involves a single Ground Mounted PV Plant and multiple rooftop PV plants with an aggregated installed DC capacity of 8.821 MWp. The average life time of the Photovoltaic Panel is around 20 years as per the equipment supplier specification. Solar radiation is converted directly into electricity by solar cells (photovoltaic cells). In such cells, a small electric voltage is generated when light strikes the junction between a metal and a semiconductor (such as silicon) or the junction between two different semiconductors. 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.

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 is covered in this monitoring report.

UCR Project ID: 50

Commissioning Date of Sudiva Spinners Private Limited : As per details in section A1
Start Date of Crediting Period Sudiva Spinners Private Limited : 23/02/2017

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 Period	
Start date of this Monitoring Period	23/02/2017
Carbon credits claimed up to	31/12/2021
Total ERs generated (tCO _{2eq})	26,039 tCO _{2eq}
Leakage	0

e) Baseline Scenario>>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”.

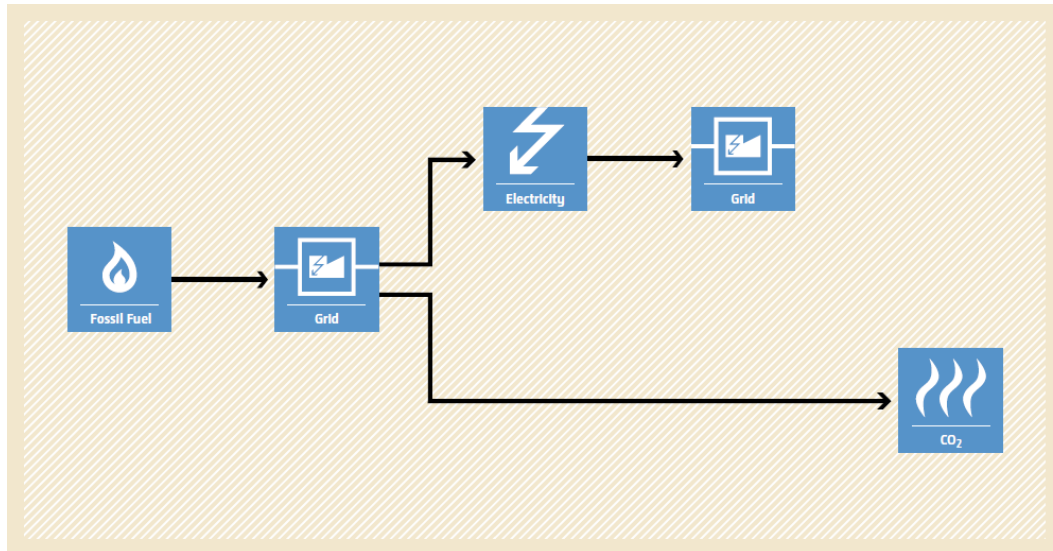


Figure 1 Baseline Scenario

A.2. Location of project activity>>

Country : India
 State : Rajasthan
 Village : Dhunwalia
 District : Bhilwara

The project site is in village Dhunwalia of Bhilwara district, Rajasthan. The nearest railway station is Ajmer junction at a distance of about 98 kms from the bundled project site. The nearest airport is in Ondwa and is at a distance of 68 kms from the bundled project site. The project site is well connected from airport and railway station. The geographic co-ordinates of the project location are Latitude: 25° 40'27.469" N and Longitude: 74° 36'28.36" E

The representative location map is included below:



A.3. Parties and project participants >>

Party (Host)	Participants
India	<p>Creduce Technologies Private Limited (Representator)</p> <p>Contact person: Shailendra Singh Rao Mobile: +91 9016850742, 9601378723 Address: 2-O-13,14 Housing Board Colony, Banswara, Rajasthan - 327001, India.</p> <p>Sudiva Spinners Private Limited (Developer)</p> <p>Address: 91 KM Stone, NH-79, Village-Dhunwalia, P.O. Sareri, Teh.-Hurda, Bhilwara-311024, Rajasthan, India.</p>

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

SECTORAL SCOPE	-	01 Energy industries (Renewable/Non-Renewable Sources)
TYPE	-	Renewable Energy Projects
CATEGORY	-	AMS-I. D: “Grid connected renewable electricity generation”, version 18

A.5. Crediting period of project activity >>

Start Date of Crediting Period Sudiva Spinners Private Limited : 23/02/2017

Length of the crediting period corresponding to this monitoring period: 04 years 11 months
i.e., 23/02/2017 to 31/12/2021 for both projects (Both the dates are inclusive).

