



# Verified Carbon Standard

## BUNDLED SOLAR POWER PROJECT BY MAHINDRA SUSTEN PRIVATE LIMITED



Document Prepared by EKI Energy Services Limited

<b>Project Title</b>	Bundled Solar Power Project by Mahindra Susten Private Limited
<b>Version</b>	03
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<b>Monitoring Period</b>	24-December-2019 to 31-March-2021 (first and last date included)
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# 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 form of electricity through renewable solar energy source. The project is a bundled project activity which involves installation of 205 MW AC solar project in different states of India through SPVs. The project is promoted by Mahindra Susten Private Limited and Divine Solren Private Limited.

Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 329,360 tCO<sub>2e</sub> per year, thereon displacing 341,202 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 details of the SPVs and commissioning dates for the project are mentioned in the table below:-

Name of SPVs	AC Capacity (MW)	COD	State
Cleansolar Renewable Energy Private Limited	30	29-June-2016	Telangana
Divine Solren Private Limited	50	22-July-2017	Telangana
Astra Solren Private Limited	40	31-March-2017	Gujarat
	25	02-June-2017	Gujarat
Mahindra Susten Private Limited	60	31-March-2017	Rajasthan

The project is running smoothly since commissioning. During the Current Monitoring Period from 24-December-2019 to 31-March-2021 (First and last date included) the project activity has injected 540,618.5 MWh of electricity to the Indian Grid, and thus contributing to the GHG reductions 521,852 tCO<sub>2e</sub>.

## 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  
**Methodology** : ACM0002: Grid-connected electricity generation from renewable sources- Version 18.1<sup>1</sup>

The project is not a grouped project activity.

<sup>1</sup> <https://cdm.unfccc.int/methodologies/DB/5725LCHYPYM4I1V8OD9SFYVAMFFWNP>

### 1.3 Project Proponent

<b>Organization name</b>	<b>Mahindra Susten Private Limited</b>
<b>Contact person</b>	Mr. Rakesh Khaitan
<b>Title</b>	CEO
<b>Address</b>	6 <sup>th</sup> Floor AFL House, Lok Bharati Complex, Marol Maroshi Road, Mumbai, Maharashtra- 400059
<b>Telephone</b>	+91-9589899649
<b>Email</b>	mehta.saurabh2@mahindra.com

<b>Organization name</b>	<b>Divine Solren Private Limited</b>
<b>Contact person</b>	Mr. Sandip Saha
<b>Title</b>	Deputy Manager, Carbon & Sustainability
<b>Address</b>	7 <sup>th</sup> Floor, FULCRUM, Sahar Road, Andheri (East), Mumbai – 400099 India
<b>Telephone</b>	+91- 9833775833
<b>Email</b>	sandip.saha@clpindia.in

### 1.4 Other Entities Involved in the Project

<b>Organization name</b>	<b>EKI Energy Services Limited</b>
<b>Role in the Project</b>	Project Consultant
<b>Contact person</b>	Prakash Kumar Sahu
<b>Title</b>	Project manager
<b>Address</b>	Office No 201, Plot No 48, Scheme 78, Part 2, Vijay Nagar, Indore-452010, Madhya Pradesh, India
<b>Telephone</b>	+91-9589899649
<b>Email</b>	<a href="mailto:prakash@enikingint.org">prakash@enikingint.org</a>

### 1.5 Project Start Date

**Project Start Date:** 29-June-2016. This is the date of commissioning of 30 MW solar PV project activity by CleanSolar Renewable Energy Private Limited (CREPL).

## 1.6 Project Crediting Period

**Crediting Period Start date** : 29-June-2016

**Crediting Period End date** : 28-June-2026

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

## 1.7 Project Location

The Geo Coordinates of the project location has been mentioned in the table below:

Name of SPVs	Village / Site	Tehsil / Mandal	District	State	Latitude (N)	Longitude (E)
Cleansolar Renewable Energy Private Limited	Gingurthi	Tandur	Vikarabad	Telangana	17° 21' 55.4"	77° 31' 45.9"
Divine Solren Private Limited	Mallapur, Mujgi	Nirmal, Dilawarpur	Nirmal	Telangana	19° 02' 39.6"	78° 17' 16.1"
Astra Solren Private Limited	Charanka	Santalpur	Patan	Gujarat	23° 54' 00.0"	71° 12' 00.0"
Mahindra Susten Private Limited	Goyalri / Gajner	Kolayat	Bikaner	Rajasthan	27° 53' 48.6"	72° 56' 48.3"

