

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT - **TEMPLATE GUIDE Monitoring Report v. 1.1**

This document contains the following Sections

Key Project Information

SECTION A - Description of project

SECTION B - Implementation of project

SECTION C - Description of monitoring system applied by the project

SECTION D - Data and parameters

SECTION E - Calculation of SDG Impacts

SECTION F - Safeguards Reporting

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KEY PROJECT INFORMATION

Key Project Information

GS ID (s) of Project (s)	GS7625
Title of the project (s) covered by monitoring report	200 MW Solar PV Plant by Mahindra Susten in Rajasthan
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	06
Version number of the monitoring report	04
Completion date of the monitoring report	15/05/2024
Date of project design certification	26/05/2022
Date of Last Annual Report	07/12/2023
Monitoring period number	1 st
Duration of this monitoring period	14/10/2021 to 31/12/2022 (Inclusive of both the dates)
Project Representative	Infinite Solutions Limited
Host Country	India
Activity Requirements applied	☐ Community Services Activities ☒ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	ACM0002: Grid-connected electricity generation from renewable sources- Version 20.0
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SGD 13: Climate Action (mandatory)	Emission Reduction	529,270	VERs
SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	Trainings	69 Trainings	No of Training
	Employees	40 Employees	No of Employees
	Income (INR)	INR 35,766,665	INR
SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all.	MWh of renewable Energy generated	568,803.20	MWh

Table 2 – Product Vintages

		Amount Achieved		
Start Dates	End Dates	MWh	No of Training No of Employees INR	VERs
14/10/2021	31/12/2021	75,632.00	6 Trainings 40 Employees INR 6,363,888	70,375
01/01/2022	31/12/2022	493,171.20	63 Trainings 40 Employees INR 29,402,777	458,895

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

The main purpose of the project activity is to generate electrical energy through sustainable means using solar power resources, the generated green electricity will contribute to climate change mitigation efforts. This project activity is a large-scale solar project. Mahindra Susten Private Limited is the project investors for this project activity. The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 424,409 tCO₂e per annum, thereon displacing 456,103 MWh/year 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.

Letter of Award has been issued from (SECI) government of India dated on 16/09/2019, under the bidding process. The project proponent has applied under GS mechanism for project development. The project is only a GS VER project and it is not considered under any other programmes like CDM and other GS-CER label. The project activity is the installation of a new grid-connected renewable power plant/unit. The start of the project activity is 03/06/2020. The commissioning date of the project is 14/10/2021.

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

Project Investor's Name	Mahindra Susten Private Limited
Capacity in MW	200 MW _{AC}
Location	Rajasthan
PPA with SECI	16/10/2019
1 st Purchase order placed	03/06/2020
Commissioning	14/10/2021

Scenario existing prior to the implementation of the project activity

As the project activity is the installation of a new grid-connected renewable power plant/unit. The scenario existing prior to the implementation of project activity is Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system" (Version 7.0, EB 100 annex 4).

Baseline Scenario

Baseline scenario and Scenario existing prior to the implementation of the project activity are both same.

Sustainable Development

The National CDM Authority (NCDMA), which is the Designated National Authority (DNA) for the Government of India (GOI) under the Ministry of Environment, Forest and Climate Change (MoEFCC), has mentioned four indicators for the sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects from India. The project's contribution towards sustainable development has been addressed based on the following sustainable development aspects, in line with the requirements of the NCDMA:

- **Social well being**

The project activity provides job opportunity to local people during erection, commissioning and maintenance of the Solar power project. Frequency of visiting to villages and nearby areas by skilled, technical and industrialist has increased due to installation /site visit/operation and maintenance work related to the project at plant site. This directly and indirectly positively effects the economy of nearby populace.

- **Environmental well being**

Solar power is one of the cleanest renewable energy powers and does not involve any fossil fuel. There are no GHG emissions. The impact on land, water, air and soil is negligible. Thus, the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.

- **Economic well being**

The project activity generates permanent and temporary employment opportunity within the vicinity of the project. The electricity supply in the nearby area improves which directly and indirectly improves the economy and lifestyle of the area.

- **Technological well being**

The project activity is step forward in harnessing the untapped solar potential and further diffusion of the solar technology in the region. The project activity leads to the promotion and demonstrates the success of solar projects in the region which further

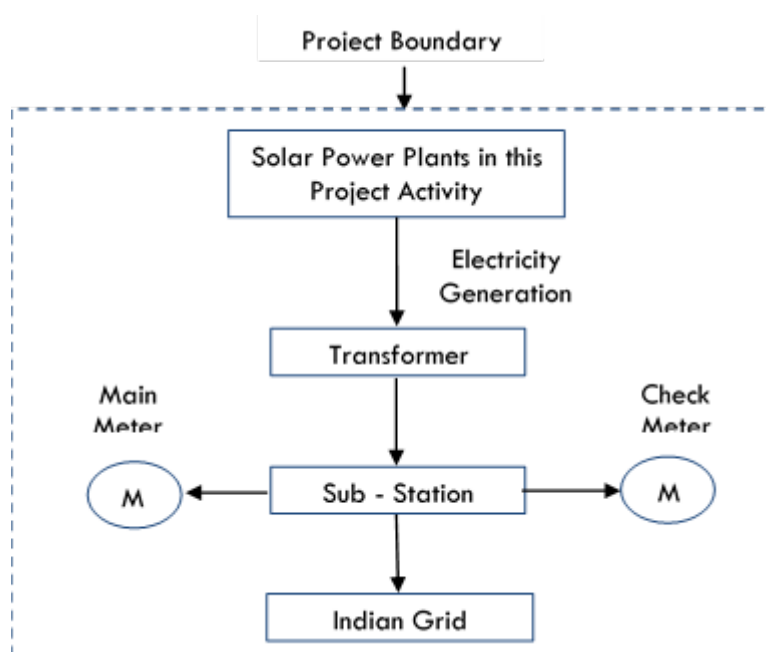
motivate more investors to invest in solar power projects. Hence, the project activity leads to technological well-being.