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

Name : Shailendra Singh Rao
Contact No : +91 9016850742, 9601378723
E-Mail : shailendra@creduce.tech

SECTION B. Implementation of project activity

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

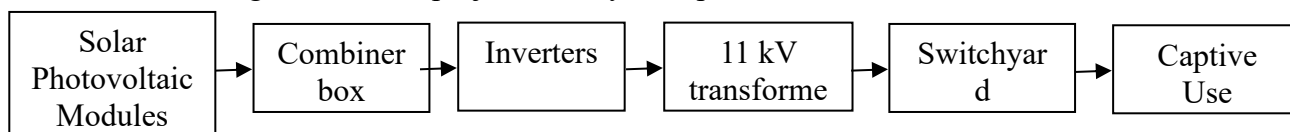
a) Provide information on the implementation status of the project activity during this monitoring period in accordance with UCR PCN>>

The project consists of multiple Photovoltaic Plant with an aggregated installed capacity of 7.676 MWp each. The plants were commissioned in different phases as mentioned in the Section A.1 by the respective authority of Government of Rajasthan. The project generates clean energy by utilizing the Solar Radiations.

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

Photovoltaic module consists of several photovoltaic cells connected by circuits and sealed in an environmentally protective laminate, which forms the fundamental building blocks of the complete PV generating unit. Several PV panels mounted on a frame are termed as PV Array. The project activity has used the reliable and proven technology from supplier to ensure that an environmentally safe and sound technology is only being implemented in the proposed project activity leading to the GHG reduction.

The technical arrangement of the project activity is as provided below:



Technical details of the machines installed are explained below:

Parameter Description

Modules model number	:	6424/335 Wp, 3952/340 Wp, 912/355 Wp, 5031/345 Wp 3580/325 Wp
Capacity of modules (total)	:	8824 kW
Module make	:	Canadian Solar and Trina
Technology	:	Thin film solar PV
Invertor	:	SPD-type 2 (AC and DC side)
Invertor make	:	Delta
PV Connectors	:	MC4 type, 1000VDC, IP68
Energy meter	:	Accuracy class-0.25
Energy meter make	:	Secure
Earthing System	:	JEFF make; as per IS 3043-1987
Lighting arrester	:	Indelec, ERICO make; as per IEC 61730

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

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.

Social well-being: There has been good employment opportunities created for the local workforce during the project construction phase. The project after implementation has also continued to provide employment opportunities for the local populace in a sustained manner and the same would be continued over the project life time. The employment opportunities created will contribute towards alleviation of poverty in the surrounding area throughout the lifetime of the project activity.

Environmental well-being: The project activity will generate power using zero emissions solar based power generation facility which helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities. The project utilizes solar energy for generating electricity which is a clean source of energy. 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. The impact on land, water, air and soil is negligible. Thus, the project causes no negative impact on the surrounding environment contributing to environmental wellbeing.

