Gold Standard for the Global Goals

Climate Security & Sustainable Development

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

Programme of Activity Information

GS ID of Programme	GS3587
Title of Programme	Gigawatt Global Programme of Activities
Version of POA-DD applicable to this monitoring report	CDM PoA-DD version 5.0
Name and GS ID of fully Validated CPA/VPAs (i.e. non-compliance check)	GS3606 ASYV 8.5MW Solar PV Project (CPA-001)

Key Project Information

GS ID (s) of Project (s)	GS3606
Title of the project (s) covered by monitoring report	ASYV 8.5MW Solar PV Project
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	GS CPA-DD version 06 GS4GG Transition annex version 3 *CDM CPA-DD version 07*
Version number of the monitoring report	03
Completion date of the monitoring report	13/07/2021
Date of project design certification	12/09/2016 (GS registration date) *23/10/2015 (CDM registration date)*
Date of Last Annual Report	01 March 2017 - 31/08/2018 (last monitoring report period)
Monitoring period number	M#3
Duration of this monitoring period	01/09/2018 to 31/12/2020
Project Representative	Gigawatt Global Coöperatief U.A Michael Fichtenberg *Consultant – Carbon Africa* *Timothy Cowman*
Host Country	Rwanda

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 (EB 81, Annex 9, version 16.0) AMS-I.D Grid connected renewable electricity generation (EB 81, Annex 24, version 18.0)
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
SDG 13 Climate Action (mandatory)	Emissions Reductions	20,035 CDM Issuance (7th October 2021) Serial Range: Block start: RW-5-1671656-2-2-0-10202 Block end: RW-5-1691690-2-2-0-10202	tCO_2e/CERs
SDG 7 – Affordable and Clean Energy	MWh of renewable energy generated	30,359	MWh
SDG 8 – Decent Work and Economic Growth	Quality Employment	3	No. of employee trainings
		0	No. of Grievances
	Quantitative employment and income generation	2 full time employment posts for operational and maintenance plus an annual average of	No. of jobs created

		83 people were employed for support roles. On average 32 women and 51 men per year	
	Human and institutional capacity & technology transfer and technological self-reliance	3 trainings provided, 22 site excursions and 2 students received solar technology/engineering training	No. of training provided

Table 2 – Product Vintages

		Amount Achieved							
Start Dates	**End Dates**	**CERs/ tCO_{2e}**	**MWh**	**No. of Employee Trainings**	**Site excursions**	**No. of student trainings**	**No. of people employed (Permanent, Support roles)**	**No. of Grievances**	**No. of Men and Women Employed**
01/09/18	31/12/18	2,856	4,328	0	0	0	2 87	0	53 M 36 W
01/01/19	31/12/19	8,607	13,042	1	17	2	2 70	0	48 M 24 W
01/01/20	31/12/20	8,572	12,989	2	5	0	2 94	0	58 M 36 W

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

The ASYV 8.5MW Solar PV project (CPA-001) forms part of the Gigawatt Global Programme of Activities, which seeks to promote grid connected renewable energy projects in Rwanda. The CPA falls under CPA type I "Greenfield small-scale solar PV power plants /units in Rwanda applying automatic additionality", which is one of the five CPA types eligible for inclusion under the PoA.

The CPA has installed a new renewable energy power plant at a site where none existed prior to the implementation of the project activity (Greenfield plant). The CPA uses solar photovoltaic (PV) modules with a single axis tracking system. The CPA has a peak output capacity of 8.5 MWp consisting of 28,360 solar PV modules and covering 16 hectares.

The project was commissioned on 18 September 2014 and has been operational since then.

A.2. Location of project

The project is located in Rwamagana District, Rubona Sector, Karambi cell at the Agahozo-Shalom Youth Village (ASYV), approximately nine kilometers from the main Kigali-Kagitumba highway and about 50 km from Kigali.
The table and figure below show the geo-coordinates and location of the project site respectively.

Table 3: Project location coordinates

Latitude	Longitude
- 2.024050°	30.377978°
- 2.027697°	30.379181°
- 2.028694°	30.375042°
- 2.026692°	30.374444°

