



RENEWABLE SOLAR POWER PROJECT BY MAHINDRA RENEWABLES PRIVATE LIMITED



Document Prepared by EKI Energy Services Limited

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project activity is a stepped towards supporting the implementation and installation of grid connected renewable solar energy power plants in India. The project activity ensures energy security, diversification of the grid generation mix and sustainable growth of the electricity generation sector in India. The main goal of project activity is to implement renewable energy projects in the country and the significant importance of revenues from sale of verified carbon units (VCUs) to achieve this goal forms the basis of the implementation of this project activity.

The total capacity of the project activity is 250 MW and the power produced displaces an equivalent amount of power from the grid, which is fed mainly by fossil fuel fired power plants. Hence, it results in reduction of GHG emissions. The earliest phase wise commissioning of the project activity is on 06-July-2018 and completed the full commissioning on 03-July-2020. Average GHG emission reductions from the project activity will be 389,911 tones of CO_{2e} per year and total GHG emission reductions for the chosen 10 year crediting period will be 3,899,117 tCO_{2e}.

The total GHG Emission reductions generated in current monitoring period of 01-October-2021 to 30-April-2022 are 284,488 tCO_{2e}. Project activity is commissioned and the detailed commissioning dates are mentioned in section 3.1 of this monitoring report.

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 19.0¹

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	Mahindra Renewables Private Limited.
Contact person	Mr. Rakesh Khaitan
Title	CEO
Address	Mahindra towers, Dr. G.M. Bhosle Marg P.K. Kurne Chowk, Worli-Mumbai-400018, Maharashtra, India.

¹ <https://cdm.unfccc.int/UserManagement/FileStorage/58IAGB7SZUDEO2VN6LYM30K41HFPRO>

Telephone	+91-99306 74683
Email	mehta.saurabh2@mahindra.com

1.4 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the Project	Project Consultant
Contact person	Ms. Bhavini Pandey
Title	Project Manager
Address	Enking Embassy, Office no. 201, Plot 48, Scheme 78 Part-2, Vijay Nagar, Indore-452010, Madhya Pradesh, India
Telephone	+91 9532180246
Email	registry@enkingint.org

1.5 Project Start Date

Project Start Date: 06-July-2018 which is the date of commissioning of first phase of the Project. Hence the project start date is 06-July-2018.

1.6 Project Crediting Period

Crediting Period Start date : 06-July-2018

Crediting Period End date : 05-July-2028

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:

Project Investor	Village	Tehsil	District	State	Latitude	Longitude
Mahindra Renewables Private Limited	Badwar	Gurh	Rewa	Madhya Pradesh	24°28'35.3"N	81°32'56.0"E
	Barsaita Pahad	Gurh	Rewa	Madhya Pradesh	24°28'53.3"N	81°34'31.9"E
	Barsaita Desh	Gurh	Rewa	Madhya Pradesh	24°28'53.2"N	81°34'31.4"E
	Itar Pahad	Gurh	Rewa	Madhya Pradesh	24°28'49.7"N	81°36'35.0"E
	Ramnagar Pahad	Gurh	Rewa	Madhya Pradesh	24°28'51.0"N	81°35'17.2"E

The project location has been highlighted in the geographical map shown below:



1.8 Title and Reference of Methodology

Project Type	: Type-I: Renewable Energy Projects
Methodology	: ACM0002
Title	: Grid-connected electricity generation from renewable sources

Version No. : Version 19.0²;

Reference : CDM Methodology

The methodology refers to following CDM Tools:

- Tool for the demonstration and assessment of additionally³ (Version 07.0.0, EB 70, Annex 8)
- Tool to calculate the emission factor for an electricity system⁴ - (Version 07.0 EB 100, Annex 04)

1.9 Participation under other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs. The project activity is not participating in any other GHG program.