Project Boundary

The project activity includes 200 MW_{AC} installed capacity and is greenfield large solar power plant. The project is located at Bikaner district in Rajasthan Project boundary has ascertained using ACM0002 (Version 20.0, EB 105, Annex 3)

The spatial extent of the project boundary includes the project power plant/unit and all power plants/ units connected physically to the electricity system that the CDM project power plant is connected to.

Hence the project boundary includes the solar project activity, substation, grid and all power plants connected to the grid. The project activity evacuates power to the Indian grid. The project activity includes 200 MW installed capacity and is greenfield large solar power plants.



The present monitoring period is from 14/10/2021 to 31/12/2022 through which emission reduction claimed is 529,270 tCO₂e.

The Emission Reductions as per the vintage break-up (2021 and 2022) in the monitoring in the following format:

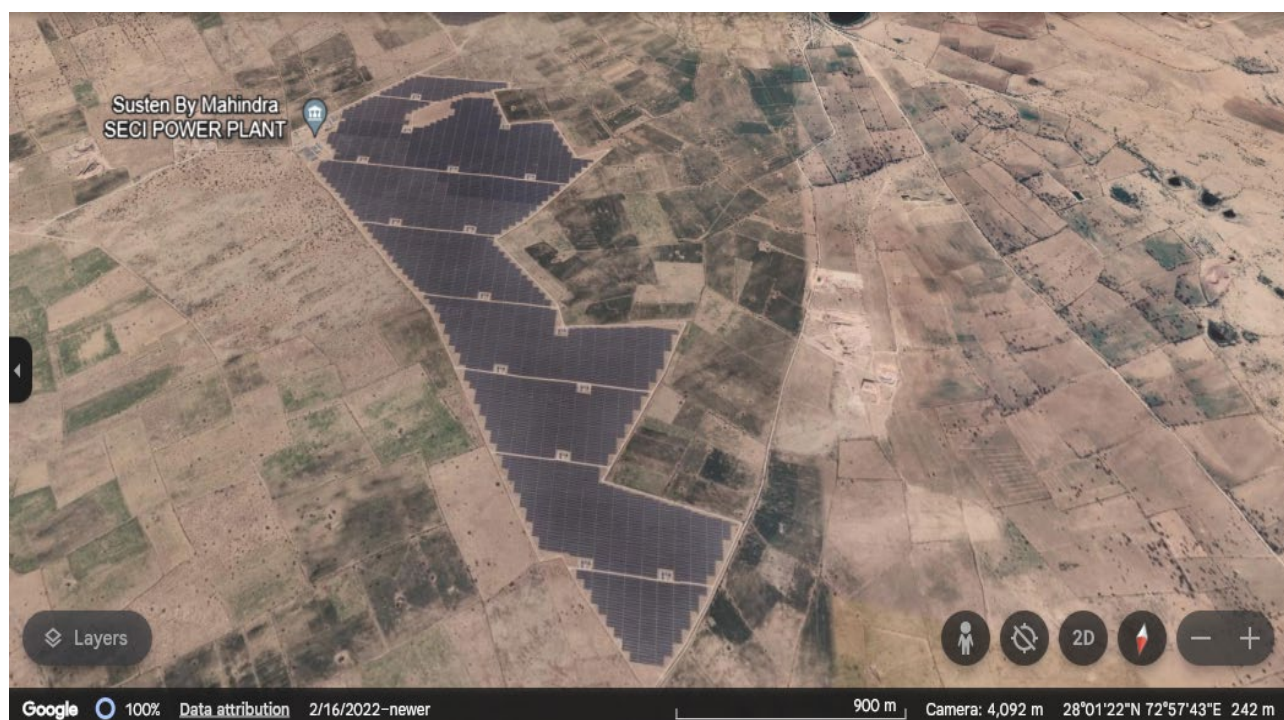
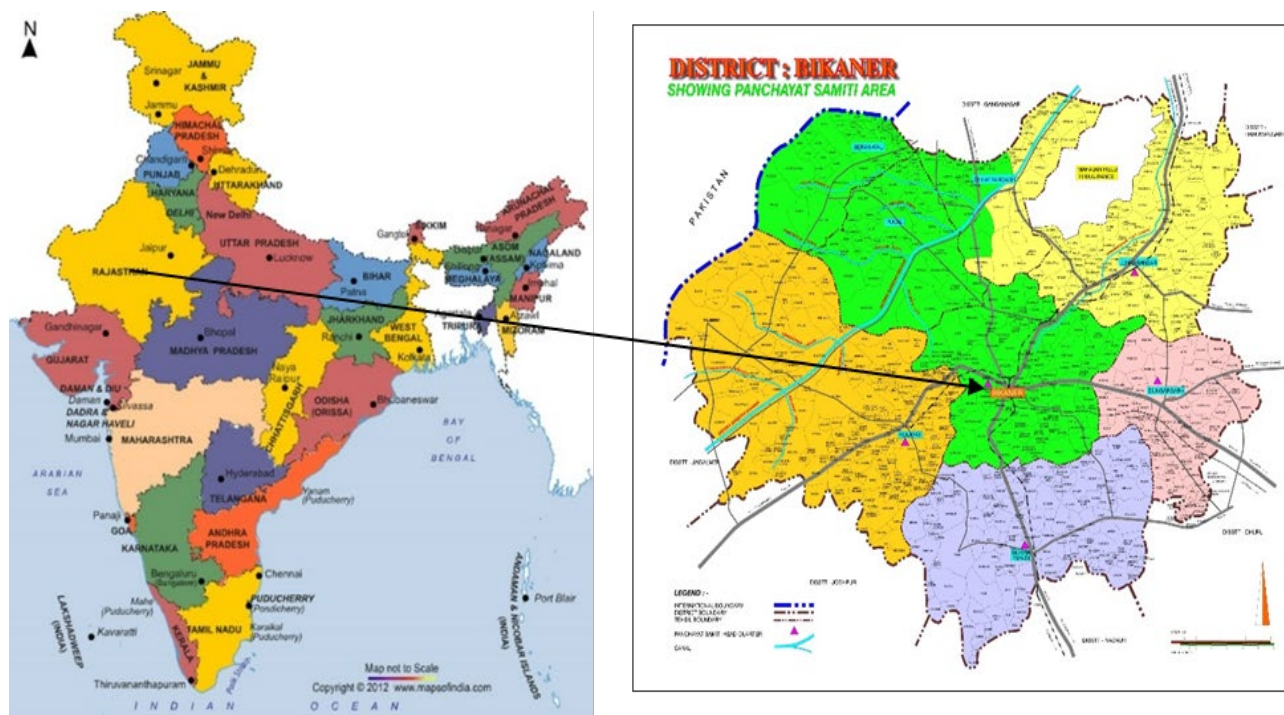
14/10/2021 to 31/12/2021: 70,375 tCO₂e.

