



**Verified Carbon
Standard**

KARNATAKA PAVAGADA-II SOLAR PROJECT BY AVAADA (150 MW)

Document Prepared by
WeAct Pty. Ltd.

Project Title	Karnataka Pavagada-II Solar Project by Avaada (150 MW)
Version	03
Report ID	VCS2017-MP02
Date of Issue	16-Jan-2022
Project ID	2017
Monitoring Period	01-November-2020 to 31-August-2021 (inclusive of both dates)
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The main purpose of this proposed project activity is to generate clean electricity through renewable source of solar energy and to supply generated electricity to the Indian grid system through Karnataka state grid via Power Purchase Agreement (PPA) with 'Bangalore Electricity Supply Company Limited' (BESCOM).

The project activity involves installation of total 150 MW (3 X 50 MW) solar photovoltaic grid interactive power plants, has been commissioned in three different blocks in Pavagada Solar Park, in the state of Karnataka (India). Project activity shall be developed, implemented and commissioned by the Special Purpose Vehicle "Avaada Solarise Energy Private Limited" (i.e. the Project Proponent of the VCS project).

- The project activity has achieved full commissioning of the total capacity in three blocks (i.e. each block of capacity 50 MW). The first block (Block 39) was commissioned on 8th Nov 2019. Hence, the start date of the project is considered as per the COD of the first phase, which is 8th Nov 2019. The remaining capacity of the project had been commissioned in two phases, as on 21st Nov & 27th Nov 2019 respectively. The entire project activity is in continuous operation since commissioning.
- The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 305,870 tCO_{2e} annualize average (proposed avg. value of 10 years of projection), thereby displacing 326,493 MWh/year (estimated annualized avg. for 10 years) of electricity from the generation-mix of power plants connected to the Indian electricity grid, which is mainly dominated by fossil fuel based power plants. Total estimated GHG emission reductions for a period of 10 years of the first crediting period shall be around 3,058,870 tCO_{2e}.
- During the current monitoring period **01-Nov-2020 to 31-Aug-2021**, inclusive both the dates) a total of **252,058 tCO_{2e}** emission reductions have been achieved. The detailed calculations are submitted in the ER sheet.

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 source

Version 19.

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	Avaada Solarise Energy Private Limited
Contact person	Praveen Golash
Title	Senior GM
Address	3rd floor, PTI building, 4 Parliament Street, Delhi – 110 001. India.
Telephone	+91-97113 02259
Email	praveen.golash@avaada.com

1.4 Other Entities Involved in the Project

Organization name	WeAct Pty Ltd
Role in the Project	Authorized Representative
Contact person	Satish Duvvuru
Title	Director
Address	1/115 Chapal Street, Windsor, Victoria-3181, Australia.
Telephone	Ph: +61-409 135 580
Email	satish@weact.com.au

WeAct Pty Ltd. is the “Authorized Representative”¹ of PP and the “Sole Focal Point” for all the communications with the DOE, VCS Board and Registry; and to take all the necessary actions for the project under VCS mechanism as and when required.

1.5 Project Start Date

8th Nov 2019.

As per VCS guidelines, the project start date is the date on which the project is commissioned.

1.6 Project Crediting Period

Crediting Period Start date : 08 November 2019

Crediting Period End date : 07 November 2029

Choice of Crediting Period : a maximum of ten (10) years of crediting period which may be renewed at most twice, which is in line with the VCS version 3 (v3.7).

¹ Communication Agreement has been executed in between PP and Authorized Representative, publicly available under VERRA.

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

- Tool to calculate the emission factor for an electricity system - Version 07.0 (EB 100, Annex 04)³

1.9 Participation under other GHG Programs

The project has not been applied⁴ under any other GHG programs. The project activity has been registered under VCS programme only and hence GHG emission reductions and removals generated by the project will not be used for compliance under any other programs or mechanisms. Further it is clarified that GHG emissions from Project activity are not included in any other emissions trading program or any other mechanism that includes GHG allowance trading.

1.10 Other Forms of Credit

The project activity has been registered under VCS programme only and has no intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program. Further it is clarified that GHG emissions from Project activity are not included in any other emissions trading program or any other mechanism that includes GHG allowance trading.

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 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 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.

³ https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v1.1.pdf/history_view

⁴ PP had evaluated the possibility of the project under Gold Standard Mechanism due to its high sustainable contributions associated with the project, in this regard an initial account opening and listing process was initiated by PP however the same was not pursued further and only VCS is being considered for the project. Hence, project is not valid or involved under any other GHG Program. PP has submitted an official Declaration to VVB confirming this scenario and justification.

- **Technological well-being:** The successful operation of project activity would lead to promotion of solar based power generation and would encourage other entrepreneurs to participate in similar projects
- **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

Further Information

Not Applicable⁵.

