



# PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT



**Title: 2.0 MW Solar Grid Power Project by VSESPL, Chittoor, Andhra Pradesh**

Version 1.0

Date of PCN: 29/04/2023

**1<sup>st</sup> CoU Issuance Period:** 31/03/2017-31/12/2022

**1<sup>st</sup> Monitoring Period:** 31/03/2017 to 31/12/2022

**1<sup>st</sup> Crediting Period:** 05 years 09 months

**8** DECENT WORK AND  
ECONOMIC GROWTH



**13** CLIMATE  
ACTION



**7** AFFORDABLE AND  
CLEAN ENERGY





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

### BASIC INFORMATION

Title of the project activity	2.0 MW Solar Grid Power Project by VSESPL, Chittoor, Andhra Pradesh
Scale of the project activity	Small Scale
Completion date of the PCN	29/04/2023
Project participants	<b>Project Proponent:</b> VYSHAKA SOLAR ENERGY SYSTEMS PRIVATE LIMITED (VSESPL)  <b>UCR Aggregator:</b> Climekare Sustainability Pvt. Ltd. <b>UCR ID:</b> 336812961
Host Party	India
Applied methodologies and standardized baselines	Type I (Renewable Energy Projects) UNFCCC Methodology Category AMS I.D.: "Grid connected renewable electricity generation" Ver 18  UCR Protocol Standard Baseline EF
Sectoral scopes	01 Energy industries (Renewable/NonRenewable Sources)
SDG Impacts:	SDG 7 Affordable and Clean energy SDG 8 Decent work and economic growth SDG 13 Climate Action
Estimated amount of total GHG emission reductions per year	<b>3264</b> CoUs/yr ( <b>3264</b> tCO <sub>2eq</sub> /yr)

## SECTION A. Description of project activity

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

The project activity titled, **2.0 MW Solar Grid Power Project by VSESPL, Chittoor, Andhra Pradesh**, is located in Village: M V Palli, Mandal: Kambam Vari Palle, District: Chittoor, State: Andhra Pradesh, Country: India.

This is a single project activity of installed capacity of 2.2 MWh (of which 2.0 MWh is supplied to the grid) ground mounted grid connected solar power generation project supplying renewable power to the Transmission Corporation of Andhra Pradesh Limited (APTRANSCO) in the District of Chittoor, in the state of Andhra Pradesh, in India. The purpose of this plant installation and power generation is for grid supply.

The promoter of the project activity is 'M/s Vyshaka Solar Energy Systems Pvt Ltd (VSESPL or PP). The PP has the full ownership of the project activity. This project is an operational activity with continuous reduction of GHGs, currently being applied under "Universal Carbon Registry" (UCR), which rewards solar programs with carbon incentives as opposed to carbon finance in other international programs. It's now widely accepted that the world needs to ramp up clean technologies by 2030 to prevent permanent climate disaster, and carbon incentive policies, such as the UCR CoU program, will be key to such efforts. India is aiming for 450 GW of renewables and 500 GW of non-fossil capacity by 2030. With 110 GW already installed (as of 2021-22), the nation needs to deploy 340 GW of new renewable energy capacity (on average, 42.5 GW of renewable energy per year for the next eight years) to meet the 2030 target and offer the world some hope in combating climate change. That would require the country's solar capacity to rise fivefold to 280 GW from 54 GW during this period. This translates to 29 GW of new solar capacity additions every year on average until the end of this decade – a far faster pace than the nation's record annual addition of 15 GW renewable energy (14 GW of solar and 1 GW wind) in fiscal 2021-22.

#### **Purpose of the project activity:**

The purpose of the proposed project activity is to generate electricity using a clean and renewable source of energy i.e., solar radiation. The project activity of 2.0 MWh (i.e., 2000 kWh) is the installation and operation of a solar power plant in Chittoor district in the state of Andhra Pradesh are per the details listed below:

Village	District	Type	Total installed capacity kW	Commissioning date
M V Palli	Chittoor	Ground mounted	2000	31/03/2017

As per the ex-ante estimate, this project will generate approximately **3626 MWh** of electricity per annum considering an average PLF of 17%. The project activity uses Poly Crystalline solar photovoltaic technology to generate clean energy.