01/01/2022 to 31/12/2022: 458,895 tCO₂e.

A.2. Location of project

The proposed project activity is located at Khari Charnan Village, Kolayat Tehsil, Bikaner district in Rajasthan.

A pictorial representation of the location of the project activity on the map of India is provided as follows:



The unique identification of this project is:

Project Investor's Name	Latitude	Longitude
Mahindra Susten Private Limited	28°0'2.75"N	72°59'10.19"E

A.3. Reference of applied methodology

Title: Grid-connected electricity generation from renewable sources.

References: Approved Large Scale Consolidated Methodology: ACM0002 "Grid-connected electricity generation from renewable sources" Version 20.0¹

Tools:

Tool for the demonstration and assessment of additionality (Tool 1)- Version7.0²

Tool to calculate the emission for an electricity system (Tool 7)- Version7.0³

A.4. Crediting period of project

Type of crediting period: Renewable

Start date of crediting period: 14/10/2021

End date of crediting period:13/10/2026

Length of crediting period: 5 years

¹ <https://cdm.unfccc.int/UserManagement/FileStorage/AG07ZJQ3EXD42LT5YV9HR16M8KINPO>

² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

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

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

The project activity involves installation of 200 MW grid connected solar photovoltaic power plant. This project activity is a large-scale solar project and it is located at Khari Charnan Village, Kolayat Tehsil, Bikaner district in Rajasthan.

The project activity is exporting 456,103 MWh/year of electrical energy to the Regional Grid of India, throughout its entire life span of 25 years i.e., the total lifetime of the equipment. This result in average annual reduction of 426,274 tCO₂e per annum from the project activity. The project activity does not involve any technology transfer. The purpose of the project activity is to generate electrical power using solar energy, there by displacing non-renewable fossil resources resulting to sustainable, economic and environmental development. The solar PV power plant mainly consist of solar PV modules, module mounting structures, inverters, transformers and other protection system and supporting components.

The technical specifications are given below:

A. Solar PV Modules:

Module Make	Longi, Jinko and Jinko Bifacial
Plant Capacity	200 MW _{AC} /280.019 MW _{DC}
Technology Used	Polycrystalline
Capacity (p)	450Wp, 460Wp, 465 Wp and 460 Wp

B. Number of Modules installed:

S.No	Make	Number of modules installed of each type
1	Longi	450Wp Total number of modules: 401,010 for 450Wp
2	Jinko	460, 465Wp Total number of modules: 38,068 for 460Wp and 159,898 for 465Wp (i.e., 197,966 for both)
3	Jinko Bifacial	455, 460Wp Total number of modules: 9,450 for 455Wp and 9,415 for 460Wp (i.e., 18,865)

C. Inverters:

S.No	Make	
1	Manufacture	Sungrow
2	Rated capacity	3,125 KW
3	Number of inverters	64

D. Transformers:

S.No	Make	
1	Manufacture	Prime Meiden
2	Type	Step up
3	Capacity	80/100 MVA, 132/33 KV
4	Number of transformers	3

E. Metering Equipment details⁴:

S.No	Make	Solar Plant and GSS End
1	Manufacture	Secure Make
2	Type	ABT meters
3	Accuracy class	0.2 s

B.1.1 Forward Action Requests

FAR01: The VVB shall conduct site visit to confirm project activity implementation and specification, implementation of monitoring plan, interview with the stakeholder to confirm SDG benefits and grievances (if any).