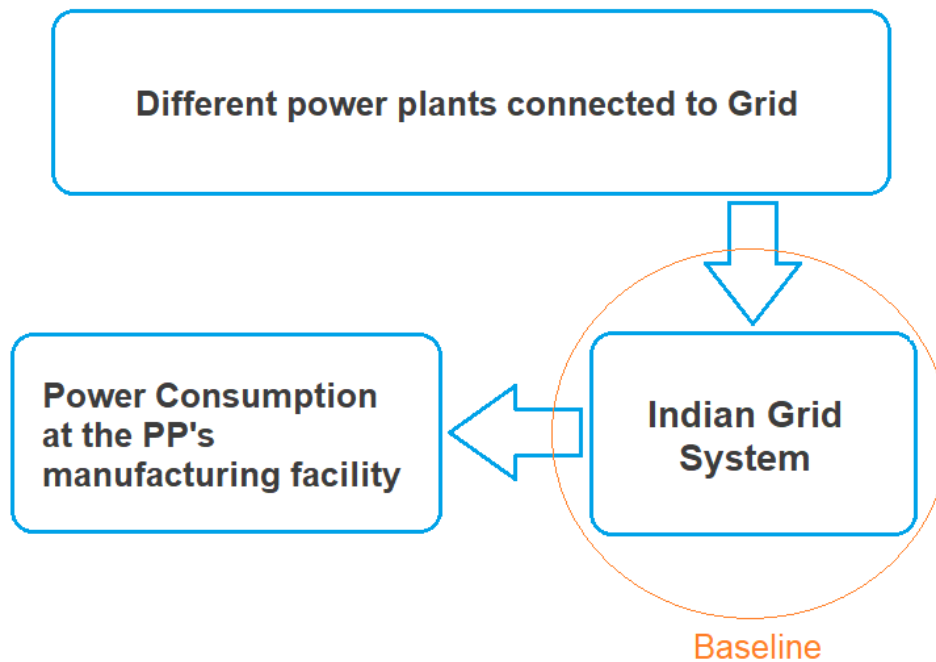
Economic well-being: The project is a clean technology investment decided based on carbon revenue support, which signifies flows of clean energy investments into the host country. The project activity requires temporary and permanent, skilled and semi-skilled manpower at the project location; this will create additional employment opportunities in the region. The electricity replaced in grid will be available for nearby area which directly and indirectly improves the economy and life style of the area. In addition, success of these kind of project will provide new opportunities for industries and economic activities to be setup 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 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. The project activity leads to the promotion and demonstrates the success of solar projects in the region which further motivate more investors to invest in solar power projects. Hence, the project activity leads to technological wellbeing.

B.3. Baseline Emissions>>

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 (NEWNE Grid)), which is carbon intensive due to predominantly sourced from fossil fuel-based power plants.

Baseline Scenario:



Thus, this project activity was a voluntary investment which replaced equivalent amount of electricity from the Indian grid. The project proponent was not bound to incur this investment as it was not mandatory by national and sectoral policies. Thus, the continued operation of the project activity would continue to replace fossil fuel-based power plants and fight against the impacts of climate change. The Project Proponent hopes that carbon revenues from 2014-2021 accumulated as a result of carbon credits generated will help repay the loans and help in the continued maintenance of this project activity.

B.4. Debundling>>

This project activity is not a de-bundled 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

Applied Baseline Methodology: AMS-I.D.: “Grid connected renewable electricity generation”, version 18

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

The project activity involves generation of grid connected electricity from the construction and operation of a new Solar Photovoltaic based project and to use for captive purpose.

The project activity has installed a total of 7.676 MW grid connected renewable energy project 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
<p>1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:</p> <p>(a) Supplying electricity to a national or a regional grid; or</p> <p>(b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.</p>	<p>The project activity involves setting up of a grid connected renewable energy (solar) generation plant for captive consumption. This has replaced equivalent amount of electricity that would otherwise been imported from fossil fuel dominated electricity grid (Indian Grid system). Thus, the project activity meets this applicability conditions.</p>
<p>2. This methodology is applicable to project activities that:</p> <p>(a) Install a Greenfield plant;</p> <p>(b) Involve a capacity addition in (an) existing plant(s);</p> <p>(c) Involve a retrofit of (an) existing plant(s);</p> <p>(d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or</p> <p>(e) Involve a replacement of (an) existing plant(s).</p>	<p>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>
<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) 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>It is a SPV plant so this criterion 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 a SPV plant, 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>It is a SPV project, so this criterion is not applicable.</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.	The proposed project is a greenfield 7.676 MW Solar Photovoltaic Project, i.e., only component is renewable power project below 15 MW, 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 7.676 MW Solar Photovoltaic Project, i.e., only component is renewable power project below 15 MW, 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 cogeneration other applicable Type-I methodologies such as “AMS- I.C.: Thermal energy production with or without electricity” shall be explored.	The proposed project is a greenfield 7.676 MW Solar Photovoltaic Project hence, this criterion is not applicable to this project activity.
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 Solar Power Project and thus the criterion is not applicable to this project activity.

