

Project Title	Panasolar Photovoltaic Project
Gold Standard Project Reference	GS3556
ERM CVS Project Reference	2570.V1
Client Name	Panasolar Generation S.A.
Client Address	Vía Domingo Díaz Centro Empresarial “Los Diamantes” Panama City, Panama

Gold Standard Validation Report

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Version Control	Date
Version 1.0	7 March 2014 (draft validation report)
Version 2.0	15 July 2019 (final validation report)
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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
FAR	Forward Action Request
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
FSR	Feasibility Study Report
GHG	Greenhouse Gas
GWP	Global Warming Potential
GWh	Giga Watt hour
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
MP	Monitoring Plan
MW/MWh	Mega Watt/Mega Watt hour
NCV	Net Calorific Value
NGO	Non-Governmental Organisation
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PPA	Power Purchase Agreement
PSD	Project Starting Date
SCE	Standard coal equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added tax
VVS	CDM Validation and Verification Standard

Project/Party specific abbreviations

ASEP	National Authority Public Services – (Autoridad Nacional de los Servicios Públicos de Panama)
ANAM	Environmental National Authority – (Autoridad Nacional del Ambiente de la Republica de Panama)
CND	National Dispatch Centre – ETESA (Centro Nacional de Despacho)
ETESA	National Electricity Transmission Company (Empresa de Transmisión Eléctrica S.A.)

1 Project Information

Key project information

Project Title	Panasolar Photovoltaic Project
Project Location(s)	City of Aguadulce, borough of El Roble, Coclé Province
Host Party	Republic of Panama
Project participants	Panasolar Generation S.A.

Methodology used	AMS-I.D Grid Connected Renewable Electricity Generation (Version 18)
Methodological tool used	Tool to calculate the emission factor for an electricity system (Version 05.0)
Sectoral Scope	1 - Renewable Energy Industries
Project Design Document Final Version	Version 4 27 February 2019

Starting date of the project activity	12 July 2016
Date of first submission to the Gold Standard	February 2014
Crediting Period start date	01 June 2018 (7 years renewable)
Estimated annual average emission reductions	10,322 tCO ₂ e

Date(s) of validation site visit	5 and 6 February 2014 Further details of the site visit are provided in section 4.2 below.
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Key technical information

Capacity of the project	9.9 MW
Lifetime of the project	25 years
Quantity of energy electrical delivered to the grid per year	19,100 MWh with a plant load factor of 22%
Grid to which the project is connected to (if applicable)	Panamanian National Electrical Grid, known as Empresa de Trasmisión Eléctrica, S.A. (ETESA).

2 Summary and Validation Opinion

Project Title	Panasolar Photovoltaic Project
Name of Client	Panasolar Generation S.A.
Basis of validation	ERM CVS based its validation work on: • CDM approved monitoring methodology(ies) AMS-I.D. Grid Connected Renewable Electricity Generation. Version 18 • Gold Standard (GS) Requirements version 2.2, its Toolkit and Annexes • CDM Validation and Verification Standard for Project Activities, v01 • ERM CVS's internal validation methodologies and templates • GS TAC updates • CDM decisions and guidance issued by the CDM Executive Board unless superseded by GS requirements
Responsibilities of ERM CVS	ERM CVS is responsible to provide a thorough independent third-party assessment of the proposed GS project activity to ensure that the proposed GS project activity meets all the identified and applicable criteria for registration of projects under the GS.
Responsibilities of Project participants	The Project Participants are responsible for preparing the PDD, supporting documentation and providing all necessary evidences to support the information included in the PDD.
Activities performed	ERM CVS conducted its activities in accordance with the GS Requirements and CDM Validation and Verification Standard. The validation consisted of a review of project documentation, a site visit, interviews with relevant personnel, cross checking information through other reliable sources and reporting. Validation work was based on a validation report template that sets out relevant GS requirements. Where necessary, Clarification Requests and Corrective Action Requests were raised and closed out with the Project participants. The validation work was subject to detailed Technical Review and assessment prior to submission. No component of the project activity was excluded from the validation.
ERM CVS Conclusion	ERM Certification and Verification Services (ERM CVS) has performed the validation of the project activity against the criteria of the Gold Standard. The validation employed standard auditing techniques, and addressed the requirements of the GS Rules and CDM Validation and Verification Standard. The validation has provided sufficient evidence to demonstrate that the project activity is not the baseline scenario, and that emission reductions would be additional to what would have taken place in the absence of the GS project activity. The GS project contributes to sustainable development of the Host Countries The project meets the applicability criteria and correctly applies methodology AMS-I.D. Grid Connected Renewable Electricity Generation. Version 18, and is therefore expected to result in real, measurable and long term reductions in greenhouse gas emissions. The monitoring plan provides for the collection and archiving of data sufficient to ensure that emission reductions can be verified and sustainability indicators can be assessed. Nothing came to our attention to suggest that the project activity, if implemented as described, would not result in emission reductions of 10,322 tCO₂e per year on average per year over the first 7 year crediting period. In summary, it is the opinion of ERM CVS that the Project as described in the PDD version 04, dated 27 February 2019, meets all stated criteria of the GS, correctly applies the methodology, is expected to