Rectification: The VVB has conducted a physical site visit dated on 01/08/2023 and has confirmed the physical implementation of project activity and specification, implementation of monitoring plan and also interviewed with the stakeholders to confirm the SDG benefits and grievances.

FAR02: VVB shall confirm avoidance of double counting by checking domestic and international registries.

Rectification: VVB has confirmed the avoidance of double counting by checking domestic and international registries.

B.2. Post-Design Certification changes

⁴ Details of the meters provided in appendix 1 of the monitoring report.

B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

There is no deviation in the monitoring and reporting plan, methodology and standardized baseline.

B.2.2. Corrections

Correction 1 – In the registered PDD, there was a typographical error related to geo coordinates. The previous geo-coordinates which were mentioned as per registered PDD having latitude and longitude as 27°57'9.33"N and 72°59'42.44"E which is approximately 5 to 6 km away from the new geo-coordinates mentioned in the current monitoring period having latitude and longitude as 28°0'2.75"N and 72°59'10.19"E. Therefore, geo-coordinates of the project activity have been corrected in the current monitoring report.

Above changes do not impact the project's Additionality, Baseline, design and applicability of methodology in any way.

B.2.3. Changes to start date of crediting period

Not Applicable

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

No permanent changes

B.2.5. Changes to project design of approved project

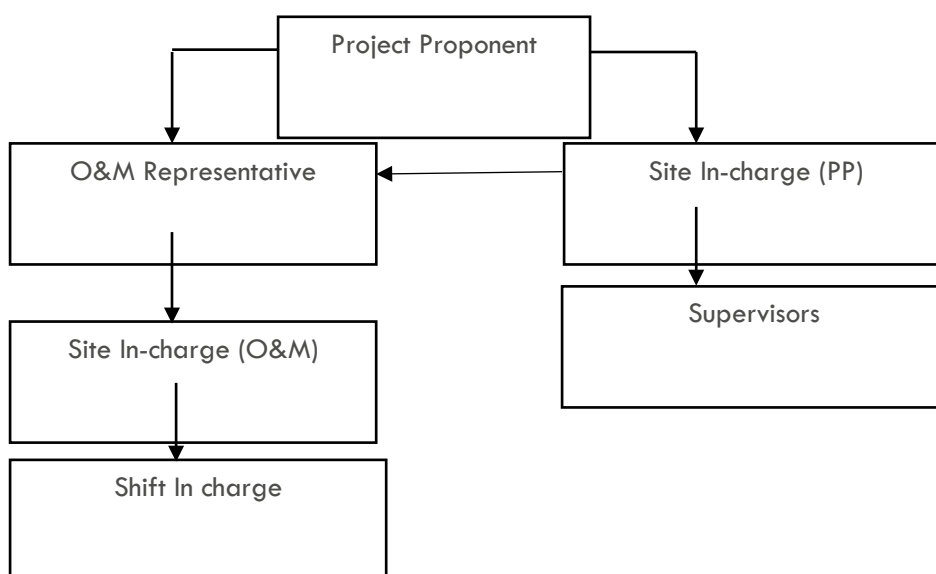
Not Applicable

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

The monitoring plan is developed in accordance with the modalities and procedures for GS4GG project activities and is for grid-connected solar power project/ unit being implemented in Rajasthan, India. The monitoring plan, which is been 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.

The monitoring team is composed of the following:



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

Responsibilities of O&M Representative (Mahindra Tego Private Limited): Co-ordination between Site in-charge of the O&M operator as well as the project participant and further report to PD head office.

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

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

Data archiving policy: All monitored data are archived electronically for a period of two years after the end of the crediting period or the last issuance of VERs, whichever occurs later.

Data Measurement:

Projects activity comprises of installation Energy meters at a Grid substation. An internal pooling substation at plant end is there where the generated power of 33kV is stepped

up to 132 kV line. The pooling substation is then be interconnected with the 220/132kV single circuit transmission line up to the nearest grid substation located at Gajner in Rajasthan. The export and import energy are measured continuously using the meters installed at Substation. Export & Import readings of meters are taken on monthly basis by authorized officer of SECI in the presence of representative(s) of PD. The meter reading is taken jointly and signed by the representatives of the SECI and representative(s) of PD. Based on the readings, invoices/ monthly bills are raised by PD. These invoices/ monthly bills are used for cross checking the meter readings taken for the respective project activity.

It is to be noted that though the PD or their representatives are available during meter reading, the calculations of net electricity supplied to grid is completely under purview of SECI and PD does not have any control on it. Also, accuracy class of meters and calibration frequency is under purview of SECI/Discom officer and PD does not have any control on it. PD gets the monthly credit report from where net electricity supplied to grid is obtained and used for emission reduction calculations.