1.10 Other Forms of Credit

Emissions Trading Programs and Other Binding Limits

The project activity is not participating in any other Emission trading program and other binding limits. The GHG emission reductions generated during the current monitoring period have not been used for compliance of other mechanism

Other Forms of Environmental Credit

The proposed project activity neither has nor intends to generate any other form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS Program. The initial project activity is neither has nor intends to generate any other form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

1.11 Sustainable Development

Contribution to sustainable development:

The project activity has beneficial effect on the local environment and employment in the nearby region. Clean Electricity generation through Solar PV result in avoidance of consumption of fossil fuels which results in contribution to SDG 7. The emission avoidance through these activities results in contribution to SDG 13. All the workers at site are trained which results in increase of skills, which contributes to SDG 4. Detailed indicators are mentioned in table 1. This is a voluntary project activity doesn't contribute to achieving any nationally stated sustainable development

² <https://cdm.unfccc.int/UserManagement/FileStorage/58IAGB7SZUDEO2VN6LYM30K41HFPRQ>

³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

⁴ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

priorities. There is no compliance for monitoring and reporting the emission reduction and SDG contribution from the project activity.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1.	7.2	7.2.1: Renewable energy share in the total final energy consumption	Implemented activities to increase	About 303,682.04 MWh renewable electricity has supplied to Indian grid during the reported period that helps to increase the renewable energy share in the energy mix.	Overall 1,446,586.45 MWh (241,508.09+ 659,001.30 + 242,395.02+303,682.04) renewable electricity has supplied to Indian grid throughout the project lifetime that helps to increase the renewable energy share in the energy mix.
2.	4.4	4.4.1 Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	Implemented activities to increase	Together with the technology supplier, the Project organize 19 training during current monitoring period. Training related to soft and technical skills.	Overall, 63(44+19) trainings are provided during over project lifetime.
3.	13.0	Total greenhouse gas emissions avoided or removed	Implemented activities to increase	By supplying 303,682.04 MWh clean electricity (generated through Solar PV) to Indian grid, the project avoided release of 284,488 tCO ₂ e in to the atmosphere during the reporting period.	Overall prevented the release of 1,355,158 (284,488+ 226,244 + 617,351 + 227,075) tCO ₂ e into the atmosphere since project commissioning.

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.

Section 3.3 and 3.4 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 or having any potential negative socio-economic impacts . Please refer below web link for the same.⁵

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

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 is 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 is received regarding site operation. No any grievances received 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 VCS VWB.

2.3 AFOLU-Specific Safeguards

Not Applicable as this is not an AFOLU project.

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

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The electricity generated by renewable technology (solar) installed as part of the project activity is being supplied to the regional grid and supplied to the identified facility via regional there by displacing the consumption of electricity from the regional grid electricity distribution system. As of 31 December 2013, the Southern grid has also been synchronized with the NEWNE grid; hence forming one unified Indian Grid. Thus, for this Project activity Indian Grid is applicable. The objective of the project activity is to develop a platform for reducing VCS Registration timelines and process costs for registration of individual projects under VCS.

Commissioning details of this project activity:

Project Investor	Capacity (MW)	Commissioning Dates
Mahindra Renewables Private Limited	5.1	06-July-2018
	35.7	07-September-2018
	100	05-April-2019
	94.2	10-July-2019
	15	03-January-2020
Total	250	

Technical specifications of project activity:

The technical specifications of 5.1 MW of 250 MW of Solar PV Power plant is provided below:

Solar PV Modules	
Make and Model	1. Longi Solar. LR6-72HV-340M 2. Longi Solar.LR6-72HV-345M
PV Module Technology	Monocrystalline
Total number of modules	19964 (340W-10044 Nos., 345W-9920Nos.)
Inverter/Power Conditioner	
Inverter Make and Model	Tmeic-PVH-L2550E
Number of Inverters	2 numbers
Continuous AC power at 50°C	2550 kWAc per Inverter
Mounting Structure	
Type of Structure	Fixed
Manufacturer and Model of Mounting Structure	Mahindra Susten
Tilt	14°
Pitch	5.8 M

