



# Monitoring Report

## CARBON OFFSET UNIT (CoU) PROJECT



**Title:** 2.415 MW Bundled Solar Power Project by SolFreedom Power Limited (UCR 057)

Version 01

Date: 18/03/2022

First CoU Issuance Period: 08 years, 00 months

Monitoring Period: 01/01/2014<sup>1</sup> to 31/12/2021

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<sup>1</sup> This is a bundle of 14 SPV plants at different locations and with different dates of commissioning. Hence, actual duration of the CoU claim shall be considered from the respective date of commissioning or from 01/01/2014 whichever is later. However, for the purpose of ex-ante presentation the start date of CoU has been nominated as the eligible start date of UCR, i.e. 01/01/2014. More details are referred under Appendix-1.



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

<b>Monitoring Report</b>	
Title of the project activity	2.415 MW Bundled Solar Power Project by SolFreedom Power Limited
UCR Project Registration Number	057
Version	01
Completion date of the MR	18/03/2022
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: first and last days included (01/01/2014 to 31/12/2021)
Project participants	SolFreedom Power Limited (Project Proponent and also the Sole Representor)  The bundle details have been mentioned in Appendix-1.
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 Sources)
Estimated amount of GHG emission reductions for this monitoring period in the registered PCN	2014: 266 CoUs (i.e. 266 tCO <sub>2eq</sub> )
	2015: 1,604 CoUs (i.e. 1,604 tCO <sub>2eq</sub> )
	2016: 2,618 CoUs (i.e. 2,618 tCO <sub>2eq</sub> )
	2017: 2,751 CoUs (i.e. 2,751 tCO <sub>2eq</sub> )
	2018: 2,648 CoUs (i.e. 2,648 tCO <sub>2eq</sub> )
	2019: 2,502 CoUs (i.e. 2,502 tCO <sub>2eq</sub> )
Total:	2020: 1,877 CoUs (i.e. 1,877 tCO <sub>2eq</sub> )
	2021: 1,999 CoUs (i.e. 1,999 tCO <sub>2eq</sub> )
<b>Total:</b>	<b>16,265 CoUs (16,265 tCO<sub>2eq</sub>)</b>

## SECTION A. Description of project activity

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

#### 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 solar energy which is a clean and renewable source of energy for power generation. As per an ex-ante estimate, the project (i.e., the total aggregated capacity) will generate approximately 4,222 MWh of electricity per annum considering an average projected PLF of 20%. The power generated by each plant (i.e., the respective power consumers of the bundle) is utilized for captive consumption. For this purpose, the net energy metering system and RPR systems are installed at load side in the plants.

The project activity is a bundled Solar PV (SPV) installation of total capacity 2.415 MW (2415.2 kWp), located in various locations of the two states namely Tamil Nādu and Maharashtra, of India. The promoter of the project activity is “SolFreedom Power Limited” (hereinafter also referred to as SFPL), who has developed and been operating the SPV plants. There are fourteen different SPV plants included under this bundle which are installed in the industrial/commercial premises of the respective power users (i.e., referred to as the consumers or bundle members). SFPL is a solar EPC and service provider, has executed individual power purchase agreement with all the bundle members and further to execute the process of submission of the total capacity as bundled project under “Universal Carbon Registry” (UCR). The SPV plants are operational with continuity and reduction of Greenhouse Gas emissions (GHGs), currently being applied under “Universal Carbon Registry” (UCR) for receiving carbon finance for a long-term sustainability of the project. More details of the project activity included under Appendix-1 of this document.

The project activity has achieved total GHG emission reduction of 16,265 tCO<sub>2</sub>e for overall period of 8 years starting from 1<sup>st</sup> Jan 2014 to 31<sup>st</sup> Dec 2021 (both days included) during this first monitoring and verification cycle. 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.

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

Power generated by the project activity directly replaces an equal amount of power which would have been generated at the regional Grid which is mainly dominated by fossil fuel-intensive thermal power plants. The project activity uses thin film solar photovoltaic technology to generate clean energy. The generation of power from rooftop 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 reduction in GHG emissions as it displaces grid power. The technological details have been provided in Section B.1.a.