Data collection and archiving

Export & Import readings from main and check meters are collected under the supervision of the O&M Team or authorized representatives of PD. The net electricity supplied to grid are calculated based on export & import readings. 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.

Mismatch in Monitoring Period and the Billing Period

In case the dates of a particular monitoring period do not match with the dates of the billing period, the net electricity exported to the grid would be calculated from:

$$D = (A/B) * C$$

Where;

A = Difference of number of days which are not matching of billing period and monitoring period.

B = Number of days of the billing period/ month which was not matched with the monitoring period.

C = Net Electricity supplied to the grid for that given billing period/ month.

The calculated value after apportioning would be used for calculation of emission reductions during that period.

Emergency preparedness: The project activity does 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 unlikely event of failure of both Main meter and check meter installed at substation, is found to be outside the acceptable limits of accuracy or faulty or not functioning properly, it will be repaired or replaced simultaneously and the meters are replaced immediately by the spare meter kept available at the site.

In the event that the Main meter is not in service as a result of maintenance, repairs or testing, the Check meter will be used for readings and in the event that both the Main meter and check meter both are not in service as a result of maintenance, repairs or testing, the Standby meter will be used for readings. In case all the three meters not function properly than in that case error factor will be applied as per the accuracy class of the meter. During the monitoring period the main, check and standby meters were operating in the acceptable limits of accuracy at site. The plant underwent scheduled maintenance and downtime, and there were some maintenance activities and situations during the current monitoring period. The details regarding the same are mentioned in Appendix 2. However, there is no major maintenance happened in given monitoring period

Personnel training: In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the staff (team) is 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.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Relevant SDG Indicator 13: Take urgent action to combat climate change and its impacts

Data/parameter	EF _{OM,y}
Unit	tCO _{2e} /MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 17 ⁵
Value(s) applied	0.9522 (Detail Calculation has been provided in ER Sheet)
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07.0.0" as 3-year generation weighted average using data for the years 2018-19, 2019-20 & 2020-21. The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 17.0, published by the Central Electricity Authority, October 2021 Ministry of Power, Government of India.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Data/parameter	EF _{BM, y}
Unit	tCO _{2e} /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 17 ⁶
Value(s) applied	0.8653 (Detail Calculation has been provided in ER Sheet)
Choice of data or Measurement methods and procedures	The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 17.0. The data are obtained from "CO ₂ Baseline Database for Indian Power Sector"

⁵ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

⁶ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

	version 17.0, published by the Central Electricity Authority October 2021, Ministry of Power, Government of India.
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Data/parameter	EF _{CM, y}
Unit	tCO ₂ e/MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 17 ⁷ , October 2021
Value(s) applied	0.9305
Choice of data or Measurement methods and procedures	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%
Purpose of data	For the calculation of the Baseline Emission
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

D.2 Data and parameters monitored

Relevant SDG Indicator 7.2.1: Affordable and Clean Energy

Data / Parameter	EG _{facility,y}
Unit	MWh

⁷ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

Description	Quantity of net electricity supplied to the grid								
Source of data	Statement of net export of power to the grid at the plant site (JMR)								
Value(s) applied	568,803.20 MWh <table border="1"> <thead> <tr> <th>Vintage</th><th>Net Generation (MWh)</th></tr> </thead> <tbody> <tr> <td>14/10/2021 to 31/12/2021</td><td>75,632.00</td></tr> <tr> <td>01/01/2022 to 31/12/2022</td><td>493,171.20</td></tr> <tr> <td>Total</td><td>568,803.20</td></tr> </tbody> </table>	Vintage	Net Generation (MWh)	14/10/2021 to 31/12/2021	75,632.00	01/01/2022 to 31/12/2022	493,171.20	Total	568,803.20
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14/10/2021 to 31/12/2021	75,632.00								
01/01/2022 to 31/12/2022	493,171.20								
Total	568,803.20								
Measurement methods and procedures	Data Type: Measured Monitoring equipment: Energy Meters of accuracy class 0.2s Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually. Archiving Policy: Paper &/or Electronic Calibration frequency: Once in 5 years as per CEA guidelines⁸ Electricity exported/imported to the grid is 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 as a difference of electricity exported to the grid, electricity imported from the grid obtained from Monthly Meter reading reports provided by SECI as per below equation: $EG_{PJ,y} = EG_{Export} - EG_{Import}$ Cross Checking: Quantity of net electricity supplied to the grid will be cross checked from the Invoices/ Monthly Bill raised by the Project Participants to SECI.								

⁸https://cea.nic.in/wp-content/uploads/2020/04/review_regulation.pdf

Monitoring frequency	Monthly
QA/QC procedures	Calibration of all the meters will be undertaken once in 5 years as per CEA guidelines. The meters will be of accuracy class 0.2s.
Purpose of data	The Data/Parameter is required to calculate the baseline emission
Additional comment	Data will be archived electronically for a period of 2 years beyond the end of crediting period.