The generation of power from solar photovoltaic is a clean technology as there is no fossil fuel fired or no GHG gases are emitted during the process. Photovoltaic module consists of several photovoltaic cells connected by circuits and sealed in an environmentally protective laminate, which forms the fundamental building blocks of the complete PV generating unit. Several PV panels mounted on a frame are termed as PV Array. Thus, project activity leads to reduce the GHG emissions as it displaces power from fossil fuel-based electricity generation in the regional grid. The technological details have been provided in Section A.4.



The estimated annual average and the total yearly CO<sub>2</sub>e emission reduction by the project activity is expected to be **3264 tCO<sub>2</sub>eq**, whereas actual emission reduction achieved during the first CoU period shall be submitted as a part of first monitoring and verification. Since the project activity generates electricity through solar energy, a clean renewable energy source it will not cause any negative impact on the environment and thereby contributes to climate change mitigation efforts.

### **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, 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:

#### **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.

#### **Economic well-being:**

The project is a clean technology investment and mitigates CO<sub>2</sub> emissions, hence is entitled to carbon incentives in the form of CoUs as carbon incentive 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 projects will provide new opportunities for industries and economic activities to be setup in

the area and also provide carbon incentives to upgrade or expand capacities as the world seeks to limit a 1.5 degree centigrade rise by 2030. 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 leads to the 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 the 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 well- being.

#### **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. The impact on land, water, air and soil is negligible. Thus, the project causes no negative impact on the surrounding environment contributing to environmental well- being.

The project activity will generate power through solar PV technology and displace equivalent amount of power from the regional grid, thereby contributing towards the reduction in greenhouse gas emission due to generation of electricity in the regional grids in India. If the world needs to ramp up clean technologies by 2030 to prevent permanent climate disaster, carbon incentive policies, such as the UCR CoU program, are key to such efforts.

#### **With regards to ESG credentials:**

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

#### **Under Environment:**

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

#### **Under Social:**

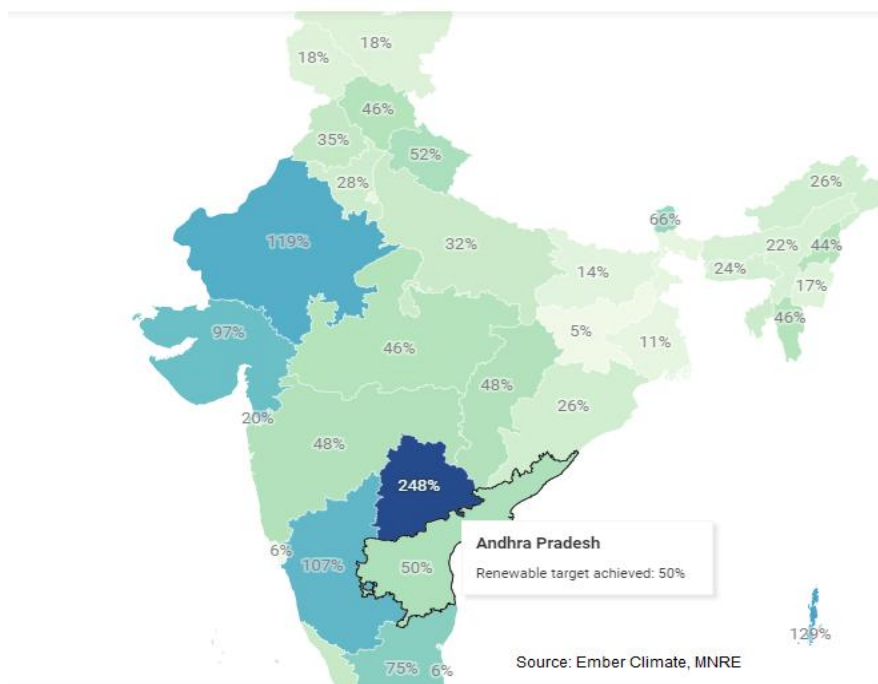
Social criteria reflect on the company's business relationships, qualitative employment, working conditions with regard to its employees' health and safety, interests of other stakeholders, etc. With respect to this project activity, the PP has robust policies in place to ensure equitable employment,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

### Under Governance:

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

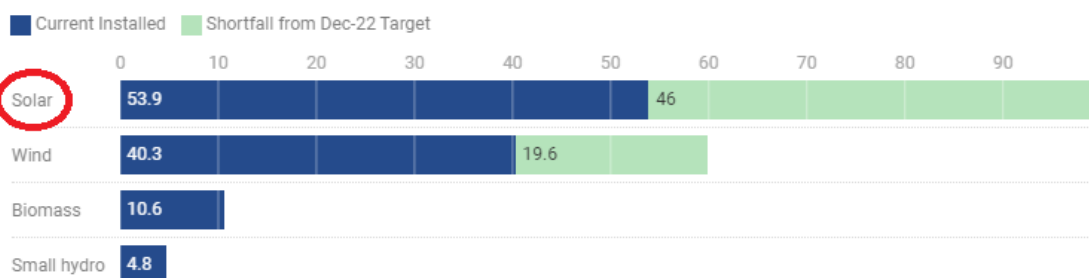
Majority of Indian states, including several currently facing power crisis due to coal shortage, have not even met half of their renewable energy targets for December 2022. As of March 2022, the country had installed 110 gigawatt of renewable energy capacity excluding large hydropower projects. That's just 63% of the 175 GW target that Prime Minister Narendra Modi's administration had targeted. India is unlikely to achieve that target this year (2022) without including large hydropower projects classified as renewable energy three years ago. (source: <https://www.bloomberquint.com/business/27-states-have-not-met-even-half-of-their-2022-renewable-targets>). Large power consuming states, like Andhra Pradesh, are already well below the halfway mark and will have a lot to catch up to meet India's renewable energy target, hence the flow of UCR carbon incentives will provide a boost to setup similar projects at scale and speed to avert the 2030 climate tragedy that is predicted by the IPCC.

27 States Have Not Met Even Half Of Their 2022 Renewable Targets



## Where's The Shortfall

India needs to ramp up solar and wind power to meet its renewable targets for December 2022. (In Gigawatts)



Source: Ember, MNRE

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


- Rational: As per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)', final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), it has been declared that solar project activity falls under the "White category". White Category projects/industries do not require any Environmental Clearance such as 'Consent to Operate' from PCB as such project does not lead to any negative environmental impacts. Additionally, as per Indian Regulation, Environmental and Social Impact Assessment is not required for small-scale Solar Projects. Additionally, there are social, environmental, economic and technological benefits which contribute to sustainable development. The key details have been discussed in the previous section. Provides employment to local communities through construction and maintenance of units.



### United Nations Sustainable Development Goals:

The project activity generates electrical power using wind energy which is generated from windmills, thereby displacing non-renewable fossil resources resulting to sustainable, economic and environmental development. In the absence of the project activity equivalent amount of power generation would have taken place through fossil fuel dominated power generating stations.

Thus, the renewable energy generation from project activity will result in reduction of the greenhouse gas emissions. Positive contribution of the project to the following Sustainable Development Goals:

- SDG13: Climate Action
- SDG 7: Affordable and Clean Energy
- SDG 8: Decent Work and Economic Growth

Development Goals	Targeted SDG	Target Indicator (SDG Indicator)
<b>13 CLIMATE ACTION</b>  SDG 13: Climate Action	13.2: Integrate climate change measures into national policies, strategies and planning  Target: 3264 tCO <sub>2</sub> per annum	13.2.1: Number of countries that have communicated establishment or operationalization of an integrated policy/ strategy/ plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a

		manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)
<p><b>7 AFFORDABLE AND CLEAN ENERGY</b></p>  <p>SDG 7: Affordable and Clean Energy</p>	<p>7.2: By 2030, increase substantially the share of renewable energy in the global energy mix</p> <p>Target: 3626 MWh per annum</p>	<p>7.2.1: Renewable energy share in the total final energy consumption</p>
<p><b>8 DECENT WORK AND ECONOMIC GROWTH</b></p>  <p>SDG 8: Decent Work and Economic Growth</p>	<p>8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value</p> <p>Target: Training, O&amp;M staff</p>	<p>8.5.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities</p>



### A.3. Location of project activity >>

Country: India

Village: M V Palli,

Mandal: Kambam Vari Palle,

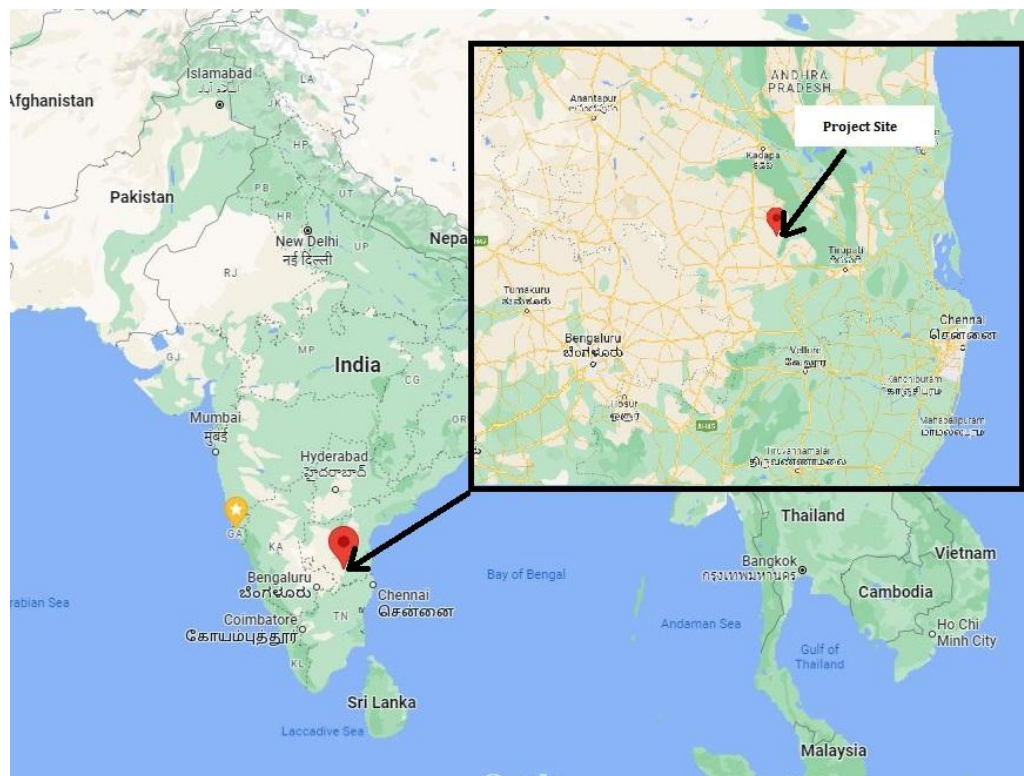
District: Chittoor

State: Andhra Pradesh

Latitude: 13°52'05.2"N

Longitude: 78°55'12.0"E

The representative location map is included below:



**POWER DEVELOPMENT  
IN  
ANDHRA PRADESH  
(STATISTICS)**

**2018-19**

<b>6.4 (c) Commissioning Dates of Generating Units in Private Sector</b>					
<b>Sl. No.</b>	<b>Name of the Company</b>	<b>Location (District)</b>	<b>District</b>	<b>Connected Capacity (in MW)</b>	<b>Date of Commissioning</b>
53	M/S "Vallaha Sūjathā" (SPROUTS Solar Energy Pvt Ltd)	Pamulapadu	Kurnool	2.00	8/9/2016
54	M/S Ushodaya Enterprises	Tadimarri (V) & (M)	Ananthapur	5.00	22/9/2016
55	Sumeru Energy Pvt Ltd	Jagadurthy(V) Dhone(M)	Kurnool	4.00	22/9/2016
56	M/S VBC Renewable Energy Pvt Ltd	Garividi	Vizianagaram(Dt)	3.00	22/7/2016
57	M/S Narasimha Swamy Solar Generations Pvt Ltd	Peravali Singanamala (M)	Ananthapur	5.00	26/9/2016
58	M/S Yashwanth Solar Energy Pvt Ltd	Kothapalli Mudunuru (M)	Kadapa	1.00	1/10/2016
59	Repal Renewables Pvt Ltd	Thanakallu (V&M)	Ananthapur	4.90	19/11/2016
60	Sri Varahalakshmi Narasimha Swamy Devasthanam	Simhachalam	Visakhapatnam	1.00	3/2/2017
61	Tirumala Tirupati Devasthanams	Kasavaripalli (V) Thamballapalle (M)	Chittoor	3.00	2/2/2017
62	Kanti Brothers oils Pvt Limited		Kurnool	3.00	11/2/2017
63	Sri Chakra cements Projects Co Private Limited	Perindesam (V) KVB Puram (M)	Chittoor	2.00	9/2/2017
64	IFMR	Sri Kalahasti, Chittoor District	Chittoor	0.50	10/3/2017
65	SVR Corporation Pvt Ltd	Jillelamanda(V), KV Palli(M), Chittoor	Chittoor	2.00	15/3/2017
66	Nateems Green Energy Pvt Ltd	Thimmapuram SS, Kadiridevarapalli(V), Kambadar (M), Ananthapuram	Ananthapur	9.90	24/3/2017
67	GSL Educational Society	Mallampudi(V) & Tokanda (V) , Rajamandry, East Godavari District	East Godavari	1.50	31/3/2017
68	Cyber Village Solutions (P) Ltd	Yeleswaram (V&M)	East Godavari	2.00	31/3/2017
69	Repal Renewables Pvt Ltd	Thanakallu (V&M)	Ananthapur	5.10	31/3/2017
70	Nateems Solar power Pvt Ltd	Elakolanu (V), Rangampeta (M),	East Godavari	1.00	31/3/2017
71	B.G.Channappa, Class-I, K.P.W.D.	Gowdipalli	Ananthapur	2.00	31/3/2017
72	Vyshaka Solar Energy System Pvt Ltd	Nuthanakaluva SS, MV Palli(V), KV Palli (M), Chittoor District	Chittoor	2.00	31.03.2017
73	Tirumala Tirupati Devasthanams	Kasavaripalli	Chittoor	7.00	31.3.2017
74	Nateems Green Energy Pvt Ltd	Garividi	Vizianagaram	10.00	31.03.2017
75	M/s Aurobind Pharma Ltd	Pydibhimavaram	Srikakulam	30.00	21.05.2017

#### **A.4. Technologies/measures >>**

The project activity is using clean renewable solar energy to produce electricity. The applied technology is considered to be one of the most environment friendly technologies available as the operation of the Solar photovoltaic does not emit any GHGs or any other harmful gases unlike the operation of conventional power plants.

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

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

1. Solar Photovoltaic modules
2. Inverters
3. Transformers
4. Circuit breakers

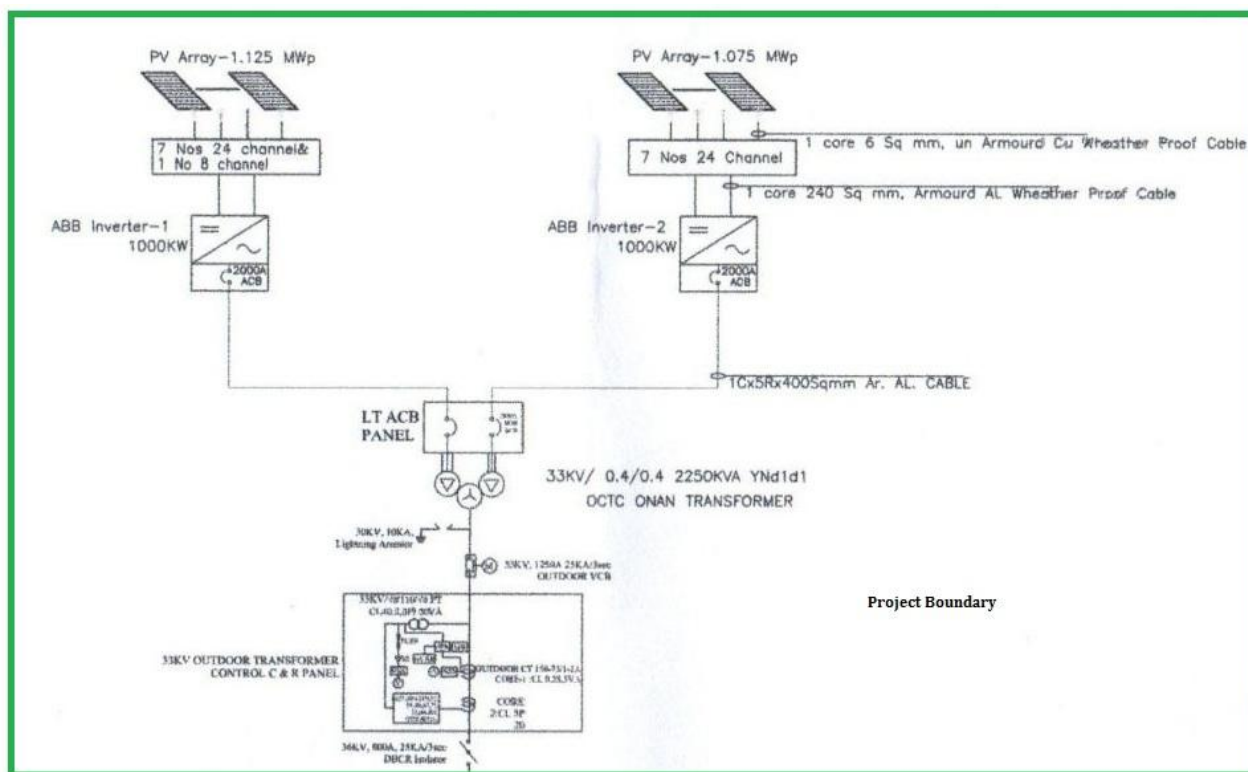


5. Mounting structures
6. Cables and hardware.
7. Junction box and distribution boxes.
8. Earthing kit.
9. Control room equipment.
10. System for control and monitoring.
11. Evacuation system

1. Project site	M V Palli Village, Kambham Vari Palli Mandal,
2. District	Chitoor
3. Name of the state	Andhra Pradesh
4. Location	Latitude : 13.8681 ' N Longitude : 78.920 ' E
5. Irradiation details considered	NASA
6. Type of System	Fixed Structure with tilt
7. Type of PV Module	Poly Crystalline silicon
8. Proposed Capacity	2.2 MWp
9. Capacity of each module	315Wp ~ 320Wp with Positive Tolerance (-0%, +3%)
10. Inverter capacity	1000KW : ABB / Gamesa
11. Projected energy generation	35.00 Lakh Units ( Kwh)

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

Solar Power Plant, Project setup by M/s Vyshaka Solar Energy Systems (P) Ltd., Name of the Sub-Station: 33/11 kV SS, Nuthanakaluva			
Details of Billing Energy Meters			
	Main Meter	Check Meter	Stand by Meter
Make	SECURE	SECURE	SECURE
Sl.No./ Year	APX01192	APX01193	APX01196
Type	E3M024	E3M024	E3M024
Meter CT Ratio	50/1 A	50/1 A	50/1 A
Meter PT Ratio	33 kV/ $\sqrt{3}$ /110V/ $\sqrt{3}$	33 kV/ $\sqrt{3}$ /110V/ $\sqrt{3}$	33 kV/ $\sqrt{3}$ /110V/ $\sqrt{3}$
MF for KWH	1000	1000	1000



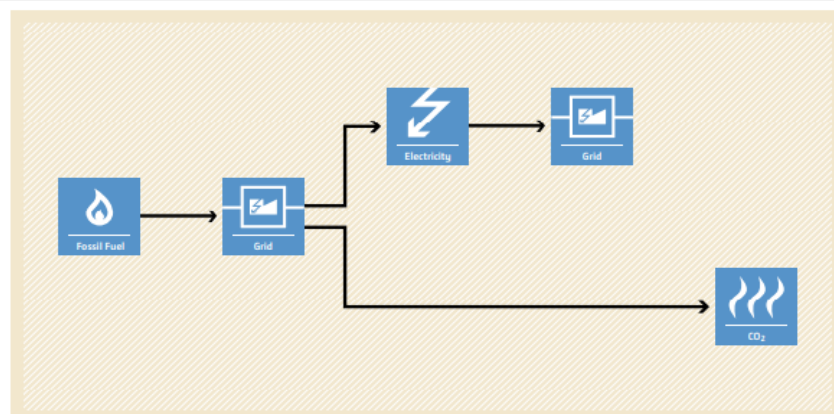
#### A.5. Parties and project participants >>

