



**Verified Carbon
Standard**

150 MW SOLAR PROJECT IN KARNATAKA BY AVAADA SOLAR

Document Prepared by
WeAct Pty Ltd.

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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 electricity through renewable source of solar energy and to supply generated electricity to the Indian grid through Karnataka state grid via different ESKOM's of Karnataka as per the PPA arrangement¹.

The project activity includes a total capacity of 150 MW_{ac} (in 3 phases each of 50 MW_{ac}) of solar plant in the state of Karnataka. The project activity displaces anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 319,470 tCO_{2e} per year (avg. value ex-ante), thereby displacing 341,009 MWh/year (annualized avg. ex-ante value) amount of electricity from the generation-mix of power plants connected to the Indian electricity grid, which is mainly dominated by thermal/fossil fuel based power plant.

The project activity has been commissioned in 3 phases; 1st phase of 50 MW commissioned on 20-Dec-2019, 2nd phase of 50 MW on 06-Feb-2019 and 3rd phase of 50 MW on 27-Feb-2019. The Project is in continuous operation since commissioning. The energy generated from the 150 MW_{ac} solar PV plant will be evacuated at 33kV to the 220/33 kV Pooling Sub-station, which would be further evacuated to 400 / 220 kV GSS located about 1.5 km from the Pooling Sub Station.

The previous monitoring period was considered for the period from 01-Jun-2019 to 30-Jun-2020. The current monitoring period is from 01-Jul-2020 to 31-Aug-2021 (includes both the dates). The total GHG emission reductions or removals generated in this monitoring period are 348,330 tCO_{2e}.

The solar power does not involve any fossil fuel consumption and hence the project does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

The details of the project developer are mentioned in the table:

Project Investors' Name	Commissioning Date	Total Capacity in MW _{ac}	Location (Village/State)
Avaada Solar Energy Private Limited (ASEPL)	20/12/2018 06/02/2019 27/02/2019	150	Village/ Taluk: Pavagada District: Tumkur, State: Karnataka Country: India

Scenario existing prior to the implementation of project activity:

The project is a green-field activity, therefore in absence of the project activity the electricity delivered to the consumer via 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, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

¹ PPA with Gulbarga Electricity Supply Company (GESCOM), Mangalore Electricity Supply Company (MESCOM) and Chamundeshwari Electricity Supply Corporation Ltd. (CESC Mysore), for 50 MW of capacity for each.

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 19²

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	Avaada Solar Energy Private Limited
Contact person	Prashant Choubey
Title	Senior Vice President
Address	3rd floor, PTI building, 4 Parliament Street, Delhi – 110001. India.
Telephone	+91-97113 02259
Email	prashant.choubey@avaada.com

Avaada Solar Energy Private Limited (ASEPL) is acting as the Project Proponent (PP) having overall operational control and ownership of the Project activity.

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” 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.

²https://cdm.unfccc.int/filestorage/5/8/I/58IAGB7SZUDE02VN6LYM30K41HFPRQ/EB100_repan06_ACM0002.pdf?t=U3p8cjN6bjcxfDC8KcBrEmN8SOI5uMoc3eU

1.5 Project Start Date

Project Start Date: 20-Dec-2018

As per VCS guidelines, the project start date is the date on which the project has been commissioned. The first phase of project activity was commissioned as on 20th Dec 2018³.

1.6 Project Crediting Period

Crediting Period Start date : 20-Dec-2018
Crediting Period End date : 19-Dec-2028

Thus, the first crediting period is of “10 years”.

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

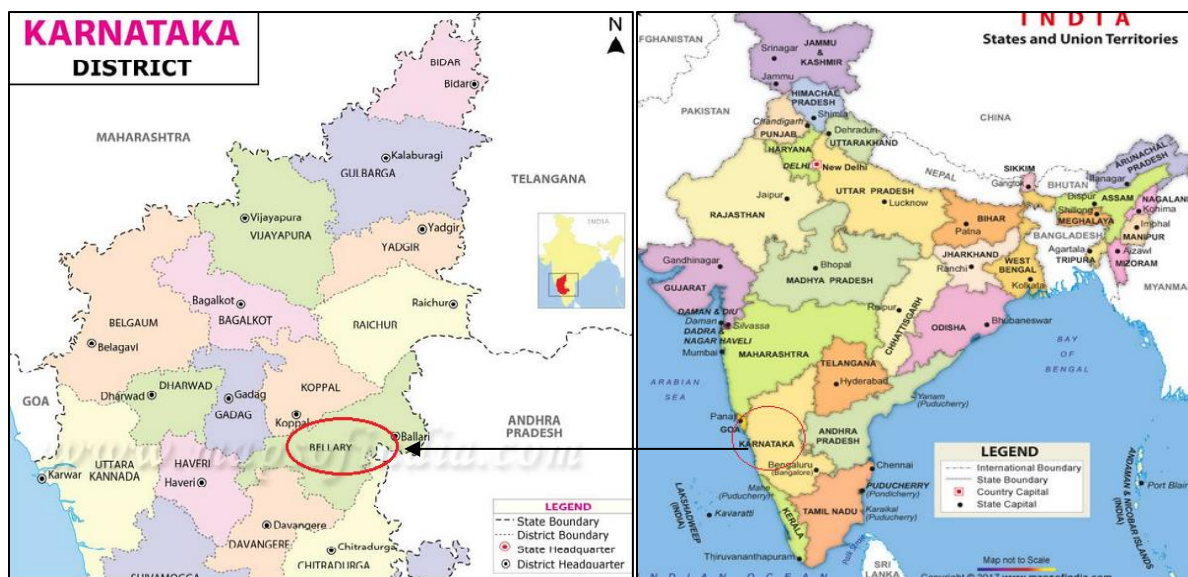
1.7 Project Location

The 150 MW_{AC} solar PV Plant site is located at the Pavagada Solar Park, in Pavagada Taluk, Tumkur district, in the Indian state of Karnataka. The project site is around 130 kms away from Bellary which is the nearest railway station. Nearest airport is at Bengaluru Airport, 155kms.

The geo-coordinates of the location are as follows:

Latitude : 14° 18'35.07" N
Longitude : 77° 24'21.38" E

Location details of the project are given below in the Figure:



³CommissioningCertificates.

1.8 Title and Reference of Methodology

Title of Methodology : ACM0002: Grid-connected electricity generation from renewable sources - Version 19⁴

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

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 - Version 07.0 (EB 100, Annex 04) ⁵
- Methodological Tool - Tool for the demonstration and assessment of additionality - Version 07.0.0 (EB 70, Annex 08)⁶

1.9 Participation under other GHG Programs

The project has not been applied⁷ under any other GHG programs. A declaration has been submitted to DOE confirming the same.

1.10 Other Forms of Credit

The Project has no intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program. A declaration has been submitted to VVB confirming the same.

Emission Trading Programs and Other Binding Limits: The project activity is not a part of any emissions trading program or any other mechanism that includes GHG allowance trading (as identified in the project description). Therefore, PP hereby confirms that net GHG emission reductions or removals generated during this monitoring period have not be used for compliance under any such programs or mechanisms.

Other Forms of Environmental Credit: The project activity has not sought or received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period.

⁴<https://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD>

⁵https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v1.1.pdf/history_view

⁶<https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

⁷ 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.

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.
- **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 Applicable⁸.

As per para 3.16 of the VCS Standard (v4.2), the requirement prescribes that *“The project proponent shall demonstrate how the project activities, or additional activities implemented by the project proponent, contribute to sustainable development, as defined by and tracked against the United Nations Sustainable Development Goals (SDGs). The project proponent must demonstrate that a project contributes to at least three SDGs by the end of the first monitoring period, and in each subsequent monitoring period.”*

In continuation of the previous SDGC claims (submitted during previous monitoring report), PP has reported two parameters in the current revised report (i.e. SDG 7 and SDG 13). PP would like to further refer that the SDG reporting requirement (i.e. at least 3 SDG as stated above) prescribed under VCS Standard V4.2 has not been applied for the current reporting period as the project activity falls under the category of "registered prior to 20-Jan-2023"; and hence as per the given timeline the reporting requirement of at least three SDG are provisioned by 20-Jan-2025. Thus, current version of the SDGC Report is submitted in consistency with the previous claims. These contributions are separately reported in VERRA's prescribed SDGC Report and submitted to VERRA. The summarized details of the contributions are provided under the table 1 below:

⁸However, 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.

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	The project supplied a total net power generation of 371,814 MWh to the grid during the reporting period. The entirety of the production was consumed by grid users, therefore increasing renewable energy share in the total final energy consumption.	The project supplied a total net power generation of 804,672 MWh to the grid during the project life time. The entirety of the production was consumed by grid users, therefore increasing renewable energy share in the total final energy consumption.
2)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	Total GHG emission reductions or removals achieved in this monitoring period are 348,330 tCO₂e	Total GHG emission reduction or removals achieved during the project life time are 753,847 tCO₂e .

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 employment directly supports upliftment of socio-economic status of 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 11th July 2019 at the project site. The local stakeholder's consultation has 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

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 submitted the copy of grievance/feedback register to the verifying DOE.

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 phase in the Pavgada Solar Park in Karnataka. The 1st phase of 50 MW was commissioned on 20-Dec-2018, 2nd phase of 50 MW on 06-Feb-2019 and the 3rd phase of 50 MW on 27-Feb-2019. The energy generated from the 150 MWAC solar PV plant will be evacuated at 33kV to the 220/33 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 Details⁹:

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:

Module Model	Renesola & SUNTECH: JC330/325/320M
Maximum Power (Pmax)	330/325/320 Wp
Module technology	Poly Crystalline
Orientation	12 Deg
Invertor: SUNGROW	
Model	PVS980-58-2091 kVA
No. of Inverters	72
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 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:

⁹The technical specification of the project has been provided to DOE during validation and will be provided during verification.

The solar power generated from the project will be displacing the electricity generated from thermal power stations feeding into Indian grid and will be 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 will 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 is submitted to DOE as a separate document).

3.2 Deviations

3.2.1 Methodology Deviations

There are no methodological deviations applied during this 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 current monitoring period there is 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 from 20-Jan-2020 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. Whereas, from Jan 2020, the SPRC has implemented 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. Therefore, no separate monthly B-Forms are applicable from the month of Jan 2020 (i.e. effectively from 20 Jan 2020). 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.

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”
Source of data	CO ₂ baseline database (Version 14.0) published by CEA on June 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 on June 2018 (http://www.cea.nic.in/tpeandce.html)
Value applied	0.9610
Justification of choice of data or description of measurement methods and procedures applied	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
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 June 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 will be 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 these computation or the values, only the net units to be billed for a particular month is directly reflected in the REA statement. Whereas, at the time of B-Form practice (i.e. till 19 January 2020), the Net electricity supplied to the grid by the project activity was calculated as a difference of electricity exported to the grid, electricity imported from the grid obtained from (B-Form) joint meter reading certificates/credit notes issued as per below equation: $EG_{PJ,y} = EG_{Export} - EG_{Import}$ 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. 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 will be 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 will be cross checked from the invoices raised by the project developer to the respective DISCOM. Also, the monthly net units in REA can be publicly cross checked from the SRPC official website: www.srpc.kar.nic.in
Frequency of monitoring/recording	Monthly
Value monitored	371,814.41
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 readings of electricity will be continuously measured by metering instrument itself and monthly recorded via REA.
QA/QC procedures to be applied	This data will be directly used for calculation of emission reductions. Measurement results of electricity supplied to the grid and that delivered from the grid to the project will be crosschecked with records for sold electricity. The meter(s) will be 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) 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

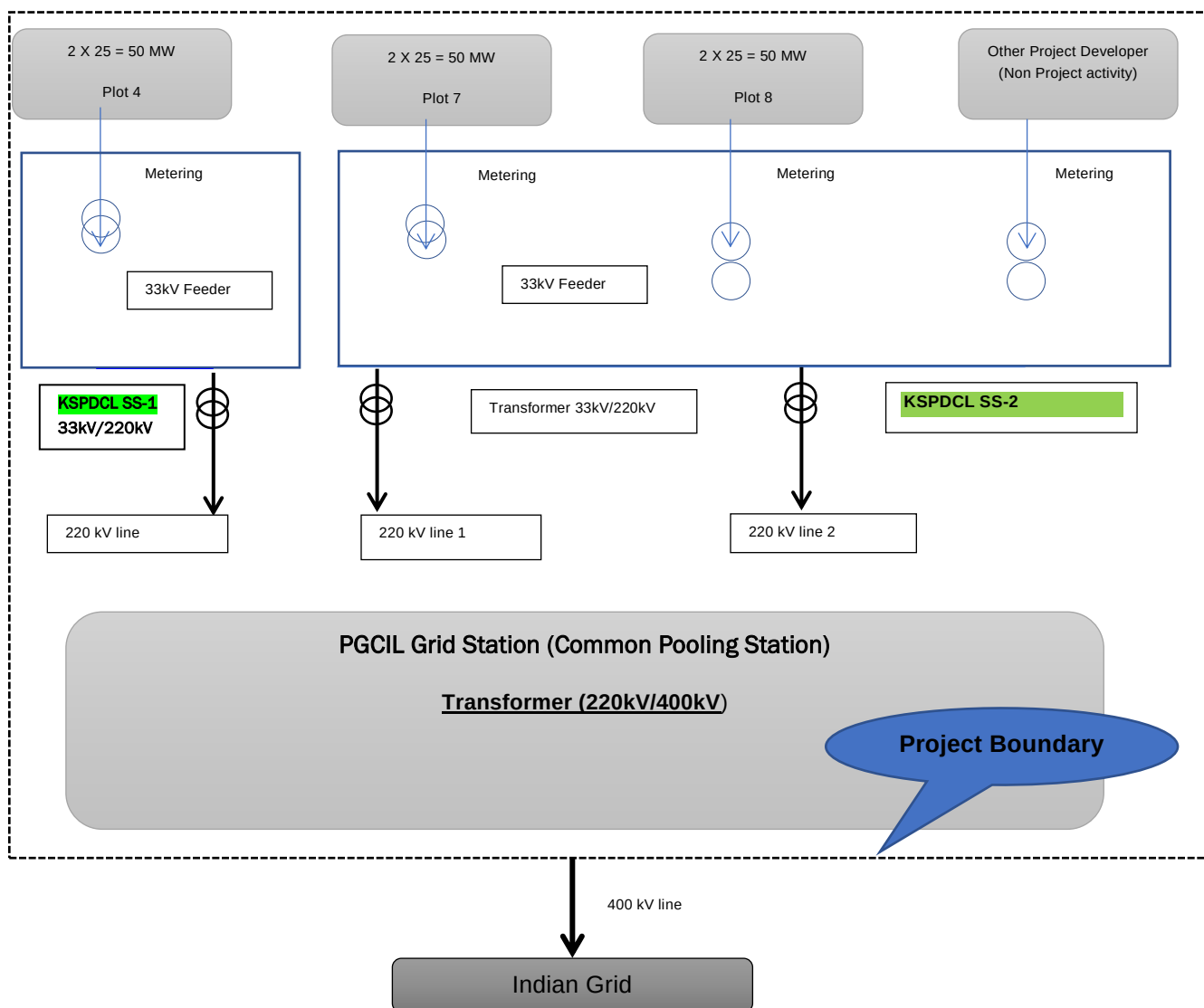
Aim of monitoring:

The monitoring methodology 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:



Monitoring Equipment Details:

All Energy Meters has been installed at 33kV feeder line.

The prescribed frequency of the meter calibration/test is once in 5 years.

The project developer “ASEPL” is having a dedicated metering arrangement on his 33kV/220V line at KSPDCL SS-1 and SS-2 which is further connected to Pavagada (PGCIL grid substation) in Tumkur district as shown in the above project boundary diagram. The meters are approved, tested & sealed by the State Utility. The meters are solely in the custody of State Utility. The frequency of calibration is once in 5 years as prescribed in the registered PD. All the meters are of 0.2s accuracy class.

The details of the energy meters are provided below:

Block 4	Main Meter	Check Meter	Stand by Meter
RR No: KSPDCL-SS1-A25 (Line 10)			
S. No	LT-0827-A	LT-0843-A	LT-0821-A
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2s
Calibration Date/Installation Date	12/12/2019	12/12/2019	12/12/2019
RR No: KSPDCL-SS1-A26 (Line 09)			
S. No	LT-0788-A	LT-0798-A	LT-0836-A
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2s
Calibration Date /Installation Date	12/12/2019	12/12/2019	12/12/2019
Block 7:			
RR No: KSPDCL-SS2-A33 (Line 09)			
S. No	LT-0804-A	LT-0803-A	LT-0842-A
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2S
Calibration Date/Installation Date	12/12/2019	12/12/2019	13/12/2019
RR No: KSPDCL-SS2-A34 (Line 10)			
S. No	LT-0801-A	LT-0807-A	LT-0825-A
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2S
Calibration Date/Installation Date	12/12/2019	12/12/2019	13/12/2019
Block 8:			
RR No: KSPDCL-SS2-A47 (Line 8)			
S. No	LT-0814-A	LT-0831-A	LT-0810-A
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2S
Calibration Date/Installation Date	13/12/2019	13/12/2019	13/12/2019
RR No: KSPDCL-SS2-A48 (Line 7)			
S. No	LT-0797-A	LT-0799-A	LT-0811-A
Make	L&T	L&T	L&T
Accuracy Class	0.2S	0.2S	0.2S
Calibration Date/Installation Date	13/12/2019	13/12/2019	13/12/2019

Energy accounting: 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. Therefore, no separate monthly B-Forms are applicable from the month of Jan 2020 (i.e. effectively from 20 Jan 2020). 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, as demonstrated under the ex-post monitoring parameter under the section 4.2 above, the overall accounting procedure of monthly units remains the same as the REA adopts algorithm-based software which accounts the net electricity injection, drawal and transmission losses for the monthly accounting, as follows:

Net Energy to be billed = [Export or net injection (kWh)] – [Import or drawl (kWh)] – [Transmission losses (kWh)]; hence the change in monthly statement generation practice (i.e. earlier B-form, currently REA statement) does not have any impact energy accounting for this project activity.

The aggregated net monthly electricity supplied/exported by the project activity (150MW Capacity) is monitored, measured & metered continuously at the 33kV/220V KSPDCL substation 1 & substation 2 which forms the basis for the monthly energy units (i.e. REA statements). REA reports can be 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 & 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 Solar (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 (which is very unlikely and remote possibility), a decision will be taken by ASEPL, 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. During the current monitoring period, all regular trainings were conducted and hence ensured standard requirements of the monitoring.

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:

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.

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 (tCO_{2e}/yr).

Here,

Monitoring Period:	Total Net Power Generated (MWh)	Baseline Emission Factor (tCO _{2e} /MWh)	Total Emission Reduction (tCO _{2e} / year)
01-July-2020 to 31-Aug-2021	371,814.41	0.93684	348,330*

* 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-Jul-2020 to 31-Dec-2020)	139,249	0	0	139,249
2021 (01-Jan-2021 to 31-Aug-2021)	209,081	0	0	209,081
Total	348,330	0	0	348,330

Comparison of Emission Reductions with ex-ante estimated values:

Start date of the current Monitoring period	01-Jul-20	
End date of the current Monitoring period	31-Aug-21	
Total days in the Monitoring period	427	#
Annual Estimated emission Reduction As per PDD	319,470	tCO ₂ e
Estimated emission reduction for this monitoring period	373,736	tCO ₂ e
Actual Emission Reduction	348,330	tCO ₂ e
Difference in Emission Reduction	-6.80%	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 6.80% ER as compared to the ex-ante estimation, which is mainly due to the marginally lower generated against the estimated value.