The technical specifications of 35.7 MW of 250 MW of Solar PV Power plant is provided below:

Solar PV Modules	
Make and Model	1. Longi Solar. LR6-72HV-340M 2. Longi Solar.LR6-72HV-345M
PV Module Technology	Monocrystalline
Total number of modules	132122 (340W-66092 Nos., 345W-66030 Nos.)
Inverter/Power Conditioner	
Inverter Make and Model	Tmeic-PVH-L2550E
Number of Inverters	14 numbers
Continuous AC power at 50°C	2550 kWAc per Inverter
Mounting Structure	
Type of Structure	Fixed
Manufacturer and Model of Mounting Structure	Mahindra Susten
Tilt	14°
Pitch	5.8 M

The technical specifications of 94.2 MW of 250 MW of Solar PV Power plant is provided below:

Solar PV Modules	
Make and Model	1. Longi Solar. LR6-72HV-340W 2. Longi Solar. LR6-72HV-345W 3. Trina Solar. TSM-DE14A(II)-340W 4. Trina Solar. TSM-DE14A(II)-345W 5. Canadian Solar. CSU-320W 6. Canadian Solar. CSU-325W 7. Canadian Solar. CSU-330W
PV Module Technology	Monocrystalline/Polycrystalline
Total number of modules	1. Longi Solar. LR6-72HV-340W:27746 Nos. 2. Longi Solar. LR6-72HV-345W:24546 Nos. 3. TRINA. TSM-DE14A(II)-340W:87326 Nos. 4. TRINA. TSM-DE14A(II)-345W:27286 Nos. 5. Canadian Solar. CS6U-320W:6944 Nos. 6. Canadian Solar. CS6U-325W:49724 Nos. 7. Canadian Solar.CS6U-330W:156984 Nos.
Inverter/Power Conditioner	
Inverter Make and Model	1. ABB:PVS980-58-2000 KVA 2. TMEIC:PVH-L2550E
Number of Inverters	1. ABB-42 Nos. 2. TMEIC-4 Nos.
Continuous AC power at 50°C	1. ABB-2000 kWAc 2. TMEIC-2550 kWAc

Mounting Structure	
Type of Structure	Fixed
Manufacturer and Model of Mounting Structure	Mahindra Susten
Tilt	14°
Pitch	5.8 M

The technical specifications of 100 MW of 250 MW of Solar PV Power plant is provided below:

Solar PV Modules	
Make and Model	1. Canadian Solar-CS6U-325W 2. Canadiun Solar-CS6U-330W 3. TRINA-TSM-DEI14A(II)-340W 4. TRINA-TSM-DEI14A(II)-345W
PV Module Technology	Monocrystalline/Polycrystalline
Total number of modules	410192 (CS: 325Wp-166160 Nos., 330Wp-212784 Nos.), (Trina: 340 Wp-15624 Nos., 345 Wp-15624 Nos.)
Inverter/Power Conditioner	
Inverter Make and Model	ABB-PVS980-58-2000 KVA
Number of Inverters	50Nos.
Continuous AC power at 50°C	2000 kWAc per Inverter
Mounting Structure	
Type of Structure	Fixed
Manufacturer and Model of Mounting Structure	Mahindra Susten
Tilt	14°
Pitch	5.8 M

The technical specification 15 MW out of 250 MW is mentioned below:

Solar PV Modules	
Make and Model	1. Canadian Solar -325 W (34462 Nos.) 2. Longi Solar-365 W (10800 Nos.) 3. Jolywood -345W (10800 Nos.)
PV Module Technology	Monocrystalline/Polycrystalline
Inverter/Power Conditioner	
Inverter Make and Model	Huawei 160 KWp 1500v – 69 Nos ABB 2 MW 1500V/660V- 2 Nos
Transformer	
Make and Model	Shilchar and Toshiba
Ratings and Quantity	4MWA 33KV/800V-800V (3 Nos) 4MWA 33KV/660V-660V (1 Nos)

The total capacity of the project activity is 250 MW and the power produced displaces an equivalent amount of power from the grid, which is fed mainly by fossil fuel fired power plants. Hence, it results in reduction of GHG emissions. During the current monitoring period, no any event occurred that impact the GHG emission reduction or removals and monitoring practices.