Party (Host)	Participants
India	<b>Project Proponent:</b> VYSHAKA SOLAR ENERGY SYSTEMS PRIVATE LIMITED (VSESPL) <b>UCR Aggregator:</b> Climekare Sustainability Pvt. Ltd. <b>UCR ID:</b> 336812961 <b>Email:</b> sustainability@climekare.com

## A.6. Baseline Emissions>>

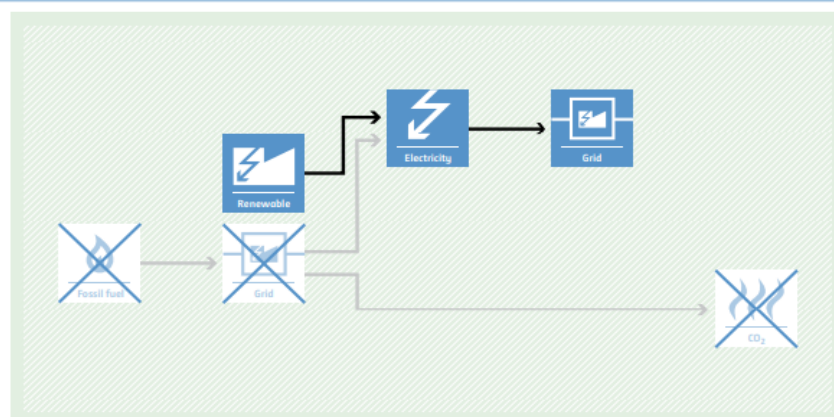
### **BASILINE SCENARIO**

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



### **PROJECT SCENARIO**

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



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

- the electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.

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

## A.7. Debundling>>

This project activity is not a debundled component of a larger carbon or GHG registered project activity.

## SECTION B. Application of methodologies and standardized baselines

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

**SECTORAL SCOPE** - 01 Energy industries (Renewable/Non-renewable sources)

**TYPE I** - Renewable Energy Projects

**CATEGORY**- AMS-I.D. - “Grid connected renewable electricity generation”, Version 18.0

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

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

This project is included within the UCR Standard Positive List of technologies and are within the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of: (a) The grid-connected renewable electricity generation technologies of installed capacity up to 15 MW, (b) Solar technologies (photovoltaic and solar thermal electricity generation);
Project activity involves installation of grid-connected solar photovoltaic power generation with totalled installed capacity 2.2 MW which is less than 15MW.
The project activity involves installation of Solar PV (SPV). Hence, the activity is not a Hydro power project.
The project activity was commissioned in 31/03/2017 and is below the 15 MW methodology threshold.
The project activity is a new installation, it does not involve any retrofit measures nor any replacement.
Landfill gas, waste gas, wastewater treatment and agro-industries projects are not relevant to the project activity. No biomass is involved, the project is only a solar power project.
The technology/measure allowed under the grid connected Solar PV based generation systems displace equivalent quantity of electricity from the regional grid in India. The testing/certifications; all the equipment of the solar project activity will be complying with applicable national/ international standards. The above details may be verified from one or more of the following documents: <input type="checkbox"/> Technology Specification provided by the technology supplier <input type="checkbox"/> Purchase order copies <input type="checkbox"/> EPC contracts <input type="checkbox"/> Power purchase agreement <input type="checkbox"/> Project commissioning certificates
The project activity is a voluntary coordinated action
As per the Ministry of Environment and Forest (MoEF), Govt. of India Office Memorandum dated 13/05/2011, it had received specific clarification regarding the applicability of EIA Notification, 2006 in respect of Solar Photo Voltaic (PV) Power plants. It was further clarified in the above memorandum that both Solar PV power projects are not covered under the ambit of EIA Notification, 2006 and no environment clearance is required for such projects under provisions thereof.
The project activity comprises of a renewable energy generation through installation of solar photovoltaic modules and will displace electricity from the regional grid by supplying to the grid itself. Hence this methodology is applicable and fulfilled.
The project activity involves installation of new power plants at listed sites where there was no renewable energy power plant operating prior to implementation of project.

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

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

As per para 19 of the approved consolidated methodology AMS-I.D. Version 18, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: “The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid”.

The project activity involves setting up of a new grid connected solar power plant to harness the green power from solar energy and utilize the generated electricity as captive source for PP. 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>/MW<sub>h</sub>) 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>/MW<sub>h</sub> for the 2014-2020 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Also, for the vintage 2021-22, 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.