The project location has been highlighted in the geographical map shown below<sup>2</sup>:

<sup>2</sup>

<https://www.google.com/maps/d/viewer?mid=1FS1BQdF7zVmUqxTYV1NnvtzwODy9DtM0&ll=22.733740151096505%2C74.74424859999999&z=6>



## 1.8 Title and Reference of Methodology

**Sectoral Scope** : 01

**Methodology** : ACM0002: Grid-connected electricity generation from renewable sources - Version 18.1

**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<sup>3</sup>- Version 06.0 (EB 97, Annex 07)
- Methodological Tool- Tool for the demonstration and assessment of additionality<sup>4</sup>- Version 07.0.0 (EB 70, Annex 08)

## 1.9 Participation under other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs. The project is seeking registration only in VCS program.

## 1.10 Other Forms of Credit

### **Emission Trading Programs and Other Binding Limits:**

Net GHG emission reductions or removals generated by the Project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions in any Emission Trading program or other binding limits.

### **Other Forms of Environmental Credit:**

Not applicable, as the project is not registered in any other GHG mechanism other than VCS. Also, the project activity is not availing any REC benefits and the same can be confirmed from publically available link of REC generators.

Web-link: [https://www.regregistryindia.nic.in/index.php/publics/accredited\\_regens](https://www.regregistryindia.nic.in/index.php/publics/accredited_regens)

## 1.11 Sustainable Development

### **Contribution to sustainable development:**

Ministry of Environment and Forests, 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.

**Social well-being:** The project would help in generating employment opportunities during the construction and operation phases. The project activity leads to development in infrastructure in

<sup>3</sup><http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v6.pdf>

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

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.

**Technological well-being:** The successful operation of project activity leads to promotion of solar-based 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 and specific pollutants like SO<sub>x</sub>, NO<sub>x</sub>, and SPM associated with the conventional thermal power generation facilities.

## 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 same<sup>5</sup>.

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

As a part of continual improvement process, feedback from the associated stakeholders is vital, therefore a dedicated Visitor register cum grievance register has been placed at the project site which is accessible to stakeholders to provide their feedback on the project. It is appropriate publicly accessible location at which local stakeholders can provide their feedback on the project. This location is also conducive to continuous and regular checks for stakeholder comments. For the global stakeholders, the suggestion and the grievance can be submitted to [susten@mahindra.com](mailto:susten@mahindra.com) and [sandip.saha@clpindia.in](mailto:sandip.saha@clpindia.in)

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<sup>5</sup> <https://smartnet.niua.org/sites/default/files/resources/report-on-developmental-impacts-of-RE.pdf>

Stakeholder meetings were organized at the time of registration of project activity in order to identify the major challenges around the area, stakeholders were invited well in advance through printed invitation, calls, meeting and a notice is placed around the local common areas. The stakeholder are also request to share their experiences and grievances on continuous basis. Registers is used to records the grievances and feedback.

During the current monitoring period, positive feedback are received regarding site operation. No any grievances received by stakeholders during the current monitoring period, therefore, no any mitigation measures are required. In case of grievances, the nature of probable resolution is discussed with the plant head office and implemented by the site in-charge. The grievance copies have been submitted to DOE.

### 2.3 AFOLU-Specific Safeguards

Not Applicable, as this is not an AFOLU project.

## 3 IMPLEMENTATION STATUS

### 3.1 Implementation Status of the Project Activity

The project activity involves the installation of Solar PV project. The total installed capacity of the project is 205 MW of Solar PV plant located at different states in India. The project is promoted by Mahindra Susten Private Limited and Divine Solren Private Limited.

The Project activity is a new facility (Greenfield) and the electricity generated by the project is being exported to the Indian electricity grid. The project therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. 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.

Solar PV Project Technology Details –

The project activity aims to harness solar energy through installation of Solar PV project with total installed capacity of 205 MW.