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

UCR Project ID or Date of Authorization: 057  
Start Date of Crediting Period: 01/01/2014

Project Commissioned: 14/05/2013<sup>2</sup>  
 Monitoring Period: 01/01/2014 to 31/12/2021

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:

<b>Summary of the Project Activity and ERs Generated for the Monitoring Period</b>	
Start date of this Monitoring Period	01/01/2014
Carbon credits claimed up to	31/12/2021
Total ERs generated (tCO <sub>2eq</sub> )	16,265 tCO <sub>2eq</sub>
Leakage	0 tCO <sub>2eq</sub>

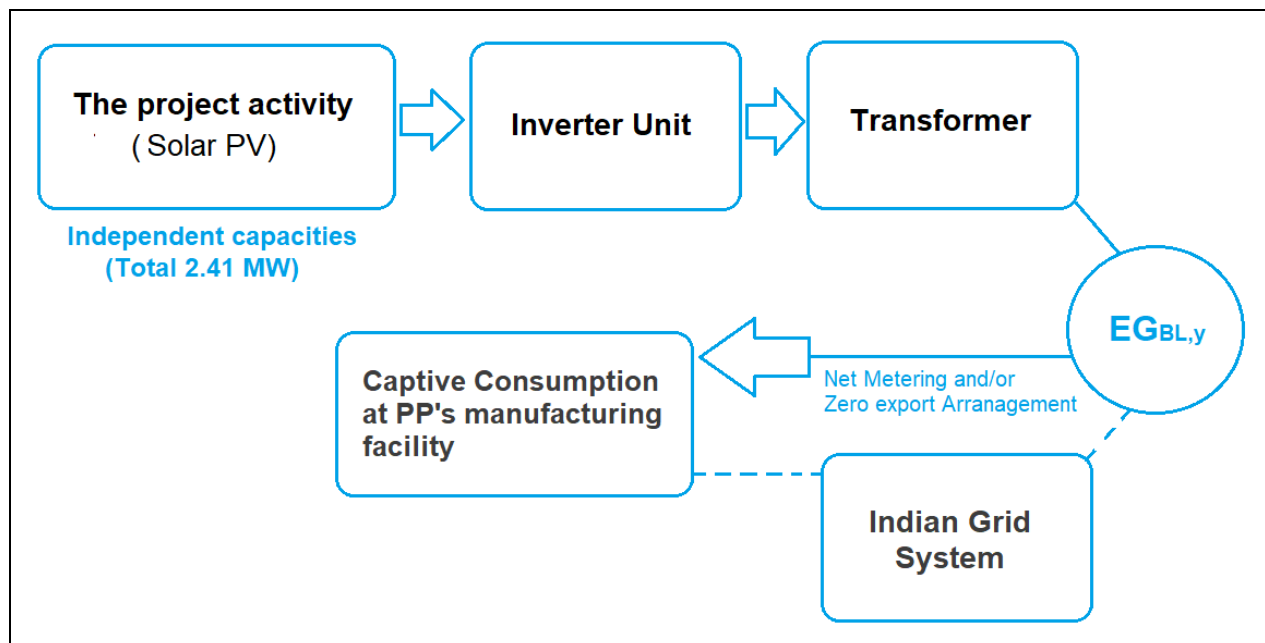
e) Baseline Scenario>>

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

- Grid

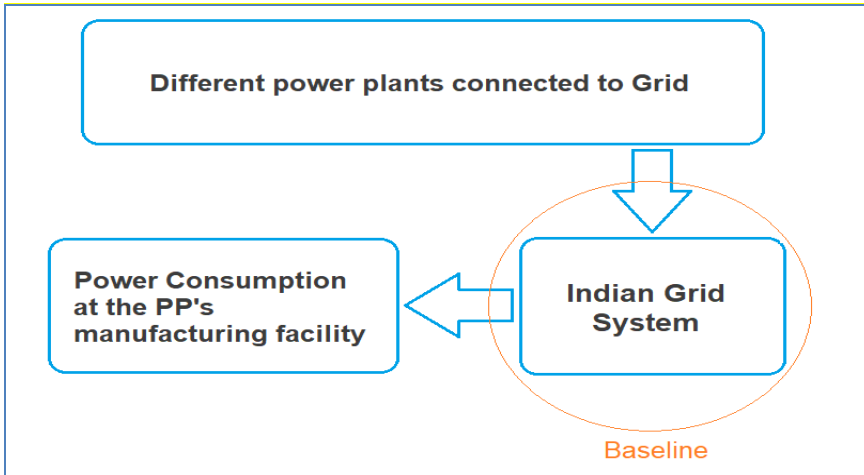
In the absence of the project activity the equivalent amount of electricity would have been imported from the regional grid (which is connected to the unified Indian Grid system), which is carbon intensive due to predominantly sourced from fossil fuel-based power plants. Hence, baseline scenario of the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

**Project Scenario:**



<sup>2</sup> Commissioning date of first commissioned project in the bundled project activity is considered. More details are referred under Appendix-1.