3.2 Deviations

2.1.1 Methodology Deviations

Not Applicable, as there are no methodological deviations during current monitoring period.

2.1.2 Project Description Deviations

Deviation 1:

This deviation is a monitoring deviation, the monitoring practice is updated (November 2019) and it's shifted to Deviation Settlement Mechanism (DSM) in order to more strengthen the national grid. The export and import values are omitted. In DSM mechanism, PP have to forecast energy generation in a day time block (In India, 15 minutes each, total 96 blocks) well in advance. The invoicing is done on the forecasted value. The actual generation deviation from the forecasted values is penalized, it depends upon the deviation magnitude. Therefore, instead of export and import values, the final net actual values is directly obtained for the calculation of emission reduction. Total Energy schedule and the Actual values (which is the actual Net delivered) is maintained by the Western Regional Power Committee (WRPC) Secretariat, Central Electricity Authority, Government of India.

Regional Energy Account (monthly net export) for every month in respect of Southern Region has been uploaded on the SRPC website, <http://www.wrpc.gov.in/>. The weekly DSM data can be fetched through the website in order to have a cross check on the Actual values. The project description deviation doesn't impact the applicability of the methodology, additionality and baseline scenario of project. The nature of deviation is permanent. These deviations are already approved in previous verifications.

Deviation 2:

As per QA/QC procedures of section 4.2 of registered PD, "*Generation data may be cross checked with the Monthly Generation Reports*". The deviation is regarding the crosschecking of scheduled data and actual injections. The scheduled data can be crosscheck through the invoice generated and the actual data can crosschecked with weekly DSM settlement statements receipt over <http://www.wrpc.gov.in>. This project description deviation doesn't impact the applicability of the methodology, additionality and baseline scenario of project. The nature of deviation is permanent. These deviations are already approved in previous verifications.

Deviation 3:

This deviation applied in the “*Description of measurement methods and procedures to be applied*” of $EF_{\text{facility},y}$ in the Data and Parameter monitored section. This deviation is applied to impart correct parameter monitoring procedure by the Project activity. Clarity added about the plant new meter procedure with respect to deviation 1. Line diagram and parameter monitoring procedures updated related to billing energy meters at substation. This project description deviation doesn’t impact the applicability of the methodology, additionality and baseline scenario of project. The nature of deviation is permanent.

These deviations are already approved in previous verifications.

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

Data / Parameter	$EF_{\text{grid},OM,y}$
Data unit	tCO ₂ /MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14, December 2018 ⁶
Value applied	0.9610
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 07” as 3-year generation weighted average using data for the years 2015-2016, 2016-2017 & 2017-2018. The data are obtained from “CO ₂ Baseline Database for Indian Power Sector” version 14, 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	$EF_{\text{grid},BM,y}$
Data unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14, December 2018
Value applied	0.8644

⁶ http://cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf

Justification of choice of data or description of measurement methods and procedures applied	Calculated as per “Tool to calculate the emission factor for an electricity system, version 07” as per the latest data available for the most recent year 2018. The data is obtained from “CO ₂ Baseline Database for Indian Power Sector” version 14, 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	$EF_{grid,CM,y}$
Data unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14, December 2018
Value applied	0.9368
Justification of choice of data or description of measurement methods and procedures applied	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ Where: $EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh) $EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 75% W_{BM} = Weighting of build margin emissions factor (%) = 25% Calculated as per “Tool to calculate the emission factor for an electricity system, version 07.0.0”. The data is obtained from “CO₂ Baseline Database for Indian Power Sector” Version 14, December 2018, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period

4.2 Data and Parameters Monitored

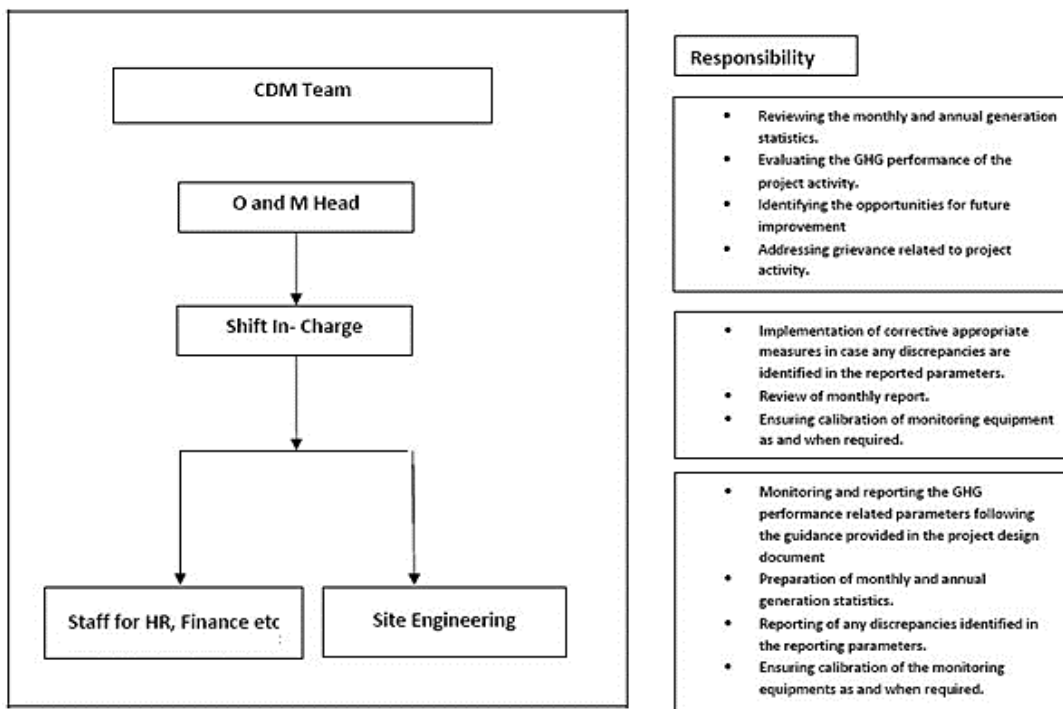
Data / Parameter	$EG_{facility,y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project (Solar) plant/unit to the grid during the monitoring period
Source of data	Monthly joint meter reading reports Regional Energy Account statement issued by WRPC

Description of measurement methods and procedures to be applied	Data Type : Measured Monitoring equipment : Energy Meters are used for monitoring. Recording Frequency : Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually Archiving Policy : Paper & Electronic Class of meter : 0.2s. Calibration frequency : One in five years
	Electricity exported by the project to the grid, the actual generation recorded and monitored by the metering system installed at the project's PGCIL substation. The metering system comprises of special energy meters (SEMs) installed at the grid substation. Project activity is connected via four transmission lines of 220 kV, each having its own SEM meter (main meter and check meter) at the PGCIL substation. In case, anyone transmission line is not in service than complete load will be shifted to other transmission line which is in operation. Currently, project activity is connected to PGCIL substation Badwar line. The energy meters are special energy meters which are installed and sealed by the Power Grid Corporation of India Limited in the presence of the representatives of the power producer. The check meter shall be used during the period the main metering system is not in service.
Frequency of monitoring/recording	Continuous measurement & monthly recording
Value monitored	303,682.04
Monitoring equipment	Special Energy Meters (SEMs) of 0.2s accuracy class. Refer <i>APPENDIX 1: CALIBRATION DETAILS</i> for the meter calibration details.
QA/QC procedures to be applied	Energy meters will be calibrated once in a five year and faulty meters will be duly replaced immediately. The scheduled data can be crosscheck through the invoice generated and the actual data can crosschecked with weekly DSM settlement statements receipt over http://www.wrpc.gov.in . <i>This project description deviation doesn't impact the applicability of the methodology, additionality and baseline scenario of project. The nature of deviation is permanent.</i>
Purpose of the data	Calculation of baseline emissions
Calculation method	NA
Comments	Data will be archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VCU for this project activity, whichever occurs later.

4.3 Monitoring Plan

The monitoring plan is developed in accordance with the modalities and procedures for CDM project activities and is proposed for grid-connected solar power project being implemented. The monitoring plan, which is 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 is 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 is 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 is collected in the presence of the plant in-charge. Export and Import data would be recorded and stored in logs as well as in electronic form on a daily basis. The records are checked periodically by the Plant Manager and discussed thoroughly with the plant

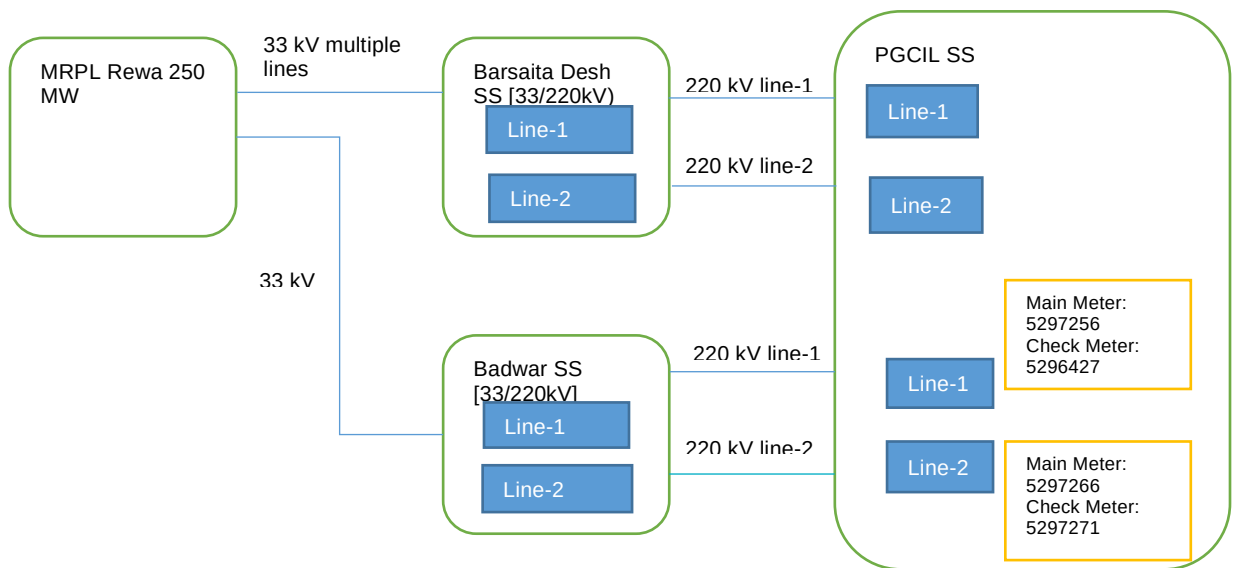
supervisor. The period of storage of the monitored data will be 2 years after the end of crediting period or till the last issuance of VERs for the project activity whichever occurs later.

Emergency Preparedness:

The project activity is 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

As per registered PD, Baseline emission is

$$BE_y = EG_{\text{facility},y} * EF_{\text{grid},CM,y}$$

Where:

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

$EG_{\text{facility},y}$: 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 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” (tCO₂e/MWh)

Based upon monitoring values:

$$BE_y = 303,682.04 * 0.9368$$

$$= 284,488 \text{ tCO}_2\text{e (round down values)}$$

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 ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01-October-2021 to 31-December-2021	112,011	0	0	112,011
01-January 2022 to 30-April-2022	172,477	0	0	172,477
Total	284,488	0	0	284,488

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 226,469 tCO₂e (the basis of calculation is unitary method using annual emission reduction in the registered PDD), whereas actual emission reductions achieved are 284,488 tCO₂e, which is approximately 25.7% 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.