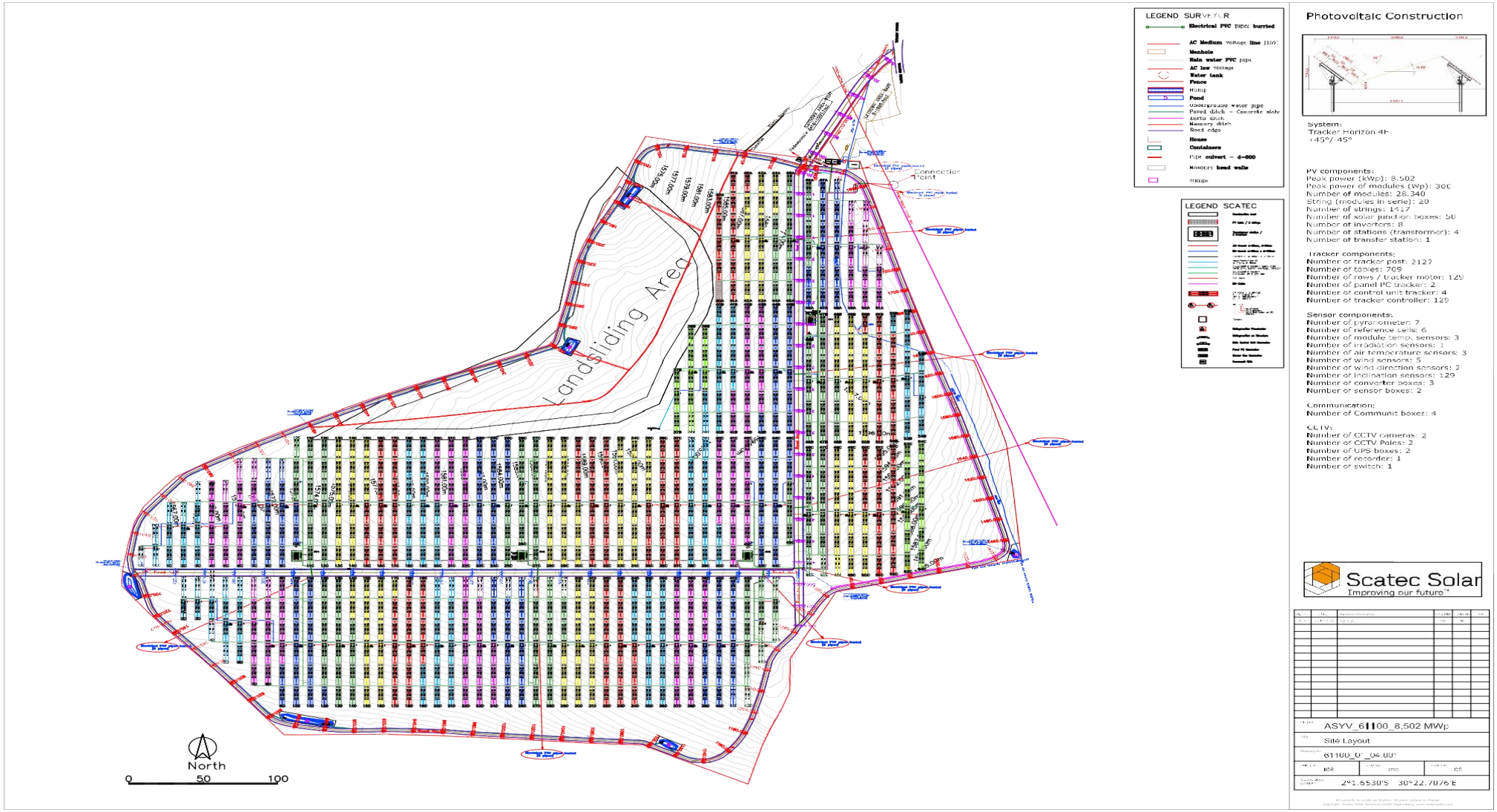

Figure 1: ASYV 8.5MW SOLAR PV PROJECT (CPA-001), GS 1D 3606

Source: Scatec Solar, 2014

A.3. Reference of applied methodology

The approved baseline and monitoring methodology selected for to the proposed project activity is: AMS-I.D Grid connected renewable electricity generation, version 18.0.

A.4. Crediting period of project

The crediting period is from 23/10/2015 to 22/10/2022 with an option to renew it twice more up to a total of 21 years..

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

The ASYV 8.5MW Solar PV project (CPA-001) forms part of the Gigawatt Global Programme of Activities, which seeks to promote grid connected renewable energy projects in Rwanda. The CPA falls under CPA type I "Greenfield small-scale solar PV power plants/units in Rwanda applying automatic additionality", which is one of the five CPA types eligible for inclusion under the PoA.

The CPA uses solar photovoltaic (PV) modules with a single axis tracking system. The CPA has a peak output capacity of 8.5 MWp consisting of 28,360 solar PV modules and covering 16 hectares.[1]
The table below highlights the solar PV module characteristics:

Table 4: Solar PV module specifications

Parameter	Value
PV Module type	Si-Poly
PV Model	BYD 300P6C-36 series
Manufacturer	BYD
Rated Nominal Capacity	300Wp
Umpp	35.97 V
Impp	8.34 A
Umax	1000 V
Max fuse Current rating	15 A
Tolerance	+3%
Number of modules	28,360
Operating Voltage	600-850 V
Array Efficiency (STC)	15.47%
Array Nominal Capacity	8.5 MWp
Array operating characteristics	646 V, 11812 A
Lifetime	25 years

[1] Feasibility Study for Solar PV power plant in Rwanda (2012)

The inverter model used in the CPA is the Sunny Central 900CP XT_25-degree type with characteristics as shown in the table below:

Table 5: Inverter specifications

Parameter	Value
Inverter Model	Sunny Central 900CP XT_25degree
Manufacturer	SMA
Operating voltage	600-850 V
Number of inverters	8
Unit nominal capacity	990 kW AC
Total nominal capacity	7,920 kW AC

The major milestones achieved during the implementation of the project activity are summarized in the table below.

Table 6: Project major milestones

Milestone	Date	Documentary Evidence
Agreement reached between the Government of Rwanda and Gigawatt Global Rwanda Ltd.	5 November 2012	MoU with the Government of Rwanda
Conclusion of the Environmental Impact Assessment	November 2012	Environmental Impact Assessment Report
Feasibility Studies for the project is finalized	28 December 2012	Feasibility Studies Report.
Approval of the Environmental Impact Assessment	9 January 2013	EIA Licence from Rwanda Development Board
Financial close (CDM Start Date)	14 February 2014	Financial close documents

Project construction is commenced	February 2014	Public media[2]
Commissioning Date	18 September 2014	Letter from the utility
CDM Registration	23 October 2015	UNFCCC CDM website
GS Registration	12 September 2016	GS registry
First crediting period start date	01 January 2016	UNFCCC CDM website

A 15 kV dedicated transmission line connects Musha substation to the project. The project has been integrated into the existing supervisory control and data acquisition (SCADA) system allowing for continuous monitoring from the utility end and enhance communication with the utility through a cellular modem.

B.1.1. Forward Action Requests

FAR01

The Gold Standard Issuance Review Feedback Form Final - dated the 07 May 2018, contained one Forward Action Request (FAR):

FAR #1: besides the staffs employed by the project owner, the DOE is requested to interview 2-3 representatives of workers who are employed for mango trees, vetiver, and grass plantation, for module washing, for grass cutting and etc. regarding the employment quality and salary pay during the next verification.

In response the DOE interviewed the requisite number of representatives of workers employed in the service provision firms in June 2021, the details of which are captured in the Verification Report.

FAR02

[2] https://energiyaglobal.com/rwanda-field-reaches-financial-close-begins-construction/

As per section B.2.1 below the project developer submitted a deviation request to the Gold Standard which was approved pending a FAR:

FAR#01:
The Project Developer shall ensure that the start date of the GS monitoring period is not more than three years before the successful completion of an onsite verification (remote site visit in case the physical site visit is not possible) by a VVB. The verifying VVB must also provide its assessment/opinion on the compliance of the start date of the monitoring period with the requirements of the GS decision to this deviation request.