	result in real, measurable and long term emission reductions, and is expected to contribute to sustainable development of the Host Country. ERM CVS therefore submits this validation report with the positive validation opinion to the Gold Standard.
Signed on behalf of ERM CVS	 A handwritten signature in black ink, appearing to read "Melanie Eddis".
Name:	Melanie Eddis
Date:	19 September 2023

3 Introduction

Validation Objectives

The purpose of validation is to ensure a thorough, independent assessment of activities submitted for registration as a proposed GS project activity against the applicable GS requirements.

The DOE is responsible for reporting the results of its assessment in a validation report and submitting this validation report, along with the supporting documents to the Gold Standard.

The DOE also presents its opinion on the compliance of the proposed GS project activity with the applicable GS requirements, and presents its opinion in the validation report.

In the course of validation, ERM CVS assesses the project's project type, baseline, additionality demonstration, applicability to an approved methodology, carbon monitoring plan (MP); contribution to sustainable development; and sustainability monitoring plan.

3.1.1.1 Validation Criteria

ERM CVS applies the following principles in performing its validation:

- Consistency
- Transparency
- Impartiality, independence and safeguarding against conflicts of interest
- Confidentiality

In all aspects of its work, ERM CVS ensures that the information and data reported are accurate, conservative, relevant, credible, reliable and complete.

Scope

The validation scope addresses the project activity as described in the Project Design Document (PDD) and associated documentation. The PDD and associated documentation are reviewed against the criteria and requirements stated in the CDM Validation and Verification Standard (VVS), the Gold Standard requirements and Toolkit, and relevant CDM requirements.

The validation scope also included an assessment of completeness and accuracy of documentation, evaluation of evidences, information and assumptions made in the PDD and supporting documentation.

Contract Review

Prior to contracting with the client, a full review of the project and the validation requirements was made. This addressed both commercial risk and project risks associated with conducting the validation activities and confirmed the availability of an appropriately qualified team to conduct the validation.

Validation Personnel

Based on ERM CVS's review of the project, a validation team was established that takes into account the coverage of the technical area(s), sectoral scope(s) and relevant host country experience and/or knowledge. Where pre-feasibility assessment was required under fast-track route, eligibility of the validators for fast-tracking was also considered.

Personnel who were involved in the validation of this project activity were:

Validation Team

Name	Role	CDM Requirements	GS Requirements	Technical area	Financial Expertise	Participated in site visit?
Miguel Cortes	Lead validator	Full	Full	Full	NA	Yes
Sushmita Seelam	Validator	Full	Full	Full	NA	No

DOE Head Office

Name	Role	CDM Requirements	GS Requirements	Knowledge relevant to the technical area
Jonathan Avis	Technical Reviewer	Full	Full	Full

Summary of CVs of the validation personnel

Miguel Cortes is a qualified GHG/Gold Standard Auditor and Technical Reviewer with over 20 years of experience. Miguel has 9 years of CDM experience, 5 of which was spent working as a project developer and 4 as a Technical Reviewer and Lead Assessor for ERM CVS. Miguel has undertaken more than 30 validations and 18 verifications in Renewable Energies (Scope 1), Manufacturing (Scope 4), Mineral Production (Scope 8) and Metal Production (Scope 9). Miguel has 9 years direct experience in the Cement industry, which included cement operations and mineral extraction/mining related activities. Miguel also has 5 years' experience as a consultant for GHG emission reduction projects in the sectoral scopes of manufacturing, mining, and metal production, including WHR, Biofuels, Biomass Production and Renewable Power CDM projects. Miguel has completed the ERM CVS CDM training, GHGMI Renewable Energy training and Gold Standard training. Miguel holds a BSc and MSc in Civil Engineering

Sushmita Seelam is an Assessor based in London and has been with ERM CVS since July 2012. Prior to ERM CVS, Sushmita had been working in sustainability consulting service industry for three years. As a CDM consultant, she has been involved in the development of over 25 CDM and VCS projects in various sectors. Her work also involves research and experience in supply chain evaluation, resource footprinting and life cycle assessment of commodities, with a focus on water and GHG footprinting for sectors such as global energy (especially oil & gas), agricultural commodities etc. Sushmita holds a B.E. in Environmental Engineering and an MSc in Environment and Sustainable Development. She has also completed the ERM CVS CDM validation and verification training and the CDM Gold Standard training

Jonathan Avis is CDM Business Manager for ERM CVS, and a GHG Assessor and Technical Reviewer with over 10 years experience in the Gold Standard and CDM. Since joining ERM CVS Jonathan has worked as a Technical Reviewer or GHG Assessor on more than 30 CDM validations in Renewable Energy (scope 1), more than 10 CDM validations in Manufacturing Industries (scope 04), 6 CDM validations in Mining (scope 8), and 5 CDM validations in Waste Handling and Disposal (scope 13). Jonathan's previous work experience involved screening and due diligence of carbon projects, Project Design Document (PDD) development, quality assurance and technical review of CDM project documentation, the development of carbon monitoring plans, and management of carbon projects through the validation, registration and verification stages. Jonathan has completed the ERM CVS CDM training as well as the GHGMI Renewable Energy training and Gold Standard training. Jonathan holds a BA in Geography and an MSc in Environmental Change and Management from the University of Oxford.

4 Validation Approach

In carrying out its validation work, ERM CVS has:

- a) Determined whether the proposed project activity complies with the requirements of GS Requirements version 2.2, the applicability conditions of the selected methodology and guidance issued by the Board;
- b) Assessed the claims and assumptions made in the project design document (PDD). The evidence used in this assessment has not been limited to that provided by the project participants.

The validation was carried out in accordance with the most recent version of the VVS. The validation process employed standard auditing techniques and undertook necessary cross-checks and follow-up actions to ascertain the correctness of the information. The validation team included staff with experience in the relevant technical areas within the sectoral scope, and financial expertise where relevant. The validation report and associated documents have undergone a thorough technical review by ERM CVS before being submitted to the Gold Standard. The validation consisted of the following key stages:

- Preparation of the validation workplan
- Review of documentation including PDD, methodology and key supporting documents and references
- A visit to the project site, including interviews with personnel responsible for developing the project
- Development of a draft validation report, identifying non-compliances including Corrective Action Requests (CARs) and Clarification Requests (CLs), taking into account findings of the desk review and site visit / interviews
- Resolution of outstanding issues (CARs and CLs) and development of a final validation report and validation opinion
- Independent technical review and report approval

Document Review

A detailed document review of the PDD, methodology and all other associated documentation and references took place in advance of the site visit, and additional documents that were not available for the desk review were requested for review during the site visit. The document review includes:

- A review of data and information to verify the correctness, credibility and interpretation of presented information;
- Cross checks between information provided in the PDD and information from other sources, not limited to those provided by the PPs, applying ERM CVS's sectoral or local expertise and, if necessary, with independent background investigations
- Reference to available information relating to projects or technologies similar to the proposed project activity
- Review, based on the approved methodology being applied, of the appropriateness of formulae and accuracy of calculations

Where the review of the PDD at the document review stage raised issues, these were further reviewed and validated through supporting documentation and cross-checking from other sources and interviewing relevant personnel involved in the project activity during the site visit. During the document review the project team also compared the proposed project activity with available information relating to projects or technologies similar to the proposed GS project activity under validation. Where appropriate, the validation team assessed the appropriateness of formulae and the correctness of calculations presented by the PPs. A list of all documents reviewed or referred to in the course of this validation is included in Appendix A.

Site visit and Interviews

The site visit involved a visit to the property of 22 hectares where the project activity will be installed on 05 February 2014. The site visit included the physical inspection of the property, the surrounding areas and visits the Vista Hermosa Village, which is the nearest town of the project activities located into the direct area of influence of the project. During the site visit the Validation team made several interviews with the neighbours, governmental and environmental authorities, PPs and Power Electricity Grid

Company in Aguadulce City (Llano Sanchez Substation). The review of supporting documentary evidence was carried out on 06 February 2014 at the hotel near to the site.

Site visits and interviews provide additional and background to the project as well as cross checks with project documentation. Interviews were undertaken with relevant stakeholders in the host country, as well as personnel with knowledge of the project design and implementation. A list of interviewees, and the main topics discussed with each person can be found in appendix A.

The site visit was designed to enable the validation team to:

- undertake a detailed review of additional project documentation and verify the supporting documentation;
- inspect the project site and confirm the validity of the project description in the PDD;
- assess the validity of the project boundary;
- cross-check the validity of the project information with other sources of information, including cross checks between information provided by interviewed personnel (i.e. by checking sources or other interviews) to ensure that no relevant information has been omitted; and
- interview relevant stakeholders in the host country, and personnel with knowledge of the project design and implementation.

Preparation of Draft Validation Report

Based on the findings of the desk review and site visit, ERM CVS prepared a draft validation report including a list of CARs and CLs, and provided this to the PPs. Where issues are identified that need to be further elaborated, researched or added to in order to confirm that the project activity meets the GS requirements and applicable CDM requirements where relevant, and can achieve credible emission reductions, ERM CVS identified these issues in the DVR so that they could be discussed with the PPs and concluded upon in the final validation report (FVR).

Remediation requests

Where issues were identified, ERM CVS raised one of the following remediation requests:

Clarification Request (CL): where information is insufficient or not clear enough to determine whether the GS requirements or applicable CDM requirements where relevant have been met.

Corrective Action Request (CAR): where:

- Mistakes have been made that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The GS requirements have not been met; or
- There is a risk that emission reductions cannot be monitored or calculated.

Forward Action Requests (FAR): where it was necessary to highlight issues related to project implementation that required review during the first verification of the project activity. FARs shall not relate to the GS requirements for registration.

CARs and CLs must be 'closed out' before the validation can be concluded. Close out is only possible where the PPs modify the project design, rectify the PDD or provide adequate additional explanation or evidence that satisfies ERM CVS's concerns. The validation process may be halted until the CARs and CLs are addressed to the validation team's satisfaction.

Final Validation Report and Validation Opinion

The final validation report (FVR) is completed when the CARs and CLs have been closed out to the satisfaction of ERM CVS. The FVR includes the validation opinion that sets out the validation conclusion regarding the compliance of the project with GS requirements.

Internal Quality Control

The process of validation and decision of the validation team has been subject to an independent Technical Review. The scope of the Technical Review process is to independently assess that all procedures have been followed, necessary requirements have been met, and all conclusions are justified. The final validation decision is based on the findings and conclusions of the validation team, assessing the compliance of the project activity with the GS requirements, and the technical evaluation of the independent technical reviewer. The final report is then reviewed and approved by the qualified signatory / final decision maker within ERM CVS.

5 Validation findings – Project Eligibility

Project eligibility

ERM CVS assessed whether the proposed project activity meets Gold Standard requirements on project type, GHGs, project cycle and double counting.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.1.1	Does the project fit either in the renewable energy supply category, the end-use energy efficiency improvement category or waste handling and disposal, as defined in the GS Toolkit and Annex C – Specific Eligibility Criteria?	ERM CVS was able to confirm during the site visit and checking relevant documents /03/08/ that the project activity is greenfield project for photovoltaic power generation connected to Panamanian National Grid. (Renewable Power Supply).	OK	OK
5.1.2	Are the GHGs involved in the project boundary eligible under the Gold Standard, i.e. are they limited to CO ₂ , CH ₄ and N ₂ O?	Yes, the project will displace the CO ₂ emissions from grid-connected power plants. No other GHG gases are involved. This was validated with project description during the site visit and relevant interviews IV3	OK	OK
5.1.3	Was an announcement made about the project going ahead without the revenue from carbon credits?	There is no previous announcement of the project activity. The validation team cannot find any public announcement that the project would take place without the revenue from carbon credits. This was cross-checked with the relevant public information on the electricity market in Panama. /10/11/12/	OK	OK
5.1.4	What is the start date of the project activity? Is the start date clearly defined in the PDD in accordance with the "Glossary of CDM terms"? Does the PDD contain a description of how this start date has been determined, and a description of the evidence available to support this start date?	The starting date defined in the PDD version 01 was 01 January 2014, but this date was not supported with evidence and was not consistent with the status of project development checked during the document review on site (the project had not started yet at the time of the site visit). CAR 01 was raised. In response, the PP updated the PDD to provide more detail on the timeline of project development in order to demonstrate the start date, i.e. the earliest date of implementation or real action on the project activity. ERM CVS has checked the evidence of the date of land purchase (24 June 2014) /20/, equipment purchase (12 July 2016) /21/, construction start (1 August 2017) /22/ and financial closure (21 December 2017) /23/. In line with the CDM glossary of terms, the start date should be the earliest date of implementation or real action on the project. Land purchase is not considered to be the start date because this represented a small proportion of the total costs, and the land could be re-sold if the project was not built. Land acquisition was necessary to proceed with detailed planning of the project activity, but did not in itself represent the start date of the project. This is reflected in the fact that financial closure was only achieved later. The start date of the project is considered to be the purchase of equipment on 12 July 2016. This is considered reasonable given that this cost is not reversible, and is the earliest significant financial expenditure on the project. CAR 01 was closed.	CAR 01	OK
5.1.4	Has the registration cycle been identified correctly? I.e. project's starting date is after or before the date of the first submission? Have the procedures been followed correctly?	The Panasolar Passport identifies that the project activity follows the regular project cycle under the Gold Standard rules. However, the project activity starting date and the date of first submission to GS require clarification. CAR 01 has been raised. Following closure of CAR 01, it was confirmed that the start date of the project is after the date of first submission to Gold Standard (indeed it is after the start of the validation process itself). Therefore the project follows the regular project cycle under Gold Standard.	CAR 01	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
5.1.5	Does the project participate in other certification schemes than Gold standard?	No. The validation team verified against the UNFCCC project list and the Gold Standard Registry that the project has not previously been registered under either scheme, and that there were no similar Photovoltaic projects in Panama at the time of the validation start. This was confirmed during the ANAM interviews /IV5/IV6/	OK	OK

Conclusion

The proposed project activity meets Gold Standard requirements on project type, GHGs, project cycle and double counting.

6 Validation findings – PDD and Project Description

Main changes between the initial PDD version submitted for validation and the final validated version:

- Changes related to the CARs and CLs, as identified in Appendix B of this report.

Project Design Document (PDD)

ERM CVS reviewed the PDD to determine whether it has been prepared in accordance with the latest PDD form (template) and guidance from the CDM Executive Board available on the UNFCCC website.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/CAR/ CL	Final OK/ NOT OK
6.3.1	Is the PDD prepared in accordance with the latest forms and guidance required by the CDM EB?	ERM CVS can confirm that the PDD has been checked against the latest template for the Project Design Document available on the CDM website. However the content and descriptions on several sections of PDD does not follow the latest guidelines for completing the project design document form. CAR 02 was raised. The PDD was updated using the latest PDD form. The final PDD is in compliance with the template and guidelines. CAR 02 was closed.	CAR 02	OK

Conclusion

ERM CVS has confirmed that the PDD has been prepared in accordance with the latest relevant forms and guidance.

Project Description

ERM CVS reviewed the description of the project in the PDD in order to evaluate whether it provides a clear and accurate description of the proposed GS project activity. Validation of the project description was based on review of documentation, a physical site inspection and interviews.

Description of the project activity

The Panasolar Photovoltaic Project is a Greenfield solar farm project activity with a total capacity of 9.9 MW connected to the Panamanian Grid through a 34.5 KV 2.7 Km long transmission line with Llano Sanchez ETESA Substation. The project will be located in the district of El Roble which belongs to Aguadulce City on the Coclé Province, Republic of Panama. The plant will comprise PV modules, inverters, transformers and the grid connection equipment. The alternating current electricity generated will be centralised and the voltage increased through step-up transformer to enable export to the grid system. The project activity is expected to deliver 19,100 MWh of electricity to the ETESA grid annually.

At the time of the site visit ERM CVS was able to confirm that there was no installation on the site, and the project was under final engineering design and procurement of all legal permits for its operation. The following is the legal status.

- ✓ ANAM approved the EIA and gave their legal conformity for project development throughout Resolution ARAC-IA_042 2013/03/
- ✓ ASEP gave the provisional permission to install, operate and use the Photovoltaic Park in Aguadulce Resolution 6299/08/. According to Project Owner verbal information the final permission is under process but no relevant evidence was supplied (See CL03)
- ✓ CL 03 was closed. The project received the construction permission on 20 August 2017 /35/ and signed a contract with the grid company ETESA on 12 July 2016 /24/.

ERM confirmed that the property of the land where the project will be installed has been acquired by Panasolar Generation company /20/. Enrico Desiata is the project owner and legal representative of the company/08/18/.

The findings of our validation of the project description in the PDD are set out below.

Project Location and Status

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.4.2 .1	(i) Description: project design Does the project description in the PDD section A.3 provide a clear, accurate and sufficiently detailed description of all relevant elements of the proposed project activity? Specifically, does the project description provide clear indication of: a) List of main technologies involved b) List of main equipment and installations c) The lifetime of the project equipment d) Monitoring equipment and its location e) Capacities and efficiencies f) Existing and forecast energy and mass flows and balances g) Interaction with processes/equipment outside the project boundary, if any, is stated.	The PDD Section A.3 does not provide a sufficiently detailed description of all elements of the proposed project activity. The PDD content is not consistent with the Guidelines for completing the project design document form for small-scale CDM project activities. CAR 02 was raised. In response, the PDD was updated to provide more detailed information provided on the technical description. The project description has been validated against the feasibility study for the project /02/. CAR 02 was closed. At the time of the site visit and according to interviews with the Civil Works Department of Aguadulce Municipality, the project activity had not yet submitted the construction permission and it was not clear when the final authorization by ETESA would be issued. CL 03 was raised The project received the construction permission on 20 August 2017 /35/ and signed a contract with the grid company ETESA on 12 July 2016 /24/. CL 03 was closed. The final PDD contains a clear and complete description of the project activity, and the nature and technical implementation of the project activity. The description includes: a) List of main technologies involved: the key components of the project technology are described, and have been confirmed against the Feasibility Study report (FSR) /02/ b) List of main equipment and installations: specifications of the PV modules are provided, and have been confirmed against the FSR /02/ c) The lifetime of the project equipment is stated in the PDD and has been validated against the FSR /02/ d) Monitoring equipment and its location. This information is consistent with the monitoring plan. e) Capacities and efficiencies: the installed capacity of the project is stated and has been validated against the FSR /02/ and the estimated load factor is further confirmed by review of the technical study simulating electricity generation from the PV panels /36/ and the contract for connection to the transmission system /24/. f) Existing and forecast energy and mass flows and balances: the annual electricity generation of the project is stated and has been validated against the FSR /02/ and the technical study simulating electricity generation from the PV panels /36/. g) Interaction with processes/equipment outside the project boundary: not applicable, since the electricity grid is also included as part of the project boundary.	CAR 02 CL 03	OK
6.4.2 .2	Description: Project location Is the location of the project correctly stated in the PDD?	Yes, the location is correctly stated in the PDD and the correct geographical coordinates are given. This information was confirmed during the site visit and by review of the technical documents that support the Environmental Impact Assessment /03/	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	Are geographical coordinates given (in decimal format)? How has the location been validated?			
6.4.2 .3	Description: Existing installations a) If the proposed GS project activity involves the alteration of an existing facility, installation or process, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation? b) How has the description of the existing facility, installation or process been validated? c) Is the description of the existing facility, installation or process consistent with information provided in other parts of the PDD such as common practice and baseline selection?	Not applicable. The project does not take place in an existing installation and the project activity is a Greenfield project as ERM CVS confirmed during the Site Visit.	OK	OK
6.4.2 .4	Description: Operational lifetime What is the expected operational lifetime of the project activity? Is this lifetime considered reasonable for a project of this type in the host country?	The expected operation lifetime of project activity has been defined on the PDD of 25 years. However this operational lifetime assumption was not supported with relevant evidence and clear justification. CAR02 has been raised. CAR 02 was closed. The lifetime was validated against the FSR /02/. The lifetime is considered reasonable for this type of equipment, based on ERM CVS's local and sectoral knowledge.	CAR02	OK
6.4.2 .5	Is information on the plant load factor provided in the PDD? How has this been validated (please refer to the Guidelines for the reporting and validation of plant load factors, EB48_Annex 11.	The PDD does not offer justification of load factor calculation and not provide relevance evidence. See CAR02 The load factor is stated and has been determined by an independent third party in a technical study simulating the power generation of the solar panels /36/ and further confirmed against the contract for connection to the transmission system /24/. CAR 02 was closed.	CAR02	OK

Conclusion

The process undertaken to validate the accuracy and completeness of the project description is set out in detail above. ERM CVS has confirmed that the project description in the PDD provides a clear, accurate and complete understanding of the nature of the proposed GS project activity.

Description of baseline scenario

The project description was evaluated to confirm whether or not it provides a clear and accurate summary of the project and baseline scenario.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
6.4.3 .1	Is there a clear description of the baseline scenario in the PDD? This should include:	The PDD includes a description of the baseline, which is defined in the methodology as "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".	OK	OK
	a) A list of the equipment(s) and systems that would have been in place in the absence of the project activity (if any)	ERM CVS confirmed during the site visit that the project will be grid-connected to National Grid on Llano Sanchez ETESA substation and confirmed with the ASEP provisional permission/08/ and interview with ETESA Llano Sanchez responsible IV3		
	b) Information about the age and average lifetime of the baseline facility based on manufacturer's specifications and industry standards (if applicable)	Details of the grid are provided in section A.1 and B.3 of the PDD, which was validated according to public information on ETESA and CND website /11/12/ (a) Not applicable since the project is a Greenfield project (b) Not applicable since there is no baseline facility (c) Not applicable since there is no baseline facility		
	c) Installed capacities, load factors and efficiencies of the baseline facility (if applicable)	(d) The PDD explains that the electricity generated by the project would have been generated by the grid in the baseline scenario.		
	d) An explanation of how the same types and levels of services provided by the project activity would have been provided in the baseline scenario.			
	If the methodology provides different options for the identification of the baseline scenario, has the correct option(s) been identified in the PDD, and has this been justified with supporting evidence? Please describe the evidence that was reviewed to validate this.	No applicable since the baseline is defined by the methodology as only one option. The project is grid-connected as confirmed during the site visit and checking the ASEP permission/08/	OK	OK
	If the scenario existing prior to the start of the implementation of the project activity is different from the selected baseline scenario, is there a clear description of the pre-existing scenario, with a list of the equipment and systems in operation at that time?	Not applicable. The scenario existing prior to the start of the implementation of the project activity is the same as the selected baseline scenario	OK	OK

Conclusion

The project description in the PDD contains a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation. The description sufficiently covers all relevant elements, is accurate, and clearly states the differences resulting from the project activity compared to the pre-project situation.

7 Validation findings – Baseline and Monitoring Methodology

ERM CVS has evaluated the baseline and monitoring methodology selected by the PPs to confirm its applicability and whether or not it has been appropriately applied to the project activity.

Validity of selected methodology and methodological tools

As per GS Toolkit section 2.2 and the VVS, ERM CVS validated that an approved and currently valid baseline and monitoring methodology (and associated methodological tools) have been applied for this proposed GS project activity.

Baseline methodology applied	AMS-I.D Grid Connected Renewable Electricity Generation (Version 18)
Methodological tools applied as required by the methodology	Tool to calculate the emission factor for an electricity system (Version 05.0)

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.1.1	Are the number, title and version of the approved methodology clearly and correctly stated? Is the methodology within its period of validity?	ERM CVS has determined that the methodology is correctly quoted and applied by comparing with the actual text of the applicable version of the methodology available on the UNFCCC CDM website. The methodology is within its period of validity.	OK	OK
	Are all the required tools applied and fully referenced in the PDD? Are the version numbers applicable at the time of validation?	ERM CVS has determined that the methodological tool to calculate the emission factor for an electricity system was not correctly quoted in the draft PDD. CAR03 has been raised to request revision and correction of the EF calculation. The PDD was revised so that the grid emissions factor will be determined ex-post. Therefore CAR 03 was closed.	CAR03	OK
	If applicable, has any specific guidance provided by the CDM EB or GS TAC relevant to the project type or methodology been considered?	Yes. The following EB guidance have been considered: Guidelines on the demonstration of additionality of small-scale project activities (version 9.0), EB 68 Annex 27 Guidance for the reporting and validation of plant load factors (version 01), EB 48 Annex 11; GS Guideline for Methodology and Tool – Version Validity For GS TAC rules updates please see http://www.cdmgoldstandard.org/project-certification/tac-update	OK	OK

Conclusion

The applied methodology and associated methodological tools have been correctly described and are approved by the CDM Executive Board. All versions are currently valid.

Applicability of the selected methodology to the project activity

ERM CVS evaluated whether the selected baseline and monitoring methodology applied is applicable to the project activity. This evaluation was based on a review of the PDD and associated documentation and a visit to the project site. ERM CVS has validated that the applicability conditions of the methodology (and tools, where relevant) are met and that the project activity is not expected to result in emissions other than those allowed by the methodology.