Due to higher solar insolation higher generation has been observed during the current monitoring period which is not in control of PP. The observed PLF (23.87%) during the current monitoring period is 25.7% higher than the estimation as the registered PD. Also, as per the registered PD, the 59.40% increase in PLF would breach the threshold value of equity IRR value. The current increase is 25.7% which is lower than 59.40%, therefore increase in PLF having no impact on the project additionality.

APPENDIX 1: CALIBRATION DETAILS

The billing Energy Meters details for the project activity located at PGCIL substation are as below:

Meter Serial No.	Make	Type	Accuracy class	Meter Calibration date	Due date of meter calibration	Meter Calibration date	Due date of meter calibration
5297256 Line-1 Main Meter	Elster	ABT	0.2s	25-November-2015	24-Novemeber-2020	22-January-2022	21-January-2027
5296427 Line-1 Check Meter	Elster	ABT	0.2s	25-November-2015	24-Novemeber-2020	22-January-2022	21-January-2027
5297266 Line-2 Main Meter	Elster	ABT	0.2s	25-November-2015	24-Novemeber-2020	22-January-2022	21-January-2027
5297271 Line-2 Check Meter	Elster	ABT	0.2s	25-November-2015	24-Novemeber-2020	22-January-2022	21-January-2027

Delay in meter calibration has been observed, delay calibration shows that the readings are within permissible limits. Therefore, conservative error factor of 0.4% (Export and import values are not available in the new version of JMRs, therefore 0.4% error factor is applied to the net values) have been applied to the net values from October 2021 to January 2022.

APPENDIX 2: BREAKDOWN REPORTS

Teqo Scope	Failure Date (DD-MM-YYYY)	Failure Time (HH:MM)	Resolution Date (DD-MM-YYYY)	Resolution time (HH:MM)	Down Time (HH:MM)	Failure Type	Failure Description	Solution
Client Scope	18-January-2022	07:08	18-January-2022	17:29	10:21:00	Trafo failure	Trafo failure, Internal shortcircuit	Trafo replacement /repairing required
Client Scope	20-January-2022	06:58	20-January-2022	17:32	10:34:00	Trafo failure	Trafo failure, Internal shortcircuit	Trafo replacement /repairing required
Client Scope	23-January-2022	07:01	23-January-2022	17:34	10:33:00	Trafo failure	Trafo failure, Internal shortcircuit	Trafo replacement /repairing required
Client Scope	21-February-2022	06:45	21-February-2022	17:53	11:08:00	IGBT failure	INV running in half load due to M2 section IGBT module failure	Running in half load
Client Scope	25-February-2022	06:42	25-February-2022	17:41	10:59:00	IGBT failure	INV running in half load due to M2 section IGBT module failure	Running in half load
Client Scope	27-February-2022	06:42	27-February-2022	17:41	10:59:00	IGBT failure	INV running in half load due to M2 section IGBT module failure	Running in half load
Client Scope	1-March-2022	6:40	1-March-2022	17:50	11:10:00	IGBT failure	INV running in half load due to M2 section IGBT module failure	Running in half load
Client Scope	2-March-2022	6:40	2-March-2022	17:50	11:10:00	IGBT failure	INV running in half load due to M2 section IGBT module failure	Running in half load
Client Scope	7-March-2022	06:25	7-March-2022	17:59	11:34:00	IGBT failure	INV running in half load due to M2 section IGBT module failure	Running in half load
Teqo Scope	20-March-2022	6:30	20-March-2022	18:04	11:34:00	Capacitor failure	Inverter under breakdown due to capacitor failure. Door damaged	Capacitor replaced , door repairing done