The project developer can confirm that:
- This GS monitoring Period has a start date of 01/09/2018 for which a virtual verification site visit was conducted on 15/04/2021. This is less than three years from the start of monitoring period. Additionally, the last physical site visit which was conducted from 16/10/2018 to 17/10/2018 is less than three years since the start date of this monitoring period.
- The VVB has provided its assessment/opinion in the verification report and contributed to the deviation request in the appropriate sections.

B.2. Post-Design Certification changes

Please refer to CDM monitoring report for 3rd monitoring period 01-09-2018 to 31-12-2020, Part I, section B.2 here for post-design CDM certification changes, though there were no changes during this monitoring period.

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

In May 2021, the PD with relevant contributions from the VVB submitted a deviation request to the Gold Standard which was approved in line with the FAR as presented in section B.1.1.

The deviation request was to allow for a 28-month monitoring period to be verified through a remote audit, the detail for which can be found in the request form - 20210507_GWG Deviation Request Form_GS3606.GS3587_Final.pdf.

B.2.2. Corrections

This section has been intentionally left blank

B.2.3. Changes to start date of crediting period

This section has been intentionally left blank

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

This section has been intentionally left blank

B.2.5. Changes to project design of approved project

This section has been intentionally left blank

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

Please refer to CDM monitoring report for 3rd monitoring period 01-09-2018 to 31-12-2020), part II, section C here.

Overall authority and responsibility for monitoring rests with the CME, who is also responsible for managing the emission reduction monitoring and verification process.

In order to enable verification of emission reductions and sustainable development impacts each CPA must maintain credible, transparent and adequate data measurement, collection, estimation and tracking systems. The following monitoring procedures and responsibilities apply.

CPA implementing entity

Each CPA implementing entity under the PoA is responsible for the technical aspects related to on-site monitoring such as:

- Employment and training of personnel responsible for gathering and recording monitoring data on emission reductions and sustainable development indicators
- Appropriate storage of data
- Submission of monitoring data to the CME

The CPA implementing entity for the CPA 0001 has appointed the managing director with the overall responsibility for the CPA, assisted by the asset manager, site manager and associate officers.

Table 7: Organisational structure for the Operation and Data Monitoring of the CPA

Title	Reports to	Roles and Responsibilities
Managing Director	Board of Directors	• Overall guidance and management • Receive information of decisions by the managers. • Provide final quality control of documents and contracts • Sign off final approval on documents and contracts • Be accountable for results, omissions, errors, etc. • Lead the management system improvement process • Supervise manager-level staff
Asset Manager	Managing Director	• Overall guidance on operations and maintenance of the power plant/CPA for the duration of the project • Overall guidance on record keeping of electricity generation and provide quality control. • Overall guidance on employment and training of personnel responsible for gathering and recording monitoring data • Overall guidance on the continuous measurement of electricity generated by the CPA • Overall guidance on the collection of metering information • Overall guidance on the calibration and maintenance of main metering equipment, according to appropriate standards or

		manufacturer specifications. • Provide supervision to the site manager
Site Manager	Asset Manager	• Responsible for operations and maintenance of the power plant/CPA for the duration of the project • Employment and training of personnel responsible for gathering and recording monitoring data • Provide supervision on the continuous measurement of electricity generated by the CPA • Provide supervision on the collection of metering information • Provide supervision on the calibration and maintenance of main metering equipment, according to appropriate standards or manufacturer specifications. • Maintenance of all equipment and machinery during the lifetime of the power plant • Ensure compliance with day-to-day tasks of the power plant e.g. inspections • Ensure adherence with the HSE regulations • Ensure adherence with the onsite emergency an evacuation procedure • Address any concerns from the local community in consultation with the local government and the project manager. • Provide supervision to the technical officers
Monitoring and Technical Officers	Site Manager	• Under supervision of the site manager, ensure the maintenance of the all equipment and machinery during the lifetime of the power plant. • Collection of metering information • Calibration and maintenance of main metering equipment, according to appropriate standards

		or manufacturer specifications • Under supervision of the site manager, ensure adherence to the HSE procedures.

Coordinating/managing entity - Gigawatt Global Coöperatief U.A.

The CME is responsible for the following:

- Training of CPAs on CDM and GS monitoring requirements;
- Receiving monitored data from the CPA Implementer;
- Storage of data for at least two years after the end of the last crediting period or the last issuance of CERs, whichever occurs later;
- Crosscheck of monitored electricity generation data with a copy of invoices and the proof of payment of those invoices;
- Confirm that the CPA has operated the power plant in line with relevant regulations;
- Preparation of monitoring report.

The CME carries out a quality control on the data upon receipt as described below and stores them in the electronic database. Subsequently to this, the CME is responsible for preparing monitoring reports for submission to the DOE for verification on a regular basis.

The CME has made provisions for electronic data storage in a centralized database that is capable of storing data for at least two years following the end of the last crediting period or the last issuance of CERs, whichever will come later. The electricity data is stored together with copies of evidence to cross-check for quality control. Such evidence includes but is not limited to records of invoices to the utility or proof of payment of the invoices.

The database contains the following information:

- Name of the CPA
- CPA implementing entity and contacts
- GPS coordinates
- Technical description
- Installed capacity
- Number of verifications and associated monitoring periods

- Monitored data/parameters and relevant evidence
- Emission reductions monitored

Training

Before the start of the crediting period of CPA 0001, the CME provided training and guidance regarding the implementation of the monitoring plan. The training included:

- CDM and GS project cycle and the significance of monitoring
- Management structure and work scope
- Components of the monitoring plan
- QA/QC procedures
- Monitoring report template
- Preparation for verification
- Questions and answers

Parameters

All of the parameters as fixed ex-ante and monitored are listed below for reference:

SDG 13 – Climate Action: Take urgent action to combat climate change and its impacts

Please refer to CDM CPA 10202-P1-0001-CP1: ASYV 8.5MW Solar PV Project (CPA-001) CPA Design Document- 10202 CPA-DD001 approved on 3 January 2018, section 2.4.2 here.

- $EF_{grid,y}$ *– Grid Emission Factor value is fixed ex-ante for this crediting period*
- $EG_{PJ,facility,y}$ - Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

SDG 7 – Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable and modern energy for all

Refer to CDM monitoring report for 3rd monitoring period (01-09-2018 to 30-12-2020), section E.2 here.

- $EG_{PJ,facility,y}$ - Amount of electricity generated from solar PV source

SDG 8 – Decent Work and Economic growth: Promote inclusive and sustainable economic growth, employment and decent work for all

- Quality Employment
    1. Training records for employees during construction and operation period
    2. Feedback loop between the employee and the employer e.g. suggestion box
- Quantitative employment and income generation
    3. Number of jobs created for Rwandans during construction period
    4. Number of jobs created for Rwandans during operation period
    5. Number of men and women employed by the project activity
- Human and Institutional capacity & Technology transfer and technological self-reliance
    1. Number of trainings carried out by the project implementer for employees of the power plant
    2. Number of excursions to the power plant by various institutions will be recorded as part of training programmes.
    3. Number of students receiving solar technology / engineering training

SECTION D. DATA AND PARAMETERS

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

SDG 13 – Climate Action: Take urgent action to combat climate change and its impacts

Please refer to CDM CPA 10202-P1-0001-CP1: ASYV 8.5MW Solar PV Project (CPA-001) CPA Design Document- 10202 CPA-DD001 approved on 3 January 2018, section 2.4.2 here.

$EF_{grid,y}$ – Grid Emission Factor value is fixed ex-ante for this crediting period.

This is calculated utilising the following parameters as fixed ex-ante:

- $NCV_{i,y}$- Net calorific value (energy content) of fossil fuel type *i* in year *y* (GJ/kg)
- $EF_{CO2,i,y}$ / $EF_{CO2,m,i,y}$- CO2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)
- $FC_{i,m,y}$ - Amount of fossil fuel type *i* consumed by power plant / unit *m* in year *y*
- $\eta_{m,y}$ - Average net energy conversion efficiency of power unit *m* in year *y (ratio)*

D.2. Data and parameters monitored

SDG 13 – Climate Action: Take urgent action to combat climate change and its impacts

Relevant SDG Indicator	SDG 13 – Climate Action
Data/Parameter	Greenhouse Gas Emission Reductions (baseline emissions) due to the Project
Unit	tCO_{2e}

<table>
<tr><td>Description</td><td>Emission reductions as the difference between Baseline emissions and Project Emissions.
The Baseline Emissions (BE_y) are a product of electrical energy baseline $EG_{PJ,y}$ expressed in MWh of electricity produced by the renewable generating unit, multiplied by the grid emission factor, i.e., $BE_y = EG_{PJ,y} * EF_{grid,y}$
$EG_{PJ,y} = EG_{PJ,facility,y}$ where $EG_{PJ,facility,y}$ is the quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)</td></tr>
<tr><td>Source of data</td><td>Emissions spreadsheet - 2021 03 04 GwG CDM PoA ER v5.0</td></tr>
<tr><td>Value(s) applied</td><td><table><tr><th>Year</th><th>tCO_{2e}</th></tr><tr><td>01/09/2018 to 31/12/2018</td><td>2,856</td></tr><tr><td>01/01/2019 to 31/12/2019</td><td>8,607</td></tr><tr><td>01/01/2020 to 31/12/2020</td><td>8,572</td></tr><tr><td>Total</td><td>20,035</td></tr></table></td></tr>
<tr><td>Measurement methods and procedures</td><td>Emission Reductions from the power plant will be monitored continuously.</td></tr>
<tr><td>Monitoring frequency</td><td>Annually</td></tr>
<tr><td>Calculation method (if applicable)</td><td></td></tr>
<tr><td>QA/QC procedures</td><td>Quality control procedures have been applied in accordance with the monitoring plan</td></tr>
<tr><td>Purpose of data</td><td>To monitor project contribution to SDG13</td></tr>
<tr><td>Additional comment</td><td>To enable conversion of generated electricity to Emission Reductions, the following values apply:
$EF_{grid,y} = 0.66\ tCO_2/MWh$
$BE_y = 30,359 * 0.66 = 20,035\ tCO_2$/monitoring period
Project Emissions, $PE_y = 0$, Leakages, $LE_y=0$
Therefore, Emission reductions, $ER_y = BE_y-PE_y-LE_y$
$20,035-0-0=20,035tCO_{2e}$</td></tr>
</table>

SDG 7 – **Affordable and clean energy**: Ensure access to affordable, reliable, sustainable and modern energy for all

<table>
<tr><td>Relevant SDG Indicator</td><td>7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix
7.2.1 - Renewable energy share in the total final energy consumption</td></tr>
<tr><td>Data/Parameter</td><td>Amount of electricity generated from solar PV source</td></tr>
<tr><td>Unit</td><td>MWh</td></tr>
<tr><td>Description</td><td>Amount of electricity generated from solar PV source as a result of implementing the project.</td></tr>
<tr><td>Source of data</td><td>Energy reports with power generation data over a given number of months. Invoices to the utility company indication the amount of power sold to the utility company. These are provided by Scatec Solar Africa (Pty) Ltd – Invoices Revenue, Meter testing reports and Energy Report</td></tr>
<tr><td>Value(s) applied</td><td>
<table>
<tr><th>Year</th><th>MWh</th></tr>
<tr><td>01/09/2018 to 31/12/2018</td><td>4,328</td></tr>
<tr><td>01/01/2019 to 31/12/2019</td><td>13,042</td></tr>
<tr><td>01/01/2020 to 31/12/2020</td><td>12,989</td></tr>
<tr><td>Total</td><td>30,359</td></tr>
</table>
</td></tr>
<tr><td>Measurement methods and procedures</td><td>Energy generation from the power plant, which is from solar, will be monitored continuously.</td></tr>
<tr><td>Monitoring frequency</td><td>The quantity of electricity supplied to the grid was monitored continuously, measured hourly and recorded at least monthly.</td></tr>
<tr><td>Calculation method (if applicable)</td><td>Energy supplied to the grid (EG_{export}) - energy imported from the grid (EG_{import})</td></tr>
<tr><td>QA/QC procedures</td><td>Quality control procedures have been applied in accordance with the monitoring plan</td></tr>
</table>

Purpose of data	To monitor the contribution to SDG 7 (Affordable and Clean Energy)
Additional comments	Justification of SDG goal/target/indicator: The electricity generated from this renewable energy project is supplied to the Rwandese population.

SDG 8 – Decent Work and Economic Growth: Promote inclusive and sustainable economic growth, employment and decent work for all

Relevant SDG Indicator	**8.5** - By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value **8.5.2** – Unemployment rate, by sex, age and persons with disabilities
Data/Parameter	**Quality Employment** *Chosen Parameter:* Records of trained workers during the construction and operational phase.
Unit	Number of Employee Trainings
Description	The number of employment opportunities created due to the operation of the solar project with training.
Source of data	Professional training certificates as provided: Training record certificates provided by Scatec Solar Africa (Pty) Ltd: Plant Supervisor 1 training Senior Electrician 2 trainings

<table>
<tr><td>Value(s) applied</td><td><table>
<tr><td>Year</td><td>Number of Employee Trainings</td></tr>
<tr><td>01/09/2018 to 31/12/2018</td><td>0</td></tr>
<tr><td>01/01/2019 to 31/12/2019</td><td>1</td></tr>
<tr><td>01/01/2020 to 31/12/2020</td><td>2</td></tr>
<tr><td>Total</td><td>3</td></tr>
</table></td></tr>
<tr><td>Measurement methods and procedures</td><td>Verifying the number of training records of workers during the construction and operation phase.</td></tr>
<tr><td>Monitoring Frequency</td><td>Annually</td></tr>
<tr><td>QA/QC procedures</td><td>Quality control procedures have been applied in accordance with the monitoring plan</td></tr>
<tr><td>Purpose of data/parameter</td><td>To monitor the contribution to SDG 8 (Decent work and Economic Growth)</td></tr>
<tr><td>Additional comment</td><td>Justification of SDG goal/target/indicator: The project creates 2 full time employment posts for operational and maintenance plus various support roles contributing to the overall SDG target.</td></tr>
</table>

Relevant SDG Indicator	**8.8** - Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment **8.8.2** - Increase in national compliance of labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status
Data/Parameter	**Quality Employment** *Chosen Parameter:* Feedback loop between employee and the employer
Unit	Number of Grievances

<table>
<tr><td>Description</td><td>Provision of a grievance mechanism for workers to raise workplace concern. All employees are informed of this mechanism at the time of recruitment or no later than before start of any work on site.</td></tr>
<tr><td>Source of data</td><td>Grievance Book provided by Scatec Solar Africa (Pty) Ltd – Grievance book</td></tr>
<tr><td>Value(s) applied</td><td>
<table>
<tr><td>Year</td><td>Number of Grievances</td></tr>
<tr><td>01/09/2018 to 31/12/2018</td><td>0</td></tr>
<tr><td>01/01/2019 to 31/12/2019</td><td>0</td></tr>
<tr><td>01/01/2020 to 31/12/2020</td><td>0</td></tr>
<tr><td>Total</td><td>0</td></tr>
</table>
</td></tr>
</table>

Measurement methods and procedures	Annual compilation of complaints filed in the grievance book The Grievance mechanism procedural steps are set out below: • Security personnel will keep the grievance book and will be instructed to provide the book (in request) to all persons to write or log their grievances. • The complainant to write or log grievances on the new page – all the grievances to be confidential. • Security personnel to notify Plant Supervisor of any complaints or grievances • The complainant should not be victimized by any manner. • The Plant Supervisor or his/her appointee to check the grievance book on regular intervals but not exceeding 48 hours. • The Plant Supervisor or his/her appointee to follow up and act on the grievance as soon as possible • The Plant Supervisor or his/her appointee to give feedback to the complainant and all affected parties. • The Plant Supervisor or his/her appointee to advise the complainant about the right to refer the matter to the project superior or other authorities if he/she is not satisfied with the outcome. • The Plant Supervisor to upload any grievances recorded on the grievance book into internal organisation mechanism.
Monitoring Frequency	Annually
QA/QC procedures	Quality control procedures have been applied in accordance with the monitoring plan
Purpose of data/parameter	To monitor the contribution to SDG 8 (Decent work and Economic Growth)
Additional comment	Justification of SDG goal/target/indicator: The provision of the grievance mechanism for workers to raise workplace concern facilitates the creation of a working environment where labour rights are protected.

<table>
<tr><td>Relevant SDG Indicator</td><td>8.5 - By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value

8.5.2 – Unemployment rate, by sex, age and persons with disabilities</td></tr>
<tr><td>Data/Parameter</td><td>Quantitative Employment and Income Generation

Chosen parameter: Number of jobs created for Rwandese in general and for the local people during the operation phase.</td></tr>
<tr><td>Unit</td><td>Number of People Employed (Permanent and Support Roles)</td></tr>
<tr><td>Description</td><td>The number of jobs created for Rwandese and local people due to the operation of the solar project</td></tr>
<tr><td>Source of data</td><td>Summarized employment records in the Environmental and Social Monitoring Report provided by Scatec Solar Africa (Pty) Ltd – ASYV ESAP Report 2018, ASYV ESAP Report 2019 and 2020 ASYV ESAP Report. Further supported by 3 sample payslips for permanent staff</td></tr>
<tr><td>Value(s) applied</td><td>
<table>
<tr><td>Year</td><td>Number of People Employed (Permanent and Support Roles)</td></tr>
<tr><td>01/09/2018 to 31/12/2018</td><td>2 permanent and 87 support roles</td></tr>
<tr><td>01/01/2019 to 31/12/2019</td><td>2 permanent and 70 support roles</td></tr>
<tr><td>01/01/2020 to 31/12/2020</td><td>2 permanent and 94 support roles</td></tr>
<tr><td>Annual Average</td><td>2 permanent and 83 support roles</td></tr>
</table>
</td></tr>
</table>

Measurement methods and procedures	Verifying the employment records
Monitoring Frequency	Annually
QA/QC procedures	Quality control procedures have been applied in accordance with the monitoring plan
Purpose of data/parameter	To monitor the contribution to SDG 8 (Decent work and Economic Growth)
Additional comment	Justification of SDG goal/target/indicator: The project creates 2 full time employment posts for operational and maintenance plus various support roles contributing to the overall SDG target.

Relevant SDG Indicator	**8.5** - By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value **8.5.2** – Unemployment rate, by sex, age and persons with disabilities
Data/Parameter	**Quantitative Employment and Income Generation** *Chosen parameter*: Number of men and women employed by the project activity
Unit	Number of men and women employed
Description	The number of jobs created for men and women due to the operation of the solar project
Source of data	Summarized employment records in the Environmental and Social Monitoring Report provided by Scatec Solar Africa (Pty) Ltd – ASYV ESAP Report 2018, ASYV ESAP Report 2019 and 2020 ASYV ESAP Report.

<table>
<tr><td>Value(s) applied</td><td>
<table>
<tr><td>Year</td><td>Number of Men* and Women Employed</td></tr>
<tr><td>01/09/2018 to 31/12/2018</td><td>53M* and 36 W</td></tr>
<tr><td>01/01/2019 to 31/12/2019</td><td>48M* and 24 W</td></tr>
<tr><td>01/01/2020 to 31/12/2020</td><td>58M* and 36 W</td></tr>
<tr><td>Annual Average</td><td>51M* and 32W</td></tr>
</table>
*The ESAP reports do not count the 2 male permanent staff in Table 1: Reporting year employment statistics therefore, they have been added.
</td></tr>
<tr><td>Measurement methods and procedures</td><td>Verifying the employment records</td></tr>
<tr><td>Monitoring Frequency</td><td>Annually</td></tr>
<tr><td>QA/QC procedures</td><td>Quality control procedures have been applied in accordance with the monitoring plan</td></tr>
<tr><td>Purpose of data/parameter</td><td>To monitor the contribution to SDG 8 (Decent work and Economic Growth)</td></tr>
<tr><td>Additional comment</td><td>Justification of SDG goal/target/indicator: The project creates 2 full time employment posts for operational and maintenance plus various support roles contributing to the overall SDG target.</td></tr>
</table>

Relevant SDG Indicator	**8.5** - By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value **8.5.2** – Unemployment rate, by sex, age and persons with disabilities

<table>
<tr><td>Data/Parameter</td><td>Human and Institutional Capacity & Technology Transfer and Technological Self-Reliance
Chosen parameter: Number of trainings carried out by the project</td></tr>
<tr><td>Unit</td><td>Number of Employee Trainings</td></tr>
<tr><td>Description</td><td>Number of trainings carried out as a result of the operation of the power plant</td></tr>
<tr><td>Source of data</td><td>Training record certificates provided by Scatec Solar Africa (Pty) Ltd:
Plant Supervisor 1 training
Senior Electrician 2 trainings</td></tr>
<tr><td>Value(s) applied</td><td><table><tr><td>Year</td><td>Number of Employee Trainings</td></tr><tr><td>01/09/2018 to 31/12/2018</td><td>0</td></tr><tr><td>01/01/2019 to 31/12/2019</td><td>1</td></tr><tr><td>01/01/2020 to 31/12/2020</td><td>2</td></tr><tr><td>Total</td><td>3</td></tr></table></td></tr>
<tr><td>Measurement methods and procedures</td><td>Review of the trainings record certificates</td></tr>
<tr><td>Monitoring Frequency</td><td>Annually</td></tr>
<tr><td>QA/QC procedures</td><td>Quality control procedures have been applied in accordance with the monitoring plan</td></tr>
<tr><td>Purpose of data/parameter</td><td>To monitor the contribution to SDG 8 (Decent work and Economic Growth)</td></tr>
<tr><td>Additional Comment</td><td>Scatec provides training through i) purchasing training on behalf of their staff with service providers ii) running internal trainings.</td></tr>
</table>

<table>
<tr><td>Relevant SDG Indicator</td><td>8.6 - By 2020, substantially reduce the proportion of youth not in employment, education or training.
8.6.1 - Proportion of youth (aged 15-24 years) not in education, employment or training</td></tr>
<tr><td>Data/Parameter</td><td>Human and Institutional Capacity & Technology Transfer and Technological Self-Reliance
Chosen parameter: Number of excursions made to the solar power plant</td></tr>
<tr><td>Unit</td><td>Number of excursions /site visits</td></tr>
<tr><td>Description</td><td>Number of excursions to the power plant by various institutions as a result of the operation of the solar project</td></tr>
<tr><td>Source of data</td><td>Excursion records provided by Scatec Solar Africa (Pty) Ltd – Site Visits records</td></tr>
<tr><td>Value(s) applied</td><td>
<table>
<tr><td>Year</td><td>Number of learning excursions to the Solar Power Plant</td><td>Number of individuals who visited the solar plant during the learning excursions</td></tr>
<tr><td>01/09/2018 to 31/12/2018</td><td>0</td><td>0</td></tr>
<tr><td>01/01/2019 to 31/12/2019</td><td>17</td><td>203</td></tr>
<tr><td>01/01/2020 to 31/12/2020</td><td>5</td><td>201</td></tr>
<tr><td>Total</td><td>22</td><td>404</td></tr>
</table>
</td></tr>
</table>

Measurement methods and procedures	Review of site visit records
Monitoring Frequency	Annually
QA/QC procedures	Quality control procedures have been applied in accordance with the monitoring plan
Purpose of data/parameter	To monitor the contribution to SDG 8 (Decent work and Economic Growth)
Additional comment	Justification of SDG goal/target/indicator: The operation of the project provides an opportunity for the youth (and broader society) to access training and education on solar technology.

