



**Project design document form
(Version 10.1)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title of the project activity	Panasolar Photovoltaic Project
Scale of the project activity	☐ Large-scale ☒ Small-scale
Version number of the PDD	4
Completion date of the PDD	27/02/2019
Project participants	Panasolar Generation S.A.
Host Party	Republic of Panama
Applied methodologies and standardized baselines	Methodology: AMS I.D (grid connected renewable electricity generation), version 18.0
Sectoral scopes linked to the applied methodologies	Sectoral Scope: 01 (renewable energy)
Estimated amount of annual average GHG emission reductions	10,322

SECTION A. Description of project activity**A.1. Purpose and general description of project activity**

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The project consists of the construction, installation, operation, and maintenance of photovoltaic panels for the production of electricity through solar energy. This energy is captured by photovoltaic modules, with an installed capacity of 9.9 MW AC and 12.09 MW DC. These panels are placed on fixed structures anchored to the ground. The project activity will connect to the 34.5KV substation in Llano Sanchez, via a mix (underground and aerial) transmission line that it does not require for trees to be cut or trimmed where the lines passes. Once the line reaches the substation, it connects to the national electrical grid, known as Empresa de Trasmisión Eléctrica, S.A. (ETESA). The project has an expected lifetime of 25 years.

The estimated annual energy generation will be 19,661 MWh with a plant load factor of 18.53% that will generate an annual average of 10,322 reductions of tCO₂e per year, which means a total emission reduction of 72,254 tCO₂e for the first crediting period.

Prior to the project activity, no activity related to the generation of electricity took place in the project area. The baseline scenario is, as per the provisions of the methodology AMS-I.D., "that the 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 into the grid."

The baseline scenario is therefore the same as the scenario existing prior the implementation of the project activity.

The proposed photovoltaic power project will contribute to the sustainable development through improvement of family income due to jobs created during construction and operation of the plant, strengthen commercial and institutional conditions and also promote the sustainable development of the surrounding area through the generation of renewable energy, which will expand the available power in Panamanian grid to meet increasing energy demand through clean and renewable sources and have positive impacts on the balance of trade, as Panama's coal and oil imports used to fuel national thermals plants will be replaced by the use of renewable indigenous energy sources.

A.2. Location of project activity

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A.2.1. Host Party (ies)

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Republic of Panama

A.2.2. Region/State/Province etc.

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Coclé

A.2.3. City/Town/Community etc.

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City of Aguadulce, borough of El Roble

A.2.4. Physical/ Geographical location

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The project activity can be located with the following coordinates:

Latitude: + 8.216667

Longitude: + 80.692778

A.3. Technologies/measures

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The project consists in installing in the Republic of Panama a PV Plant of up to 9.9 MW AC of installed power with an estimated annual energy generation will be 19,661 MWh with a plant load factor of 18.53% and an operational lifetime of 25 years.

The energy will measure by two SMEC meters SEL-735. The first one installed at the plant exit with coordinates 8 12 52.85 N / 80 41 40.17 W (8.21468, -80.69449236649221) and the other one in the substation with coordinates 8 11 40.66 N / 80 41 53.36 (8.194627777777779, -80.69815555555556)

Below some more detailed technical information:

- PV Panel model: GCL-P6/72 manufactured by GCL System Integration Technology Co., Ltd.
- Length x width x thickness: 1956×992×35mm (77×39.05×1.38 inches)
- Weight: 22.2kg

Max. Power output (Wp)	330 + (0~+5)
Open Circuit tension (V)	46.2
Short Circuit Current (A)	9.33
Max. System Tension (V)	1,000.00
Max. Power output Tension (V)	37.8
Max. Power output Current (A)	8.73
Number inverter modules per series	20
Number of parallel strings:	1,839

A.4. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Party A (host Party)	Panasolar Generation S.A (Private entity)	No

A.5. Public funding of project activity

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There is no public funding available for the project activity. The project proponents have arranged funds from financial institutions and internal resources.

A.6. Debundling

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As per GUIDELINES ON ASSESSMENT OF DEBUNDLING FOR SSC PROJECT ACTIVITIES version 03, EB54, Annex 13, a small-scale project is considered a debundled component of a large project activity if there is a registered small-scale activity or an application to register another small-scale activity:

- With the same project participants;
- In the same project category and technology/measure;
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

The project participant confirms that there are no projects from the same participant in the same project category within the previous 2 years whose project boundary is within 1 km of the project boundary of proposed small scale project activity. Accordingly, the project is not a debundled component of a larger scale project activity.