⁵ However, PP has documented activities related Sustainable development related contributions at organization level. Also, the project has generated local jobs. Many skilled and unskilled workers are from local regions. Also, local vendors and contractors are being benefitted with regular works related to project. The supporting documents are submitted to VVB for further reference.

2 SAFEGUARDS

2.1 No Net Harm

There were no harm identified from the project and hence no mitigations measures are applicable.

Being renewable Solar PV power generation project there is no negative environmental and socio-economic impacts in fact project activity contributes positively by providing environment friendly power generation leading to sustainable development of the region. Also, the generation of local employment has directly supported the socio-economic development of the status of the project region.

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 (29/02/2016), 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 (as described under the EIA section of the registered PD) Environmental and Social Impact Assessment is not required for Solar Projects.

2.2 Local Stakeholder Consultation

The PP had conducted a Stakeholders Consultation meeting on 20th Nov 2019 at the project site. The local stakeholder's consultation had been conducted as per the standard guidelines and requirements followed under CDM & VCS mechanism. The invitations had been sent to the stakeholder of the regions in the vicinity along with public display of invitation letters for the stakeholder consultation so that maximum number of local stakeholder can be accounted.

Identified local stakeholders at the project site:

- Local villagers,
- Panchayat members,
- Shopkeepers, suppliers, vendors and representatives of project developers.
- Employees and local labours

The stakeholders were made aware about the project activity and discussed about the various benefits arising out of the project activity. A feedback round will be held in which the views of the local stakeholders will be addressed.

Attendance records, summary of comments received and photographs of the stakeholder meet were documented & provided to DOE during registration of project activity. There were no negative comments received during the meeting and stakeholders appreciated the proactive efforts taken by project proponent towards reducing emission.

For ongoing communication, the PP has also placed a grievance register onsite, wherein, the stakeholders can put down his/her feedback and the same will be addressed on timely manner.

However, there is no external feedback/grievance has been reported within this monitoring period. Therefore, no action has been undertaken. PP has submitted the copy of grievance/feedback register to the verifying DOE for this monitoring period.

2.3 AFOLU-Specific Safeguards

This is a non-AFOLU project. For non-AFOLU projects, this section is not required.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity has been commissioned in 3 phases (block 22, 39 and 40A) in the Pavagada Solar Park in Karnataka. The 1st phase of 50 MW was commissioned on 08-Nov-2019, 2nd phase of 50 MW on 21-Nov-2019 and the 3rd phase of 50 MW on 27-Nov-2019. The energy generated from the 150 MW_{AC} solar PV plant will be evacuated at 66kV to the 220/66 kV Pooling Sub-station, which would be further evacuated to 400/220 kV GSS located about 1.5 km from the Pooling Sub Station.

Solar Power Project Technology Details⁶:

The technology employed, converts solar energy to electrical energy. In solar power generation, energy of solar is converted into mechanical energy and subsequently into electrical energy. The technology is an environment friendly technology since there are no GHG emissions associated with the electricity generation. There is no transfer of technology involved in the project activity.

Technical Details:

Plot 22 (50 MW):

Date of Commissioning:	27 th November 2019
Location Number:	Thirumani (V)
SS connected to:	5 (KSPDCL T1)
Module Model:	
Make or Supplier(s)	JA solar and Renesola
Maximum Power (Pmax)	325wp,330wp and 335wp
Module technology	Polycrystalline Silicon photovoltaic modules
Orientation	12*6 = 72 cells, 12 Degree, Fixed Angle
Invertor:	
Model / Make	SUNGROW & 3125KW GRID CONNECTED PV INVERTER & SG3125HV-20
No. of Inverters	16
Lifetime of the Inverters	25 YEARS
Technical Lifetime of the SPV plant:	25 YEARS

⁶The technical specification of the project has been provided to DOE during validation and will be provided during verification.

Plot 39 & 40A (50 X 2 MW):

Date of Commissioning:	Plot 39 – 8 th November 2019 Plot 40 A – 21 st November 2019
Location Number:	Rayacharlu (V)
SS connected to:	8
Module Model:	
Make or Supplier(s)	Renesola
Maximum Power (Pmax)	325Wp,330Wp and 335 Wp
Module technology	Polycrystalline Silicon photovoltaic modules
Orientation	12*6 = 72 cells, 12 Degree, Fixed Angle
Inverter:	
Model / Make	SINENG & 3125KW ,Grid connected PV inverter, EP-3125-HA-UD
No. of Inverters	32
Lifetime of the Inverters	25 years
Technical Lifetime of the SPV plant:	25 years

The project activity is in continuous operation since commissioning and there is no such incident reported during the current monitoring period which may impact the operation & capacity design of the project activity. Therefore, no events have happened that may impact the GHG emission reductions or removals and monitoring in this monitoring Period. However, there was some change in billing procedure and change of energy meters during the previous monitoring period has happened, which was as per the requirement of the state utility applicable for all power producers across the state. PP doesn't have any control on such events or not under the direct purview of PP.