Relevant SDG Indicator	**8.6** - By 2020, substantially reduce the proportion of youth not in employment, education or training. **8.6.1** - Proportion of youth (aged 15-24 years) not in education, employment or training
Data/Parameter	**Human and Institutional Capacity & Technology Transfer and Technological Self-Reliance** *Chosen parameter*: Number of students receiving solar technology / engineering training
Unit	Number of Students Trained
Description	Number of students receiving solar technology/engineering training due to the presence of the power plant
Source of data	ASYV education records provided by Scatec Solar Africa (Pty) Ltd - Internships

<table>
<tr><td>Value(s) applied</td><td><table>
<tr><td>Year</td><td>Number of Students Trained</td></tr>
<tr><td>01/09/2018 to 31/12/2018</td><td>0</td></tr>
<tr><td>01/01/2019 to 31/12/2019</td><td>2</td></tr>
<tr><td>01/01/2020 to 31/12/2020</td><td>0</td></tr>
<tr><td>Total</td><td>2</td></tr>
</table></td></tr>
<tr><td>Measurement methods and procedures</td><td>Review of ASYV education records</td></tr>
<tr><td>Monitoring Frequency</td><td>Annually</td></tr>
<tr><td>QA/QC procedures</td><td>Quality control procedures have been applied in accordance with the monitoring plan</td></tr>
<tr><td>Purpose of data/parameter</td><td>To monitor the contribution to SDG 8 (Decent work and Economic Growth)</td></tr>
<tr><td>Additional comments</td><td>Justification of SDG goal/target/indicator: Based on the number of students receiving training in solar technology/engineering, the project has contributed to improving the proportion of youth in education and training.</td></tr>
</table>

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

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
tCO_{2e}	20,035	12,369
MWh	30,359	18,745
Employee Training	3	2
Grievances	0	0
Jobs during construction period*	147	147
Jobs during operation period	2 permanent, plus an annual average of 83 people were	2 permanent, plus an annual average of 101 people were

	employed for support roles	employed for support roles
Men and women employed	On average 32 women and 51 men per year	On average 36 women and 65 men per year
Employee Trainings	3	2
Excursions to the Solar Plant	22	150 persons visited
Students receiving Solar Technology/Engineering Training	502**	500

** Fixed at the construction phase and not this monitoring period*

*** 2 students were trained during this monitoring period, in addition to the on average 500 students at the ASYV orphanage that have continued access to solar PV technology.*

D.4. Implementation of sampling plan

The project does not involve any sampling.

SECTION E. CALCULATION OF SDG IMPACTS

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

SDG 13

Refer to CDM monitoring report and approved issuance for 3rd monitoring period 01-09-2018 to 31-12-2020, section F.1 here.

- 20,035 CERs issued on 7 Oct 2021
- Serial Range: Block start: RW-5-1671656-2-2-0-10202 Block end: RW-5-1691690-2-2-0-10202

SDG 7

Refer to CDM monitoring report for 3rd monitoring period 01-09-2018 to 31-12-2020, section F.1 here.

- 0 MWh

SDG 8

The baseline values for SDG 8 parameters listed below are considered as zero (0) in the absence of the project:

- Employee Training
- Grievances (opportunities for employees to provide feedback)
- Jobs during construction period
- Jobs during operation period
- Men and women employed
- Employee Trainings
- Number of excursions to the solar power plant
- Students receiving Solar Technology/Engineering Training

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

SDG Impact	Value obtained in this monitoring period	Supporting Documents
SDG 13		
Emission reductions	20,035tCO_2e	Refer to CDM monitoring

		report for 3rd monitoring period 01-09-2018 to 31-12-2020, section F.1 *here*
SDG 7		
Amount of electricity generated from solar PV source	30,359 MWh	Refer to CDM monitoring report for 3rd monitoring period 01-09-2018 to 31-12-2020, section F.2 here
SDG 8		
Employee Training	3	Training certificates
Grievances	0	Grievance Book
Jobs during construction period	147	*Previous monitoring reports*
Jobs during operation period	2 permanent plus an annual average of 83 were employed for support roles	ASYV ESAP report 2018, ASYV ESAP Report 2019 and 2020 ASYV ESAP Report Sample payslips for permanent staff
Men and women employed	On average 32 women and 51 men per year	ASYV ESAP report 2018, ASYV ESAP Report 2019 and 2020 ASYV ESAP Report
Employee Trainings	3	Training certificates
Excursions to the project power plant	22	Site Visit Records
Students receiving Solar Technology/Engineering Training	2	Internship Certificates

E.3. Calculation of leakage

No leakage emissions are considered since the CPA is not a biomass project activity.

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

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Emission Reduction	20,035 tCO2e	0 $tCO2_e$	20,035 $tCO2_e$
7	MWh of renewable energy generated	0 MWh	30,359 MWh	30,359 MWh
8	Training records for employees during construction and operation period	0	3	3
8	Feedback loop between the employee and the employee (grievances)	0	0	0
8	Number of jobs created for Rwandans during construction period	0	147	147
8	Number of jobs created for Rwandans during operation period	0	2 permanent, plus an average 83 employed per year in support roles	2 permanent, plus an average 83 employed per year in support roles
8	Number of men and women employed by the project activity	0	An average of 32 women and 51 men per year	An average of 32 women and 51 men per year
8	Number of trainings provided by the project implementer for power plant employees	0	3	3
8	Number of excursions to the power plant by various institutions	0	22	22
8	Number of students receiving solar technology /engineering training	0	2	2

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[3] achieved during this monitoring period
13	23,451 $tCO2_e$	20,035 $tCO2_e$
7	35,532 MWh	30,359 MWh

**no values were estimated ex ante for the SDG 8 parameters*

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

SDG 13

- *Refer to CDM monitoring report and approved issuance for 3rd monitoring period 01-09-2018 to 31-12-2020, section F.5.1 here.*
- 20,035 CERs issued on 7 Oct 2021
- Serial Range: Block start: RW-5-1671656-2-2-0-10202 Block end: RW-5-1691690-2-2-0-10202

SDG 7

- *Refer to CDM monitoring report for 3rd monitoring period 01-09-2018 to 31-12-2020, section F.5.1 here.*

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

SDG 13

Refer to CDM monitoring report and approved issuance for 3rd monitoring period 01-09-2018 to 31-12-2020 section F.6 here.