C.3 Applicability of double counting emission reductions >>

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

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.” Thus, the project boundary includes the Solar PV plant and the Indian grid system.

Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected electricity generation	CO ₂	Yes	CO2 emissions from electricity generation in fossil fuel fired power plants
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
		Other	No	No other GHG emissions were emitted from the project
	Greenfield	CO ₂	No	No CO ₂ emissions are emitted from the project

Solar Power Project Activity	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

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

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 Solar Photovoltaic Plant to harness the green power from Solar energy and use it for personal requirement (captive consumption). In the absence of the project activity, the equivalent amount of power would have been generated by the operation of grid-connected fossil fuel-based power plants and by the addition of new fossil fuel-based generation sources into the grid. 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 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 same emission factors as that of the default value. Hence, the same emission factor has been considered to calculate the emission reduction.

Net GHG Emission Reductions and Removals

$$ER_y = BE_y - PE_y - LE_y$$

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:

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

Where:

- BE_y = Baseline emissions in year y (t CO₂)
- EG_{PI,y} = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of this project activity in year y (MWh).
- EF_{grid,y} = UCR recommended emission factor of 0.9 tCO₂/MWh has been considered, this is conservative as compared to the combined margin grid emission factor which can be derived from Database of Central Electricity Authority (CEA), India. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

Hence,

$$BE_y = 28,932 \times 0.9 = 26,039 \text{ tCO}_2\text{eq}$$

Project Emissions

As per paragraph 39 of AMS-I.D. (version 18), for most renewable energy project activities emission is zero.

Hence, PE_y = 0

Leakage Emissions

As per paragraph 42 of AMS-I.D. version-18, all projects other than Biomass projects have zero leakage.

Hence, LE_y = 0

Total Emission reduction by the project for the current monitoring period is calculated as below:

Hence, ER_y = 26,039 – 0 – 0 = 26,039 CoUs

C.6. Prior History>>

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

C.7. Monitoring period number and duration>>

First Monitoring Period: 04 years 11 months
23/02/2017 to 31/12/2021 (inclusive of both dates)

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

Crediting period start date is 23/02/2017.

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

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

C.10. Monitoring plan>>

The project activity essentially involves generation of electricity from Solar Radiations, the employed SPV can only convert Solar energy into electrical energy and cannot use any other input fuel for electricity generation, thus no special ways and means are required to monitor leakage from the project activity. The recording of the electricity fed to the state utility grid is carried out jointly at the incoming feeder of the state power utility (AVVNL).

Parameter	EG _{PJ,y}
Data unit	MWh
Description	Quantity of net electricity generation that is produced for captive consumption.
Source of data Value(s) applied	JMR
Procedures	The Net electricity generation by the Solar Photovoltaic Plant is recorded by the project proponent in the record logs. At the end of every month, Energy bill is generated based on the total monthly electricity exported to the grid.
Monitoring frequency	Monthly
Purpose of data	To estimate Baseline Emission

ANNEXURE 2 (Emission Reduction Calculation)

7.676 MW Bundled Solar Power Project by Sudiva Spinners Private Limited

Month - Wise Aggregated Energy Delivered to Grid (in KWh)												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	0	0	61500	189568	187008	172128	125568	127296	147038	215292	170462	152554
2018	190654	196808	269568	268678	271522	232846	189718	189696	184166	224302	184948	178044
2019	185832	211260	258420	262818	256798	480948	392041	348266	353412	410965	306159	567560
2020	677084	790214	620974	272161	974368	893903	820209	654013	867883	965712	966736	1015820
2021	986736	1129665	1294592	1351960	1242161	1207451	927129	668342	558650	706444	608220	568162
Year-Wise Emission reduction calculation for the project activity												
Year	Total No. of Electricity delivered in MWh		Recommended emission factor tCO ₂ /MWh		Total CoUs generated							
2017	1,548		0.900		1,393							
2018	2,581		0.900		2,323							
2019	4,034		0.900		3,631							
2020	9,519		0.900		8,567							
2021	11,250		0.900		10,125							
Total CoUs to be issued for the first monitoring period (Year: 2017 to 2021)												26,039