Relevant SDG Indicator **SDG 8.5.1: Decent Work and Economic Growth**

Data / Parameter	- Quantitative employment (No of permanent employment happened due to the project activity), - Quality of employment - Income generation
Unit	- Number (Trainings) - Number (Employees) - INR (Salary)
Description	- Number of Trainings provided to employees & O&M staff - Number of project employees with Number of male/female, permanent/temporary, age and person with disabilities. - Salary given to the employees of the project. The income to all the unskilled workers is made on day-to-day basis in line with the minimum wage requirements⁹. Annual records of income paid to all the employees would be available. The skilled worker and unskilled worker classification depends on the project needs. The skilled worker for a solar PV implementation is required for operating the plant and maintaining the plant. The unskilled worker will be used for day-to day basis for loading and unloading and sweeping activities. The wage rates can be referred from the Indian labor act Labor bureau, Government of India¹⁰ notifications

⁹ https://clc.gov.in/clc/sites/default/files/mygov_16593417421.pdf

¹⁰ https://clc.gov.in/clc/sites/default/files/mygov_16593417421.pdf

Source of data	Training Records (HSE & HR) Salary Slip of the project employees.
Value(s) applied	The trainings & workshops are given to the O&M staff are: • HSE Training Record • Soft Skill Training The total number of employments are 40. 40 local employees are working at the site. Skilled employees: 21 Unskilled employees: 19 Permanent employees: 2 Temporary employees: 38 Male: 40 Female: 00¹¹ There are 69 number of trainings carried out in this monitoring period. The training programmes help in making the workforce efficient and skilled at their job. This not only helps the company but adds to growth of individual employees. Thus, the project has a positive impact on the parameter. The income generation in the current monitoring period is INR 35,766,665¹²
Measurement methods and procedures	• Training Attendance sheets. • Employee Records • Salary slips of the employees

¹¹ The project owner adheres with No discrimination policy. But due to the remoteness of site females do not prefer to work here.

¹² As per the order from the Office of the Chief Labour Commissioner, Govt. of India dated 28/10/2021 (File No. 1/26(1)/2021 – LS-II), the wage comparison on the basis of at the employee's skill set is as per the below table:

Category of worker	Rates of wages including V.D.A per day (in Rupees (INR)) as per Indian Wages Law	Project Activity (Average Salary per day in INR)
	Area B	---
Unskilled	560	720
Skilled	743	1,074

Therefore, it is fulfilling the minimum wage requirement as per local/National regulations and the same can be cross checked from salary slips.

Monitoring frequency	Once in a Monitoring period
QA/QC procedures	The number of persons employed are mentioned in the plant register, which can be crossed checked with daily attendance register. Salary slip can be checked for earnings of employees
Purpose of data	Continuation of regular trainings/workshops for employees & O&M staff
Additional comment	-

Relevant SDG Indicator 13.2.1: Climate Action

Data / Parameter	Air Quality								
Unit	tCO ₂ e								
Description	Reduction in CO ₂ e emission reduction due to implementation of project activity								
Source of data	Calculated as per "Tool to calculate the emission factor for an electricity system,". The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 17.0 ¹³ , published by the Central Electricity Authority, Ministry of Power, Government of India.								
Value(s) applied	529,270 tCO ₂ e emission reductions estimated per annum <table border="1"> <thead> <tr> <th>Vintage</th><th>Emission Reduction (tCO₂e)</th></tr> </thead> <tbody> <tr> <td>14/10/2021 to 31/12/2021</td><td>70,375</td></tr> <tr> <td>01/01/2022 to 31/12/2022</td><td>458,895</td></tr> <tr> <td>Total</td><td>529,270</td></tr> </tbody> </table>	Vintage	Emission Reduction (tCO ₂ e)	14/10/2021 to 31/12/2021	70,375	01/01/2022 to 31/12/2022	458,895	Total	529,270
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14/10/2021 to 31/12/2021	70,375								
01/01/2022 to 31/12/2022	458,895								
Total	529,270								
Measurement methods and procedures	Calculated from CEA database and Energy Generation								
Monitoring frequency	Calibration and Testing of Meters will be done by the accredited agency as per norms. Once in 5 years as per CEA guidelines ¹⁴								

¹³ https://cea.nic.in/wp-content/uploads/tpe_cc/2022/02/User_Guide_ver_17_2021.pdf

¹⁴ https://cea.nic.in/wp-content/uploads/2020/04/review_regulation.pdf

QA/QC procedures	A check meter is also installed near to the export meter to cross check the electricity exported to the grid. The check meter reading would also be used in case of failure of export meter
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be archived for crediting period+2 years

D.3. Comparison of monitored parameters with last monitoring period

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
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NA

NA

As per monitoring template guidelines, this section is not applicable for non- Community Service Activities, hence not applicable.

D.4. Implementation of sampling plan

Not Applicable.

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

SDG 7 & 13: -

Baseline emissions include only tCO₂e emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid- connected power plants and the addition of new grid-connected power plants. As per para 39 of ACM0002 version 20 the baseline emissions are to be calculated as follows:

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

Where,

BE_y - Baseline emissions in year y, (tCO₂e/yr)

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

EF_{grid,CM,y} - Combined margin CO₂ emission factor for grid connected power generation in year y

Calculation of EG_{PJ,y}

The calculation of EG_{PJ,y} is different for

- a) Greenfield plants,
- b) Retrofits and replacements, and
- c) Capacity additions

The project activity is the installation of solar projects, and it is a green field project. So the formula in option (a) i.e., greenfield plants is used to calculate the value of EG_{PJ,y}. In accordance with para 41 of the applied methodology:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

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

EG_{facility,y} = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr).