**Baseline Scenario:**



**A.2. Location of project activity>>**

Country : India  
States : Tamil Nadu & Maharashtra



Pic: The reference states of the project within the host country

The project is a bundled project activity for which the SPVs are located at various locations of the states of Tamil Nadu & Maharashtra in India. The project site is well connected from airport and railway station. The details of the respective project locations have been given below.

<b>Sr. No.</b>	<b>Name of bundle member</b>	<b>Location</b>	<b>GPS Coordinates</b>
1	Hiranandai Hospital Day care	HIRANANDANI HOSPITAL DAY CARE Hiranandani Estate Ghodbandar Road Thane Pincode :- 400607, State –Maharashtra.	19°15'09.91" N 72°58'48.54" E
2	Chemtrols Samil India Pvt. Ltd	Plot No. F-43 and F-44, Anand Nagar, MIDC, Additional Ambarnath Industrial Area, Ambarnath (E.) - 421 506, Thane. Maharashtra.	19°10'30.50" N 73°11'23.18" E
3	Vrihis Property Pvt. Ltd	Citi Park, Hiranandani, Powai, Mumbai – 400 076, Maharashtra.	19°06'56.29" N 72°54'33.29" E
4	Vrihis Property Pvt. Ltd	Ventura, Hiranandani, Powai, Mumbai – 400 076, Maharashtra.	19°06'59.66" N 72°54'32.35" E
5	Festus Properties Pvt. Ltd	Kensington- A, Hiranandani, Powai, Mumbai – 400 076, Maharashtra.	19°06'43.79" N 72°54'41.91" E
6	Festus Properties Pvt. Ltd	Kensington- B, Hiranandani, Powai, Mumbai – 400 076, Maharashtra.	19°06'43.47" N 72°54'38.35" E
7	Speciality Restaurants Ltd	Plot no. 4, Local Shopping Centre Masjid Moth, Greater Kailash II, New Delhi-110048.	28°32'14.00" N 77°14'19.55" E
8	Flyjac Logistics Pvt Ltd	FLYJAC LOGISTICS PVT LTD, survey no. 109A & 109B village-Wavanje, Taloja- Panvel, Maharashtra.	19°04'52.28" N 73°08'58.12" E
9	KG Fabriks Ltd.	Plot no FFI (Phase –ii) SIPCOT Industrial Growth Centre, Perunurai, Erode, Chennai, Tamil Nadu.	11°15'04.81" N 77°33'17.05" E
10	Supreme Ind. Ltd.	Village Honad, Taluka Khalapur, Dist. Raigad, Maharashtra.	18°46'03.36" N 73°18'29.11" E
11	Supreme Ind. Ltd	D-101/102, MIDC, Jalgaon, Maharashtra.	20°58'57.79" N 75°34'46.26" E
12	Supreme Ind. Ltd.	Unit no. 3, Gadegaon, Taluka Jamner, Dist. Jalgaon, Maharashtra.	20°52'12.83" N 75°39'11.84" E
13	Polybond India Pvt. Ltd.	Gat No 1087 / 1088 Pimple Jagtap Link Road Sanasawadi Tal. Shirur Pune 411 006	18°41'40.20" N 74°05'19.33" E
14	Veermata Jijabai Technological Institute	H. R. MAHAJANI MARG Matunga Mumbi – 400 019.	19°01'20.04" N 72°51'23.39" E

### A.3. Parties and project participants >>

Party (Host)	Participants
India	<p><b>Solfreedom Power Limited (Project Proponent)</b></p> <p><u>Address:</u> 602/A-Wing, Prathmesh Tower, Raghuvanshi Mills Compound, Senapati Bapat Marg, Lower Parel (W), Mumbai-400013, India.</p> <p><u>Contact:</u> Mr. Janmejai Bagrodia (President) <a href="mailto:janmejai@solfreedom.com">janmejai@solfreedom.com</a> Contract: +91 98200 93282</p>

### 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)

#### The Standardized baseline:

Not applicable.