The technical specification of 30 MW plant commissioning on 29-June-2016 by CleanSolar Renewable Energy Private Limited are as follows:

Sl. No.	Technical details of the equipment	Description
1	Technology Used	Multi-crystalline and Thin Film
2	Make of modules installed	Trina Solar and Solar Frontier
3	Model of the modules installed	Trina Solar TSM-310PC14; Solar Frontier SF170-S
4	Make & Model of Invertor	SMA - Sunny Central 2200

5	Number of Inverters	14
6	Make & Number of Transformers	Power transformer- 1, make-CGL ; Inverter duty transformers-14, make-Danish

The technical specification of 50 MW plant commissioning on 22-July-2017 by Divine Solren Private Limited are as follows:

Sl. No.	Technical details of the equipment	Description
1	Technology Used	Multi-crystalline
2	Make of modules installed	Hanwha Solar
3	Model of the modules installed	Hanwa Solar HSL 72 P6-PC-1-315/320
4	Make & Model of Invertor	SMA - Sunny Central 1000CP-XT
5	Number of Inverters	46
6	Make & Number of Transformers	Power transformer- 2, make-CGL ; Inverter duty transformers-12, make-Danish

The technical specification of 40 MW plant commissioning on 31-March-2017 by Astra Solren Private Limited are as follows:

Sl. No.	Technical details of the equipment	Description
1	Technology Used	Multi-crystalline and Thin Film
2	Make of modules installed	Canadian Solar and First Solar
3	Model of the modules installed	Canadian Solar 320 P Mix, First Solar FS 4117A-3
4	Make & Model of Invertor	SMA - Sunny Central 1000CP-XT, GE Power - LV5 1000kW
5	Number of Inverters	40
6	Make & Number of Transformers	Power transformer- 2, make-CGL ; Inverter duty transformers-11, make-Danish

The technical specification of 25 MW plant commissioning on 02-June-2017 by Astra Solren Private Limited are as follows:

Sl. No.	Technical details of the equipment	Description
1	Technology Used	Multi-crystalline
2	Make of modules installed	Hanwha Solar
3	Model of the modules installed	Hanwa Solar HSL 72 P6-PC-1-320
4	Make & Model of Invertor	SMA - Sunny Central 1000CP-XT
5	Number of Inverters	25

6	Make & Number of Transformers	Power transformer- 1, make-CGL ; Inverter duty transformers-7, make-Danish
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The technical specification of 6\*10 MW plant commissioning on 31-March-2017 by Mahindra Susten Private Limited are as follows:

Sl. No.	Technical details of the equipment	Description
1	Technology Used	Multi-crystalline and Thin Film
2	Make of modules installed	Canadian Solar and First Solar
3	Model of the modules installed	Canadian Solar 320 P Mix, First Solar FS 4117A-3
4	Make & Model of Invertor	SMA - Sunny Central 1000CP-XT, GE Power - LV5 1000kW
5	Number of Inverters	60
6	Make & Number of Transformers	Power transformer- 1, make-Bharat Bijlee ; Inverter duty transformers-18, make-Danish

During the Current Monitoring Period, all the sites are operational and the project activity has supplied 540,618.5 MWh of electricity, and thus contributing to 521,852 tCO<sub>2e</sub> GHG reductions.