SECTION B. Application of selected methodologies and standardized baselines**B.1. Reference to methodologies and standardized baselines**

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A.1. Reference of methodology

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Title: Grid connected renewable electricity generation

Reference: The project activity meets the eligibility criteria to use the simplified modalities and procedure for small-scale CDM project activities as set out in paragraph 6 (c) of decision 17/CP.7.

Details of methodology for baseline calculations for CDM projects of capacity less than 15 MW are available in the "Appendix B of the simplified modalities and procedure for small scale CDM project activities".

Methodology: AMS-I.D Grid Connected Renewable Electricity Generation (Version 18). Type I : Renewable Energy Project (Small Scale) Category : I. "D", Grid Connected Renewable Electricity Generation

Reference has been taken from indicative simplified baseline and monitoring methodologies for selected small scale (CDM projects less than 15 MW) project activity categories.

Tools referred with above methodology are:

Tool to calculate the emission factor for an electricity system - Version 06.0 (

Please click following link for more information about the methodology and tool:

<http://cdm.unfccc.int/methodologies/SSCmethodologies/approved>

B.2. Applicability of methodologies and standardized baselines

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AMS-I.D. Ver 18 applicability conditions	Project Applicability
2. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal, and renewable biomass: (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	This project generates energy from solar photovoltaic and supply electricity to the national grid. Hence the condition is applicable.
3. Illustration of respective situations under which each of the methodology (i.e. "AMS-I.D.: Grid connected renewable electricity generation", "AMS-I.F.: Renewable electricity generation for captive use and mini-grid" and "AMS-I.A.: Electricity generation by the user) applies is included in the Table 1.	As per Table 1 of the AMS.I.D Version 18 (also provided below), project activities that supply electricity to the national/regional grid or to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling) are applicable under AMS.I.D Version 18. Thus, this criterion is applicable to the project activity and the project activity complies with this criterion.
4. This methodology is applicable to project activities that: (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s); or (d) Involve a replacement of (an) existing plant(s).	This project activity is a newly grid connected solar PV based renewable electricity generation project. Hence, the criterion is applicable for the project activity.
5. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: (a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir; (b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m ² ; (c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions	The project activity is not a hydro power plant. Thus, this criterion is not applicable to the project activity.

section, is greater than 4 W/m ² .	
6. If new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.	The installed capacity of the project will be 9.9MW, which is below 15 MW and complies with the provisions of small scale project activities. The project does not involve any use of fossil fuel. Thus, this criterion is not applicable to the project activity.
7. Combined heat and power (co-generation) systems are not eligible under this category.	The project activity generates only electricity from solar and hence is not a cogeneration system. Thus, this criterion is not applicable to the project activity.
8. In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units	This project activity is a newly installed solar PV based renewable electricity generation project and does not involve addition of capacity in any existing renewable energy generation unit. The total capacity of this project activity is 9.9 MW which is less than the limit of 15 MW.
9. In the case of retrofit or replacement, to qualify as a small scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	Since there is no retrofit or replacement of units in the project activity, this criterion is not applicable.
10. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as "AMS-I.C.: Thermal energy production with or without electricity" shall be explored.	Since the project activity generates only electricity from solar, this criterion is not applicable.
11. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	

Table 1 of the methodology AMS-I.D. version 18:

	Project type	AMS-I.A	AMS-I.D	AMS-I.F
1	Project supplies electricity to a national/regional grid		√	
2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			√

3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√	
4	Project supplies electricity to a mini grid system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			√
5	Project supplies electricity to household users (included in the project boundary) located in off grid areas	√		

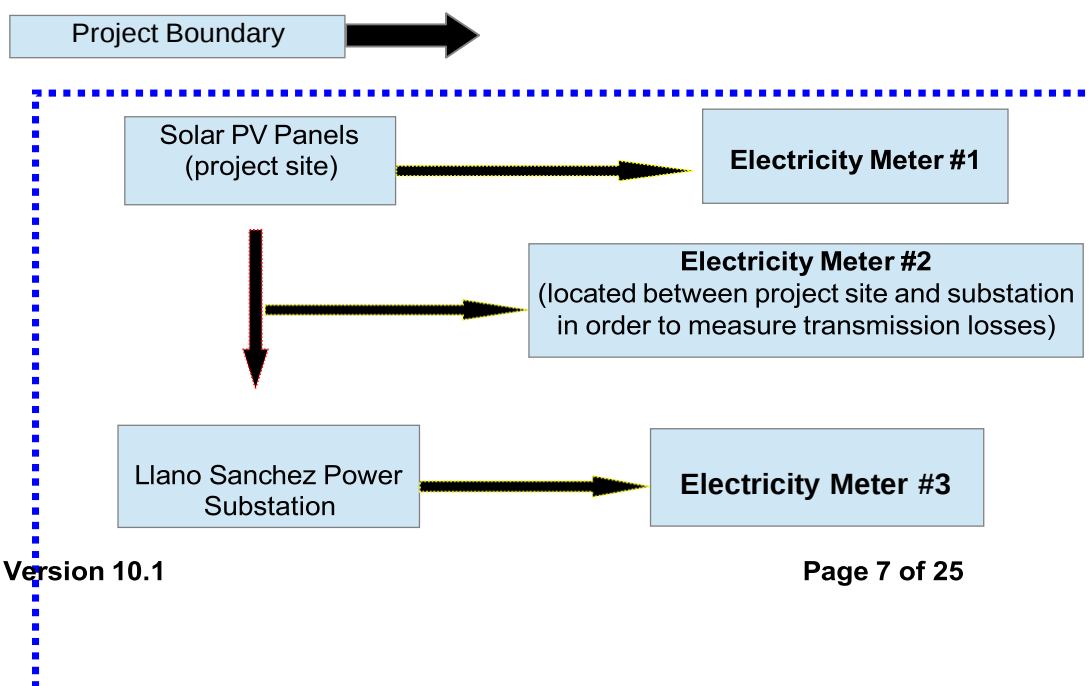
B.3. Project boundary, sources and greenhouse gases (GHGs)

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As per the approved methodology, "The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to" is defined as the boundary. The project boundary is therefore the physical boundary, which includes the Solar PV panels and the metering/substation system connected to the ETESA Grid. The proposed project and all other power plants are connected physically to the ETESA grid.

Source		GHG	Included ?	Justification/Explanation
Baseline	Grid emission factor of the ETESA grid.	CO ₂	Yes	Main emission source.
		CH ₄	No	Excluded for simplification. This is
		N ₂ O	No	Baseline conservative
Project activity	Solar electricity production	CO ₂	No	The project does not lead to CO ₂ emission.
		CH ₄	No	The project does not lead to CH ₄ emission.
		N ₂ O	No	The project does not lead to N ₂ O emission.

The spatial extension of the limits of the project includes the physical location of the project (Panasolar Photovoltaic Project) and all plants connected to the electrical system, which will be connected to the ETESA National Interconnected System of Panama, as shown on the following figure:



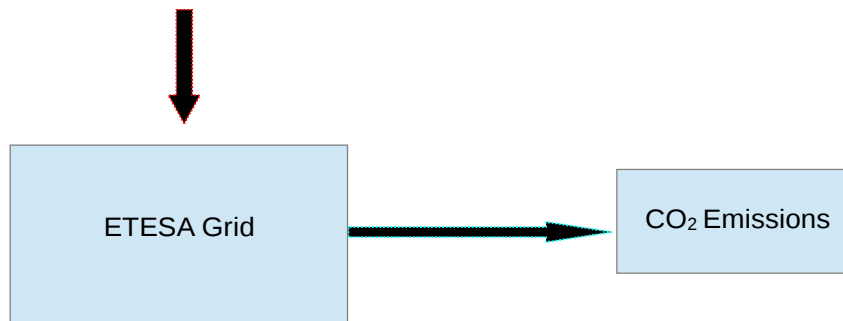


Figure 2: Project Boundary

The Project will be connected to the national grid via a transmission line of 34.5 KV to the sub-station of Llano Sanchez. The distance of the transmission line is 2.7km.

B.4. Establishment and description of baseline scenario

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The project activity is a grid connected renewable electricity generation project which meets all the applicability criteria stated in methodology ASM I.D (Version 18.0).

The project activity will generate electricity without emitting GHGs, supplying it to the ETESA national system in Panama and therefore displacing fossil fuel based electricity generation that would otherwise be supplied to the ETESA grid.

The baseline scenario is identified as the continuation of the current situation, before implementing the project activity, of electricity supplied by thermal power stations.

The “Tool to calculate the emission factor for an electricity system” (Version 6.0) was adopted to estimate the emission factor of the project. According to the “Tool to calculate the emission factor for an electricity system”: This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand side energy efficiency projects).

B.5. Demonstration of additionality

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The additionality for the Project Activity has been demonstrated as per “Demonstration of additionality of small scale project activities”, (version 12.0).

1. Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;

(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;

(c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;

(d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

2. Documentation of barriers, as per paragraph 1 above, is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of:

(a) The following grid-connected and off-grid renewable electricity generation technologies:

(i) Solar technologies (photovoltaic and solar thermal electricity generation);

(ii) Off-shore wind technologies;

(iii) Marine technologies (wave, tidal);

(iv) Building-integrated wind turbines or household rooftop wind turbines of a size up to 100 kW;

(b) The following off-grid electricity generation technologies where the individual units do not exceed the thresholds indicated in parentheses with the aggregate project installed capacity not exceeding the 15 MW threshold:

(i) Micro/pico-hydro (with power plant size up to 100 kW);

(ii) Micro/pico-wind turbine (up to 100 kW);

(iii) PV-wind hybrid (up to 100 kW)

(iv) Geothermal (up to 200 kW);

(v) Biomass gasification/biogas (up to 100 kW);

(c) Project activities solely composed of isolated units where the users of the technology/measure are households or communities or Small and Medium Enterprises (SMEs) and where the size of each unit is no larger than 5% of the small-scale CDM thresholds;

(d) Rural electrification project activities using renewable energy sources in countries with rural electrification rates less than 20%; the most recent available data on the electrification rates shall be used to demonstrate compliance with the 20 per cent threshold. In no case shall data be used if older than three years from the date of commencement of validation of the project activity.

Given the fact that the proposed project activity is a 9.9 MW solar photovoltaic based grid connected power project, it falls under the grid-connected renewable electricity generation technologies that are automatically defined as additional.

Based on the above discussion on additionality it can be concluded that the proposed project activity, being a small scale solar photovoltaic power plant, automatically get defined as additional.

B.6. Estimation of emission reductions

B.6.1. Explanation of methodological choices

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According to methodology AMS-I.D, the baseline is the power generation in MWh produced by the renewable generating unit multiplied by the Combined Margin emission factor (measured in CO₂e/MWh).

The emission factor was calculated with the latest available data at the time of start of validation and will serve as an example of the calculation that is to take place ex post.

According to the Tool to calculate the emission factor for an electricity system, for the purpose of determining the operating margin and the build margin emission factors, a project electricity system is defined by the spatial extent of the power plants that can be dispatched without significant transmission constraints. Similarly a connected electricity system is defined as an electricity system that is connected by transmission lines to the project electricity system and in which powerplants can be dispatched without significant transmission constraints.

Baseline Emissions (BE):

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{BL,y} * EF_{CO_2,grid,y} \quad (1)$$

Where:

BE_y = Baseline Emissions in year y (t CO₂)

$EG_{BL,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{CO_2,grid,y}$ = CO₂ emission factor of the grid in year y (t CO₂/MWh)

Project emissions (PE):

For most renewable energy project activities, $PE_y = 0$. However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of AMS ID

- Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption)
- Emissions from water reservoirs of hydro power plants

Since the project activity is solar power project so there is no emission due to the project activity and hence, $PE = 0$

Leakage (LE):

As the energy generating equipment is not transferred from another activity or the existing equipment is transferred to another activity, hence leakage is not to be considered.

Emission reductions (ER)

Emission reductions are calculated as follows:

Emission reduction, $ER = BE - PE - LE$

But here:

PE= 0

LE=0

So ER= BE

The grid emission factor will be calculated ex post according with the “Tool to calculate the emission factor for an electricity system” version 6, to calculate the Combined margin CO2 emission factor for grid connected power generation in year y.

B.6.2. Data and parameters fixed ex ante

N/A.

B.6.3. Ex ante calculation of emission reductions

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Yearly generation as per feasibility study: 19,661 MWh/year

Grid emission factor: 0.525 tCO₂/MWh (ex ante estimated value)

Yearly emission reduction: 10,322 CERs.

B.6.4. Summary of ex ante estimates of emission reductions

Year	Baseline emissions (t CO ₂ e)	Project emissions (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions (t CO ₂ e)
Year 1	10,322	0	0	10,322
Year 2	10,322	0	0	10,322
Year 3	10,322	0	0	10,322
Year 4	10,322	0	0	10,322
Year 5	10,322	0	0	10,322
Year 6	10,322	0	0	10,322
Year 7	10,322	0	0	10,322
Total	72,254	0	0	72,254
Total number of crediting years	7			
Annual average over the crediting period	10,322	0	0	10,322

B.7. Monitoring plan**B.7.1. Data and parameters to be monitored**

Data/Parameter	EF _{grid,CM,y}
Unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor for the electricity system in year y
Source of data	Calculated ex-post and during each verification. The plant is connected to the Llano Sanchez Substation owned by ETESA (Empresa de Transmision Electrica S.A) which is the State-owned owner of the Transmission grid. The method to be used to calculate the Operating Margin emissions factor is Simple adjusted OM
Value(s) applied	Calculated ex-post. Grid Emission factor: 0.525 tCO ₂ /MWh (ex-ante estimated value). Yearly emission reduction estimated: 10,322 CERs.
Purpose of data	To calculate baseline emissions
Additional comment	To be calculated ex-post and during each verification.

Data/Parameter	EG _{facility,,y}
Data unit	MWh/year
Description	Quantity of net electricity supplied by the project activity to the grid
Source of data	Electricity meter. The primary meter is #1.
Value(s) applied	19,322 MWh
Measurement methods and procedures	This parameter will be monitored using bi-directional energy meters for the primary (meter #1), secondary (meter #2), and backup meters (meter #3) installed on an hourly basis. The total annual electricity of the proposed project activity supplied to SIN in the crediting period shall be obtained by the SCADA system installed at the project site. Furthermore, two redundantly set-up energy meters, as established in the commercial measuring system regulations, have been installed in the substation.
Monitoring frequency	Continuous monitoring, hourly measurement and at least monthly recording.
QA/QC procedures	Equipment will be annually calibrated by the CND in Panama as per Panama law and manufacturer specification. The electricity supplied to the grid will be acquired from the SCADA System. The meters will conform to the accuracy class of 0.2 The electricity supplied by the project activity to the grid is measured by calibrated electricity meters. The parameter is monitored at the control room and crosschecked with review of the receipts of electricity sales.
Purpose of data	Baseline emissions.
Additional comment	This parameter will be used ex-post during each verification.

B.7.2. Sampling plan

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There is no specific sampling plan involved in the project activity, as 100% of the data will be monitored.

B.7.3. Other elements of monitoring plan

>> Emissions Factor Calculation: Emissions Factor for the electricity grid is calculated ex post and will be done so prior to each verification,

Management Structure and Responsibilities

Overall responsibility for daily monitoring and reporting lies with the project owner. The manager of the proposed project is responsible for review the monthly reported results/data and checks the calibration certificates.

Data Collection: The electricity supplied by the project activity to the grid is measured by calibrated electricity meters. The parameter is monitored at the control room and crosschecked with review of the receipts of electricity sales.

Data is measured continuously and recorded at least hourly as required by the applicable methodology.

Data Recording: All data collected is recorded monthly into an electronic spreadsheet.

Meter Calibration: All measurements are conducted with calibrated measurement equipment according to relevant industry or national standards named "Reglamento de Operacion". published by the "Centro Nacional de Despacho" in February 2018. The frequency of calibration is annual.

Data Report: Data recorded and the receipts will be consolidated on a monthly basis and will be checked for quality control purposes with official reports or statistics. If there are discrepancies in the data, the source of the variation will be identified. The data report will be concluded monthly and will be verified by the Project Developer's Head Office.

Data Archives: The data recording, the data report and the invoices are archived, together with this monitoring plan. All data collected as part of monitoring are archived electronically and be kept at least for 2 years after the end of the last crediting period or the last issuance of CERs, whichever is later.

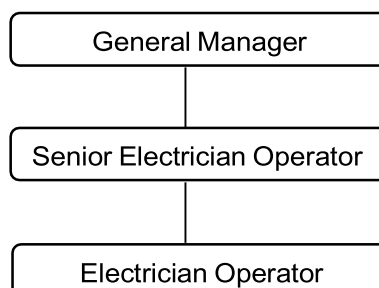
Data Quality Control: An internal procedure to secure the correctness of data is regularly carried out. Data and reports are checked internally to secure correctness of data. In case of mistakes, the source of the variation will be identified, whether it is the primary meter or the backup meter. The data report is concluded monthly and verified by the Project Developer's Head Office. Corrective actions will be applied to avoid future similar mistakes wherever appropriate.

Training and Monitoring Personnel: All people that participate in the monitoring process are suitably qualified and trained in the operation and maintenance of the plant. They will also receive instructions of the monitoring plan.

Verification and Monitoring Results: The monitoring report is prepared by the monitoring personnel and/or the designed consulting company, in this case Anaconda Carbon S.A. It contains the data report, the emission factor calculation and the results of the emissions reductions of the project for a certain period.

Leakage monitoring: No energy generating equipment is transferred from another activity to this project and there is no existing equipment to be transferred to another activity. The project activity involves electricity generation from solar radiation. The employed solar energy generator can only convert solar radiation into electrical energy and cannot use any other input fuel for electricity generation. Thus, in no ways and means are required to monitor leakage from the project activity. The project owner can adjust and modify the monitoring plan accordingly in order to meet operational requirements. These changes need to be approved by the verifier during the periodic verifications.

The relevant company personnel involved in the monitoring activities are:



The responsibilities of each function are as follows:

General Manager

- Signs off on the written statement for each month.
- Designates the representative for precision testing and calibration.
- Attaches seals to the meters or designates the appropriate person for this function.

Senior Electrician Operator

- Drafts the written statement for each month to be delivered to the General Manager for signature.
- Verifies the readings carried out by the Electrician Operator.
- Maintains communication with the energy buyer.

Electrician Operator

- Carries out readings from meters.
- Stores readings in electronic database.
- Sends meter readings to Senior Electrician Operator for the monthly written statement.

SECTION C. Start date, crediting period type and duration

C.1. Start date of project activity

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Phase	Start
Land Purchase	June 24, 2014
Financial Closure	December 21, 2017
Order of Equipment	July 12, 2016
Construction Begins	August 01, 2017
Commissioning	August 31, 2018

The start date of project activity was on July 12, 2016 with the equipment order.

The land purchase was not considered as the earliest date because the land could be sold and the project could be reversible. That's why the initial date considered is the Order of Equipment, because the investment is much more, and the project will not be reversible.

The purchase of equipment and the beginning of the construction was purchase by own money while the financial closure was done.

C.2. Expected operational lifetime of project activity

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25 years 0 months

C.3. Crediting period of project activity**C.3.1. Type of crediting period**

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7 years twice renewable twice

C.3.2. Start date of crediting period

>>

01/06/2018

C.3.3. Duration of crediting period

>>

7 years

SECTION D. Environmental impacts**D.1. Analysis of environmental impacts**

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The project activity does not present any environmental risks to the area near the project and also has established a series of measures to mitigate any effects that may present themselves regarding noise, occupational hazards, erosion, etc. Below is a description of the environmental impacts and their mitigation during the construction, operational and closure phases of the project activity.

Construction

The project construction will be realized in phases in order to minimize environmental impacts. The time taken to complete project construction is estimated to last approximately one year. Some of the main activities to be undertaken during this phase are:

- Clearing of the land in order to being the levelling of the terrain
- Moving of land in order to obtain a flat surface area required for proper installation and operation of the PV panels. There will also be a 60mm layer of gravel and a drainage system in the areas where the PV panels are to be placed.
- Preparation of land where shipping containers are to be placed to serve as offices and equipment depots.
- Construction of a system of pipes for water. The water well already located in the land would be used for this purpose.
- Mounting and installation of PV panels on support structures.
- Installation of posts for the transmission lines that will lead to the Llano Sanchez sub-station
- Maintenance of the remaining green areas, planting of grass and ornamental vegetation in barren areas.
- Placement of waste recipients for the collection of solid wastes located in strategic locations within the land where the project activity is to take place.

During the construction phase wastewater generated will be treated through portable latrine, liquid and solid waste will be recycled, organic household waste will be collected in suitable containers, confined, treated and finally disposed as established by the local authorities in the town of Aguadulce, in no instance will any waste be buried or placed near a water source. Any sort of non-recoverable waste or scrap, will be supplied to companies that specialize in their handling.

Operational Phase

This step includes the generation, and transmission of energy as well as scheduled and corrective maintenance of the project. These activities will be coordinated with the appropriate authorities in agreement with the National Environmental Authority. The most significant environmental activities that occur at this stage are: production of solid and liquid wastes and maintenance of green areas. The collection of solid waste is the responsibility of the town of Aguadulce, and the project proponent is committed to pay for this service.

Project Closure

If a stage of project abandonment is deemed necessary, all legal and environmental requirements will be met. The mechanical parts are to be removed from the property and any other obsolete project components will be removed move for reuse, recycling or disposal in accordance with regulations from the Panamanian environmental authorities.

Since the ground will get virtually no modifications, the land where the project activity will take place will be as in its previous state.

Regarding possible environmental impacts to the quality of air, noise, soil, water, flora and fauna the following should be noted:

Air

Possible impacts:

- An increase of particulate matter near the access roads and in the project site during the construction phase.
- An increase in combustion gases from machinery and trucks during the construction phase of the project.
-
- Mitigation actions:
- Proper maintenance to all engines in the trucks and machinery used in the construction phases in order to minimize unnecessary emissions from these sources.
- Watering of dirt roads in order to minimize dust being unsettled during the transportation of equipment to the project site.

Noise

Possible impacts:

- Increase in noise levels during the construction phase due to transportation of equipment to the project site and from machinery.
-
- Mitigation actions:
- Proper maintenance of transportation trucks and machinery.
- Transportation of equipment to the project site will be done during the day and at night.

Soil

Possible impacts:

- Increased possibility of erosion
- Increased possibility of destabilization of landscape due to barren land and the effects of erosion
- Alteration of subterranean drainage systems
-
- Mitigation actions:
- Levelling of the land is to be done taking into account relief of the land, minimizing amount of soil to be moved.

- Sediment traps are to be placed strategically
- Revegetation of the land is to be encouraged via reforestation program
- Design and implementation of a comprehensive drainage system for erosion and water management. Excess soil that has been moved will be placed in an area with as little incline as possible and will be vegetated once it is placed.

Water

Possible impacts:

- Alteration of subterranean water drainage
- Increased water collection on the surface
- Increased sedimentation on surface water
-
- Mitigation actions:
- Design and implementation of a comprehensive drainage system for erosion and water management.
- Revegetation of the land is to be encouraged via reforestation program
- Sediment traps are to be placed strategically
- Excess soil that has been moved will be placed in an area with as little incline as possible and will be vegetated once it is placed.

Flora

Possible impacts:

- Loss of herbaceous species
- Loss of vegetation

Mitigation actions:

- Revegetation of the land is to be encouraged via reforestation program
- Revegetation of barren land on the project site

Fauna

Possible impacts:

- Modifications to the habitat of terrestrial and aviary species
- Possibility of accidents with animals and construction machinery or trucks

Mitigation actions:

- All workers are to be briefed as to be aware of any fauna in the area when handling machinery or driving near the project site.

Having analysed the criteria described above, it can be stated with certainty that the project activity does not present any kind of threat to the environment or to the communities surrounding the project site. And any impacts that can be envisaged have a mitigation plan in place.

SECTION E. Local stakeholder consultation**E.1. Modalities for local stakeholder consultation**

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On May 09, 2014 a Local Stakeholder Consultation took place in the church of the community of Vista Hermosa. Local inhabitants were invited in person as well as through radio announcements, through flyers placed in the local store and church of Vista Hermosa. Local authorities were invited also in person and through emails.

Below is a copy of the format of the invitation to the consultation:

Aguadulce, 15 de mayo del 2014

A QUIEN CONCIERNE:

Por este medio hacemos constar que en los días sábado 3, lunes 5, martes 6, miércoles 7, miércoles 7 en el programa comentarios y propuestas, y viernes 9, de mayo del 2013, se emitieron varios comunicados en los cuales se realizó invitación a todos los interesados en participar en el evento. El comunicado emitido fue el siguiente:

La empresa Panasolar Generation S.A. Y Anaconda Carbón, se complace en invita a la comunidad de Vista hermosa del roble, a la consulta pública, el día, 9 de mayo del 2014, a partir de las 3:30 P.M., en la iglesia de Vista hermosa, esta reunión tiene como objetivo, detallar las características, del proyecto, Fotovoltaico, Panasolar Generation, S.A., y la aplicación del registro "Gold Standard".

A quien interese extendemos la presente constancia a los 15 días del mes de mayo del 2014, Aguadulce, provincia de Coclé, panamá.

Atentamente,

 **RADIO
PODEROSA**
Ítalo E. Rojas
Gerente General de Radio Poderosa

The meeting had an attendance of 27 members of the local community and from the surrounding areas. There were also present several members of the local community council, known as the “patronato”.

Prior to the presentations given by the project owner there was an introduction given by Anel Saenz, who works with Anaconda Carbon, the carbon consultancy in charge of the carbon development of the project activity. Mr. Saenz gave a description of the agenda and introduced Mr. Enrico Desiata, who represents that Panasolar Generation S.A. And who also spoke during the meeting.

Anel Saenz went on to present some information on the project itself, such as the technical characteristics of the installations and what the anticipated environmental and social impacts of the project would be like. This presentation lasted approximately 20 minutes. All items in the sustainable development matrix were touched upon during this presentation.

After this presentation the floor was opened to a question and answer period regarding the presentation given and the sustainable development matrix parameters.

The participants did not mention any grievances with the project and had no comments regarding negative impacts upon the environmental parameters such as soil, water quality and quantity, etc.

Below are some pictures from the consultation:





E.2. Summary of comments received

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Below are the questions and answers given during this section of the meeting:

Question #1: When will the project construction begin and how long will it last?

Answer: Construction will begin in approximately 4-5 months and should last one year.

Question #2: What contributions will the company make to the community?

Answer: Panasolar will donate a community water storage tank to replace the one that is in place now, which is too small. Panasolar will also donate the electricity necessary to run the water pump that feeds water to Vista Hermosa.

Panasolar will also donate paint and materials necessary for the maintenance of the sport installations in Vista Hermosa.

Question #3: Will Panasolar repair the road in the town?

Answer: We cannot pave the road because this is too expensive and is responsibility of the government. However, we will be able to add gravel to the road and help with some maintenance to the best of our abilities.

Question #4: Will the creek that runs through the property where the project activity be affected?

Answer: The creek will be protected and the trees that surround the creek will also be left untouched and protected.

Question #5: Will the PV panels affect the community?

Answer: The panels will not affect anybody because this is a renewable energy project with no adverse impacts to speak of. The panels absorb the sun's rays and do not reflect these.

Question #6: How many permanent jobs will there be after the construction?

Answer: Between 5 and 6, which include engineers, technicians, maintenance, and security staff.

Question #7: Can Panasolar help us convince the authorities to help the community with infrastructure and other necessities?

Answer: Panasolar would like nothing more than to help the community improve its living conditions. However, we cannot guarantee that the authorities will respond to our communications.

Question #8: What labour will be used in the project?

Answer: The unqualified labour will come from the local community and the engineering and technical labour will come from Panama City mostly.

After the concerns that were remaining were addressed the participants were thanked for their participation and invited to some refreshments and snacks provided.

E.3. Consideration of comments received

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There were no negative comments received from the stakeholders. Therefore, it was not necessary to take due account of any of the other comments received.

The local community is enthusiastic about the prospect of a new source of employment and happy that Panama is now going to have a solar project in operation.

SECTION F. Approval and authorization

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Not applicable for Gold Standard registration, as it is a voluntary scheme. .

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Appendix 1. Contact information of project participants

Organization name	Panasolar Generation S.A.
Country	Panama
Address	PH Rivage Tower – Suite 60, Avenida Balboa y Calle 33 Este, Panama City
Telephone	+507 68966754 / +507 8339954
Fax	
E-mail	Panasolar.generation@gmail.com / enrico.desiata@gmail.com
Website	
Contact person	Mr. Enrico Desiata

Appendix 2. Affirmation regarding public funding

There is no public funding from Annex I Parties for this Project.

Appendix 3. Applicability of methodologies and standardized baselines**Appendix 4. Further background information on ex ante calculation of emission reductions****Appendix 5. Further background information on monitoring plan****Appendix 6. Summary report of comments received from local stakeholders****Appendix 7. Summary of post-registration changes**

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
10.1	28 June 2017	Revision to make editorial improvement.
10.0	7 June 2017	Revision to: • Improve consistency with the “CDM project standard for project activities” and with the PoA-DD and CPA-DD forms; • Make editorial improvement.
09.0	24 May 2017	Revision to: • Ensure consistency with the “CDM project standard for project activities” (CDM-EB93-A04-STAN) (version 01.0); • Incorporate the “Project design document form for small-scale CDM project activities” (CDM-SSC-PDD-FORM); • Make editorial improvement.
08.0	22 July 2016	EB 90, Annex 1 Revision to include provisions related to automatically additional project activities.
07.0	15 April 2016	Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0).
06.0	9 March 2015	Revision to: • Include provisions related to statement on erroneous inclusion of a CPA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Provisions related to the Host Party; • Make editorial improvement.
05.0	25 June 2014	Revision to: • Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the “Guidelines for completing the project design document form” (Version 01.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1; • Change the reference number from F-CDM-PDD to CDM-PDD-FORM; • Make editorial improvement.
04.1	11 April 2012	Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b.
04.0	13 March 2012	Revision required to ensure consistency with the “Guidelines for completing the project design document form for CDM project activities” (EB 66, Annex 8).
03.0	26 July 2006	EB 25, Annex 15
02.0	14 June 2004	EB 14, Annex 06b
01.0	03 August 2002	EB 05, Paragraph 12 Initial adoption.

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