However, such changes in the process did not have any impact on the project operation, design and emission reductions. The information has been reported under the section 3.2 below under project description deviation.

Emission Reductions from anthropogenic sources:

The solar power generated from the project is displacing the electricity generated from thermal power stations feeding into Indian grid and thereby replacing the usage of diesel generators for meeting the power demand during shortage periods. Since, the solar power plant harvests energy from sustainable source of "solar energy" and also it does not use any fossil fuel for its operation the power generated from the project is certainly prevent the anthropogenic GHG emissions which is generally produced by the fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas etc. which contributes to the project's baseline, i.e.

Grid (an emission reduction calculation sheet has been submitted to DOE as a separate document).

3.2 Deviations

3.2.1 Methodology Deviations

There are no methodological deviations applied during previous and current monitoring period.

3.2.2 Project Description Deviations

There is no change in project design related to install capacity, technology, specification, etc. However, during the previous monitoring period there was permanent change in monthly energy accounting and bill generation practice as mandated by Southern Regional Power Committee (SRPC) under Central Electricity Authority, Ministry Of Power India.

This change in billing practice has been effected for all projects in the region and shall remain as permanent practice for all upcoming months of monthly power accounting. Hence, this change has been considered as a permanent deviation to the project description.

Deviation:

As a part of earlier practice of monthly generation accounting, standard practice of monthly joint meter reading was adopted and monthly net electricity units were reflected in the form of a B-Form. However as per the current provision, the B-form reflects the net Energy Billed as "Net Energy - 15% Import - Tr Loss" in kWh. There is no separate import value shown in the B-form. Therefore, during the period "Export" value itself is the net energy billed for the month. Also, as per the new practice SPRC affected an online practice of monthly energy accounting, termed as "Regional Energy Account" (REA) (starting from the year 2020). In this new practice, the project wise monthly net energy units are calculated by authority and uploaded under 'Regional Energy Account' for that month on the SRPC web site (www.srpc.kar.nic.in) to enable downloading of the monthly net energy units by respective constituents. Therefore, no separate monthly B-Forms are applicable for the project. Also, the REA accounting statement provides calculated value of net energy to be billed by PP; hence no separate export, import & transmission losses values are reflected. The net energy units are directly considered by PP for issuing the invoice.

However, this change in procedure of monthly statement generation does not have any impact on any parameter of the project; also no impact on emission reductions calculation and applicability of the methodology. Therefore, no further change in project description is applicable. However, the reference of REA practice has been included in the relevant sections of the MR as updated information with respect to this deviation reported.

Deviation: Furthermore, during the current monitoring period there is a change in Standby meter has been identified for Plot No: 22, 39 & 40A as detailed in Section 4.3 of MR below.

However, this change of standby Meters does not have any impact on any parameter of the project; also no impact on emission reductions calculation and applicability of the methodology. Therefore, no further change in project description is applicable. The main meter & Check meter are used for the generation of Monthly Statement of energy delivered to the grid.

3.3 Grouped Projects

This section is not applicable to the project activity as the project is not a grouped project activity.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid, CM, y}
Data unit	tCO ₂ e/MWh
Description	Combined margin emission factor for Indian grid connected power generation in year y calculated using the latest version of “Tool to calculate the emission factor for an electricity system version 07”
Source of data	CO ₂ baseline database (Version 14.0) published by CEA in December 2018 (http://www.cea.nic.in/tpeandce.html)
Value applied	0.93684
Justification of choice of data or description of measurement methods and procedures applied	This value is calculated using OM and BM values as per Version 7.0 of methodological tool to calculate the emission factor for an electricity system and using data base of CEA.
Purpose of Data	For the calculation of Emission Factor of the grid
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	EF _{grid, OM, y}
Data unit	tCO ₂ e/MWh
Description	Simple operating margin emission factor for Indian grid
Source of data	CO ₂ baseline database (Version 14.0) published by CEA (in December 2018); (http://www.cea.nic.in/tpeandce.html)
Value applied	0.9610
Justification of choice of data or description of measurement methods	This value is calculated by taking weighted average of Simple Operating Margin of recent three years for Indian grid as per the “Tool to calculate the emission factor for an electricity system”, version 07.0.0

and procedures applied	
Purpose of Data	For the calculation of Emission Factor of the grid
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	EF _{grid, BM, y}
Data unit	tCO ₂ e/MWh
Description	Simple build margin emission factor for Indian grid
Source of data	CO ₂ baseline database (Version 14.0) published by CEA (in December 2018); (http://www.cea.nic.in/tpeandce.html)
Value applied	0.8644
Justification of choice of data or description of measurement methods and procedures applied	This value is calculated by taking weighted average of Simple build Margin of recent three years for Indian grid as per the “Tool to calculate the emission factor for an electricity system”, version 07.0.0
Purpose of Data	For the calculation of Emission Factor of the grid
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
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Monthly Regional Energy Account (REA) issued by SRPC (Please refer to the comment section below for more details)
Description of measurement methods and procedures to be applied	Data Type: Measured (published data) Monitoring equipment: Energy Meters are used for monitoring Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, issued by SRPC. Archiving Policy: Paper & Electronic Calibration frequency: Once in 5 years Electricity units are measured in kWh. However for the calculation purpose electricity exported is converted in MWh. The Net electricity supplied to the grid by the project activity is calculated by SRPC and published in their official website as Regional Energy Account (REA). The monthly net energy units from REA are

	directly used for monthly billing purposes. Therefore, the value for “EG_{PJ,y}” is directly sourced from REA statement. The calculation method used for net energy calculation in REA by SRPC is based on the algorithm-based software which accounts the net electricity injection, drawal and transmission losses as follows: Net Energy to be billed = [Export or net injection (kWh)] – [Import or drawl (kWh)] – [Transmission losses (kWh)] However, Project developers do not have any access to this computation or the values, only the net units to be billed for a particular month is directly reflected in the REA statement. Thus, the measurement methods and procedures to be applied for this parameter is simplified with the practice of REA and this is the most reliable source of data as directly controlled by SRPC and based on which the bills are also generated. (This practice of accounting has been reported in the B-Forms and the REA statements) Regarding metering arrangement, the electricity exported to the grid by the project activity connected to the sub-station is measured by energy meters of accuracy class 0.2s. The electricity exported is measured continuously using Main & Check meters at the substation, whereas a standby meter is also installed at generation end as backup. The metering arrangement and details of the energy meters are included under the section 4.3 of the MR, Cross Checking: Quantity of net electricity supplied to the grid is being cross checked from the invoices raised by the project developer to the respective DISCOM. Also, the monthly net units in REA can be publically cross checked from the SRPC official website: www.srpc.kar.nic.in
Frequency of monitoring/recording	Monthly
Value monitored	269,051.38
Monitoring equipment	The two parameters, import and export to the grid, are measured at the same location near the connection to the grid, through standard electricity metering instrument. The metering instruments are installed at the grid-connected point to measure the amount of electricity going from and to the grid. The kWh reading of electricity is continuously measured by metering instrument itself and monthly recorded via REA.

QA/QC procedures to be applied	This data is directly used for calculation of emission reductions. Measurement results of electricity supplied to the grid and that delivered from the grid to the project is being crosschecked with records for sold electricity. The meter(s) is calibrated once in 5 years in accordance with national standards and procedures.
Purpose of the data	The Data/Parameter is required to calculate the baseline emission.
Calculation method	N/A
Comments	1) Data will be archived electronically for a period of 2 years beyond the end of crediting period. 2) During the periodic verification, the value of this parameter will be submitted here for the cumulative capacity of 150 MW_{ac} for the total period; whereas ER sheet will provide month-wise data and calculation in line with the REA statement. 3) As mentioned above, prior to the implementation of REA practice, the monthly values are considered in line with the B-Form calculation practice. Whereas with the implementation of REA practice, the monthly generation statement only provides 'net electricity supplied by the project activity', whereas values for export, import, losses etc. are not separately published and same is not under the direct control of PP. However, as per the SRPC document available to public "Annexure-II: Technical Specification for Interface Energy Meters, Automated Meter Reading System and Meter Data Processing for Inter State Transmission System" (http://www.srpc.kar.nic.in/website/2021/meetings/special/rn_ts_amr_080421.pdf) it can be referred that REA practice accounts injection, drawal and transmission losses based on the algorithms incorporated in the Software module. Hence, accounting formula remains the same even after REA practice has been implemented..

4.3 Monitoring Plan

Aim of monitoring:

The monitoring method specified in the methodology requires that the project-monitoring plan to consist of monitoring of quantity of net electricity supplied to the grid in the year y. In order to monitor the mitigation of GHG due to the project activity, the total energy exported needs to be measured. The net energy supplied to grid by the project activity multiplied by emission factor for regional grid, would form the baseline for the project activity.