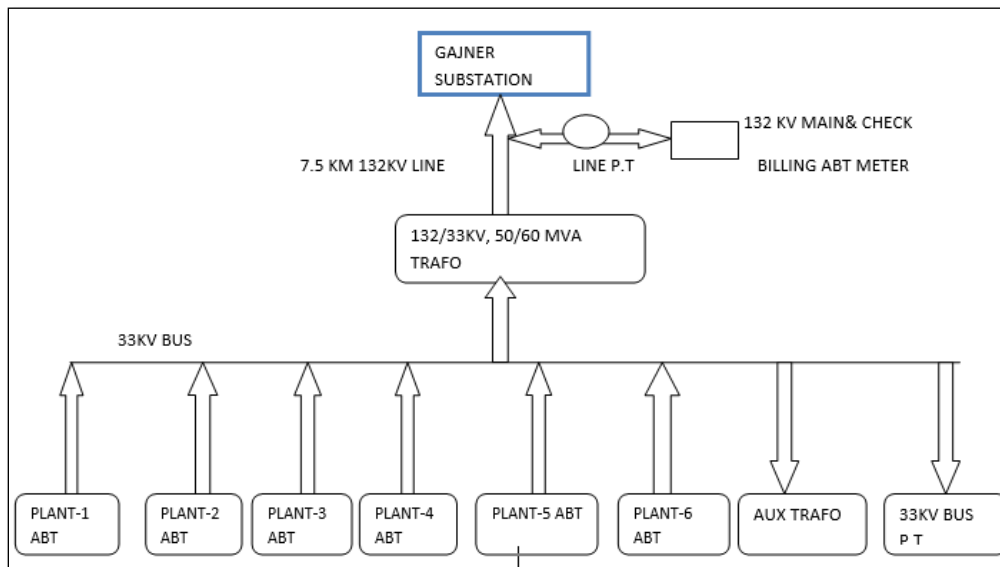


Figure 1. Mahindra Susten Private Limited

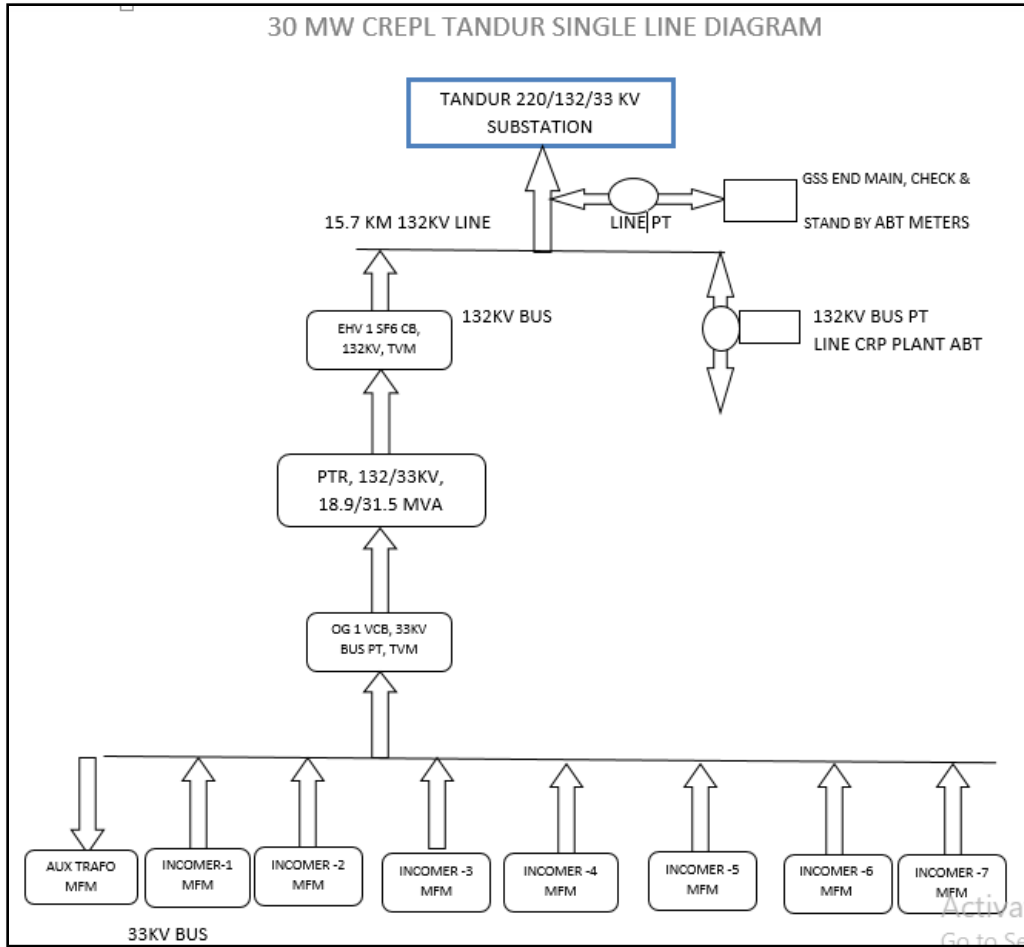


Figure 2. Brief line diagram of Cleansolar Renewable Energy Private Limited

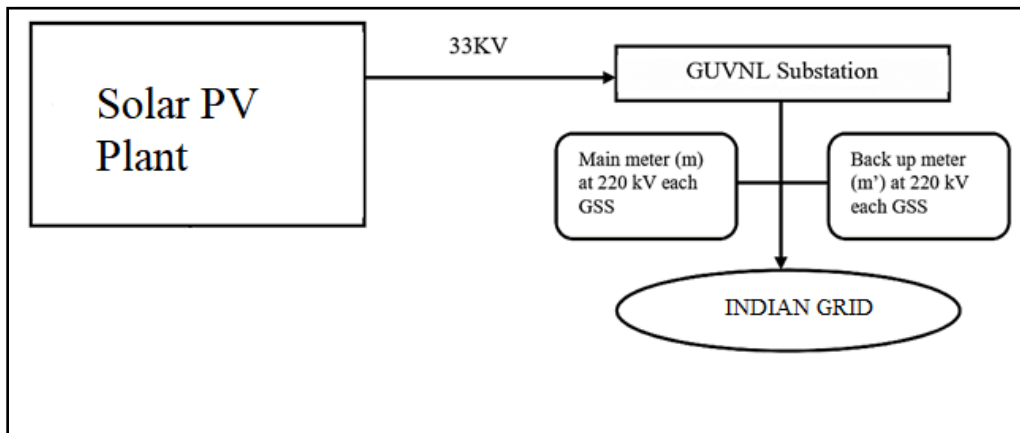


Figure 3. Astra Solren Private Limited

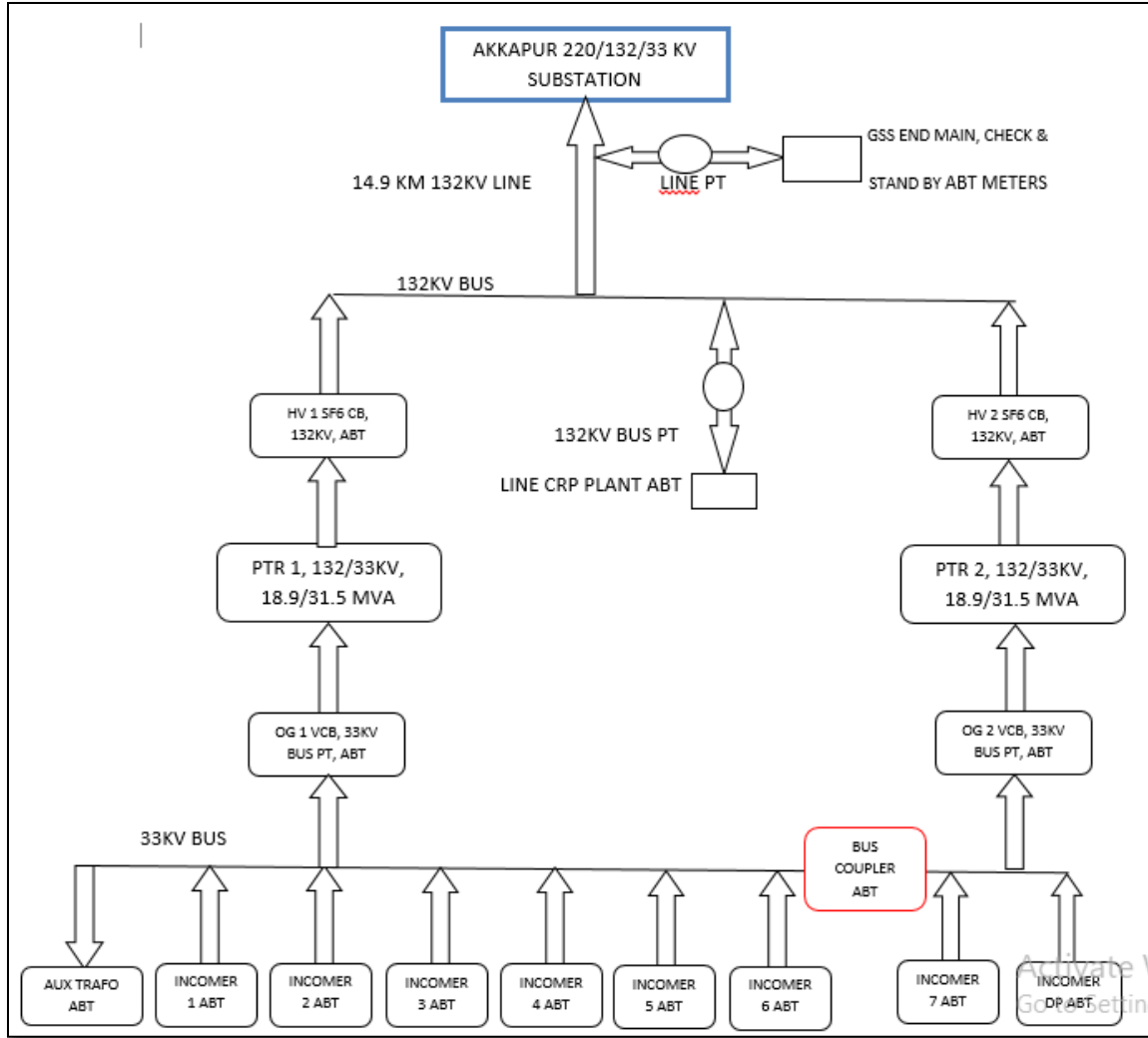


Figure 4. Divine Solren Private Limited

### 3.2 Deviations

#### 2.3.1 Methodology Deviations

Not Applicable, as there are no methodological deviations.