#### Applicability of methodologies and standardized baselines >>

The scale of the activity is under the project Type-I and the project activity remained under the limit of 15 MW every year during the crediting period. Therefore, the GHG emission reductions that are claimed remains within the limit of its type as per the applied methodologies.

### A.5. Crediting period of project activity >>

Length of the crediting period corresponding to this monitoring period: 08 years, 00 months.

Date: 01/01/2014 to 31/12/2021 (inclusive of both dates).

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

Particulars	Details
Name	Mr. Janmejai Bagrodia
Designation	President
Company	Solfreedom Power Limited
Address	602/A-Wing, Prathmesh Tower, Raghuvanshi Mills Compound, Senapati Bapat Marg, Lower Parel (W), Mumbai-400013, India.
E-mail	<a href="mailto:janmejai@solfreedom.com">janmejai@solfreedom.com</a>
Contact	+91 98200 93282



## 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 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 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 to ensure that an environmentally safe and sound technology has been implemented. A few sites are based on net metering arrangement with DISCOMs and a few are based on RPR arrangement without net metering.

The technical details of the individual SPV plants included under this project activity provided below:

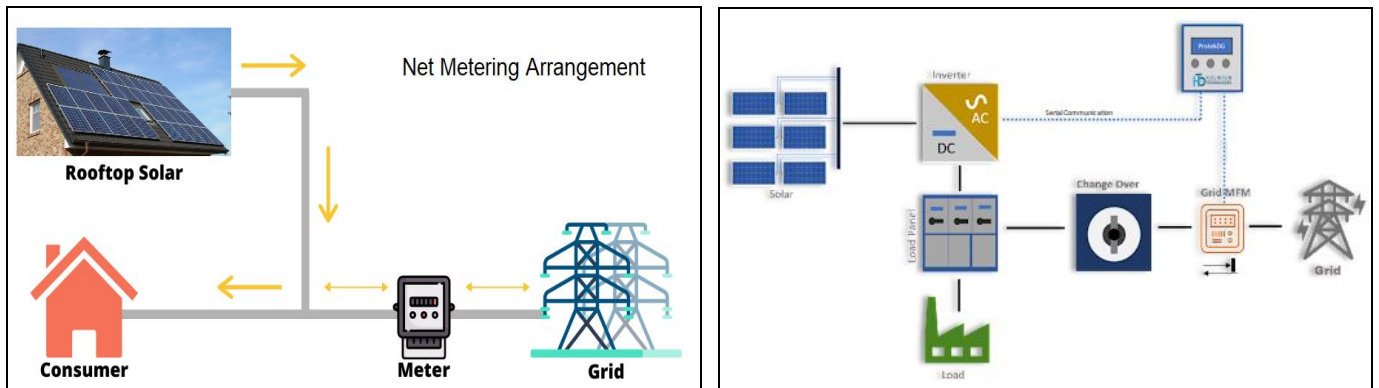
SN	Name of Party	PV PANEL/MODULE PLATE			INVERTER DETAILS				METER DETAILS	
		Make	Nos	Rating in WP	Type	Make	Rating in KW	Nos	Make	Nos
1	Hiranandai Hospital Day care	EMVEE	126	240	STRING	REFUSOL	17	2	SCHNEIDER	1
2	Chemtrols Samil India Pvt. Ltd	PV POWERTECH	150	240	STRING	SMA	17	2	ELMEASURE	1
3	Vrihis Property Pvt. Ltd	EMVEE	180	250	STRING	DANFOSS	15	3	ELMEASURE	3
4	Vrihis Property Pvt. Ltd	EMVEE	220	250	STRING	DANFOSS 2 - ABB 1	12.5	3	ELMEASURE	2
5	Festus Properties Pvt. Ltd	EMVEE	200	250	STRING	DANFOSS 1 - THEA 1	15	3	ELMEASURE	2
6	Festus Properties Pvt. Ltd	EMVEE	200	250	STRING	DANFOSS 2 - ZEVEER 1	15	3	ELMEASURE	1
7	Speciality Restaurants Ltd	ALPEX	30	300	STRING	SOCOMOC	10	1	SOCOMEK	1
8	Flyjac Logistics Pvt Ltd	JINCO	190	250	STRING	ZEVEER SOLAR	20	2	ELMEASURE	2
9	KG Fabriks Ltd.	CANADIAN	3442	305	CENTRAL	HITACHI	1000	1	TRIVACTOR	1
10	Supreme Ind. Ltd.	RENESOLA	840	295	STRING	REFUSOL	20	11	SOCOMEK	2
11	Supreme Ind. Ltd	RENESOLA	1020	295	STRING	REFUSOL	20	15	ELMEASURE	4
12	Supreme Ind. Ltd.	RENESOLA	984	305	STRING	SMA	25	10	ELMEASURE, SOCOMEK	2
13	Polybond India Pvt. Ltd.	RENESOLA	558	305	STRING	ZEVEER	33/20	4/1	SCHNEIDER	2
14	Veermata Jijabai Technological Institute	CANADIAN	76	330	STRING	REFUSOL	20	1	ELMEASURE	2