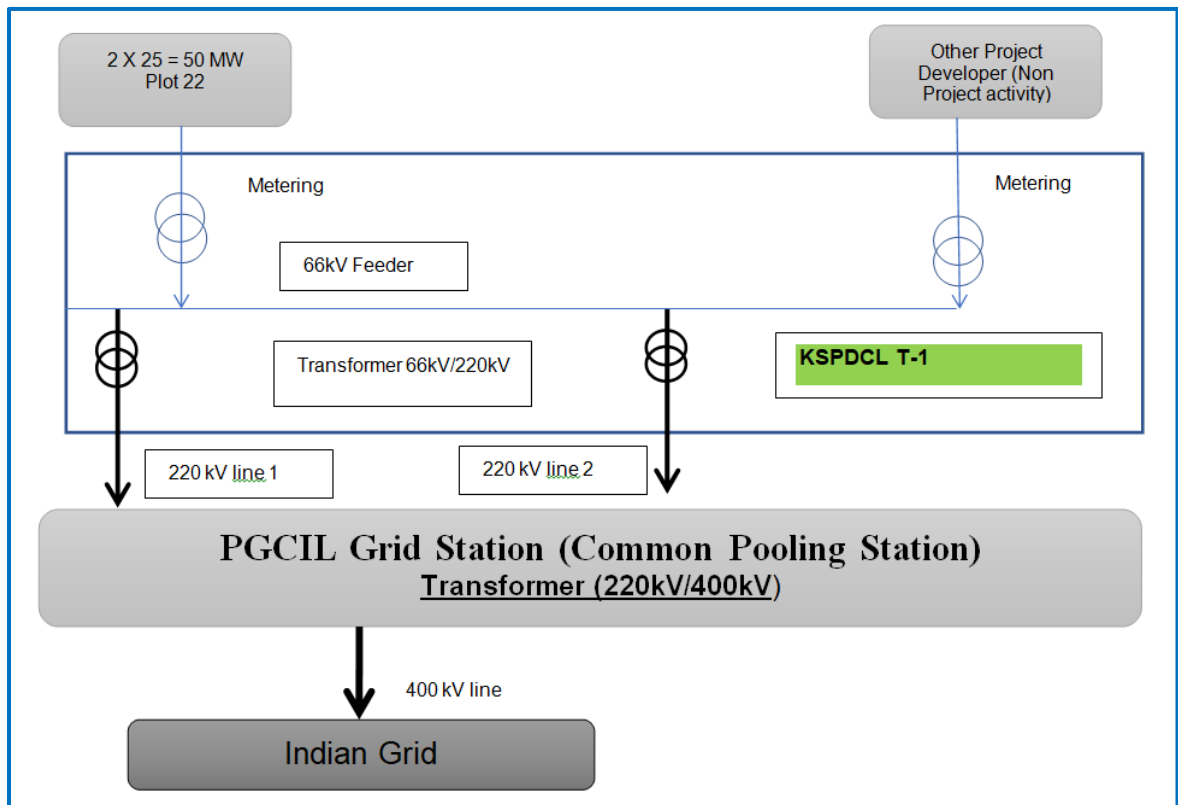
Since the baseline emission factor is based on an ex-ante determination, monitoring of this parameter is not required. The sole parameter for monitoring is the net electricity exported to the grid.

The project boundary includes the solar project, sub-stations, grid and all power plants connected to grid. The proposed project activity evacuates power to the Indian grid. Therefore, the entire

Indian grid and all connected power plants have been considered in the project boundary for the project activity.

The monitoring layout and monitoring points under the project boundary:

For Block 22:



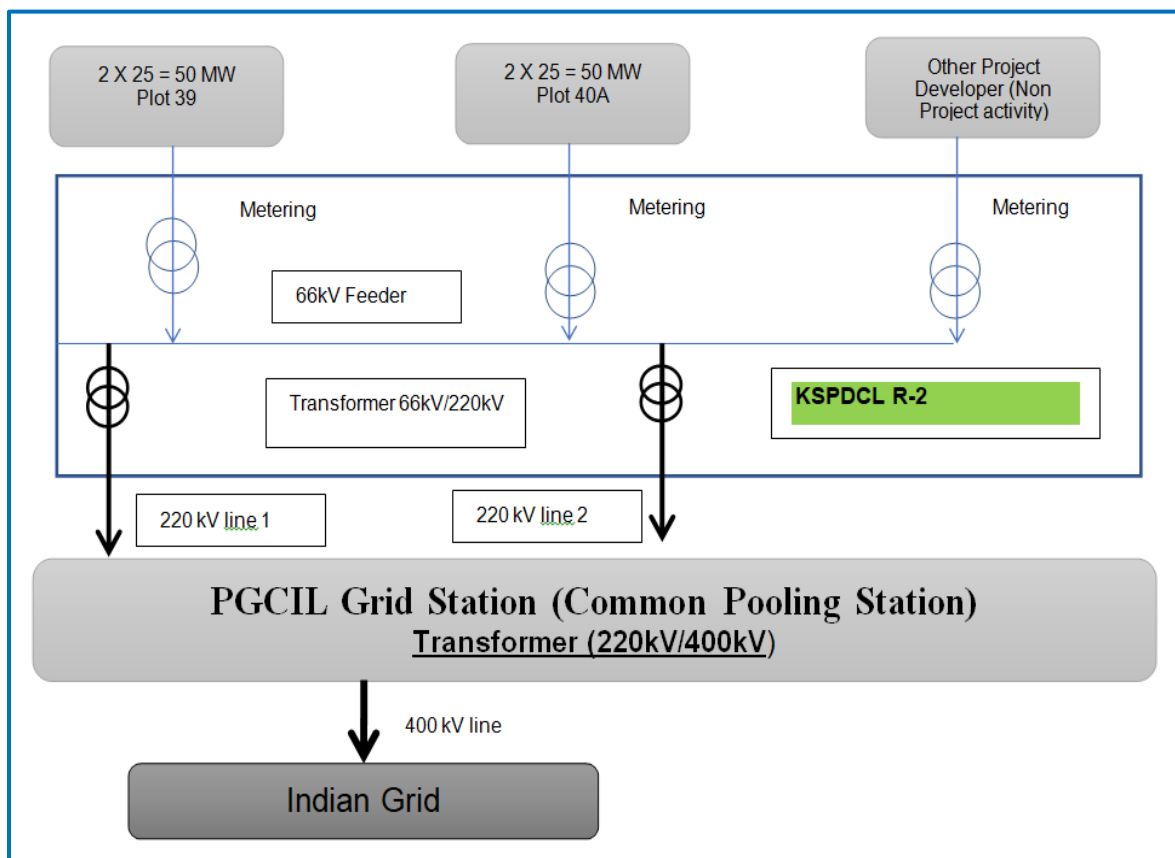
Monitoring Equipment Details: All Energy Meters have been installed at 66kV feeder line.