Therefore,

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

$$BE_y = 75,632.00 \text{ (MWh)} * 0.9305 \text{ (tCO}_2\text{/MWh)} + 493,171.20 \text{ (MWh)} * 0.9305 \text{ (tCO}_2\text{/MWh)}$$

$$BE_y = 70,375 \text{ tCO}_2\text{e (Rounded down)} + 458,895 \text{ tCO}_2\text{e (Rounded down)}$$

$$BE_y = 529,270 \text{ tCO}_2\text{e}$$

SDG 8: -

Employment opportunities created for 40 persons in total and 69 trainings were conducted during the current monitoring period. The income generation in the current monitoring period is INR 35,766,665.

E.2. Calculation of project value or estimation of project situation of each SDG Impact

SDG 7:

The monitoring parameter for the SDG 7 is Quantity of net electricity supplied to the grid during the year y. In the project situation, the project supplied 568,803.20 MWh electricity during the monitoring period. This can be crosschecked from JMR & Invoices.

During Monitoring period - 14/10/2021 to 31/12/2022

Quantity of net electricity supplied to the grid (MWh) = 568,803.20

SDG 8:

The monitoring parameter for the SDG 8 are Number of trainings provided to employees & O&M staff, income generation & Number of O&M staffs involved in the project. During the project scenario, the following is achieved:

During Monitoring period - 14/10/2021 to 31/12/2022

Quality of Employment – 69 training

Quantitative employment and income generation - 40 employees & INR 35,766,665.

These can be crosschecked from the training records, O&M contract & employment records.

SDG 13:

The monitoring parameter for the SDG 13 is Quantity of emission reduction during the year y. In the project situation, the project reduced 529,270 tCO₂e during the current monitoring period. This parameter is calculated.

During Monitoring period - 14/10/2021 to 31/12/2022

Quantity of emission reduction – 529,270 tCO₂e

As per the approved consolidated Methodology ACM0002 (Version 20.0):

“For most renewable energy power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

PE_y - Project emissions in year y (tCO₂e/yr)

$PE_{FF,y}$ - Project emissions from fossil fuel consumption in year y (tCO₂e /yr)

$PE_{GP,y}$ - Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (tCO₂e/yr)

$PE_{HP,y}$ - Project emissions from water reservoirs of hydro power plants in year y (tCO₂e/yr)”

As the project activity is the installation of a new grid-connected Solar power plant/unit and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore $PE_{FF,y}$, $PE_{GP,y}$, $PE_{HP,y}$ is equal to zero and thus, $PE_y = 0$ tCO₂e.

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

E.3. Calculation of leakage

No leakage emissions are applicable thus, $LE_y = 0$ tCO₂e.

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Climate Action (mandatory)	529,270 tCO ₂ e	0	529,270 tCO ₂ e
8	Promote sustained	0	69 Trainings	69 Trainings

	inclusive and sustainable economic growth, full and productive employment and decent work for all.	40 employees INR 35,766,665	40 employees INR 35,766,665
7	Ensure access to affordable, reliable, sustainable and modern energy for all.	568,803.20 MWh	568,803.20 MWh

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ¹⁵ achieved during this monitoring period
7	456,103 MWh/year 544,821.18 MWh for the monitoring period (444 days)	568,803.20 MWh
8	1 Trainings 15 employees	69 Trainings 40 employees INR 35,766,665
13	424,409 tCO ₂ /year 516,267 tCO ₂ for the monitoring period (444 days)	529,270 tCO ₂ e

E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

SDG 7: Affordable and Clean Energy

The annual estimated power generation for the project activity is 456,103 MWh, thus considering number of days covered during current monitoring period to be 444, the

¹⁵ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

estimated power generation is 544,821.18. Whereas, the actual power generation is 568,803.20 MWh.

$$= 456,103 * 444 \text{ (days)} / 365$$

$$= 544,821.18 \text{ MWh}$$

SDG 8: Decent Work and Economic Growth

The project leads to employment opportunities which was not possible in the baseline scenario. The project provides employment to 40 persons. Also, project activity improves the quality of employment by giving training to employee. Thus, 69 number of trainings are conducted by the project activity in the current monitoring period. The income generated in the current monitoring period 35,766,665 INR.

SDG 13: Climate Action

The annual estimated emission reduction for the project activity is 424,409 tCO₂e, thus considering number of days covered during current monitoring period to be 444, the estimated emission reduction contributing towards SDG 13 is 516,267. Whereas the actual emission reduction is 529,270 tCO₂e.

$$= 424,409 * 444 \text{ (days)} / 365$$

$$= 516,267 \text{ tCO}_2\text{e}$$

The below comparison of SDG 7, SDG 8 and SDG 13 for the monitoring period of 14/10/2021 to 31/12/2022 is as per follows:

SDG	Parameter	Annual Average Estimation as per PDD	Estimation for the monitoring period	Actual Achieved during the monitoring period	Difference
7	Renewable electricity generation (MWh)	456,103	554,821.18	568,803.20	2.52%
8	Number of Trainings Conducted	1	NA	69	NA
	Income generation (INR)	NA	NA	35,766,665	NA
	Number of Employment	15	15	40	166.67%
13	Emission Reduction (tCO ₂ e)	424,409	516,267	529,270	2.52%

