

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

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

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Key Project Information

GS ID (s) of Project (s)	GS7572 ¹
Title of the project (s) covered by monitoring report	120 MW Solar PV Plant by Juniper Green Sigma Private Ltd. in Gujarat
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	16/08/2023
Date of project design certification	09/11/2020
Date of Last Annual Report	14/12/2022
Monitoring period number	04
Duration of this monitoring period	01/07/2022 to 31/12/2022 (Inclusive of both the dates)
Project Representative	Infinite Environmental Solutions LLP ²
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 ³
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label

¹ <https://registry.goldstandard.org/projects/details/2153>

² As per new cover letter, the registry is changed from Infinite Environmental Solutions llp (Project representative) to Juniper (Project investor) and as per new cover letter Infinite Environmental Solutions LLP is project representative.

³ https://cdm.unfccc.int/filestorage/A/G/0/AG07ZJQ3EXD42LT5YV9HR16M8KINPO/EB105_repan03_ACM0002.pdf?t=Y2p8cnF2cndifDA6h-sPdvI6KmIwlbrPqvHh

☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 7	Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable and modern energy for all	136,165	MWh
SDG 8	Decent Work and Economic Growth: Promote inclusive and sustainable economic growth, employment and decent work for all	21 Trainings 21 employees (2 employees hired in current MP) INR (12,969,917+516,750) 13,486,667	No of Training No of Employees INR
SDG 13	Take urgent action to combat climate change and its impact	128,253	tCO ₂ (VERs)

Table 2 – Product Vintages

		Amount Achieved		
Start Dates	End Dates	SDG 7 Affordable and Clean Energy	SDG 8 Decent Work and Economic Growth	SDG 13 Climate Action (VERs)
01/07/2022	31/12/2022	136,165 MWh	21 Trainings 21 Employed 13,486,667 INR	128,253 tCO ₂ e

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

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The main purpose of the project activity is to generate electrical energy through sustainable means using solar power resources, the generated green electricity contributes to climate change mitigation efforts. This project activity is a large-scale solar project. Juniper Green Sigma Private Limited is the project investors for this project activity. The project replaces anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 275,305 tCO₂e per annum, thereon displacing 298,072 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. The actual emissions reductions during current monitoring period are achieved as 128,253 tCO₂ thereon displacing 136,165 MWh amount electricity. The project activity is the installation of a new grid-connected renewable power plant/unit and this is not a CPA that has been excluded from a registered CDM PoA as a result of erroneous inclusion of CPAs. The details of the project are mentioned in the table:

Project Investors' Name	Capacity in MW	State
Juniper Green Sigma Private Limited	120 MW	Gujarat

Project activity is being implemented by Juniper Green Sigma Private Limited and represented by Infinite Solutions. 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).

A.2. Location of project

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The proposed project activity is located at Sabarkantha, Banaskantha and Aravali district in Gujarat. The geographical coordinates of the project site have been provided below:

S.No.	Location	Latitude	Longitude
1	Village Babsar, Tal-Vadali, Dist.- Sabarkantha	23°58'35.8"N	72°54'41.8"E
2	Village-Bhordu,TalTharad, Dist.- Banaskantha	23°58'25.0"N	72°54'43.5"E
3	Village Bilvaniya, Vantda Suka, Tal- Dhansura, Dist.-Aravali	23°58'15.5"N	72°54'40.0"E



Figure 1 Map showing location of Project

A.3. Reference of applied methodology

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Title: Large Scale Consolidated Methodology to describe baseline and monitoring methodology for ACM0002 "Grid-connected electricity generation from renewable sources"

References: Approved Large-Scale Consolidated Methodology: ACM0002 "Grid-connected electricity generation from renewable sources" (Version 20)⁴

Tools:

Tool for the demonstration and assessment of additionality (Tool 1)- Version 7.0⁵

Tool to calculate the emission factor for an electricity system (Tool 7)- Version 7.0⁶

A.4. Crediting period of project

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Type of crediting period: Renewable

Start date of crediting period: 17/10/2020

End date of crediting period: 16/10/2025

Length of crediting period: 5 years

Monitoring period: 01/07/2022 – 31/12/2022 (both dates included)

Length of the monitoring period: 184 days

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

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The project activity involves installation of 120 MW grid connected solar photovoltaic power plant. The start date of the project activity is 04/03/2020, i.e., the date of the earliest Purchase Order and 25MW, Bilvaniya, Vantda Suka, Tal-Dhansura, Dist.-Aravali site Commissioned earlier on 17/10/2020, therefore 17/10/2020 is commercial operation date. The PV system mainly consists of PV modules, module mounting structures, inverters, regulators, monitoring devices etc. Electrical Characteristics are as below:

- 3-phase alternating current

⁴https://cdm.unfccc.int/filestorage/A/G/0/AG07ZJQ3EXD42LT5YV9HR16M8KINPO/EB105_repan03_ACM0002.pdf?t=Y2p8cnF2cndifDA6h-sPdvI6KmIwlbrPqvHh

⁵ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

⁶ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.0.pdf>

- Nominal frequency is 50 Hz
- Final Voltage at Delivery Point is 400/220/132/66kV.

The project activity is expected to operate at a plant load factor of 28.36% exporting 298,072 MWh of electrical energy to the INDIAN grid, throughout its entire life span of 25 years. This results in average annual reduction of 275,305 tCO₂ per annum from the project activity. The project activity does not involve any technology transfer.

The commissioning dates for the project activity is given below:

S.No.	Organization name	Location	Capacity (AC)	Date of Commissioning
1	Juniper Green Sigma Private Limited	Village Bilvaniya, Vantda Suka, Tal-Dhansura, Dist.- Aravali	25 MW	17/10/2020
2		Village Babsar, Tal-Vadali, Dist.-Sabarkantha	25 MW	19/10/2020
3			10 MW	28/11/2020
4		Village Bilvaniya, Vantda Suka, Tal-Dhansura, Dist.- Aravali	20 MW	28/11/2020
5		Village-Bhordu, Tal-Tharad, Dist.- Banaskantha	25 MW	09/12/2020
6			15 MW	17/12/2020

The technical specifications are given below:

Capacity	25 MW (AC) / 36.247 MW (DC)
SPV Modules – Type/make	Monocrystalline / Trina Solar
No. of Photovoltaic Modules / Rating	72492 / 405 Wp, 16800 / 410 Wp
Inverters – Type/make	String/Sungrow
No. of Inverter / Rating	125 /200 KW
ABT Meter – Make / Serial No.	Secure / GJ-4608 - A
Name of Substation	66 kV GETCO Substation, Khadol

Capacity	25 MW (AC) / 36.41 MW (DC)
SPV Modules – Type/make	Monocrystalline / JA Solar & Trina Solar

No. of Photovoltaic Modules / Rating	52192 / 405 Wp, 19656 / 410 Wp & 3640 / 405 Wp, 14000 / 410 Wp
Inverters – Type/make	String/Sungrow
No. of Inverter / Rating	125 /200 KW
ABT Meter – Make / Serial No.	Secure / GJ-4585 - A
Name of Substation	66 kV GETCO Substation, Babsar

Capacity	10 MW (AC) / 14.696 MW (DC)
SPV Modules – Type/make	Mono PERC / JA Solar & Trina Solar
No. of Photovoltaic Modules / Rating	36288 / 405 Wp
Inverters – Type/make	String/ Sungrow
No. of Inverter / Rating	50 /200 KW
ABT Meter – Make / Serial No.	Secure / GJ-4585 - A
Name of Substation	66 kV GETCO Substation, Babsar

Capacity	20 MW (AC) / 29.459 MW (DC)
SPV Modules – Type/make	Mono PERC / Trina Solar
No. of Photovoltaic Modules / Rating	50064 / 405 Wp, 22400 / 410 Wp
Inverters – Type/make	String/ Sungrow
No. of Inverter / Rating	100 /200 KW
ABT Meter – Make / Serial No.	Secure / GJ-4608 - A
Name of Substation	66 kV GETCO Substation, Khadol

Capacity	25 MW (AC) / 36.541 MW (DC)
SPV Modules – Type/make	Mono PERC / JA Solar
No. of Photovoltaic Modules / Rating	71092 / 405 Wp, 18900 / 410 Wp
Inverters – Type/make	String/ Sungrow
No. of Inverter / Rating	125 /200 KW
ABT Meter – Make / Serial No.	Secure / GJ-4605 - A
Name of Substation	66 kV GETCO Substation, Bhordu

Capacity	15 MW (AC) / 21.86 MW (DC)
SPV Modules – Type/make	Mono PERC / JA Solar

No. of Photovoltaic Modules / Rating	36260 / 405 Wp, 17500 / 410 Wp
Inverters – Type/make	String/ Sungrow
No. of Inverter / Rating	75 /200 KW
ABT Meter – Make / Serial No.	Secure / GJ-4605 - A
Name of Substation	66 kV GETCO Substation, Bhordu

B.1.1 Forward Action Requests

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In previous performance review one FAR was raised.

FAR#1: 'All stakeholders invited to participate in the first consultation should be invited to the Stakeholder Feedback Round.' This requirement is not met during stakeholder feedback round. VVB shall interview local villagers, panchayat members and landowners in next verification and check whether there are any feedback/comments on the project activity.

Rectification: Remote audit conducted by PP on 21/11/2022, during remote audit VVB team has interviewed the panchayat member of all districts and local villagers resides near the project location. VVB verified that, during interview no negative comment/feedback received regarding the project activity.

B.2. Post-Design Certification changes

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Not Applicable

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

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There are no deviations/delays regarding the implementation status from registered PDD, Monitoring & Reporting Plan, applied methodology or applied standardized baseline.

B.2.2. Corrections

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B.2.3. Changes to start date of crediting period

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Not Applicable

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

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Monitoring plan is already included, in the registered PDD. No change from registered monitoring plan, applied methodology or applied standardized baseline.

B.2.5. Changes to project design of approved project

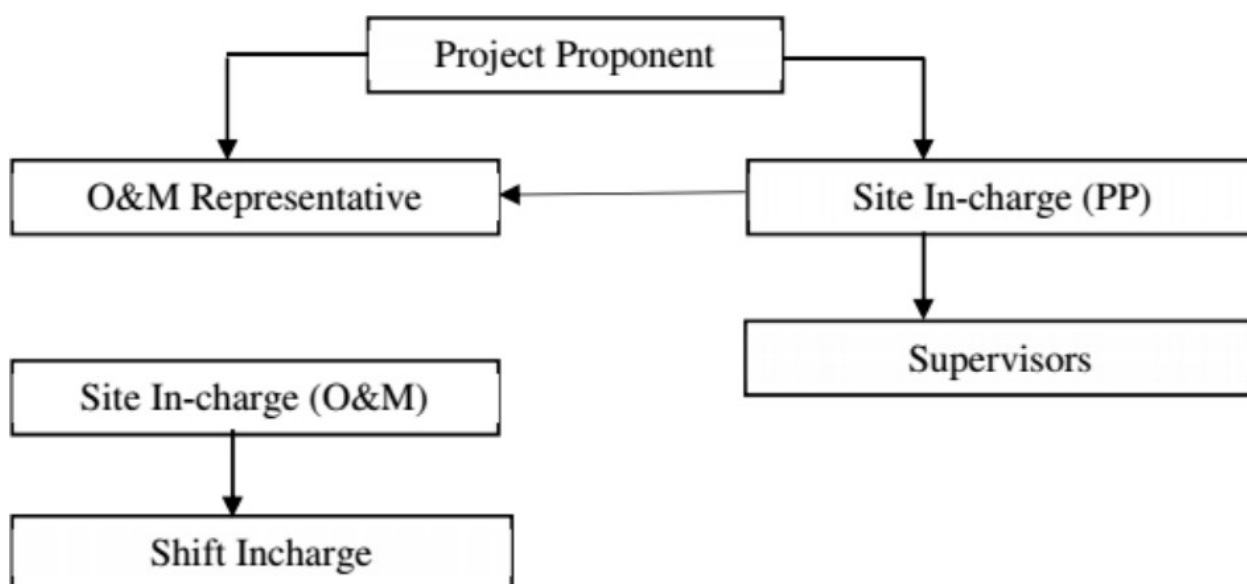
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Not Applicable

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

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The monitoring plan is developed in accordance with the modalities and procedures for CDM project activities and is proposed for grid-connected solar power projects being implemented in Rajasthan, India. The monitoring plan, describes about the monitoring organization, 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 participants. The team comprises of the following members:



Responsibilities of Site Incharge (PP): Overall functioning and maintenance of the project activity, the Site incharge coordinates with the O&M operator as well as the site supervisors.

Responsibilities of O&M Representative: Co-ordination between Site in-charge of the O&M operator as well as the project participant and further report to PP 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 is archived electronically for a period of two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

Data Measurement: The export and import energy will be measured continuously using above mentioned Main & Check meters installed at Sub-station. Export & Import readings of Main & Check meters shall be taken on monthly basis by authorized officer of SEB in the presence of PP or representative of PP. The meter reading will be taken jointly and signed by the representatives of the SEB and PP or representative of PP. Based on the readings, invoices/ monthly bills will be raised by PP or representative of PP. These invoices/ monthly bills can be used for cross checking the meter readings taken for the respective project activity.

It is to be noted though Project owner or their representatives are available during meter reading, the calculations of net electricity supplied to grid is completely under purview of SEB/Discom officer and Project owner do not have any control on it. Also, accuracy class of meters and calibration frequency is under purview of SEB/Discom officer and Project owner do not have any control on it. Project owner 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 & check meter will be collected under the supervision of the O & M Team or authorized representatives of PP. The net electricity supplied to grid would be calculated based on export & import readings. Export and Import data would be recorded and stored in electronic&/or Paper. The records are checked periodically by the Head (Operations) and discussed thoroughly with the O & M Team. The period of storage of the monitored data will be 2 years after the end of crediting period or till the last issuance of CERs 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:

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

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 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 unlikely event of failure of both Main meter & Check meter installed at sub-station, where both the faulty meters are required to repair or replaced simultaneously, the meters are replaced immediately by the spare meter kept available at the site.

Personnel training: In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the staff (CDM team) will be trained. The plant helpers will be trained in equipment operation, data recording, reports writing, operation and maintenance and emergency procedures in compliance with the monitoring plan.

Following training sessions have been provided in this monitoring period:

1. Training on electrical safety
2. Training on material handling
3. O&M training
4. Road Safety training

SECTION D. DATA AND PARAMETERS

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

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

Data/parameter	$EF_{grid,OM,y}$
Unit	tCO _{2e} /MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 15
Value(s) applied	0.9622
Choice of data or Measurement methods and procedures	The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 15.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	The data is used to calculate baseline emission reductions
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Data/parameter	$EF_{grid,BM,y}$
Unit	tCO _{2e} /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 15.0
Value(s) applied	0.8811
Choice of data or Measurement methods and procedures	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 15.0, published by the Central Electricity Authority, Ministry of Power, and Government of India.

Purpose of data	The data is used to calculate baseline emission reductions
Additional comment	This parameter is fixed ex-ante for the entire crediting period.

Data/parameter	$EF_{grid,CM,y}$
Unit	tCO ₂ e/MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 15
Value(s) applied	0.9419
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system", The data is obtained from "CO ₂ Baseline Database for Indian Power Sector" version 15.0, published by the Central Electricity Authority, 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.

D.2 Data and parameters monitored

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Relevant SDG Indicator 7.2: Affordable and Clean Energy

Data / Parameter	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity supplied by the project plant/unit to the grid in year y (MWh)
Measured/calculated/default	Method: 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 SEB as per below equation: $EG_{facility,y} = EG_{Export} - EG_{Import}$
Source of data	Statement of net export of power to the grid at the plant site
Value(s) of monitoring parameter	136,165 MWh Vintage date: (01/07/2022 to 31/12/2022)

Monitoring equipment	Energy Meters are used for monitoring. Refer Appendix 1 for Calibration details.
Measuring/reading / recording frequency:	Monthly
Calculation method (if applicable)	The net energy exported to the grid is measured every month using calibrated energy meter by the State Electricity Board authorities in the presence of the project implementer. The meter/s are jointly inspected and sealed by authorized representatives of the company and the state utility. Measuring procedure: Measured by an export-import energy meter. The net electricity exported by the project plant is calculated by deducting the amount of imported electricity from the total amount of exported electricity. Accuracy class of energy meter: 0.2S Entity responsible: JGSPL
QA/QC procedures	The meters are calibrated once in every 3 years by an independent testing laboratory. Calibration records are maintained at the plant. Data is cross-verified against sold electricity figure in the joint meter reading statement issued by the Gujarat Urja Vikas Nigam Limited (GUVNL). It is to be noted that the meter in question is in control and supervision of GUVNL and are calibrated only as and when GUVNL so desires. The metering system comprises of main and check meter. In the event that the main metering system is not in service due to maintenance, repair or testing, the reading is obtained from the check meter.
Purpose of data	The Data/Parameter is required to calculate the baseline emission
Additional comment	Data is 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, - 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 requirements. Annual records of income paid to all the employees would be available. Total 21 employees Skilled – 21 (Permanent) Unskilled - 0 (temporary)
Measured/calculated/default	Measured
Source of data	- Training Records (HSE & HR) - Salary Slip of the project employees.
Value(s) of monitored parameter	Training Provided – 21 (please find below tables, training details project site wise). No. of employees – 21 (19 Old employees and 2 new hiring done in current MP). Bifurcation based on skills: Skilled – 21 (permanent) Unskilled - 0 (temporary) Bifurcation based on gender: Male – 21 Female – 0 Employee Income – 13,486,667 INR
Monitoring equipment	- Training Attendance sheets and records. - Employment Records - Salary slips of the employees
Measuring/reading / recording frequency:	Once in a Monitoring period
Calculation method (if applicable)	- Training Attendance sheets. - Employee Records - Salary slips of the employees
QA/QC procedures	The number of persons employed would be 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

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Trainings-

Khadol site: -

S.No	Date	Topic of training	No. of Attendees
1	27/07/2022	Electrical Safety Training	6
2	07/09/2022	Electrical safety, LOTOTO, Fire & Emergency Preparedness	5
3	09/11/2022	Fire Safety Training	5
4	30/11/2022	5S Training	4
5	14/12/2022	ERT Training	4
6	16/12/2022	Training given on L.I.F.E (Lifestyle for the Environment)	3
7	29/12/2022	PTW (Permit To Work) Training	4

Babsar site: -

S.No	Date	Topic of training	No. of Attendees
1	24/08/2022	Electrical Safety Training	5
2	08/09/2022	Electrical safety, LOTOTO, Fire & Emergency Preparedness	5
3	24/11/2022	Fire Safety Training	4
4	01/12/2022	HIV / AIDS Awareness	4
5	03/12/2022	5S Training	5
6	14/12/2022	ERT Training	2
7	16/12/2022	Training given on L.I.F.E (Lifestyle for the Environment)	4

Bhordu site: -

S.No	Date	Topic of training	No. of Attendees
1	19/07/2022	Electrical Safety Training	6
2	09/9/2022	Electrical safety, LOTOTO, Fire & Emergency Preparedness	7

3	25/09/2022	Fire Safety Training	5
4	02/12/2022	HIV / AIDS Awareness	4
5	14/12/2022	ERT Training	1
6	16/12/2022	Training given on L.I.F.E (Lifestyle for the Environment)	4
7	05/12/2022	PTW (Permit To Work) Training	5

Relevant SDG Indicator 13.2.1: Climate Action

Data / Parameter	Air Quality
Unit	tCO ₂ e
Description	Reduction in CO ₂ emission reduction due to implementation of project activity
Measured/calculated/default	calculated
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 15.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) of monitored parameter	128,253 tCO ₂ e Vintage date: (01/07/2022 to 31/12/2022)
Monitoring equipment	Not Applicable
Measuring/reading / recording frequency:	The meters are calibrated once in every 3 years by an independent testing laboratory.
Calculation method (if applicable)	Calculated from CEA database and Energy Generation
QA/QC procedures	Calibration records are maintained at the plant. Data is cross verified against sold electricity figure in the joint meter reading statement issued by the Gujarat Urja Vikas Nigam Limited (GUVNL). It is to be noted that the meters in question are in control and supervision of GUVNL and are calibrated only as and when GUVNL so desires. The metering system comprises of main and check meter. In the event that the main metering system is not in service due to maintenance, repair or testing, the reading is obtained from the check meter.
Purpose of data	Calculation of baseline emissions
Additional comment	The data will be archived for crediting period+2 years

Relevant SDG Indicator 4.3.5: Hazardous and Non- hazardous waste

Data / Parameter	Safeguarding principle 4.3.5: Hazardous and Non-hazardous Waste
Unit	-
Description	The manufacture, trade, release, and use of hazardous and non- hazardous chemicals and/or materials
Measured/calculated/default	Measured
Source of data	Plant Records
Value(s) applied	0 (This project activity is a solar project activity. Hence there had been no generation of 'Hazardous and Non-hazardous Waste' throughout the monitoring period)
Monitoring equipment	-
Measuring/reading / recording frequency:	Once in a monitoring period
Calculation method (if applicable)	-
QA/QC procedures	The waste will be disposed to the waste handlers and the firm will comply with all the local laws for monitoring and disposal.
Purpose of data	Analysis of safeguarding principle
Additional comment	-

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

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

D.4. Implementation of sampling plan

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No sampling process is involved, hence not applicable.

SECTION E. CALCULATION OF SDG IMPACTS

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

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SDG 7 & 13: -

Baseline emissions include only CO₂ 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. The baseline emissions are to be calculated as follows:

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

Where,

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

$EGPJ,y$ = 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)

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

Calculation of $EGPJ,y$

The calculation of $EGPJ,y$ 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 $EGPJ,y$. In accordance with para 44 of the applied methodology:

Where:

$EGPJ,y$ = 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).

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

$$BE_y = 136,165 * 0.9419$$

$$BE_y = 128,253 \text{ tCO}_2\text{e (Rounded down)}$$

SDG 8: -

Employment opportunities were created for 21 persons in total and 21 trainings were conducted during the current monitoring period

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

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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 136,165 MWh electricity during the monitoring period. This can be crosschecked from JMR & Invoices.

During Monitoring period - 01/07/2022 to 31/12/2022

Quantity of net electricity supplied to the grid (MWh) = 136,165

SDG 8:

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

During Monitoring period - 01/07/2022 to 31/12/2022

Quality of Employment – 21 trainings

Quantitative employment and income generation - 2 employees & 516,750 INR

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

SDG 13:

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 (t CO₂e/yr)

$PE_{FF,y}$ - Project emissions from fossil fuel consumption in year y (t CO₂/yr)

$PE_{GP,y}$ - Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO₂e/yr)

$PE_{HP,y}$ - Project emissions from water reservoirs of hydro power plants in year y (t CO₂e/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, $PE_y = 0$.

E.3. Calculation of leakage

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No leakage emissions are considered in the project activity. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g., extraction, processing, and transport). Since the emissions sources are small, it is neglected, thus, $LE_y = 0$.

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

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
7	Affordable and Clean Energy (MWh)	0	136,165	136,165
8	Decent Work and Economic Growth	0	21 Trainings (19+2) employees (12,969,917+516,750) 13,486,667 INR	21 Trainings 21 employees 13,486,667 INR
13	Climate Action (mandatory) (tCO ₂)	128,253	0	128,253

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 ⁷ achieved during this monitoring period
7	150,261 MWh	136,165 MWh
8	1 Trainings 8 employees	21 Trainings 21 employees 13,486,667 INR
13	138,783 tCO ₂	128,253 tCO ₂

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 298,072 MWh, thus considering number of days covered during current monitoring period to be 184, the estimated power generation is 150,261 MWh.

Whereas, the annual estimated emission reduction for the project activity is 275,305 tCO₂e, thus considering number of days covered during present monitoring period to be 184, the estimated emission reduction contributing towards SDG 13 is 138,783 tCO₂e.

$$= 275,305 * 184 \text{ (days)} / 365$$

$$= 138,783 \text{ tCO}_2\text{e (Round down)}$$

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 21 persons. Also, project activity

⁷ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

improves the quality of employment by giving training to employee. Thus, 21 trainings are conducted by the project activity.

SDG 13: Climate Action

The annual estimated emission reduction for the project activity is 275,305 tCO₂e, thus considering number of days covered during the current monitoring period to be 184, the actual emission reduction contributing towards SDG 13 is 128,253 tCO₂e.

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 138,783 tCO₂e whereas during the current monitoring period the emission reductions claimed are 128,253 tCO₂e, which is approximately 8% lower than the estimated emission reductions for the same monitoring period. The reductions in actual emission reduction are justified, the generation is subject to climate conditions which are beyond the control of the Project Proponent. The current monitoring period is 01/07/2022 till 31/12/2022. Most of the months involved in this monitoring period are low yield months. Moreover, the difference is due to the variation in the Solar radiation's availability during the current monitoring period, which is a natural uncontrolled phenomenon and may vary. Hence the actual emission reductions are 8% lower as compared to the estimated emission reductions.

SECTION F. SAFEGUARDS REPORTING

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As per the safeguarding Principles Assessment in Section D.1. of the GS4GG PDD, there is one safeguarding principle (4.3.5: Hazardous and Non-hazardous Waste) which is included in the monitoring plan (Refer section D.2 above). Also, there are no any impact (positive/negative/slightly) for any mitigation measures, being applicable to any of the safeguarding principles.

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.

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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

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

Appendix – 1 Meter Details

For 35 MW solar plant connected to Babsar Substation:

S.No.	Meter Number	Type	Make	Accuracy class	Date of calibration	Due date
1	GJ4583A	Main meter	Secure	0.2s	26/06/2020	25/06/2023
2	GJ4584A	Check meter	Secure	0.2s	26/06/2020	25/06/2023
2	GJ4585A	Standby meter	Secure	0.2s	26/06/2020	25/06/2023

For 40 MW solar plant connected to Bhordu Substation:

S.No.	Meter Number	Type	Make	Accuracy class	Date of calibration	Due date
1	GJ4603A	Main meter	Secure	0.2s	21/07/2020	20/07/2023
2	GJ4604A	Check meter	Secure	0.2s	21/07/2020	20/07/2023
2	GJ4605A	Standby meter	Secure	0.2s	21/07/2020	20/07/2023

For 45 MW solar plant connected to Khadol Substation:

S.No.	Meter Number	Type	Make	Accuracy class	Date of calibration	Due date
1	GJ4606A	Main meter	Secure	0.2s	18/08/2020	17/08/2023
2	GJ4607A	Check meter	Secure	0.2s	18/08/2020	17/08/2023
2	GJ4608A	Standby meter	Secure	0.2s	18/08/2020	17/08/2023

APPENDIX 2: Breakdown details

Babsar substation:

Date	Breakdown Description	Break Down Start time	Break Down Stop time	Total Break Down [HH:MM]
04/07/2022	Grid BD from GSS	12:29	12:37	0:08
04/07/2022	Grid BD from GSS	12:47	13:01	0:14
07/07/2022	Grid BD from GSS	11:18	11:29	0:11
16/07/2022	Grid BD from GSS	12:07	12:19	0:12
18/07/2022	Grid BD from GSS	14:08	14:40	0:32
05/08/2022	Grid BD from GSS	8:17	8:31	0:14
16/08/2022	Grid BD from GSS	13:53	14:13	0:20
19/08/2022	Grid BD from GSS	6:30	7:25	0:55
17/10/2022	Grid BD from GSS	13:01	13:38	0:37
26/11/2022	Grid BD from GSS	7:16	10:28	3:12
10/12/2022	Grid BD from GSS	8:24	17:11	8:47

Bhordu substation:

Date	Breakdown Description	Break Down Start time	Break Down Stop time	Total Break Down [HH:MM]
02/07/2022	Grid BD from GSS	6:00	6:40	0:40
03/07/2022	Grid BD from GSS	6:00	6:45	0:45
04/07/2022	Grid BD from GSS	6:05	6:25	0:20
05/07/2022	Grid BD from GSS	6:07	7:07	1:00
06/07/2022	Grid BD from GSS	12:03	12:36	0:33
06/07/2022	Grid BD from GSS	12:44	12:58	0:14
15/07/2022	Grid BD from GSS	14:14	14:27	0:13
19/07/2022	Grid BD from GSS	13:34	13:53	0:19
31/07/2022	Grid BD from GSS	15:26	15:40	0:14
04/08/2022	Grid BD from GSS	12:58	13:30	0:32
06/08/2022	Grid BD from GSS	16:31	17:12	0:41
08/08/2022	Grid BD from GSS	14:45	15:53	1:08
11/08/2022	Grid BD from GSS	12:03	12:20	0:17
19/08/2022	Grid BD from GSS	8:20	9:25	1:05
27/08/2022	Grid BD from GSS	9:46	10:26	0:40
28/08/2022	Grid BD from GSS	6:27	7:19	0:52
03/09/2022	Grid BD from GSS	14:01	14:28	0:27
09/09/2022	Grid BD from GSS	10:26	10:41	0:15
11/09/2022	Grid BD from GSS	6:30	7:05	0:35
12/09/2022	Grid BD from GSS	6:35	7:05	0:30
12/09/2022	Grid BD from GSS	11:56	12:20	0:24
18/09/2022	Grid BD from GSS	11:18	11:36	0:18
19/09/2022	Grid BD from GSS	8:20	16:00	7:40

Khadol substation:

Date	Breakdown Description	Break Down Start time	Break Down Stop time	Total Break Down [HH:MM]
16/08/2022	Grid BD from GSS	10:25	10:54	0:29
17/08/2022	Grid BD from GSS	10:04	10:50	0:46
26/08/2022	Grid BD from GSS	9:32	10:00	0:28
07/10/2022	Grid BD from GSS	9:49	10:03	0:14
07/10/2022	Grid BD from GSS	10:11	10:22	0:11
07/10/2022	Grid BD from GSS	10:33	10:46	0:13
19/10/2022	Grid BD from GSS	12:47	13:10	0:23
01/12/2022	Grid BD from GSS	9:52	10:39	0:47
20/12/2022	Grid BD from GSS	7:20	12:00	4:40
21/12/2022	Grid BD from GSS	10:25	11:15	0:50
28/12/2022	Grid BD from GSS	7:13	9:31	2:18

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