This project activity is a bundled project and include 14 members with overall bundled project capacity as 2.415 MW. Details for individual members for their status of implementation and start date of operation are provided in Appendix-1 of this document.

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

The Schematic diagram of the SPV plants (both types – net metering and with RPR zero export to grid arrangement) are shown below for representation purposes:



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

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, Forests & Climate Change, 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:

**Economic well-being:** The project is a clean technology investment decided based on carbon revenue support, which signifies boosting up of clean energy investments into the host country and more awareness alongside. 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. Whereas, for the power consumer, they will be largely benefitted as it's a sustainable of using energy and can be a secured source of power for captive use. In many cases, the local people also get better prices for their land, thereby resulting in overall economic development.

**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 lifetime. The local employment opportunities created will directly contribute towards alleviation of financial conditions in the surrounding area throughout the lifetime of the project activity.

**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. This is also a green initiative both for the project developer and power user, thus the project will result in increased interest in solar energy projects to 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 which helps to reduce GHG emissions and specific pollutants like SO<sub>x</sub>, NO<sub>x</sub>, 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. Thus, the project causes no negative impact on the surrounding environment contributing to environmental well-being.

Also, to summarize, as can be seen in the depiction below, industrial investment is crucial to the development of a particular technology. It is necessary for industries to invest in such clean, efficient and cost-effective technologies. In addition, such projects boost up R&D activities and allows technical development to be refined and becoming more acceptable. Technical development leads to improvements in the awareness and generic education about the sector. Human awareness and training experts will then improve human capacity, which in turn affects industrial investment due to higher demand for the technology. Thus, the cycle shows parameters which are effective and associated with such solar projects.

### **B.3. Baseline Emissions>>**

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 bundled solar power plant to harness the green power from solar energy and supply the generated electricity to the 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 CO<sub>2</sub> emission factor (tCO<sub>2</sub>/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<sub>2</sub>/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 which could be referred in emission reduction calculation spreadsheet and in section C.5.

### **B.4. Debundling>>**

This project activity is not a de-bundled component of a larger project activity. Similarly, each of the bundle members is also not a de-bundled component of any 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 >>

The project activity involves generation of grid connected electricity from new solar PV installations at different facilities with an objective to consume to power for captive consumptions via net energy metering and/or based on zero export arrangement with the grid interface. Thus, project activity (and its individual plant) is a grid connected renewable energy project. The project activity has installed total capacity of 2.415 MW (a bundle of 14 different plants) 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> <ul style="list-style-type: none"> <li>(a) Supplying electricity to a national or a regional grid; or</li> <li>(b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.</li> </ul>	<p>The project activity is a Renewable Energy Project i.e., Solar PV (SPV) project 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”.</p> <p>Hence the project activity meets the given applicability criterion as well as satisfies the applicability illustration mentioned in Appendix of AMS-I.D. Table 1 – Scope of AMS-I.D. version 18.</p>
<p>2. This methodology is applicable to project activities that:</p> <ul style="list-style-type: none"> <li>(a) Install a Greenfield plant;</li> <li>(b) Involve a capacity addition in (an) existing plant(s);</li> <li>(c) Involve a retrofit of (an) existing plant(s);</li> <li>(d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or</li> <li>(e) Involve a replacement of (an) existing plant(s).</li> </ul>	<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>

Applicability Criterion	Project Case
<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/m<sup>2</sup>.</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/m<sup>2</sup></p>	<p>The project is a Solar PV (SPV) installation, hence 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 2.415 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 project is a greenfield 2.415 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 project is a greenfield 2.415 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 project is a greenfield 2.415 MW SPV, hence this criterion is not applicable to this project activity.</p>

Applicability Criterion	Project Case
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 involved, the project is only a SPV 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 the location coordinates of all the individual plant,
- The plants have dedicated commissioning certificates and connection points,
- Each plant is associated with energy meters which are dedicated to the consumption point.

Each plant has dedicated Power Purchase Agreement (PPA) signed in between SFPL and the power consumer.

### 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 systems and the Indian grid system.

Source		Gas	Included	Justification/Explanation
Baseline	Electricity from Grid (Grid Power)	CO <sub>2</sub>	Yes	Main emission source
		CH <sub>4</sub>	No	Minor emission source
		N <sub>2</sub> O	No	Minor emission source
		Other	No	No other GHG emissions were emitted from the project
Project	Greenfield Bundled Solar power project Activity	CO <sub>2</sub>	No	No CO <sub>2</sub> emissions are emitted from the project
		CH <sub>4</sub>	No	Project activity does not emit CH <sub>4</sub>
		N <sub>2</sub> O	No	Project activity does not emit N <sub>2</sub> O
		Other	No	No other emissions are emitted from the project

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

#### Net GHG Emission Reductions and Removals

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER<sub>y</sub> = Emission reductions in year y (tCO<sub>2</sub>/y)

BE<sub>y</sub> = Baseline Emissions in year y (tCO<sub>2</sub>/y)

PE<sub>y</sub> = Project emissions in year y (tCO<sub>2</sub>/y)

LE<sub>y</sub> = Leakage emissions in year y (tCO<sub>2</sub>/y)

## Baseline Emissions

Baseline emissions include only CO<sub>2</sub> 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 (tCO <sub>2</sub> )
$EG_{PJ,y}$	=	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 tCO <sub>2</sub> /MWh has been considered. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4)

## 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<sub>y</sub> = 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<sub>y</sub> = 0**

The actual emission reduction achieved during the first CoU period (i.e., period for this monitoring report) is calculated in detail in separate spreadsheet. The same is provided as attachment below for reference.

Overall emission reduction achieved by the proposed bundled project activity for this monitoring period (01/01/2014 to 31/12/2021) is demonstrated below (vintage wise breakup is given in Appendix 2):

$$\begin{aligned} BE_y &= 18,124 \text{ MWh} \times 0.9 \text{ tCO}_2/\text{MWh} \\ &= 16,265 \text{ tCO}_2\text{e} \end{aligned}$$

$$\begin{aligned} ER_y &= BE_y - PE_y - LE_y \\ &= 16,265 - 0 - 0 \\ &= 16,265 \text{ tCO}_2\text{e (i.e., 16,265 CoUs)} \end{aligned}$$



## C.6. Prior History>>

There is no prior history of the project activity under any GHG mechanism.

The project activity is a bundle of 14 small-scale solar installations and these projects have never been applied under any other GHG mechanism prior to the participation in this bundle project activity for the registration with UCR. Also, the individual capacities or the total project as a whole has not been applied for any other environmental crediting or certification mechanism. It also ensures that project will not cause double accounting of carbon credits (i.e., CoUs).

## C.7. Monitoring period number and duration>>

First CoU Issuance Period : 8 years, 0 months

Duration (dates) : 01/01/2014 to 31/12/2021 (inclusive of both dates).

Project Proponent (SolFreedom) would like to clarify that this is a bundle of 14 SPV plants at different locations and with different dates of commissioning. Except for two plants (serial no. 1 & 2 in the bundle list), all other SPV plants were commissioned after 01/01/2014. Hence, for accounting purposes the actual duration of the CoU claim shall be considered from the respective date of commissioning of the SPV plants or from 01/01/2014 whichever is later. Therefore, for the purpose of ex-ante presentation the start date of CoU for the entire project capacity has been nominated as the eligible start date of UCR, i.e., 01/01/2014. More details are referred under Appendix-1.

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

There is no change in the start date of crediting period, as prescribe under the UCR PCN. The project activity is being submitted at UCR for its first-issuance.