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

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

	Source	GHG	Included?	Justification/Explanation
Baseline	Grid-connected electricity	CO <sub>2</sub>	<b>Included</b>	Major source of emission
		CH <sub>4</sub>	Excluded	Excluded for simplification. This is conservative
		N <sub>2</sub> O	Excluded	Excluded for simplification. This is conservative
Project Activity	Greenfield solar power project	CO <sub>2</sub>	Excluded	Excluded for simplification. This is conservative
		CH <sub>4</sub>	Excluded	Excluded for simplification. This is conservative
		N <sub>2</sub> O	Excluded	Excluded for simplification. This is conservative

#### Net GHG Emission Reductions and Removals

Thus,  $ER_y = BE_y - PE_y - LE_y$  Where:

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

$BE_y$  = Baseline Emissions in year y (t CO<sub>2</sub>/y)  $PE_y$  = Project emissions in year y (tCO<sub>2</sub>/y)

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

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

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.

Total Installed Capacity: 2.2MW<sub>h</sub>

Total Grid Connected Capacity: 2.0 MW<sub>h</sub>

Commissioning Date of first installation: 31/03/2017

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

$BE_y$  = Emission reductions in a year y.

where:

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

$EF_{Grid, CO_2, y}$  = CO<sub>2</sub> emission factor of the grid in year y (t CO<sub>2</sub>/MWh) as determined by the UCR Standard.

**Estimated annual baseline emission reductions ( $BE_y$ ) = 3264 CoUs (3264 tCO<sub>2eq</sub>)**

### **B.6. Prior History>>**

The project activity is a ground mounted small-scale solar project and this project has never applied under any other GHG mechanism prior to this registration with UCR. Also, the capacity or the total project as a whole has not been applied for any other environmental crediting or certification mechanism. Hence project will not cause double accounting of carbon credits (i.e., COUs).

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

There is no change in the start date of crediting period. The start date of crediting under UCR is considered as 31/03/2017 and no GHG emission reduction has been claimed so far.

### **B.8. 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

### **B.9. Monitoring period number and duration>>**

**Monitoring Period: 01**

**1<sup>st</sup> Monitoring Period:** 31/03/2017 to 31/12/2022 (05 years 09 months)



## B.10. Monitoring plan>>

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

### 1. Monitoring Plan Objective and Organization

PP is the project implementer and monitors the electricity delivered to the electricity grid by the project activity. The data is already archived electronically and is stored since 31/03/2017.

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

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

Data / Parameter:	<b>EGy</b>
Data unit:	MWh
Description:	Quantity of net electricity supplied by the PoA to the grid in year y
Source of data:	JMR. Statement of net export of power to the grid issued Monthly by State Electricity Board or any other competent authority as applicable.
Measurement procedures (if any): Monitoring frequency:	To be specified by State Electricity Board  The net energy exported to the grid is measured every month using calibrated energy meter by the State Electricity Board authorities in the presence of the project implementer or its representatives. The meter/s shall be jointly inspected, and sealed by authorised representatives of the company and the state utility.  Measuring procedure: Will be measured by an export-import energy meter. The net electricity exported by the project plant would either be directly sourced as a measured parameter or be calculated by deducting the amount of imported electricity from the total amount of exported electricity.  Accuracy class of energy meter: As per Power Purchase Agreement (PPA) or relevant National standards amended/modified from time to time.  Calibration Frequency: As per the Central Electricity Authority the testing and calibration frequency should be minimum once in five years. However, the calibration will be done following the relevant applicable National Guidelines updated from time to time during the operation of the CPAs. Entity responsible: Aggregator
QA/QC procedures:	Monitoring frequency: Continuous Measurement frequency: Hourly Recording frequency: Monthly

	The electricity meter/s record both export and import of electricity from the solar Power plant and the readings with regard to net electricity generated will be used for calculation of emission reductions. The net electricity supplied to the grid will be cross checked with the monthly invoices. The meter/s would be checked for accuracy and the meters will be calibrated as per the procedures of State Electricity Board as per the national or international standards. Measurement results shall be cross checked with records for sold electricity (i.e. invoice).
Purpose of Data	-Calculation of baseline emission

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