Block 22			
RR No: KSPDCL-T1-A83 (Bay 612, Line 09) Feeder: 602	Main Meter	Check Meter	Standby ⁷ Meter
S. No	LT-0830-A	LT-0837-A	16094016
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2s
Meter Calibration Date	25 Nov 2019	25 Nov 2019	25 Nov 2019
Due Date of Calibration (Once in 5 Years)	24 Nov 2024	24 Nov 2024	24 Nov 2024
Meter Replacement (if any)	NA	NA	Yes
New Meter Details:	-	-	
S. No			LT-0943-A
Make			L&T
Accuracy Class			0.2s
Calibration Date			10 Jan 2020
Due Date of Calibration (Once in 5 Years)			09 Jan 2025
RR No: KSPDCL-T1-A84 (Bay 613, Line 10) Feeder: 601	Main Meter	Check Meter	Stand by ⁸ Meter
S. No	LT-0790-A	LT-0824-A	16093972
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2s
Calibration Date	25 Nov 2019	25 Nov 2019	25 Nov 2019
Due Date of Calibration (Once in 5 Years)	24 Nov 2024	24 Nov 2024	24 Nov 2024
Meter Replacement (if any)	NA	NA	Yes
New Meter Details:	-	-	
S. No			LT-0937-A
Make			L&T
Accuracy Class			0.2s
Calibration Date			10 Jan 2020
Due Date of Calibration (Once in 5 Years)			09 Jan 2025

⁷ The replacement of standby meter does not have any impact on generation or emission reduction since Main meter & Check meter are primarily responsible for the delivered electricity measurement & recording and standby meter are not used on monthly basis for REA statement. It is used as fail-safe backup arrangement in the event when both the Main & Check Meters are found faulty & nonfunctional.

⁸ The replacement of standby meter does not have any impact on generation or emission reduction since Main meter & Check meter are primarily responsible for the delivered electricity measurement & recording and standby meter are not used on monthly basis for REA statement. It is used as fail-safe backup arrangement in the event when both the Main & Check Meters are found faulty & nonfunctional.

For Block 39 & 40A:



Monitoring Equipment Details: All Energy Meters have been installed at 66kV feeder line.

Block 39			
RR No: KSPDCL-R2-A73 (Line 03) Feeder – 604 (SS End)	Main Meter	Check Meter	Stand by ⁹ Meter
S. No	LT-0780-A	LT-0786-A	17010111
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2s
Calibration Date	04 Nov 2019	04 Nov 2019	04 Nov 2019
Due Date of Calibration (Once in 5 Years)	03 Nov 2024	03 Nov 2024	03 Nov 2024
Meter Replacement (if any)	NA	NA	Yes
New Meter Details:	-	-	
S. No			LT-0931-A
Make			L&T
Accuracy Class			0.2s
Calibration Date			10 Jan 2020

⁹ The replacement of standby meter does not have any impact on generation or emission reduction since Main meter & Check meter are primarily responsible for the delivered electricity measurement & recording and standby meter are not used on monthly basis for REA statement. It is used as fail-safe backup arrangement in the event when both the Main & Check Meters are found faulty & nonfunctional.

Due Date of Calibration (Once in 5 Years)			09 Jan 2025
RR No: KSPDCL-R2-A74 (Line 04): Feeder: 605 (SS End)	Main Meter	Check Meter	Stand by ¹⁰ Meter
S. No	LT-0787-A	LT-0789-A	17010150
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2s
Calibration Date	04 Nov 2019	04 Nov 2019	04 Nov 2019
Due Date of Calibration (Once in 5 Years)	03 Nov 2024	03 Nov 2024	03 Nov 2024
Meter Replacement (if any)	NA	NA	Yes
New Meter Details:	-	-	
S. No			LT-0932-A
Make			L&T
Accuracy Class			0.2s
Calibration Date			10 Jan 2020
Due Date of Calibration (Once in 5 Years)			09 Jan 2025
Block 40A:			
RR No: KSPDCL-R2-A75 (Line 05): Feeder:606 (SS End)	Main Meter	Check Meter	Stand by Meter
S. No	LT-0806-A	LT-0791-A	17010143
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2S
Calibration Date	18 Nov 2019	18 Nov 2019	18 Nov 2019
Due Date of Calibration (Once in 5 Years)	17 Nov 2024	17 Nov 2024	17 Nov 2024
Meter Replacement (if any)	NA	NA	Yes
New Meter Details:	-	-	
S. No			LT-0933-A
Make			L&T
Accuracy Class			0.2s
Calibration Date			10 Jan 2020
Due Date of Calibration (Once in 5 Years)			09 Jan 2025
RR No: KSPDCL-R2-A76 (Line 6): Feeder:607 (SS End)	Main Meter	Check Meter	Stand by ¹¹ Meter
S. No	LT-0793-A	LT-0800-A	17010123
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2S
Calibration Date	18 Nov 2019	18 Nov 2019	18 Nov 2019
Due Date of Calibration (Once in 5 Years)	17 Nov 2024	17 Nov 2024	17 Nov 2024

¹⁰ The replacement of standby meter does not have any impact on generation or emission reduction since Main meter & Check meter are primarily responsible for the delivered electricity measurement & recording and standby meter are not used on monthly basis for REA statement. It is used as fail-safe backup arrangement in the event when both the Main & Check Meters are found faulty & nonfunctional.

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Years)			
Meter Replacement (if any)	NA	NA	Yes
New Meter Details:	-	-	
S. No			LT-0935-A
Make			L&T
Accuracy Class			0.2s
Calibration Date			10 Jan 2020
Due Date of Calibration (Once in 5 Years)			09 Jan 2025

Energy accounting: as per the provision of PGCIL, the B-form reflects the net Energy Billed as "Net Energy - 15% import - Tr Loss" in kWh. There is no separate import value shown in the B-form. Therefore, during the period "Export" value itself is the net energy billed for the month. This change of practice has been accounted in the ER sheet and properly demonstrated.

Additionally, from January 2020, the SRPC (Southern Regional Power Committee) has affected an online practice of monthly energy accounting, termed as "Regional Energy Account" (REA). In this new practice, the project wise monthly net energy units are calculated by authority and uploaded under 'Regional Energy Account' for that month on the SRPC web site (www.srpc.kar.nic.in) to enable downloading of the monthly net energy units by respective constituents. Also, the REA accounting statement provides calculated value of net energy to be billed by PP; hence no separate export, import & transmission losses values are reflected. The net energy units are directly considered by PP for issuing the invoice.

Metering Equipment:

As per PPA provisions, the metering point will be at 66kV side of 220/66kV substation (as shown in the line diagrams above), where the power from the solar project is injected and at 220 kV side of 400/220 kV substation of CTU. i.e. Power-grid. For commercial settlement, PPA proposes interconnection point or delivery point shall mean the point at 220 kV side of 400/220 kV PGCL substation of CTU.

The aggregated net monthly electricity supplied/exported by the project activity (150MW Capacity) is monitored, measured & metered continuously at the 66kV/220V KSPDCL substation 1 & substation 2 which forms the basis for the monthly energy units (i.e. REA from). REA reports can be cross checked with the monthly invoices of sale.

Calibration of monitoring equipment:

The energy meters at the feeders are maintained and owned by DISCOM. Neither the project proponent nor the site personnel have any control over it. The records will be cross-checked with the records of sold electricity to the third party. As per ongoing practice in the region, the meters are being tested/calibrated by authority in every quarter or at once in six months. However, in line with the CEA order dated 17 Mar 2016 (para 18(b)), PP proposes that the meters will be calibrated by the authority at-least once in five years.

In the absence or delay in the meter calibration appropriate guidelines will be applied appropriately to confirm the conservativeness of metering & monitored values.

The metering arrangement, accuracy class of meters, calibration frequency and apportioning approach is under control of state electricity board and project developer Avaada (i.e. 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.

QA/QC procedures:

The energy meters at the feeders are maintained and owned by Karnataka DISCOM. Neither the project proponent nor the site personnel have any control over it. The records will be cross-checked with the records of sold electricity to the third party. The meters are calibrated by DISCOM at least once in five years.

Data Archiving:

Monthly data shall be archived electronically and in paper form and stored for the entire crediting period and two years thereafter.

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.

In the event that the main meter, which is used to record the net electricity exported by the project, is found to be faulty it will be repaired or replaced and the data from the check meter will be used in its place. In the unlikely event that the check meter fails it will also be repaired or replaced and stand by meter reading will be used by ESKOMs official only for the emergency as per PPA.

In case of failure of all the meters simultaneously, a decision will be taken by KSPDCL and DISCOM as per the clause mentioned in the PPA and a generation statement will be issued by DISCOM based on their specific procedure. The DISCOM statement will form the basis for considering the amount of electricity delivered to the grid in that particular situation.

Training and maintenance requirements:

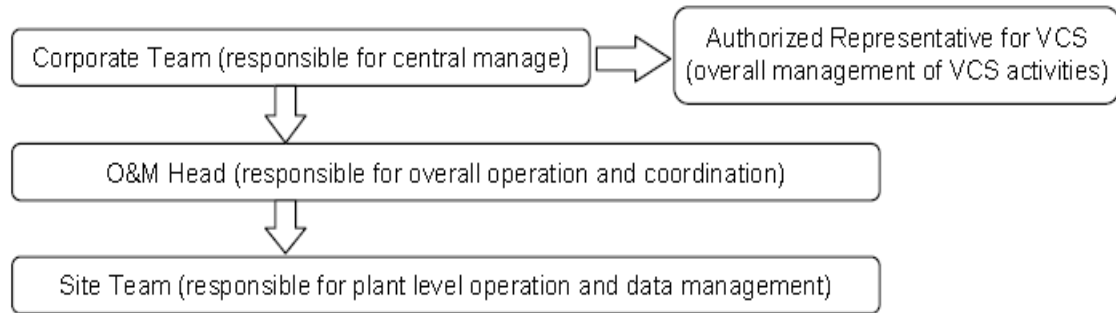
Training on the machine is an essential pre-requisite, to ensure necessary safety of man and machine. Further, in order to maximize the output from the solar plants, it is extremely essential, that the engineers and technicians understand the equipment(s) and keep them in good health. In order to ensure, that O&M team is deft at handling technical snags, the necessity of ensuring that they are capable of handling mounts and structures with absolute ease and comfort has been established. Each and every site personnel is provided with proper training to meet the requirements of the Operations and maintenance. This ultimately leads to creativity in problem solving.

Personnel training:

In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the project staff will be trained as per project requirements.

Apportioning:

The B-forms were the source of net energy data which are calculated value by utility; and thereafter SRPC does the calculation for monthly power for each generator and releases through REA which is the source of net energy and monthly billing; hence no separate apportioning is required. However, in case of mismatch of date between the start date of the billing cycle and the start date of monitoring period in VCS, the data will be apportioned in line to the daily generation values for the said mismatch period.

Organization Structure:

This is the current organizational structure which will help PP achieving effective operation & management of the VCS project activity.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per procedure established in the registered PD:

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

Where,

$EF_{grid,CM,y}$: 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” (tCO₂/MWh) (i.e., 0.93684 tCO₂/MWh).

$EG_{PJ,y}$: 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)

BE_y : Baseline emissions in year y (tCO₂e/yr).

Here,

Monitoring Period:	Total Net Power Generated (MWh)	Baseline Emission Factor (tCO ₂ e/MWh)	Total Emission Reduction (tCO ₂ e/ year)
01-Nov-2020 to 31-Aug-2021	269,051.38	0.93684	252,058*

* rounded down value has been considered vintage-wise which gives most conservative value, hence considered. Detail calculation to be referred from the ER sheet.

5.2 Project Emissions

As per applied methodology ACM0002, only emission associated with the fossil fuel combustion, emission from operation of geo-thermal power plants due to release of non-condensable gases, emission from water reservoir of Hydro should be accounted for the project emission.

Since the project activity is a solar power project there is no fossil fuel combustion involved in the project activity.

Hence, $PE_y = 0$.

5.3 Leakage

As per para 56 of the applied methodology ACM0002, no Leakage emissions are considered.

Hence, $LE_y = 0$.

5.4 Net GHG Emission Reductions and Removals

As per the applied methodology, emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where,

ER_y = Emission Reduction in tCO₂e/year

BE_y = Baseline emission in tCO₂e/year

PE_y = Project emissions in tCO₂e/year

LE_y = Leakage Emissions in tCO₂e/year

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)
2020 (01-Nov-2020 to 31-Dec-2020)	45,489	0	0	45,489
2021 (01-Jan-2021 to 31-Aug-2021)	206,569	0	0	206,569
Total	252,058	0	0	252,058

Comparison of Emission Reductions with ex-ante estimated values:

Start date of the current Monitoring period	01-Nov-2020	
End date of the current Monitoring period	31-Aug-2021	
Total days in the Monitoring period	304	#
Annual Estimated emission Reduction As per PDD	305,870	tCO ₂ e
Estimated emission reduction for this monitoring period	254,752	tCO ₂ e
Actual Emission Reduction	252,058	tCO ₂ e
Difference in Emission Reduction	-1.06%	Decrease

Therefore, there is no increase in emission reductions as compared to the ex-ante estimated value for the equivalent period. There is a marginal decrease of 1.06% ER as compared to the ex-ante estimation, which is mainly due to the marginally lower generation against the estimated value.