## 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	tCO <sub>2</sub> /MWh
Description	A "grid emission factor" refers to a CO <sub>2</sub> emission factor (tCO <sub>2</sub> /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 <sub>2</sub> /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	<a href="https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com/Documents/UCRStandardNov2021updatedVer2_301121081557551620.pdf">https://a23e347601d72166dcd6-16da518ed3035d35cf0439f1cdf449c9.ssl.cf2.rackcdn.com/Documents/UCRStandardNov2021updatedVer2_301121081557551620.pdf</a>

Value 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
	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	$EG_{PJ,y}$
Data unit	MWh
Description	Net electricity supplied to PP's facility by the project activity
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 &amp; Electronic  Calibration frequency: Once in 5 years (as per CEA India provision).</p> <p>The Net electricity supplied to PP's facility by the bundled project activity will be calculated as a difference of electricity supplied to PP's facility and electricity imported from the grid (if any);</p> $EG_{PJ,y} = EG_{Export} - EG_{Import}$ <p>When the source of data directly provides the net units, then export and import values are not required as input parameters. The directly available value of net export quantity shall be used for calculation.</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:	18,124 (Summation of annualized value of net electricity generated for specified issuance period of 8 years; the same could be verified by referring to documents and spreadsheet)
QA/QC procedures applied:	Not required. The PP has already been following proper documentation and management practices and also the monthly statements are available during any verification ensuring the best accuracy in data and results.
Purpose of data:	The Data/Parameter is required to calculate the baseline emission.
Any comment:	Data will be archived electronically for a period of 36 months beyond the end of crediting period.

Other monitoring parameters are not applicable as  $PE_y$  and  $LE_y$  are nil for the project activity.

## APPENDIX - 1:

List of individual SPV units and their respective details:

S. No.	Name of Party	GPS Coordinates	Grid connected/off grid	Net Metering	Capacity (kWp)	COD	Date of PPA signed	PPA Tenure (Years)	Start date of CoU claim
1	Hiranandai Hospital Day care	19°15'09.91" N 72°58'48.54" E	Grid Connected	YES	30	14-May-13	29-Aug-12	20	01-Jan-2014
2	Chemtrols Samil India Pvt. Ltd	19°10'30.50" N 73°11'23.18" E	Grid Connected	YES	35	11-Sep-13	12-Dec-12	25	01-Jan-2014
3	Vrihis Property Pvt. Ltd	19°06'56.29" N 72°54'33.29" E	Grid Connected	NO	45	14-Mar-14	29-Nov-13	20	14-Mar-14
4	Vrihis Property Pvt. Ltd	19°06'59.66" N 72°54'32.35" E	Grid Connected	NO	55	14-Mar-14	29-Nov-13	20	14-Mar-14
5	Festus Properties Pvt. Ltd	19°06'43.79" N 72°54'41.91" E	Grid Connected	NO	50	14-Mar-14	29-Nov-13	20	14-Mar-14
6	Festus Properties Pvt. Ltd	19°06'43.47" N 72°54'38.35" E	Grid Connected	NO	50	14-Mar-14	29-Nov-13	20	14-Mar-14
7	Speciality Restaurants Ltd	28°32'14.00" N 77°14'19.55" E	Grid Connected	NO	9	13-Feb-14	9-Aug-13	20	13-Feb-14
8	Flyjac Logistics Pvt Ltd	19°04'52.28" N 73°08'58.12" E	Grid Connected	YES	47.5	29-Sep-14	8-Jul-14	20	29-Sep-14
9	KG Fabriks Ltd.	11°15'04.81" N 77°33'17.05" E	Grid Connected	NO	1050	24-Feb-15	16-Jun-14	20	24-Feb-15
10	Supreme Ind. Ltd.	18°46'03.36" N 73°18'29.11" E	Grid Connected	NO	247.8	9-Aug-15	30-Mar-15	20	9-Aug-15
11	Supreme Ind. Ltd	20°58'57.79" N 75°34'46.26" E	Grid Connected	NO	300.9	25-Aug-15	30-Mar-15	20	25-Aug-15
12	Supreme Ind. Ltd.	20°52'12.83" N 75°39'11.84" E	Grid Connected	NO	300	01-Jan-16	30-Mar-15	20	01-Jan-16
13	Polybond India Pvt. Ltd.	18°41'40.20" N 74°05'19.33" E	Grid Connected	NO	170	13-Jul-16	3-Feb-16	20	13-Jul-16
14	Veermata Jijabai Technological Institute	19°01'20.04" N 72°51'23.39" E	Grid Connected	YES	25	14-Sep-17	26-May-17	25	14-Sep-17
				Total =	2415.2				

**APPENDIX - 2:**

Vintage wise CoU claim:

Units in tCO<sub>2</sub>eq:

2014	2015	2016	2017	2018	2019	2020	2021	Total
266	1,604	2,618	2,751	2,648	2,502	1,877	1,999	16,265