

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

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KEY PROJECT INFORMATION

Key Project Information

GS ID (s) of Project (s)	GS7627 ¹
Title of the project (s) covered by monitoring report	150 MW Solar PV Plant by Juniper Green Field Pvt. Ltd. in Maharashtra
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	07
Version number of the monitoring report	04
Completion date of the monitoring report	16/12/2024
Date of project design certification	20/07/2022
Date of Last Annual Report	07/12/2023
Monitoring period number	3 rd
Duration of this monitoring period	01/01/2024 to 30/06/2024 (Inclusive of both the dates)
Project Representative	Infinite Environmental 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 ²
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

¹ <https://registry.goldstandard.org/projects/details/2316>

² <https://cdm.unfccc.int/UserManagement/FileStorage/AG07ZJQ3EXD42LT5YV9HR16M8KINPO>

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 7: Affordable and Clean Energy	MWh of renewable energy generated	183,045.30	MWh
SDG 8: Decent Work Trainings and Economic Growth	Employees	48 Trainings ³	No of Trainings
	Income generation	24 ⁴ employees	No of Employees
		INR 65,28,247	Income (INR) Generation
SDG 13: Climate Action (mandatory)	Emission Reduction	170,323 tCO ₂ e	GSVERs

Table 2 – Product Vintages

		Amount Achieved		
Start Dates	End Dates	SDG 7: Affordable and Clean Energy MWh	SDG 8: Decent Work and Economic Growth	SDG 13: Climate Action VERs
01/01/2024	30/06/2024	183,045.30 MWh	48 Trainings 24 Employed 65,28,247 INR	170,323 GSVERs

³ For all the above parameters and the amounts achieved are for current monitoring period

⁴ 2 new employees were hired in the current monitoring period

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 is contributing to climate change mitigation efforts. This project activity is a 150 MW_{AC} (80 MW + 70 MW) Solar PV technology-based grid connected large scale solar power generation project developed by Juniper Green Field Private Limited.

The aggregated capacity of project activity is 150 MW_{AC}, which comprised of two sites as follows:

Site 1 (80MW_{AC}) is located at Arni region, Tehsil – Arni, District – Yavatmal in Maharashtra. The power generated from the Solar Power Plant is step up to 132kV voltage level and it is connected to 132/33kV Arni GSS.

Site 2 (70 MW_{AC}) is located at Malkapur region, Tehsil – MALKAPUR, District – Buldahana in Maharashtra. The power generated from the Solar Power Plant is step up to 132kV voltage level and is connected to 132/33kV MALKAPUR GSS.

Project Investors' Name	Commissioning Date	Capacity in MW	District	State
Juniper Green Field Private Limited.	01/06/2022	80 MW _{AC} / 107.6 MW _{DC}	Yavatmal (Site-1)	Maharashtra
	08/08/2022	70 MW _{AC} / 99.5 MW _{DC}	Buldhana (Site-2)	Maharashtra

The project replaces anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 330,355 tCO_{2e} per annum, thereon displacing 355,030 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 estimated emission reduction during the current monitoring period is 164,724 tCO_{2e} displacing 177,028.66 MWh, and the actual emissions reductions are achieved as 170,323 tCO_{2e} thereon displacing 183,045.30 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 project activity is not registered with any other compliance or voluntary market-based mechanism such as Clean Development

Mechanism (CDM)⁵, Voluntary Carbon Standard (VCS)⁶, Global Carbon Council (GCC)⁷, I-REC⁸ and Indian REC⁹ or any other mechanism. The GHG emissions reductions from the project activity are not accounted for within the relevant system of the host country/regional regulator. The VERs for the same vintage will not be claimed in another standard other than GS and there is no double accounting with national climate policies or programs. Also, self-declaration for no double counting has been provided by the Project Developer.

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

⁵ <https://cdm.unfccc.int/Projects/projsearch.html>

⁶ <https://registry.terra.org/app/search/VCS>

⁷ <https://projects.globalcarboncouncil.com/>

⁸ <https://www.ecohz.com/i-recs>

⁹ https://www.recregistryindia.nic.in/index.php/publics/registered_regens

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 life style 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.

The present monitoring period is from 01/01/2024 to 30/06/2024 through which emission reduction claimed is 170,323 tCO₂e.

The Emission Reductions as per the vintage break-up (2024) in the current monitoring in the following format:

01/01/2024 to 30/06/2024: 170,323 tCO₂e.

A.2. Location of project

The project activity is located at two different sites in Maharashtra. Site 1 is in Village - Shirpur, Taluka-Arni, Distt-Yavatmal and Site 2: Village-Tighra, Taluka- Malkapur, Distt-Buldhana. The project activity exports the generated energy to grid which is interconnected to the unified Indian grid through a 132/33 kV transmission line up to the nearest grid substation located at Arni and Malkapur respectively in Maharashtra. A pictorial representation and geographical coordinates of the location of the project activity on the map of India is provided as follows:

Capacity	Location	Coordinates
80 MW	Site 1: Village -Shirpur, Taluka-Arni, Distt-Yavatmal Maharashtra	20.127428°N 77.920963°E
70 MW	Site 2: Village-Tighra, Taluka- Malkapur, Distt-Buldhana, Maharashtra	20.951549°N 76.123278°E

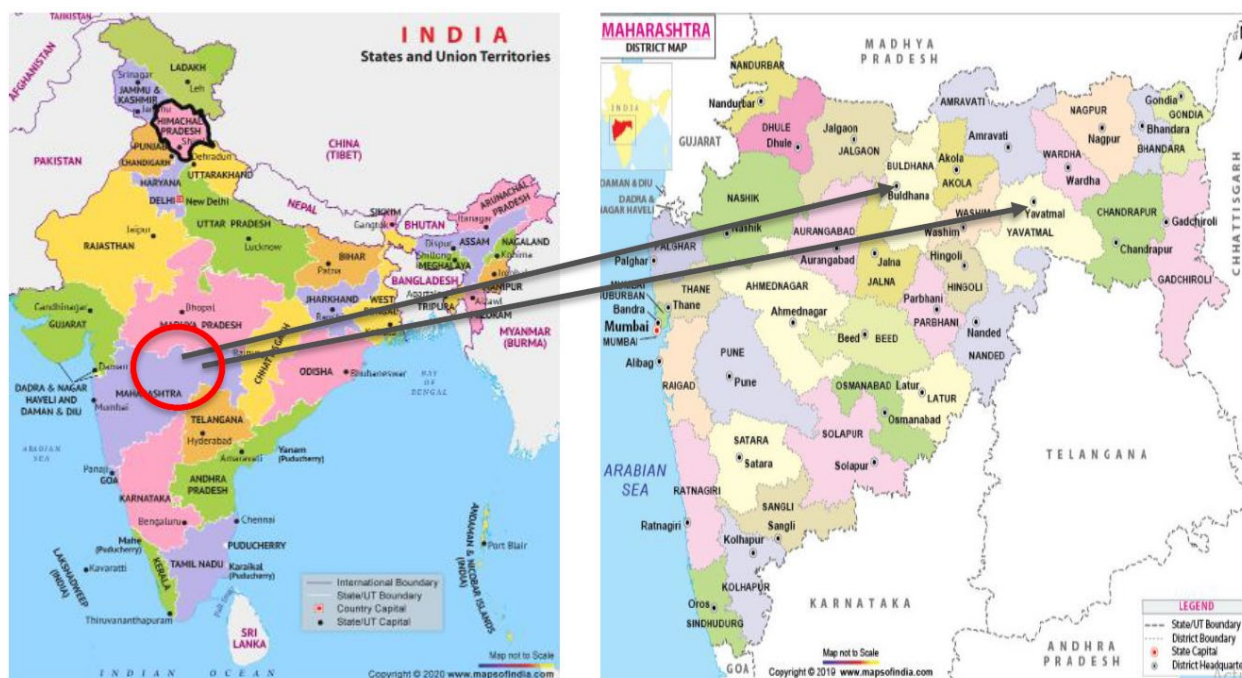


Figure 1: Map showing location of Project

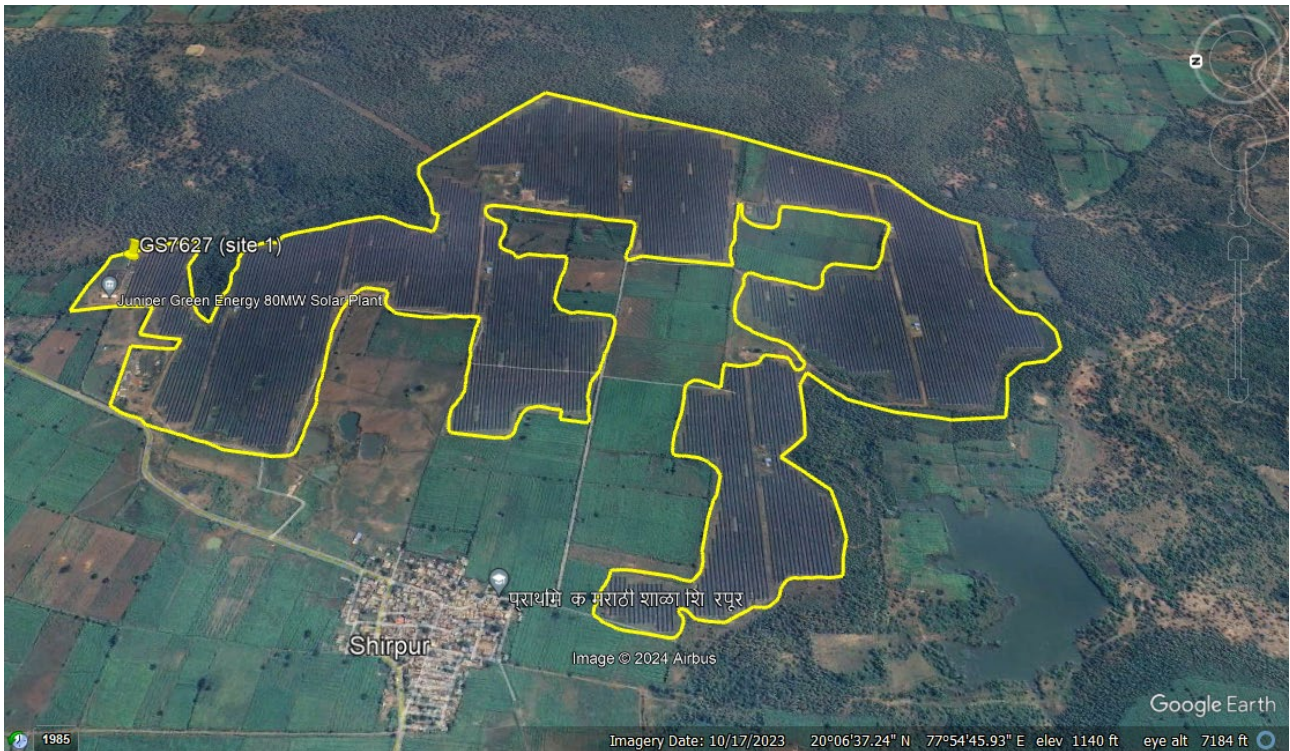


Figure 2: For Site 1

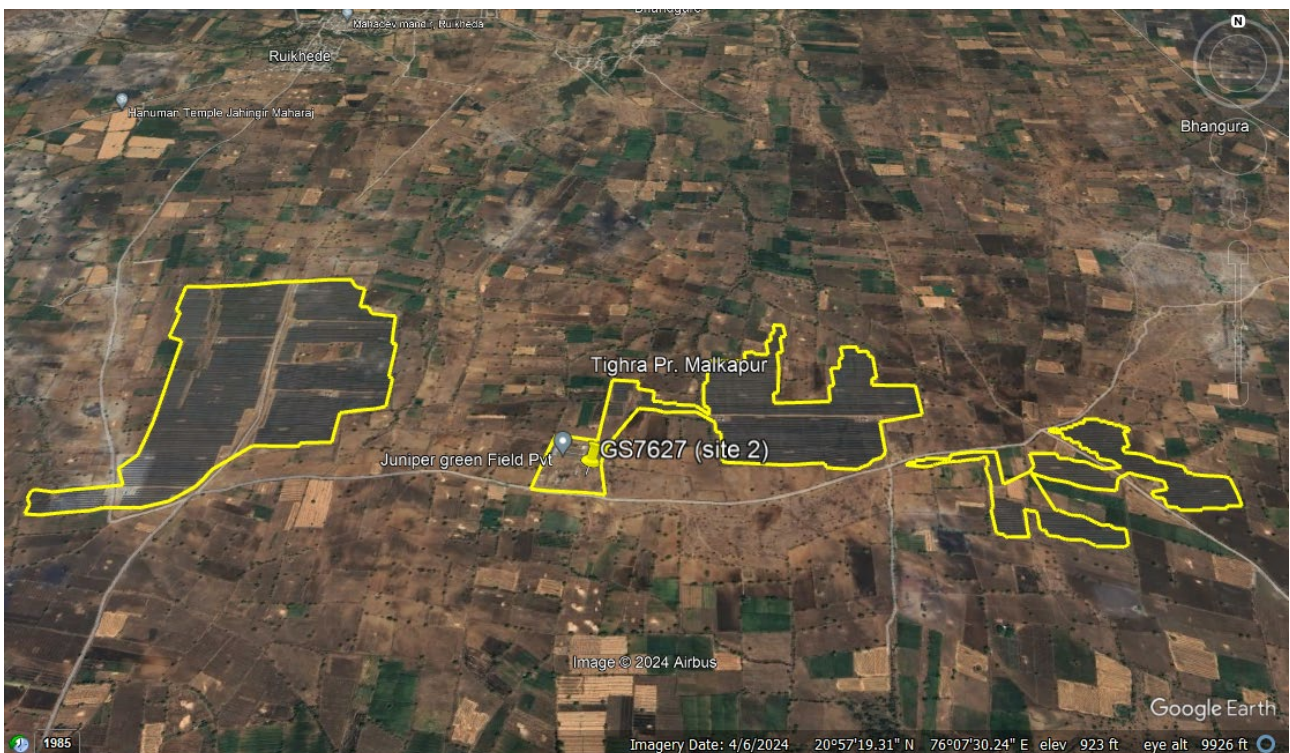


Figure 3: For Site 2

A.3. Reference of applied methodology

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

References: Approved Large-Scale Consolidated Methodology: ACM0002 "Grid-connected electricity generation from renewable sources" (Version 20)¹⁰

Tools:

Tool for the demonstration and assessment of additionality (Tool 1)- Version 7.0 (EB 70, Annex 08)¹¹

Tool to calculate the emission factor for an electricity system (Tool 7)- Version 7.0 (EB 100, Annex 04)¹²

A.4. Crediting period of project

Type of crediting period: Renewable

Start date of crediting period: 01/06/2022

End date of crediting period: 31/05/2027

Length of 1st crediting period: 5 years (Renewable Crediting Period i.e., it will be renewed twice maximum up to 15 years i.e., 5yrs+5yrs+5yr)

Monitoring period: 01/01/2024 – 30/06/2024 (both dates included)

Length of the monitoring period: 182 days

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

The project activity involves installation of 150 MW_{AC} grid connected solar photovoltaic power plant. The PV system is mainly consisting of PV modules, module mounting structures, inverters, regulators, monitoring devices etc. The solar PV module details are different as compared to registered PDD because, at the time of the design review, commissioning was going on, and at that time the complete solar PV module details were not available. There is no design or technology change. There were no major occurred in the current monitoring period. Moreover, the total maintenance and

¹⁰ <https://cdm.unfccc.int/UserManagement/FileStorage/AG07ZJQ3EXD42LT5YV9HR16M8KINPO>

¹¹ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

¹² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

downtime for the current monitoring period is mentioned in appendix 3. The actual Key Components Technical Specification for project activity (150 MW_{AC}) is as follows:

Site -1: Arni (80 MW_{AC})

Solar PV modules:

Site Name	Module Make	Type	Capacity (p)	Number of Module	Total DC Capacity (MWp)
Arni - 80 MW _{AC}	Trina Solar	DEG19C.20	545	60,944	33.4521
	Trina Solar	DEG19C.20	540	62,689	33.9
	JA Solar	JAM72D30	540	37,828	20.4
	JA Solar	JAM72D30	535	37,212	19.9
	JA Solar	JAM72D30	545	308	0.2
	Total			198,981	107.8

Inverters:

S.No.	Parameter	Details
1.	Make	HUAWEI
2.	Model	SUN2000-200KTL-H2/ SUN2000-200KTL-H3
3.	Rated Capacity	185 kW (AC)
4.	No. of Inverters	432

Grid Connected substation Details: MSETCL (Maharashtra State Electricity Transmission Company Limited) ARNI 132/33kV Substation

Feeder Details: 1 No's 132 kV dedicated feeders connected from solar project substation (PSS) (located within Solar Power Plant) having 2 nos. 40/50 MVA Power 33/132 kV Step-up Power Transformer.

Site -2: Malkapur 70 (MW_{AC})

Solar PV modules:

Site Name	Module Make	Type	Capacity (p)	Number of Module	Total DC Capacity (MWp)
Malkapur – 70 MW _{AC}	JA Solar	DEG19C.20	535	86,620	46.3
	JA Solar	DEG19C.20	540	89,208	48.2
	Trina Solar	DEG19C.20	545	4,572	2.5
	Trina Solar	DEG19C.20	540	4,572	2.5
	Total			184,972	99.5

Inverters:

S.No.	Parameter	Details
1.	Make	HUAWEI
2.	Model	SUN2000-200KTL-H2
3.	Rated Capacity	185 kW
4.	No. of Inverters	378

Grid Connected substation Details: LILO on Malkapur – Khadka MSETCL Substation 132kV Line.

Feeder Details: 1 No's 132 kV dedicated feeders connected from solar project substation (PSS) (located within Solar Power Plant) having 2 nos. 40/50 MVA Power 33/132 kV Step-up Power Transformer.

The project activity is expected to operate at an annual average plant load factor of 27.40 % (Cumulative PLF) exporting 355,030 MWh of electrical energy annually to the Regional grid of India, throughout its entire life span of 25 years. This results in an average annual reduction of 330,355 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 Field Private Limited.	Site 1: Village -Shirpur, Taluka-Arni, Distt-Yavatmal Maharashtra	80 MW	01/06/2022
2		Site 2: Village-Tighra, Taluka- Malkapur, Distt-Buldhana, Maharashtra	70 MW	08/08/2022

B.1.1 Forward Action Requests

In previous performance review no FAR was raised.

B.2. Post-Design Certification changes

Not applicable.

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

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

There are two corrections as mentioned below i.e., one in the current monitoring period and one during the 1st verification report, which has been carried forward for the subsequent verifications.

Correction 1: The project is registered under GS4GG; however, an error was identified at the time of registration regarding the GS4GG-specific product claimed. The product was mistakenly mentioned as GSCERs, despite the project being registered solely under GS4GG and not under CDM or any other mechanism. As such, labeling was not applicable since GSCERs are specific to CDM or JI projects. This error has been corrected during the current monitoring period under the Issuance track. The GS4GG-specific product has now been updated to Gold Standard Verified Emission Reductions (GSVERs) instead of GSCERs, in compliance with the GHG Emissions Reduction & Sequestration Product Requirements.

Correction 2: The solar PV module details are different as compared to registered PDD because at the time of design review, commissioning was going on, so at that time the complete solar PV module details were not available, so in the 1st verification report, PV module details have been corrected and the same has been followed for subsequent verification.

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

B.2.3. Changes to start date of crediting period

There is no change of start date of crediting period.

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

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

B.2.5. Changes to project design of approved project

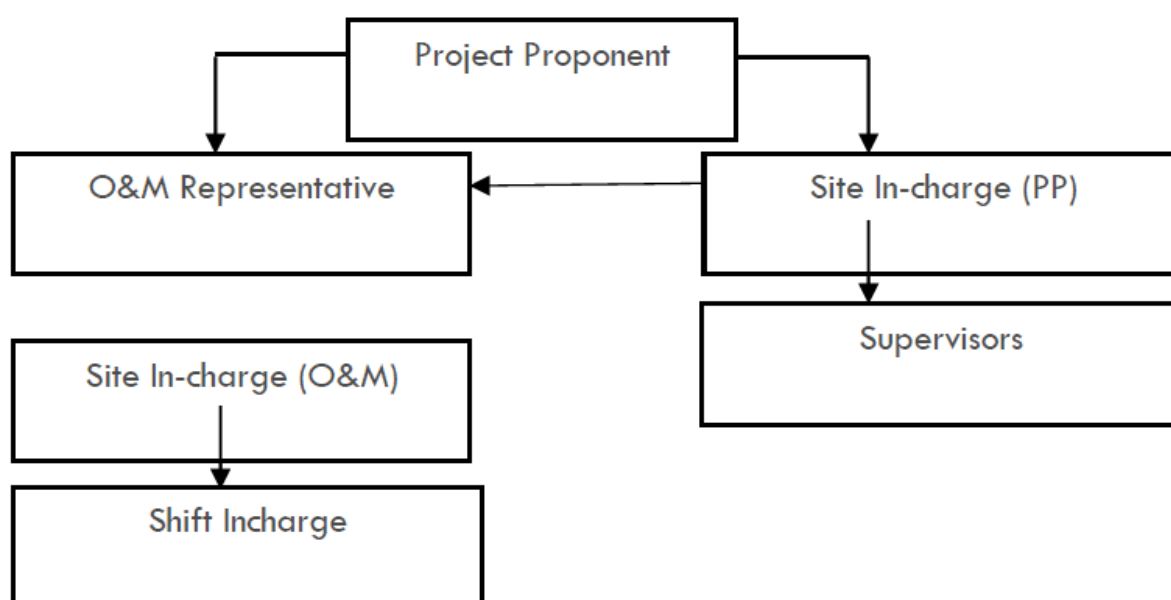
There is no change to project design of approved project.

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 proposed for grid-connected solar power project/ unit being implemented in Maharashtra, India. The monitoring plan, which is implemented by the project participant 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 participant.

The monitoring team is composed the following staff:



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

Responsibilities of O&M Representative (In house): 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 will be 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 Pooling Substation prior to the Delivery point.

The export and import energy are measured continuously using above mentioned Main & Check meters¹³ installed at Substation for each site. Export & Import readings of Main & Check meters is taken on monthly basis by authorized officer of MSEDCL in the presence of representative(s) of PD. The meter reading is taken jointly and signed by the representatives of the MSEDCL and representative(s) of PD. Based on the joint meter reading, apportioning certificates/credit notes/JMR, the project developer raises the invoice which can be used to crosscheck the data values.

Total Generation of the project activity can be calculated

$$\text{as: } EG_{PJ,y} = EG_{\text{Export, Malkapur}} + EG_{\text{Export, Arni}}$$

Where:

$EG_{PJ,y}$ = Total net electricity generated and exported to grid

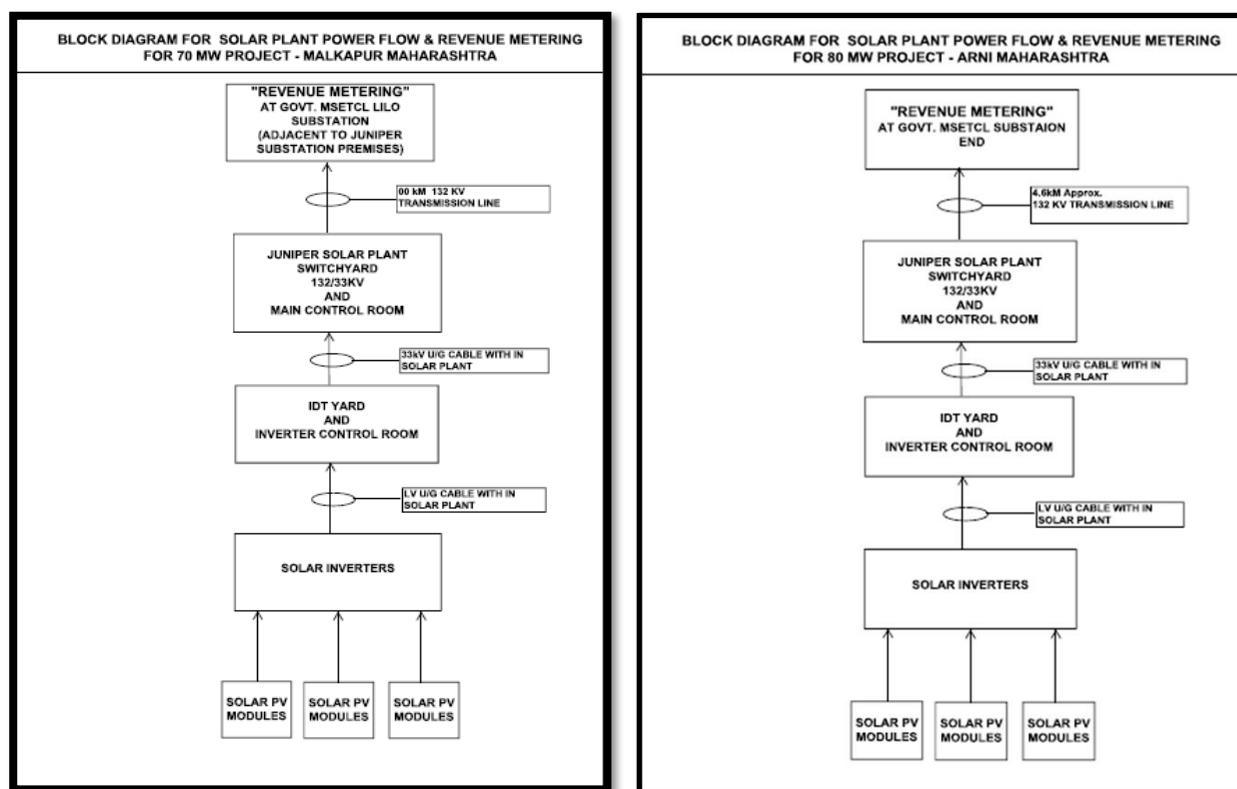
$EG_{\text{Export, Malkapur}}$ = Electricity generated and exported to grid at Malkapur Site

$EG_{\text{Export, Arni}}$ = Electricity generated and exported to grid at Arni Site

¹³ As per CEA data base the frequency of meter calibration is once in five years.

https://cea.nic.in/old/reports/regulation/CEA_metering_regulation_amendment_2019.pdf

Please refer the block diagram below:



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 MSEDCL (Maharashtra State Electricity Distribution Co. Ltd.) and PD does not have any control on it. Also, accuracy class of meters and calibration frequency is under purview of MSEDCL/Discom officer and PD does not have any control on it. PP 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 is 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:

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

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.

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 or in case there is delay in calibration as per the calibration dates than error factor will be applied as per the accuracy class of the meter. During the monitoring period the main and check meters were operating in the acceptable limits of accuracy at site.

Personnel training:

In order to ensure a proper functioning of the project activity and a properly monitoring of emission reductions, the site persons and staffs are trained. The O&M team 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 ₂ e/MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 17.0 ¹⁴
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, Ministry of Power, Government of India.
Purpose of data	Government of India.
Additional comment	For the calculation of the Baseline Emission

Data/parameter	EF _{BM, y}
Unit	tCO ₂ e/MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 17.0
Value(s) applied	0.8653
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07.0" as 3-year generation weighted average using data for the years 2020-21. The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 17.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of data	For the calculation of the Baseline Emission

¹⁴ <https://cea.nic.in/cdm-co2-baseline-database/?lang=en>

Additional comment	This parameter is fixed ex-ante for the entire crediting period.
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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 17.0
Value(s) applied	0.9305 (Indian Grid)
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: Affordable and Clean Energy

Data / Parameter	$EG_{PJ,y}$
Unit	MWh
Description	Quantity of net electricity generation that is produced and fed into the grid

Measured/calculated/default	Method: The Net electricity supplied to the grid by the project activity is 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: $EG_{\text{facility},y} = EG_{\text{Export}} - EG_{\text{Import}}$
Source of data	Statement of net export of power to the grid at the plant site (Credit Note)
Value(s) of monitoring parameter	183,045.30 MWh For monitoring period: 01/01/2024 to 30/06/2024 (Inclusive of both the dates)
Monitoring equipment	Energy Meters are used for monitoring. Refer Appendix 1 for Calibration details.
Measuring/reading/recording frequency:	Monthly
Calculation method (if applicable)	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 guidelines¹⁵. 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 is calculated as a difference of electricity exported to the grid, electricity imported

¹⁵ https://cea.nic.in/old/reports/regulation/CEA_metering_regulation_amendment_2019.pdf

	from the grid obtained from Monthly Meter reading reports provided by MSEDCL as per below equation: $EG_{PJ,y} = EG_{\text{Export, Malkapur}} + EG_{\text{Export, Arni}}$ Cross Checking: Quantity of net electricity supplied to the grid is cross checked from the Invoices Project Participants to MSEDCL.
QA/QC procedures	Calibration of all the meters is undertaken once in 5years as per CEA guidelines. The meters are 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, - 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 generation to all the unskilled workers is made on day-to-day basis in line with the minimum wage

requirements¹⁶. Annual records of income generation 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

¹⁶ https://labour.gov.in/sites/default/files/theminimumwagesact1948_0.pdf

activities. The wage rates can be referred from the Indian

	labor act Labor bureau, Government of India ¹⁷ notifications.						
Measured/calculated/default	Measured						
Source of data	• Training Records (HSE & HR) • Salary Slip of the project employees.						
Value(s) of monitored parameter	Training Provided – 12 (please refer Appendix – 2 for training details project site wise).						
	Trainings provided		For Arni Site		For Malkapur site		
			30		18		
	Total		48				
	No. of employees – 24 employees						
	Employee bifurcation	Perm anent	Tem pora ry	Skilled	Unsk illed	Male	Femal e

¹⁷ https://labour.gov.in/sites/default/files/powact2017_0.pdf

	<table><tr><td></td><td>24</td><td>0</td><td>24</td><td>0</td><td>24</td><td>0¹⁸</td></tr><tr><td>Total</td><td colspan="6">24</td></tr></table> Income generation – 65,28,247 INR For monitoring period: 01/01/2024 to 30/06/2024		24	0	24	0	24	0 ¹⁸	Total	24					
	24	0	24	0	24	0 ¹⁸									
Total	24														
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	Monitoring of regular trainings/workshops for employees & O&M staff in project activity.														
Additional comment	-														

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

¹⁸ Since site is in remote location therefore women are not preferring to work.

	obtained from "CO ₂ Baseline Database for Indian Power Sector" version 17.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Value(s) of monitored parameter	170,323 tCO ₂ e For monitoring period: 01/01/2024 to 30/06/2024
Monitoring equipment	Not Applicable, as it is a calculated parameter
Measuring/reading / recording frequency:	Every verification period
Calculation method (if applicable)	Calculated from "CO ₂ Baseline Database for Indian Power Sector" and Energy Generation
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
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

No sampling process is involved as the project activity is a Solar Power generation. Hence, this section is 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:

The monitoring parameter for the SDG 7 is Quantity of net electricity supplied to the grid during the year y. Since baseline and pre-project scenario are same, in the baseline

condition no renewable electricity will be supplied to grid from the project location. Hence, the baseline value is zero.

Vintage	Baseline Value
	Quantity of net electricity supplied to the grid (MWh)
01/01/2024 to 30/06/2024 (Inclusive of both the dates)	0

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. Since baseline and pre-project scenario are same, in the baseline condition these values are zero.

Vintage	Baseline Value		
	Number of trainings (Nos)	Income generation (Lakh INR)	Number of employees (Nos)
01/01/2024 to 30/06/2024 (Inclusive of both the dates)	0	0	0

SDG 13: -

Baseline emissions include only CO₂ emissions from electricity generation in 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:

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

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 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 $EG_{PJ,y}$

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. As per ACM0002 version 20.0 the project is greenfield 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).

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

$$BE_y = 183,045.30 * 0.9305 \text{ tCO}_2\text{e}$$

$$BE_y = 170,323 \text{ tCO}_2\text{e (Rounded down)}$$

Thus, the estimated baseline situation of each SDG outcomes is summarised as follows:

SDGs	Baseline value
SDG 7: Affordable and Clean Energy	No Activities in the baseline
SDG 8: Decent Work and Economic Growth	No Activities in the baseline
SDG 13: Climate Action	Emission of 170,323 tCO ₂ e

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 183,045.30 MWh electricity during the monitoring period. This can be crosschecked from JMR & Invoices.

During Monitoring period - (01/01/2024 to 30/06/2024)

Quantity of net electricity supplied to the grid (MWh) = 183,045.30

Vintage	Project Value
	Quantity of net electricity supplied to the grid (MWh)
01/01/2024 to 30/06/2024 (Inclusive of both the dates)	183,045.30

Total	183,045.30
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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 - (01/01/2024 to 30/06/2024)

Quality of Employment – 48 Trainings

Quantitative employment and income generation - 24 employees & 65,28,247 INR¹⁹

These can be crosschecked from the training records, income declaration/sample salary slips & employment records.

Vintage	Project Value		
	Number of trainings (Nos)	Income generation (INR)	Number of employees (Nos)
01/01/2024 to 30/06/2024 (Inclusive of both the dates)	48	65,28,247	24
Total	48	65,28,247	24

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 170,323 tCO₂e during the current monitoring period. This parameter is calculated.

During Monitoring period - (01/01/2024 to 30/06/2024)

Quantity of emission reduction – 170,323 tCO₂e

Vintage	Project Value		
	Net generation (MWh)	Grid Emission Factor (tCO ₂ /MWh)	Emission Reduction (tCO ₂)

¹⁹ INR here signifies the total income generated for skilled employees.

01/01/2024 to 30/06/2024 (Inclusive of the dates)	183,045.30	0.9305	170,323
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As per para 31 of section 5.4 of 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/year)

$PE_{FF, y}$ - Project emissions from fossil fuel consumption in year y (tCO₂/ year)

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

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

" 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.

Vintage	Project Emission (tCO ₂ e)
01/01/2024 to 30/06/2024 (Inclusive of both the dates)	0

E.3. Calculation of leakage

As per para 53 of section 5.6 of the approved consolidated Methodology ACM0002 (Version 20.0):

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, $LE_y = 0$ tCO₂e.

Vintage	Leakage Emission (tCO ₂ e)
01/01/2024 to 30/06/2024 (Inclusive of both the dates)	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	183,045.30	183,045.30
8	Decent Work and Economic Growth	0	48 Trainings 24 employees INR 65,28,247	48 Trainings 24 employees INR 65,28,247
13	Climate Action (mandatory) (tCO ₂)	170,323	0	170,323

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 ²⁰ achieved during this monitoring period
7	355,030 MWh/year 177,028.66 MWh for the monitoring period (182 days)	183,045.30 MWh
8	2 Trainings 20 employees	48 Trainings 24 employees 65,28,247 INR
13	330,355 tCO ₂ /year 164,724 tCO ₂ for the monitoring period (182 days)	170,323 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

²⁰ Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

The annual estimated power generation for the project activity is 355,030 MWh/year, thus considering number of days covered during current monitoring period to be 182, the estimated power generation is 177,028.66 MWh. Whereas, the actual power generation is 183,045.30 MWh.

$$= 355,030 * 182 \text{ (days)} / 365$$

$$= 177,028.66 \text{ MWh}$$

SDG 8: Decent Work and Economic Growth

The annual estimation regarding SDG 8 is 02 trainings and giving employment to 20 persons. Thus, considering number of days covered during current monitoring period to be 182, the estimation regarding SDG 8 for current monitoring period are 02 trainings and giving employment to 20 persons. Whereas, in actual 48 Trainings given to employees. During the current verification, total 24 employees are working and income generation is 65,28,247 INR during the current monitoring period.

SDG 13: Climate Action

The annual estimated emission reduction for the project activity is 330,355 tCO₂e, thus considering number of days covered during the current monitoring period to be 182, the estimated emission reduction is 164,724 tCO₂e. Whereas the actual emission reduction is 170,323 tCO₂e.

$$= 330,355 * 182 \text{ (days)} / 365$$

$$= 164,724 \text{ tCO}_2\text{e (Round down)}$$

The below comparison of SDG 7, SDG 8 and SDG 13 for the monitoring period of 01/01/2024 to 30/06/2024 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)	355,030	177,028.66	183,045.30	3.40%
8	Number of Trainings Conducted	2	NA	48	NA
	Income generation (INR)	NA	NA	65,28,247	NA
	Number of Employment	20	20	24	20.00%

13	Emission Reduction (tCO ₂ e)	330,355	164,724	170,323	3.40%
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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 164,724 tCO₂e whereas during the current monitoring period the emission reductions claimed are 170,323 tCO₂e, which is approximately 3.40% higher than the estimated emission reductions for the same monitoring period. The reductions in actual emission reduction are justified, since during the current monitoring period most of the months have higher yield months and higher sunshine hours. The generation is subject to climate conditions which are beyond the control of the Project Developer. The current monitoring period is 01/01/2024 till 30/06/2024. 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.

SECTION F. SAFEGUARDS REPORTING

As per the safeguarding Principles Assessment in Appendix-1 of the GS4GG PDD, ongoing monitoring is summarized below:

Principles	Mitigation Measures added to the Monitoring Plan
Principle 2. Gender Equality and Women's Rights	The project developer is committed to the employee's equal pay for equal work during all phases of the project ²¹ . Please refer section D.2 above, same has been considered as monitoring parameter under SDG 8 (8.5.1)
Principle 6.1 Labor Rights	The Project Developer ensures the training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.

²¹ Since site is in remote location therefore women are not preferring to work.

Principle 9.5

Hazardous and Non-hazardous Waste

The waste is disposed to the waste handlers and the firm comply with all the local laws for monitoring and disposal.

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 – 1 Meter Details

For 70 MW solar Malkapur site²²:

S.No.	Meter Number	Type	Make	Accuracy class	Date of calibration	Due date ²³
1	22004105	Main	L&T	0.2s	20/06/2022	19/06/2027
2	22004106	Check	L&T	0.2s	20/06/2022	19/06/2027

²² Commissioning date is 08/08/2022 so meter has been calibrated before the Commissioning.

²³As per PDD Calibration frequency is once in 5 years as per CEA guidelines

For 80 MW Arni site²⁴:

S.No.	Meter Number	Type	Make	Accuracy class	Date of calibration	Due date
1	22001180	Main	L&T	0.2s	18/04/2022	17/04/2027
2	22001181	Check	L&T	0.2s	18/04/2022	17/04/2027

Appendix – 2 Training Details

For 80 MW Arni site:

S.No.	Date	Topics	Number of participants
1	19/01/2024	RSW-24 awareness training	8
2	23/01/2024	JGEPL Safety Rules & Regulations	11
3	23/01/2024	Site Safety Rules & Regulations / Do & Don'ts at Site	1
4	24/01/2024	Hot Work Awareness training	4

²⁴ Commissioning date is 01/06/2022 so meter has been calibrated before the Commissioning.

5	25/01/2024	Road Accident Mock-drill Training	8
6	27/01/2024	Road safety Awareness training	15
7	08/02/2024	Electrical safety awareness training	11
8	10/02/2024	Road safety Awareness training	6
9	23/02/2024	Fire safety training	5
10	24/02/2024	Fire Safety Training	12
11	27/02/2024	JGEPL Safety Rules & Regulations	7
12	27/02/2024	Behaviour safety training	13
13	27/02/2024	Cyber security	10
14	04/03/2024	Nsw-2024 Awareness on training	21
15	04/03/2024	National safety week awareness training	14
16	08/03/2024	Fire Safety Training	14
17	09/03/2024	Fire safety training	24
18	12/03/2024	Electrical safety awareness training	15
19	13/04/2024	Heat Stroke Awareness training	10
20	20/04/2024	Site Safety Rules & Regulations / Do & Don'ts at Site	1
21	30/04/2024	Fire incident initial reporting Awareness training	11
22	08/05/2024	Initial incident reporting	10
23	10/05/2024	LOTOTO training	5
24	13/05/2024	SOP training for LT panel shut down	4
25	14/05/2024	Inverter shut down awareness training	3
26	15/05/2024	Electrical safety awareness training	4
27	26/06/2024	World Environment Day Awareness training	11
28	27/06/2024	Initial incident reporting System	11
29	28/06/2024	Site Safety Rules & Regulations / Do & Don'ts at Site	1
30	28/06/2024	Site Safety Rules & Regulations / Do & Don'ts at Site	1
Total trainings		30	

For 70 MW solar Malkapur site

S.No.	Date	Topics	Number of participants
1	17/01/2024	PPEs Awareness	12
2	19/01/2024	Road safety awareness training	12
3	14/03/2024	Road safety awareness training	10
4	15/03/2024	Fire Fighting training	13
5	16/03/2024	National safety week training	9
6	17/03/2024	Fire safety training	9

7	23/04/2024	Heat stroke Awareness training	7
8	27/04/2024	UA-UC Awareness training	7
9	28/04/2024	Heat stroke awareness training	5
10	30/04/2024	General awareness safety training	10
11	02/05/2024	Snake and insect bite awareness	12
12	04/05/2024	JGEPL Safety Rules & Regulations	11
13	06/05/2024	PPEs Awareness training	11
14	08/05/2024	First- aid and CPR training	11
15	28/05/2024	Incident Reporting awareness training	5
16	19/06/2024	LOTOTO Training	6
17	21/06/2024	Electrical Safety training	8
18	23/06/2024	World Environment Awareness training	8
Total trainings		18	

Therefore, the total number of trainings conducted for both the sites in the current monitoring period are 48.

Appendix – 3 Shutdown details/major maintenance or disruption in power generation

For 80 MW Arni site:

Date	B/d Description	Start time	Stop time	Total down time Hrs.
18/01/2024	Grid BD from GSS	7:15	7:45	0:30
05/02/2024	Grid BD from GSS	15:23	15:39	0:16
12/02/2024	Grid BD from GSS	14:15	14:30	0:15

09/03/2024	Grid BD from GSS	22:16	22:50	0:34
30/03/2024	Grid BD from GSS	15:13	15:29	0:16
16/04/2024	Grid BD from GSS	15:15	15:25	0:10
01/05/2024	Grid BD from GSS	13:36	13:50	0:14
02/06/2024	Grid BD from GSS	22:26	22:55	0:29
Total				2:44:00

For 70 MW solar Malkapur site

Date	B/d Description	Start time	Stop time	Total down time Hrs.
12/02/2024	Grid BD from GSS	6:15	6:55	0:40
15/03/2024	Grid BD from GSS	14:23	15:39	1:16
02/04/2024	Grid BD from GSS	14:25	15:15	0:50
22/05/2024	Grid BD from GSS	21:16	21:50	0:34
Total				3:20:00

Therefore, the total maintenance and downtime for the current monitoring period is 06:04:00 hrs.

Revision History

Version	Date	Remarks
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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