#### 2.3.2 Project Description Deviations

**Deviation 1:**

Addition of Divine Solren Private Limited as a Project Participant. The VCS-Accession-Representation is being submitted to VERRA and VVB. The nature of deviation is permanent.

**Deviation 2:**

There geo coordinates for Clean Solar Renewable Energy Private Limited, Divine Solren Private Limited and Mahindra Susten Private Limited was slightly inconsistent. The correct coordinates are mentioned below

Divine Solren Private Limited	Mallapur, Mujgi	Nirmal, Dilawarpur	Nirmal	Telangana	19° 02' 39.6"	78° 17' 16.1"
Cleansolar Renewable Energy Private Limited	Gingurthi	Tandur	Vikarabad	Telangana	17° 21' 55.4"	77° 31' 45.9"
Mahindra Susten Private Limited	Goyalri / Gajner	Kolayat	Bikaner	Rajasthan	27° 53' 48.6"	72° 56' 48.3"

The nature of deviation is permanent.

### Deviation 3:

The grid connectivity date for Astra Solren Private Limited was 23-May-2017, after successful trails, it received the commissioning status on 02-June-2017. The grid connectivity date was earlier mentioned as Commissioning date in section 1.1 of the MR, now it has been updated with certified commissioning date. The nature of deviation is permanent.

### Deviation 4:

Billing Meter details of Astra Solren Private Limited has been corrected. During earlier verification, all details were mentioned in Astra Solren Private Limited 40 MW space. Now it has been corrected, billing energy meters connected to GETCO-400KV substation are being mentioned.

## 3.3 Grouped Projects

Not Applicable, as this is not a grouped project activity.

# 4 DATA AND PARAMETERS

## 4.1 Data and Parameters Available at Validation

<b>Data / Parameter</b>	EF <sub>grid,OM,y</sub>
<b>Data unit</b>	tCO <sub>2</sub> /MWh
<b>Description</b>	Operating Margin CO <sub>2</sub> emission factor in year y
<b>Source of data</b>	Calculated from CEA database, Version 12, May 2017 <sup>6</sup>

<sup>6</sup> [https://cea.nic.in/wp-content/uploads/baseline/2020/07/user\\_guide\\_ver12.pdf](https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver12.pdf)

Value applied	0.9843
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 05” as 3-year generation weighted average using data for the years 2013-14, 2014-15 & 2015-16. The data are obtained from “CO <sub>2</sub> Baseline Database for Indian Power Sector” version 12, published by the Central Electricity Authority, Ministry of Power, and 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.

Data / Parameter	EF <sub>grid,BM,y</sub>
Data unit	tCO <sub>2</sub> /MWh
Description	Build Margin CO <sub>2</sub> emission factor in year y
Source of data	Calculated from CEA database, Version 12, May 2017
Value applied	0.9083
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 05” as per the latest data available for the most recent year 2015-16. The data is obtained from “CO <sub>2</sub> Baseline Database for Indian Power Sector” version 12, 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.

Data / Parameter	EF <sub>grid,CM,y</sub>
Data unit	tCO <sub>2</sub> /MWh
Description	Combined Margin CO <sub>2</sub> emission factor in year y
Source of data	Calculated from CEA database, Version 12, May 2017
Value applied	0.9653
Justification of choice of data or description of measurement methods and procedures applied	<p>The combined margin emissions factor is calculated as follows:</p> $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ <p>Where:</p> <p>EF<sub>grid,BM,y</sub> = Build margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh)</p> <p>EF<sub>grid,OM,y</sub> = Operating margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh)</p> <p>W<sub>OM</sub> = Weighting of operating margin emissions factor (%) = 75%</p> <p>W<sub>BM</sub> = Weighting of build margin emissions factor (%) = 25%</p>
Purpose of Data	For the calculation of the Baseline Emission

Comments	This parameter is fixed ex-ante for the entire crediting period
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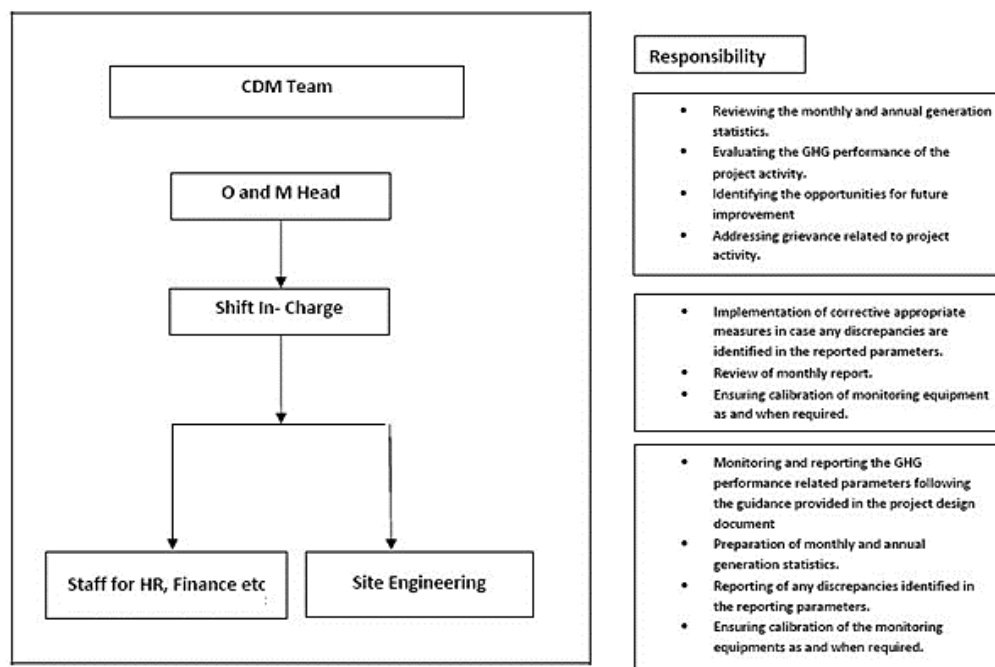
## 4.2 Data and Parameters Monitored

Data / Parameter	<b>EG<sub>PI, y</sub></b>
Data unit	MWh/y
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh. (This value will be the sum of the net electricity generated from all 4 sites).
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
Value monitored	540,618.5 MWh
Monitoring equipment	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. The calibration details are being mentioned in <b>Error! Reference source not found..</b>
QA/QC procedures to be applied	<p>The meters is approved, tested &amp; sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years. 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 do 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> <p>The billing is raised based on substation meters.</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 VCUs 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 is being 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.

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests 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:



#### Data Measurement

The export and import energy are 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 are 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 are collected in the presence of the plant in-charge. Export and Import data is 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 are trained. The plant helpers are trained in equipment operation, data recording, reports writing, operation and maintenance and emergency procedures in compliance with the monitoring plan.

## 5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

### 5.1 Baseline Emissions

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

Where:

$BE_y$  : Baseline emissions in year y (tCO<sub>2</sub>e/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 VCS project activity in year y (MWh/yr)

$EF_{grid,CM,y}$  : Combined margin CO<sub>2</sub> 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” (tCO<sub>2</sub>e/MWh)

Based upon monitored values:

Year	Capacity (MW)	Net Generation (MWh)
Cleansolar Renewable Energy Private Limited (CREPL)	30	69,499.12
Divine Solren Private Limited (DSPL)	50	119,555.42
Astra Solren Private Limited (ASPL)	40	111,174.00
	25	68,883.00
Mahindra Susten Private Limited (MSPL)	60	171,506.99
<b>Total</b>	<b>205</b>	<b>540,618.5</b>

$$EG_{PJ,y} = 540,618.5 \text{ MWh}$$

$$EF_{\text{grid,CM,y}} = 0.9653 \text{ tCO}_2\text{e}$$

$$BE_y = 540,618.5 * 0.9653$$

$$= 521,852 \text{ (Round down value for each SPVs for each vintage year)}$$

## 5.2 Project Emissions

Not Applicable, since emissions from the project activity is zero as per ACM0002 methodology. Hence,  $PE_{FF,y} = 0$ .

## 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

Year	Baseline emissions or removals (tCO <sub>2</sub> e)	Project emissions or removals (tCO <sub>2</sub> e)	Leakage emissions (tCO <sub>2</sub> e)	Net GHG emission reductions or removals (tCO <sub>2</sub> e)
24-December-2019 to 31-December-2019	7,063	0	0	7,063
01-January-2020 to 31-December-2020	413,215	0	0	413,215
01-January-2021 to 31-March-2021	101,574	0	0	101,574
<b>Total</b>	<b>521,852</b>	<b>0</b>	<b>0</b>	<b>521,852</b>

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period is 418,693 tCO<sub>2</sub>e, whereas actual emission reductions achieved are 521,852 tCO<sub>2</sub>e, which is approximately 24.64% higher than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, which are not within the control of the project participant. The higher generation during the current verification period is due to uncertain natural conditions.

Project Investor	Capacity (MW)	PLF at the time of validation	PLF observed	Percentage increase	Breaching Value
Cleansolar Renewable Energy Private Limited (CREPL)	30	19%	20.80%	9.49%	12.16%
Divine Solren Private Limited (DSPL)	50	19%	21.47%	13.01%	17.39%
	40	19%	24.96%	31.36%	38.23%

<b>Astra Solren Private Limited (ASPL)</b>	25	19%	24.74%	30.22%	38.23%
<b>Mahindra Susten Private Limited (MSPL)</b>	60	19%	25.67%	35.10%	35.12%

Also, current monitoring period comprises of two high generation seasons and one low generation seasons of India, therefore observed PLF is on higher side. The increased PLF is cross checked with breaching value, the observed PLF is on lower side as compared to breaching values. Hence, increased emission reduction is acceptable.

The SPV wise vintage breakdown as follows:

<b>Project Investor</b>	<b>Project Location</b>	<b>Site</b>	<b>MWh generation</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>Total VCUs</b>
Cleansolar Renewable Energy Private Limited (CREPL)	Telangana	Vikarabad	69,499.12	1,112	51,617	14,357	67,086
Divine Solren Private Limited (DSPL)	Telangana	Nirmal	119,555.42	1,828	90,092	23,485	115,405
Astra Solren Private Limited (ASPL)	Gujarat	Patan	111,174.00	1,696	83,668	21,951	107,315
	Gujarat		68,883.00	984	51,999	13,508	66,491
Mahindra Susten Private Limited (MSPL)	Rajasthan	Bikaner	171,506.99	1,443	135,839	28,273	165,555
<b>Total</b>				<b>7,063</b>	<b>413,215</b>	<b>101,574</b>	<b>521,852</b>

# APPENDIX 1: CALIBRATION DETAILS

The Energy Meters details for the project activity is as below.

Calibration and Meter Details of 30 MW solar project by Clean solar Renewable Energy Private Limited

Meter Details	Main Meter	Check Meter	Standby Meter
Meter Serial No	APX00619	APX00620	APX00622
Meter Make	SECURE	SECURE	SECURE
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration	23-February-2019	23-February-2019	23-February-2019
Due date of Calibration	22-February-2024	22-February-2024	22-February-2024

Calibration and Meter Details of 50 MW solar project by Divine Solren Private Limited

Meter Details	Main Meter	Check Meter	Standby Meter
Meter Serial No	APZ00292	APZ00293	APZ00294
Meter Make	SECURE	SECURE	SECURE
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration	04-September-2019	04-September-2019	04-September-2019
Due date of Calibration	03-September-2024	03-September-2024	03-September-2024

Calibration and Meter Details of 40 MW solar project by Astra Solren Private Limited

Meter Details	Main Meter	Check Meter
Meter Serial No	GJ 3832 A	GJ 3833 A
Meter Make	SECURE	SECURE
Accuracy Class	0.2 s	0.2 s
Date of Calibration	24-March-2017	24-March-2017
Due date of Calibration	23-March-2022	23-March-2022

Calibration and Meter Details of 25 MW solar project by Astra Solren Private Limited

Meter Details	Main Meter	Check meter
Meter Serial No	GJ 3830 A	GJ 3831 A
Meter Make	SECURE	SECURE
Accuracy Class	0.2 s	0.2 s
Date of Calibration	24-March-2017	24-March-2017
Due date of Calibration	23-March-2022	23-March-2022

Calibration and Meter Details of 60 MW solar project by Mahindra Susten Private Limited

Meter Details	Main Meter	Check Meter
Meter Serial No	15624818	15624819

Meter Make	L & T	L & T
Accuracy Class	0.2 s	0.2 s
Date of Calibration	28-September-2019	
Due date of Calibration	27-September-2024	