- 20,035 CERs issued on 7 Oct 2021
- Serial Range: Block start: RW-5-1671656-2-2-0-10202 Block end: RW-5-1691690-2-2-0-10202

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

SDG 7

Refer to CDM monitoring report for 3rd monitoring period 01-09-2018 to 31-12-2020 section F.6 here.

SECTION F. SAFEGUARDS REPORTING

The safeguards reporting remain as per the CPA transition annex (version 3.0) as in the table below, under which no mitigation measures were listed as required.

Safeguarding principles	**Assessment questions**	**Assessment of relevance to the project (Yes/potentially/no)**	**Justification**	**Mitigation measure (if required)**
3.2 Gender Equality and Women's Rights	Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?	No	The generated electricity is neutrally delivered to the Rwandese Electricity grid for clients of the country's utility company to access. The jobs created are new with the project being compliant with the IFC Performance Standards on Labour and Working Conditions.	Not applicable

	Is there a possibility that the Project can adversely affect men and women in marginalized or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?	No	The generated electricity is neutrally delivered to the Rwandese Electricity grid for clients of the	Not applicable
	Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?	No	The Project is already constructed and women participated in the design process, for example through invitations to the local stakeholder consultation.	Not applicable.

	Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?	Yes	The generated electricity is neutrally delivered to the Rwandese national grid for clients of the country's utility company to access.	Not applicable.
	Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?	No	The generated electricity is neutrally delivered to the Rwandese national grid for clients of the country's utility company to access.	Not applicable.
	Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?	No	The generated electricity is neutrally delivered to the Rwandese national grid for clients of the country's utility company to access.	Not applicable.

	Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?	No	The generated electricity derived from a solar power is neutrally delivered to the Rwandese national grid for clients of the country's utility company to access.	Not applicable.
	Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards?		The generated electricity is neutrally delivered to the Rwandese Electricity grid for clients of the country's utility company to access. The project is in compliance with the IFC Performance Standards on Labour and Working Conditions. The project has been constructed and is maintained in compliance with Rwandese law.	Not applicable.

3.4.3 Land Tenure and Other Rights	Does the Project require any change to land tenure arrangements and/or other rights?	No	The project has been constructed and is maintained in compliance with Rwandese law. It is located on a privately owned land (Agahozo- Shalom Youth Village), leased to Gigawatt Global Rwanda Ltd. for the purpose of the project.	Not applicable
	For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?	No	The project has been constructed and is maintained in compliance with Rwandese law. It is located on a privately owned land (Agahozo- Shalom Youth Village), leased to Gigawatt Global Rwanda Ltd. for the purpose of the project.	Not applicable
3.6.2 Negative Economic Consequences	Is the Project financially sustainable during implementation and beyond the Project Certification period?	Yes	The project has a signed Power Purchase Agreement (PPA) for 25 years.	Not applicable

	Does the Project pose any potential risks to the local economy and have they been taken into consideration during design, implementation, operation and after the Project?	No	The solar PV plant is constructed with the PPA signed by the relevant authorities in Rwanda on behalf of the Government.	Not applicable
4.1.1 Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	The solar PV plant is constructed and supplies electricity from a renewable energy source to the national grid, therefore it does not contribute to a rise in GHG emissions over the baseline scenario.	Not applicable
4.1.2 Energy Supply	Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The solar PV plant is constructed and is connected to the national grid. Solely supplying and consuming electricity from the same source.	Not applicable
4.2.1 Impact on natural water patterns and flow	Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	Potentially	The land change at the project site through clearing of vegetation and mounting of the solar PV panels with heavy rains could lead to increased soil erosion.	Not applicable – Implementation of a drainage system and revegetation of cleared areas. Both measures have already been

				implemented and are monitored.
4.2.2 Erosion and/or water body stability	1. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? If 'Yes' or 'Potentially' proceed to question 2.	Potentially	The land change at the project site through clearing of vegetation and mounting of the solar PV panels with heavy rains could lead to increased soil erosion.	Not applicable - Implementation of a drainage system and revegetation of cleared areas. Both measures have already been implemented and are monitored.
	2. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	No	The increased risk of soil erosion has been offset by the implementation and monitoring of a drainage system and revegetation of cleared areas.	Not applicable
4.3.1 Landscape modification and soil	Does the Project involve the use of land and soil for production of crops or other products?	No	The land is currently in use to generate electricity from installed solar PV modules.	Not applicable
4.3.2 Vulnerability to Natural Disaster	Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought	Potentially	The land change at the project site through clearing of vegetation and mounting of the solar PV panels with heavy	Not applicable - Implementation of a drainage system and revegetation of

	or other extreme climatic conditions?		rains could lead to increased soil erosion.	cleared areas. Both measures have already been implemented and are monitored.
4.3.3 Genetic Resources	Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development)?	No	The project site is being utilized for generating electricity from solar PV modules with no requirement for GMOs.	Not applicable
4.3.4 Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	Potentially	The limited volumes of solid waste generated at the site are collected for safe processing by a contracted third party.	Not applicable – Third party waste collection company is contracted and implements the contracted service at the site. This is already being monitored.
4.3.5 Hazardous and Non-hazardous Waste	Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	No	This does not apply as the elements are not covered in the project scope.	Not applicable

4.3.6 Pesticides and fertilizers	Will the Project involve the application of pesticides and/or fertilisers?	No	The project is energy-based with a small vegetation component that does not require pesticides and/or fertilizers.	Not applicable
4.3.7 Harvesting of forests	Will the Project involve the harvesting of forests?	No	This does not apply as harvesting of forests is not covered in the project scope.	Not applicable
4.3.8 Food	Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	This does not apply as food is not covered in the project scope.	Not applicable
4.3.9 Animal Husbandry	Will the Project involve animal husbandry?	No	This does not apply as animal husbandry is not covered in the project scope.	Not applicable

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.

No Grievances were received during this monitoring period.

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

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

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