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

The emission reductions as per the registered PDD for the current monitoring period is estimated to be 516,267 tCO₂e whereas during the current monitoring period the emission reductions claimed are 529,267 tCO₂e, which is approximately 2.52% higher than the estimated emission reductions for the same monitoring period. The increase in actual emission reductions is justified, since during the current monitoring period, the plant has higher number of sunshine hours. The generation is subject to climate conditions which are beyond the control of the Project Proponent. The current monitoring period is 14/10/2021 till 31/12/2022. Some of the months involved in this monitoring period are higher sunshine. The net electricity generated is high due to the higher number of sunshine hours which is beyond the control of the project participant. Hence the actual emission reductions are 2.52% higher as compared to the estimated emission reductions and even the generation is higher, the IRR is not breaching the benchmark value just because the variation in PLF is already covered in sensitivity (+10%, -10%). Therefore, the higher actual generation is not impacting on additionality of the project and project is still additional.

SECTION F. SAFEGUARDS REPORTING

Safeguarding principle 2 Gender Equality

Data/parameter	Gender Equality
Source of data	Employment data
Measurement methods and procedures	The project proponent is committed to the employee's equal pay for equal work during all phases of the project
Monitoring frequency	Once in monitoring period
Additional comments	-

Safeguarding principle 6.1 Labor Rights

Data/parameter	Labor Rights
Source of data	Employment data and training records
Measurement methods and procedures	The Project Developer ensures the training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.
Monitoring frequency	Once in monitoring period
Additional comments	-

Safeguarding principle 9.5 Hazardous and Non- Hazardous waste

Data/parameter	Hazardous and Non- Hazardous waste
Source of data	Interview with maintenance staff
Measurement methods and procedures	The waste is disposed to the waste handlers and the firm will comply with all the local laws for monitoring and disposal.
Monitoring frequency	Once in monitoring period
Additional comments	-

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

As a part of continuous feedback from stakeholders, the grievances register is placed at site and is being continuously monitored and addressed through the grievances cell on regular basis and maintained in a register at site office. A copy of the grievance Register has been provided separately. There has been no grievance received during the current monitoring period.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

There has been no stakeholder mitigation that were agreed to be monitored in this verification period.

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

No, there has been no legal contest that has arisen with the project during the monitoring period.

Appendix I- Details of meters

The total capacity of the project activity is 200 MW. Project site has installed three meters one main meter, one check meter and one stand by meter and the meters are located at 220 KV GSS Gajner.

Details	Main meter	Check meter	Standby meter
Make	SECURE	SECURE	SECURE
Serial Number	RJB98241	RJB98242	RJB98240
Accuracy class	0.2s	0.2s	0.2s
Location of meters	220kv GSS Gajner (GSS END)	220kv GSS Gajner (GSS END)	220kv GSS Gajner (Plant END)
Calibration frequency as per PD	Once in 5 years	Once in 5 years	Once in 5 years
Installation date	06/10/2021	06/10/2021	06/10/2021
Calibration date	05/11/2022	05/11/2022	05/11/2022
Calibration validity	04/11/2027 ¹⁶	04/11/2027	04/11/2027

¹⁶ As per registered PDD & CEA guideline the calibration frequency is once in 5 years however DISCOM is carrying out calibration once in a year which is not under the control of PP.

Appendix II- Maintenance and downtime details

Date	D/d Description	Start time	Stop time	Total down time Hrs.
20/10/2021	Grid BD from GSS	11:38	11:52	0:14
28/10/2021	Grid BD from GSS	12:28	13:32	1:04
12/11/2021	Grid BD from GSS	14:43	16:30	1:47
22/11/2021	Grid BD from GSS	13:09	13:45	0:36
08/12/2021	Grid BD from GSS	8:26	9:33	1:07
24/12/2021	Grid BD from GSS	10:43	11:58	1:15
10/01/2022	Grid BD from GSS	13:02	14:51	1:49
25/01/2022	Grid BD from GSS	11:35	12:55	1:20
06/02/2022	Grid BD from GSS	16:55	17:52	0:57
15/02/2022	Grid BD from GSS	13:11	13:51	0:40
23/02/2022	Grid BD from GSS	12:21	12:53	0:32
24/03/2022	Grid BD from GSS	11:42	12:02	0:20
03/04/2022	Grid BD from GSS	16:02	16:29	0:27
04/05/2022	Grid BD from GSS	12:57	13:19	0:22
07/06/2022	Grid BD from GSS	8:37	15:41	7:04
14/07/2022	Grid BD from GSS	9:21	9:57	0:36
11/08/2022	Grid BD from GSS	15:45	15:58	0:13
24/08/2022	Grid BD from GSS	12:36	12:49	0:13
26/09/2022	Grid BD from GSS	12:25	13:15	0:50
27/10/2022	Grid BD from GSS	11:27	11:40	0:13
10/11/2022	Grid BD from GSS	7:12	7:32	0:20
19/11/2022	Grid BD from GSS	8:01	8:49	0:48
20/12/2022	Grid BD from GSS	10:34	10:47	0:13
Total				23:00

Therefore, the total maintenance and downtime for the current MP is 23:00 hrs. which is 0.22% of the monitoring period hours.

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption