



**Verified Carbon
Standard**

GHANI SOLAR RENEWABLE POWER PROJECT BY GREENKO GROUP



Document Prepared by Greenko Group

Project Title	Ghani Solar Renewable Power Project by Greenko Group
Version	02
Report ID	VVER43
Date of Issue	30-12-2022
Project ID	1792
Monitoring Period	01/08/2021 to 31/10/2022 (Inclusive of both days)
Prepared By	Greenko Group
Contact	Greenko Hub #13, Sy No.64 Part, Block-D, Madhapur, Hyderabad – 500081, Telangana State, India .T: +91 (40) 4030 1000 Website: www.greenkogroup.com

Contents

1	PROJECT DETAILS.....	3
1.1	Summary Description of the Implementation Status of the Project	3
1.2	Sectoral Scope and Project Type	4
1.3	Project Proponent	4
1.4	Other Entities Involved in the Project	5
1.5	Project Start Date	5
1.6	Project Crediting Period	5
1.7	Project Location	6
1.8	Title and Reference of Methodology	8
1.9	Participation under other GHG Programs.....	8
1.10	Other Forms of Credit and Supply Chain (Scope 3) Emissions	8
1.11	Sustainable Development Contributions	8
2	SAFEGUARDS	13
2.1	No Net Harm	13
2.2	Local Stakeholder Consultation	13
2.3	AFOLU-Specific Safeguards	13
3	IMPLEMENTATION STATUS	14
3.1	Implementation Status of the Project Activity	14
3.2	Deviations	17
3.3	Grouped Projects	17
4	DATA AND PARAMETERS.....	18
4.1	Data and Parameters Available at Validation	18
4.2	Data and Parameters Monitored.....	18
4.3	Monitoring Plan.....	19
5	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	22
5.1	Baseline Emissions	22
5.2	Project Emissions	23
5.3	Leakage.....	23
5.4	Net GHG Emission Reductions and Removals.....	23
	APPENDIX 1: CALIBRATION RECORDS	25

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The main purpose of this project activity is to generate clean forms of electricity through renewable solar energy sources. The project activity involves installation of a 500 MW solar power project in Andhra Pradesh state of India.

Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 996,010 tCO₂e per year, thereon displacing 1,051,200 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel-based power plant.

The project is a bundled project activity by Greenko Group and the project is promoted by Zuvan Energy Private Limited. The details of the project and their location of installation are mentioned in the table below:-

Name of Investor	Capacity in MW	COD	Connection with Grid	State	Usage
Aarish Solar Power Private Limited	50 MW	31/03/2017	Indian Grid	Andhra Pradesh	Sale to State DISCOM
Aashman Energy Private Limited	50 MW	31/03/2017			
Divyesh Power Private Limited	50 MW	31/03/2017			
Elena Renewable Energy Private Limited	50 MW	31/03/2017			
Pratyash Renewable Private Limited	50 MW	31/03/2017			
SEI Baskara Power Private Limited	50 MW	31/03/2017			
SEI Enerstar Renewable Energy Private Limited	50 MW	31/03/2017			
SEI Mihir Energy Private Limited	50 MW	31/03/2017			
Shreyash Renewable Energy Private Limited	50 MW	31/03/2017			
Zuvan Energy Private Limited	50 MW	31/03/2017			

During the Current Monitoring Period from 01/08/2021 to 31/10/2022 (First and last date included), the project activity has supplied 1,456,656 MWh of electricity, and thus contributing to the GHG reductions 1,380,180 tCO₂e.

Audit Type	Period	Program	VB Name	Number of years
Joint Validation/ Verification	31.03.2017 to 30.06.2018	VCS	LGAI Technological Center S.A.	1.3 Years
Verification	01.07.2018 to 30.09.2019	VCS	Earthhood Services Private Limited	1.3 Years
Verification	01.10.2019 to 31.12.2020	VCS	Earthhood Services Private Limited	1.3 Years
Verification	01.01.2021 to 31.07.2021	VCS	Earthhood Services Private Limited	0.7 Years
Verification	01.08.2021 to 31.10.2022	VCS	Earthhood Services Private Limited	1.3 Years
Total	5			5.7 Years

1.2 Sectoral Scope and Project Type

The project activity falls under the following Sectoral scope and Project Type:

Sectoral Scope : 01 - Energy industries (renewable / non-renewable sources)

Project Type : I - Renewable Energy Projects

Project Category: Grid-connected electricity generation from renewable sources ACM0002-
Version 18.1¹

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	Zuvan Energy Private Limited
Contact person	Murali Krishnam Raju M
Title	AGM- Commercial

¹ <http://cdm.unfccc.int/methodologies/DB/5725LCHYPYM4I1V80D9SFYVAMFFWNP>

Address	2/127/21/16, Silpa Singapore Township, Kurnool-518007, Andhra Pradesh, India
Telephone	+91 40 40301000
Email	muraliraju.m@greenkogroup.com

1.4 Other Entities Involved in the Project

Organization name	Zuvan Energy Private Limited
Role in the Project	Project Management
Contact person	Murali Krishnam Raju M
Title	AGM- Commercial
Address	2/127/21/16, Silpa Singapore Township, Kurnool-518007, Andhra Pradesh, India
Telephone	+91 40 40301000
Email	muraliraju.m@greenkogroup.com

1.5 Project Start Date

Start date of the project activity is the earliest date of interconnection with the grid i.e., 31/03/2017. This is the date of commissioning of 50 MW Solar Project activity each developed by Aarish Solar Power Private Limited, Aashman Energy Private Limited, Divyesh Power Private Limited, Elena Renewable Energy Private Limited, Pratyash Renewable Private Limited, SEI Baskara Power Private Limited, SEI Enerstar Renewable Energy Private Limited, SEI Mihir Energy Private Limited, Shreyash Renewable Energy Private Limited, and Zuvan Energy Private Limited.

1.6 Project Crediting Period

Crediting Period Start date : 31/03/2017

Crediting Period End date : 30/03/2027

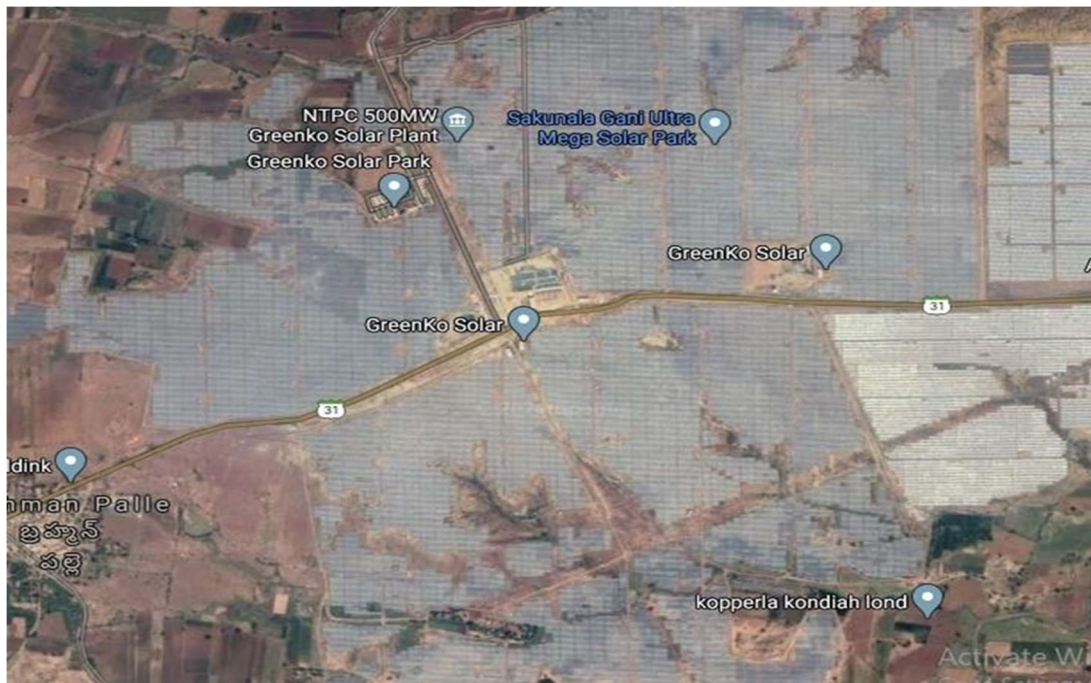
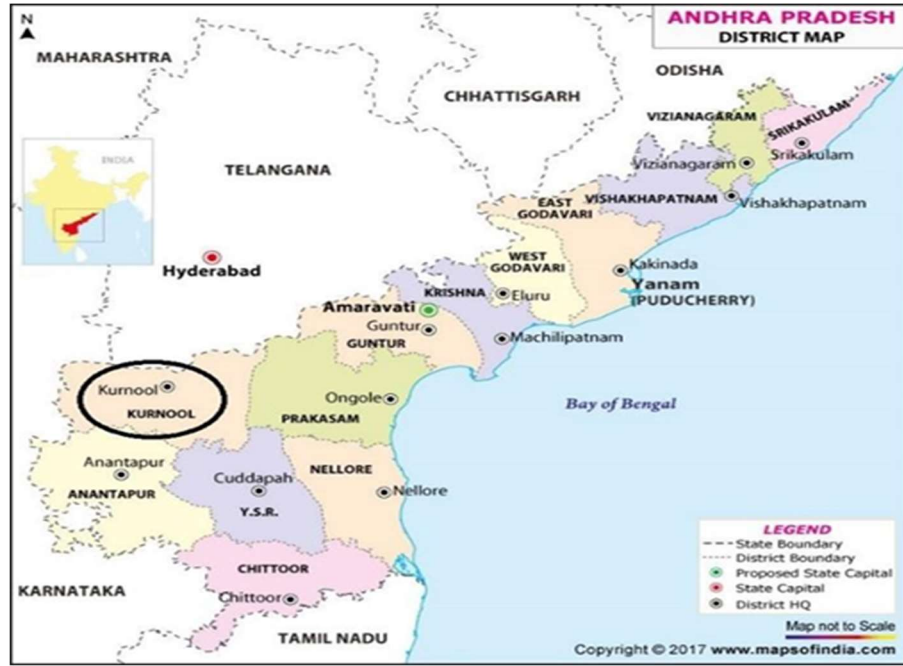
The project activity adopts renewable crediting period of 10 years period which can be renewed for maximum 2 times.

1.7 Project Location

The details of the project locations are mentioned in the table below:

Name of Investor	Capacity (MW)	Village Tehsil / Mandal	District	State	Latitude (N)	Longitude (E)
Aarish Solar Power Private Limited	50 MW	Ghani Solar Park	Kurnool	Andhra Pradesh	15° 39' 46.80" N	78° 16' 04.80" E
Aashman Energy Private Limited	50 MW				15° 40' 48.0" N	78° 14' 24.0" E
Divyesh Power Private Limited	50 MW				15° 39' 03.60" N	78° 15' 21.60" E
Elena Renewable Energy Private Limited	50 MW				15° 40' 26.40" N	78° 14' 56.40" E
Pratyash Renewable Private Limited	50 MW				15° 40' 33.60" N	78° 14' 13.20" E
SEI Baskara Power Private Limited	50 MW				15° 39' 10.80" N	78° 15' 46.80" E
SEI Enerstar Renewable Energy Private Limited	50 MW				15° 40' 40.80" N	78° 15' 25.20" E
SEI Mihir Energy Private Limited	50 MW				15° 41' 06.00" N	78° 16' 30.00" E
Shreyash Renewable Energy Private Limited	50 MW				15° 39' 21.60" N	78° 15' 10.80" E
Zuvan Energy Private Limited	50 MW				15° 39' 43.20" N	78° 15' 39.60" E

The project locations have been shown in the map below:



1.8 Title and Reference of Methodology

Title : Grid-connected electricity generation from renewable sources

Reference : The project activity meets the eligibility criteria of large-scale project as it is more than 15 MW

Methodology : ACM0002: Grid-connected electricity generation from renewable sources - Version 18.1²

Type I : Energy industries (renewable / non-renewable sources)

Category : Approved Consolidated Methodology (ACM0002)

Tools referred with above methodology and applicable for project activity are:

- Tool to calculate the emission factor for an electricity system ³- Version 07.0 (EB 100, Annex 04)
- Methodological Tool- Tool for the demonstration and assessment of additionality⁴ - Version 07.0.0 (EB 70, Annex 08)

1.9 Participation under other GHG Programs

The project proponent hereby confirms that the project has not participated under other GHG Programs.

The undertaking from PP has been submitted for no any double accounting for current monitoring period and project activity is not participated any other GHG program other than VCS.

1.10 Other Forms of Credit and Supply Chain (Scope 3) Emissions

The project activity is not availing any REC benefits and the same can be confirmed from publicly available link of REC generators.

Web-link: https://www.recregistryindia.nic.in/index.php/general/publics/registered_regens . PP has also submitted undertaking for not availing other forms of environmental credit for the current monitoring period under consideration.

1.11 Sustainable Development Contributions

Contribution to sustainable development:

Ministry of Environment, Forests and Climate Change, GoI, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways.

² <http://cdm.unfccc.int/methodologies/DB/5725LCHYPYM4I1V80D9SFYVAMFFWNP>

³ <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

⁴ <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

Social well-being: The project would help in generating employment opportunities during the construction and operation phases. The project activity will lead to development in infrastructure in the region like development of roads and also may promote business with improved power generation.

- **Economic well-being:** The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity will also help to reduce the demand supply gap in the state.

The project activity will generate power using zero emissions solar energy based power generation which helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

- **Technological well-being:** The successful operation of project activity would lead to promotion of solar power generation and would encourage other entrepreneurs to participate in similar projects.
- **Environmental well-being:** Solar being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	7.2.1: Renewable energy share in the total final energy consumption	Implemented activities to increase	About 14,56,656 Mwh, renewable electricity has supplied to Indian grid during the reported period that helps to increase the renewable energy share in the energy mix.	A Total of 5,133,636.81 MWh renewable electricity has been supplied to the Indian grid by the project activity since commissioning
2)	8.5	8.5.2 Unemployment rate, by sex, age and persons with disabilities	Implemented activities to decrease	<p>All Operational and Maintenance jobs are awarded to local population. The number of people employed are as follows.</p> <ol style="list-style-type: none"> 1. Maintenance team – 15 2. Breakdown & Tech Services 10 3. Plant operation team – 30 4. Technician - 5 <p>Total: - 60 peoples employed during this reporting period.</p>	The project has created about 73 permanent jobs since commissioning

3)	13	Tonnes Of greenhouse gas emissions avoided or removed	Implemented activities to increase	By supplying 14,56,656 MWh clean electricity to Indian grid, the project avoided release of 13,80,180 tCO ₂ into the atmosphere during the reporting period.	Since commissioning the project has avoided emission of 4,864,117 tCO ₂ in the atmosphere. project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 9,96,010tCO ₂ e per year
4)	3.b	3.b.1 Proportion of the population with access to affordable medicines and vaccines on a sustainable basis	Implemented activities to increase	<ul style="list-style-type: none"> ➤ A total of 700 people participated in these medical camps and benefited from the free diagnostic, treatment, and free medicines services. ➤ Health Camps are organized at least once in a year at the operational plants. 	<ul style="list-style-type: none"> ➤ A total of 36000 people participated in these medical camps and benefited from the free diagnostic, treatment, and free medicines services. ➤ Health Camps are organized at least once in a year at the operational plants.
5)	4.3	4.3.1 Participation rate of youth and adults in formal and non- formal education and training in the previous 12 months, by sex	Implemented activities to increase	About 776 children from various schools have benefited from our educational initiatives and school support, that are located around our Greenko projects and plants.	About 1058 children from various schools have benefited from our educational initiatives and school support, that are located around our Greenko projects and plants.

6)	6.1	6.1.1 Proportion of population using safely managed drinking water services	Implemented activities to increase	Provided clean drinking water to the village communities total 5994 no of people benefited during the reporting period.	About 72000 no of people benefited during the Since project operation.
7)	8.6	8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training	Implemented activities to increase	<ul style="list-style-type: none"> ➤ Greenko has introduced a Solar Skill Development Certification Program for 280 ITI students of the local communities in Kurnool cluster at Ghani Solar Park with a vision to enhance their skills for employability. ➤ Greenko has provided employment to over 100 trainees of Surya Mitra Skill Development Program. 	<ul style="list-style-type: none"> ➤ Greenko has introduced a Solar Skill Development Certification Program for 280 ITI students of the local communities in Kurnool cluster at Ghani Solar Park with a vision to enhance their skills for employability. ➤ Greenko has provided employment to over 100 trainees of Suryamitra Skill Development Program.

2 SAFEGUARDS

2.1 No Net Harm

The project activity does not involve any major construction activity. It primarily requires the installation of the solar PV panels, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories.

The report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013. This report clearly mentioned that solar PV project activity operations do not result in direct air pollution, noise pollution. Please refer below web link for the same⁵.

Thus there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity.

2.2 Local Stakeholder Consultation

The stakeholders of the project activity were invited to attend the stakeholder meeting on 11/07/2016. Personal invitations were also sent to the prominent members of the regions in the vicinity along with public display of invitation letters.

A stakeholder meeting was held on 18/07/2016 involving the local stakeholders at the project site. The meeting was attended by local villagers, panchayat members, shopkeepers, suppliers, vendors and representatives of PPs.

The stakeholders were explained about the project activity and the various benefits arising out of the project activity. A discussion was held in which the views of the local stakeholders were addressed. No negative comments received.

Nevertheless, PP is open for the continuous stakeholder interaction and formed a grievance/suggestion register and a grievance box placed at the project site for the comments at any point of time during the project crediting period. PP has explained this mechanism for on-going communication to the local stakeholders and transparently kept the notice mentioning the grievance register and box at the project site.

2.3 AFOLU-Specific Safeguards

Not applicable to this as this is not an AFOLU project activity.

⁵ <http://164.100.94.214/sites/default/files/uploads/report-on-developmental-impacts-of-RE.pdf>

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity involves the installation of solar project. The total installed capacity of the project is 500 MW Solar projects located at Andhra Pradesh state in India. The project is a bundled project activity by Greenko Group and the project is promoted by Zuvan Energy Private Limited.

The Project activity is a new facility (Greenfield) and the electricity generated by the project will be exported to the Indian electricity grid. The project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. The Project Proponent plans to avail the VCS benefits for the project.

In the Pre- project scenario the entire 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.

The project shall result in replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 996,010 tCO_{2e} per year, thereon displacing 1,051,200 MWh/year amount of electricity from the grid over the 10 years crediting period.

The technical specifications for each of the individual bundled projects are described below;

The technical specification for 50 MW solar project by Aarish Solar Power Private Limited.

SI. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The technical specification for 50 MW solar project by Ashman Energy Private Limited.

SI. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The technical specification for 50 MW solar project by Divyesh Power Private Limited.

SI. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The technical specification for 50 MW solar project by Elena Renewable Energy Private Limited.

SI. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The technical specification for 50 MW solar project by Pratyash Renewable Private Limited

SI. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The technical specification for 50 MW solar project by SEI Baskara Power Private Limited.

SI. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The technical specification for 50 MW solar project by SEI Enerstar Renewable Energy Private Limited.

SI. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The technical specification for 50 MW solar project by SEI Mihir Energy Private Limited.

SI. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The technical specification for 50 MW solar project by Shreyash Renewable Energy Private Limited.

SI. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The technical specification for 50 MW solar project by Zuvan Energy Private Limited.

Sl. No.	Technical details of the equipment	Description
1	Technology Used	Solar PV technology (Poly-Crystalline)
2	Module capacity	Module capacity- 315 Wp 320 Wp & 325 Wp
3	Number of Inverters, Inverter Make & Model	56 Inverters SMA/Sunny Central 1000CP XT
4	Modules per String	21
5	Tilt	Fixed Tilt

The electricity generated by the project is exported to the Indian electricity grid. The project activity will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid.

The project activity has been in operation continuously since its commissioning. There have been no emergencies happened to the monitoring system. There are no events or situation that occurred during the monitoring period which may impact the applicability of the methodology.

There is no major shutdown observed during the current monitoring period in the project activity.

3.2 Deviations

3.2.1 Methodology Deviations

No methodology deviation is applied during the monitoring period.

3.2.2 Project Description Deviations

No deviation has taken place in project description during the monitoring period.

3.3 Grouped Projects

The project is not a grouped project thus this is not applicable.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid, 0M, y}$
Data unit	tCO ₂ /MWh
Description	Operating margin CO ₂ emission factor for the project electricity system in year y
Source of data	Calculated from CEA database, Version 13, June 2018 ⁶
Value applied	0.9726
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 07” as 3-year generation weighted average using data for the years 2014-15, 2015-16 & 2016-17. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 13, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{PJ, y}$
Data unit	MWh/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)
Source of data	Monthly joint meter reading reports
Description of measurement methods and procedures to be applied	The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value will be considered for ER calculations
Frequency of monitoring/recording	Continuous measurement & monthly recording

⁶ http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver13.pdf

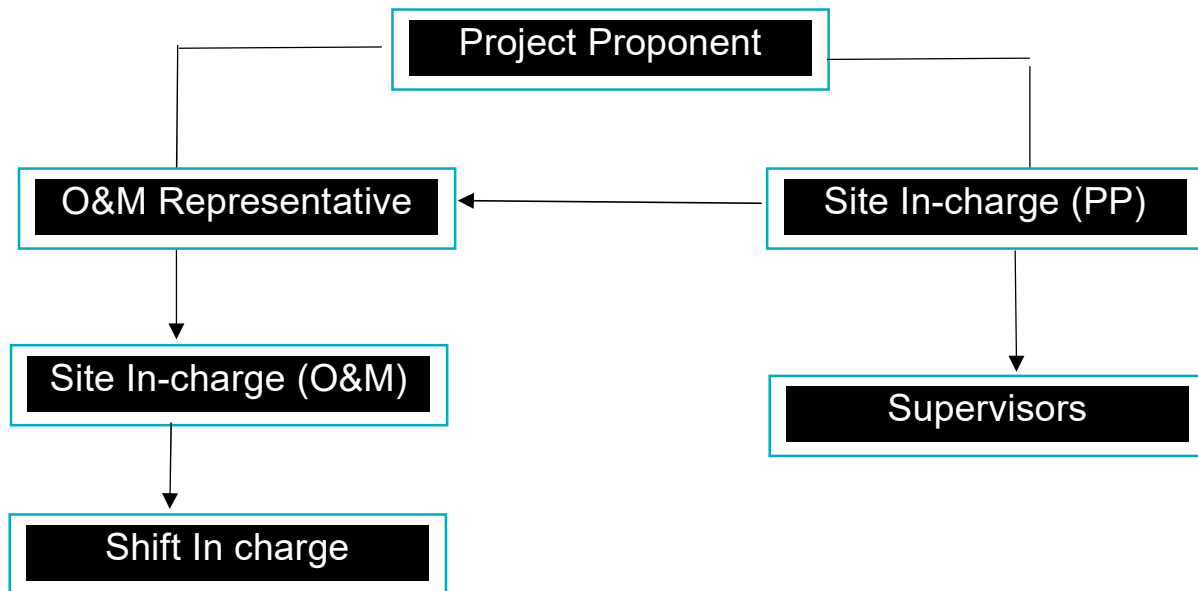
Value monitored	1,456,656 MWh
Monitoring equipment	<p>The electricity exported / supplied by the plant to pooling substation and further to substation. This meter also measures electricity imported by the plant from the grid.</p> <p>There are numerous meters used in this project activity and the details including Meter serial number, Make, accuracy class and the calibration dates are mentioned APPENDIX 1: Calibration Records</p>
QA/QC procedures to be applied	<p>The meters are approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years⁷. The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines will be applied appropriately to confirm the conservativeness of metering.</p> <p>The metering arrangement, accuracy class of meters, calibration frequency is under control of state electricity board and PP does not have any control on it. PP is getting value of net electricity supplied to grid and the same is considered the monitoring parameter.</p>
Purpose of the data	Calculation of baseline emissions
Calculation method	Thus, Net electricity supplied to the grid by the project plant in a given month = Export, kWh – Import, kWh
Comments	Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.

4.3 Monitoring Plan

The monitoring plan is developed in accordance with the modalities and procedures for CDM project activities and is proposed for grid-connected solar power project being implemented. The monitoring plan, which will be implemented by the project participant describes about the monitoring organisation, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

⁷ http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data remains with the project participant. PP proposed the following structure for data monitoring, collection, data archiving and calibration of equipment's for this project activity. The team comprises of the following members:



Responsibilities of Site In charge (PP): Overall functioning and maintenance of the project activity, the Site in charge shall coordinate with the O&M operator as well as the site supervisors.

Responsibilities of O&M Representative: Co-ordination between Site in charge of the O&M operator as well as the project participant and further report to PP head office.

Responsibilities of Site In-charge (O&M Operator): Responsibility for maintaining the data records, ensures completeness of data, and reliability of data (calibration of equipment) as well as data recording for all the parameters.

Responsibilities of Shift In-charge: Responsibility for day-to-day data collection and maintains day to day monitored data.

Data Measurement

The export and import energy will be measured continuously using above mentioned Main and Check meters located at the substations. Readings of meters shall be taken on monthly basis by authorized officer of SEB in the presence of PP or representative of PP. Based on the Meter Reading Statement to PP, invoices will be raised. These invoices can be used for cross checking the meter readings taken for the respective project activity.

Data collection and archiving

Readings from meters will be collected in the presence of the plant in-charge. Export and Import data would be recorded and stored in logs as well as in electronic form on a daily basis. The records are checked periodically by the Plant Manager and discussed thoroughly with the plant supervisor. The period of storage of the monitored data will be 2 years after the end of crediting period or till the last issuance of VERs for the project activity whichever occurs later.

Emergency preparedness

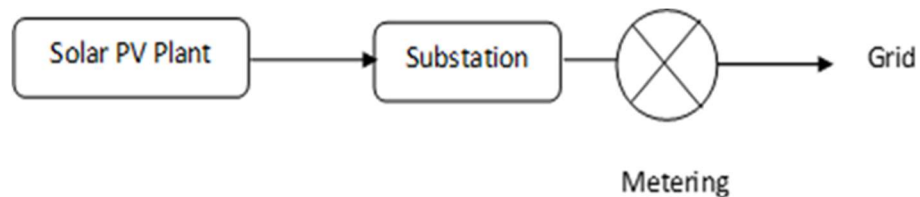
The project activity will not result in any unidentified activity that can result in substantial emissions from the project activity. No need for emergency preparedness in data monitoring is visualized.

Personnel training

In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the staff will be trained. The plant helpers will be trained in equipment operation, data recording, reports writing, operation and maintenance and emergency procedures in compliance with the monitoring plan.

Metering Arrangement

Line diagram with metering arrangement for the solar project activity is shown below.



The solar plant has their own dedicated metering arrangement at the substation end. The metering arrangement is under control of state electricity board and may change in future.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per the approved consolidated Methodology ACM0002 (Version 18.1) para 42:

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired 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:

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

Where:

BE_y = Baseline emissions in year y (tCO₂/yr)

$EG_{PJ, y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh/yr)

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

Grid Emission Factor

The GEF is fixed ex-ante in the PD as given below:

Parameter	Value
OM	0.9726
BM	0.8723
CM	0.9475

Therefore,

$$BE_y = 1,456,656 \times 0.9475$$

$$= 1,380,180 \text{ (Round down values)}$$

5.2 Project Emissions

Not Applicable, since emissions from the project activity is zero as per ACM0002 methodology. Hence, $PE_y = 0$.

5.3 Leakage

Not Applicable since leakage emissions from the project activity is zero as per ACM0002 methodology. Hence, $LE_y = 0$.

5.4 Net GHG Emission Reductions and Removals

The Formula used to calculate the net emission reduction for the project activity is

$$ER_y = BE_y - PE_y$$

Where,

ER_y = Emission Reduction in tCO₂/year

BE_y = Baseline emission in tCO₂/year

PE_y = Project emissions in tCO₂/year

For the project activity during the current monitoring period, as per section 5.1

$$BE_y = = 1,380,180 \text{ Round down values)}$$

$$PE_y = 0 \text{ tCO}_2\text{e}$$

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01/08/2021 to 31/12/2021	428,212	0	0	428,212
01/01/2022 to 31/10/2022	951,968	0	0	951,968
Total	1,380,180	0	0	1,380,180

The achieved GHG emission is 11% higher as compared to the estimated values in the registered VCS PD. This is due to the greater number of sunshine hours during the monitoring period and Present Monitoring period considered was Peak summer period. The generation of electricity

depends upon many other climatic conditions, and the availability of sunlight is not within the control of the project participant. Thus, there is impact on emission reductions of the project.

The actual PLF achieved during the current monitoring period are 11.75% greater than the estimated PLF at the time of validation, which is due to greater number of sunshine hours during the monitoring period. It is to be noted that PLF is completely governed by availability of sunshine hours, which is natural phenomenon and same is beyond the control of PP.

The PLF estimated at the time of validation was 24%, however actual PLF achieved during the current monitoring period is 26.82%. As per the registered PD, the IRR will breach the benchmark if PLF increased by 46.88%, hence it can be confirmed that the increment in PLF is well within the threshold limit and does not have any impact on additionality.

<u>Ex-ante emissions reductions/removals</u>	<u>Achieved emissions reductions/removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
1,247,059	1,380,180	11%	<ul style="list-style-type: none"> ➤ The achieved GHG emission is 11% higher as compared to the estimated values in the registered VCS PD. This is due to the greater number of sunshine hours during the monitoring period and Present Monitoring period considered was Peak summer period. The generation of electricity depends upon many other climatic conditions, and the availability of sunlight is not within the control of the project participant. Thus, there is impact on emission reductions of the project. ➤ The actual PLF achieved during the current monitoring period are 11.75% greater than the estimated PLF at the time of validation, which is due to greater number of sunshine hours during the monitoring period. It is to be noted that PLF is completely governed by availability of sunshine hours, which is natural phenomenon and same is beyond the control of PP.

APPENDIX 1: CALIBRATION RECORDS

The meters and Calibration details at 220KV side at 400KV Substation,

S.no	Feeders	Location	SPDs
1	Feeder -211	Pooling Substation (PSS) - 1	1. Divyesh Power Ltd.
			2. SEI Baskara Power Ltd.
	3. Shreyash Renewable Energy Pvt Ltd.		
	4. Zuvan Energy Pvt Ltd.		
	5. Aarish Solar Power Ltd.		
2	Feeder -215	Pooling Substation (PSS)- 2	6. Prayatash Renewables Pvt Ltd
			7. Elena Renewable Energy Pvt Ltd.
	8. Aashman Energy Pvt Ltd		
	9. SEI Mihir Energy Pvt Ltd		
	10. SEI Ener star Renewable Energy Pvt Ltd		
Feeder-216			

PSS - 01 - 220 KV Side at 400 KV Substation						
Meter Details	Main Meter	Check Meter	Standby Meter	Main Meter	Check Meter	Standby Meter
Feeder Detail	211	211	211	212	212	212
Location	PSS 1	PSS 1	PSS 1	PSS 1	PSS 1	PSS 1
Meter Serial No	16196439	16196441	16196443	16196434	16196435	16196437
Meter Make	L & T	L & T	L & T	L & T	L & T	L & T
Accuracy Class	0.2s	0.2s	0.2s	0.2s	0.2s	0.2s
Last Calibration date	16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020
Calibration date	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Due date	27/10/2026	27/10/2026	27/10/2026	27/10/2026	27/10/2026	27/10/2026

PSS - 02 - 220 KV Side at 400 KV Substation						
Meter Details	Main Meter	Check Meter	Standby Meter	Main Meter	Check Meter	Standby Meter
Feeder Detail	215	215	215	216	216	216
Location	PSS 2	PSS 2	PSS 2	PSS 2	PSS 2	PSS 2
Meter Serial No	16196452	16196456	16196449	16196455	16196458	16196460
Meter Make	L & T	L & T	L & T	L & T	L & T	L & T
Accuracy Class	0.2s	0.2s	0.2s	0.2s	0.2s	0.2s
Last Calibration date	16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020	16/10/2020
Calibration date	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021	28/10/2021
Due date	27/10/2026	27/10/2026	27/10/2026	27/10/2026	27/10/2026	27/10/2026