ERM CVS has assured the compliance of the project activity with each of the applicability conditions of the selected methodology and tools:

	Applicability Conditions in methodology and/or tools	Is this condition discussed in the PDD? (yes/no)	Does the project meet this condition? (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
7.2.1	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. b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	Yes	Yes	This applicability condition was able to be validated on site. ERM CVS has confirmed by visual inspection that the project is a Greenfield photovoltaic farm plant and will be connected to National Grid System on Llano Sanchez ETESA sub-station. This was confirmed with the ASEP permission/08/ and during interview with the ETESA responsible of Llano Sanchez substation IV3 During the validation site visit, the validation team verified that the Project Owner has not developed any type of activity for equipment installation or civil works at the time of the site visit.	OK	OK
	Illustration of respective situations under which each of the methodology (i.e. AMS-I.D.) applies is included in the appendix (of the methodology).	Yes	Yes	No renewable power plant was operated at the site prior to the implementation of the project activity. This was confirmed by review of the public list of all existing power plants in the country provided by the ETESA/12/	OK	OK
	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); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s).	Yes	Yes		OK	OK
	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology	Yes	Not relevant to the project activity	Not applicable. The project is photovoltaic farm	OK	OK
	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	Yes	Yes	ERM has checked with the FSR/02/, ASEP permission/08/ and EIA/03/ that the total installed capacity of the project activity will be 9.9 MW and the project does not involve any use of fossil fuel.	OK	OK

	Applicability Conditions in methodology and/or tools	Is this condition discussed in the PDD? (yes/no)	Does the project meet this condition? (Yes/No, or state that this condition is not relevant for the project)	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
	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.					
	Combined heat and power (co-generation) systems are not eligible under this category	Yes	Not relevant to the project activity	Not applicable. The project is photovoltaic farm	OK	OK
	In the case of project activities that involve the 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	Yes	Not relevant to the project activity	ERM during the site visit confirmed that the project activity is Greenfield project. This was checked with ASEP permission/08/	OK	OK
	In the case of retrofit or replacement, to qualify as a small scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	Yes	Not relevant to the project activity		OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence).	Draft OK/ CAR/CL	Final OK/ Not OK
7.2.2	Has any source of GHG emission been identified within the project boundary that is expected to contribute more than 1% of the project activity's expected average annual emissions reductions, and which is not addressed by the applied methodology?	Other than the emissions addressed in the applied approved methodology ERM CVS has determined that there will be no other GHG emissions within the project boundary expected to contribute more than 1% of the predicted emission reductions, which are not addressed by the applied methodology. This was confirmed by assessment of the project on site and by review of the detailed project design in the FSR /02/	OK	OK

Conclusion

The applied methodology and associated tools are fully applicable to the project activity and are correctly applied in the PDD. There are no greenhouse gas emissions occurring within the proposed GS project activity boundary as a result of the implementation of the proposed GS project activity which are expected to contribute more than 1% of the overall expected average annual emissions reductions, and which are not addressed by the applied methodology.

Small scale project eligibility criteria

For small scale projects, the following has been checked:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.2.1	Does the project meet the criteria for eligibility as a small scale project, as per GS Toolkit section 1.2 and decision 17/CP.7, paragraph 6(c), i.e.: Type (i) project activities: renewable energy project activities with a maximum output capacity equivalent to up to 15 MW (or an appropriate equivalent) Type (ii) project activities: energy efficiency improvement project activities which reduce energy consumption, on the supply and/or demand side, by up to the equivalent of 15 GWh per year Type (iii) project activities: other project activities that both reduce anthropogenic emissions by sources and directly emit less than 15 kilotonnes of carbon dioxide equivalent annually	The project falls under Type (i) since it is a photovoltaic power project with an installed capacity of 9.9 MW, which is less than the stated threshold. This was confirmed with the revision of FSR/02/ and double checked with ASEP permission/08/ and EIA/03/	OK	OK
	Has it been demonstrated that the project is not a debundled component of a larger project activity, in accordance with the Guidelines on the Assessment of de-bundling for SCC project activities (Version 03) (EB 54, Annex 13)?	ERM CVS can confirm compliance with the “Guidelines on assessment of debundling for SSC project activities (version 03)”, since there is no CDM or GS project activity or application to register a CDM project activity: a) With the same PPs; b) In the same project category and technology/measure; and c) Registered within the previous 2 years; and d) Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point (4/CMP.1, Annex II, Appendix C, paragraph 2; EB 54, Annex 13, paragraph 2)	OK	OK

Conclusion

The small scale project was confirmed to fully meet the applicability criteria for a small scale project and it has been confirmed that the project is not a debundled component of a larger project activity.

Project Boundary

ERM CVS reviewed the description of the project boundary in the PDD, to determine whether all main GHG emission sources, the physical delineation of the proposed project activity and other relevant project and baseline emission sources covered in the methodology are included within the project boundary for the purpose of calculating project and baseline emissions for the proposed GS project activity.

According to the applied methodology, the spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system (grid) that the CDM project power plant is connected to.

Physical delineation of the project

ERM CVS evaluated whether the PDD correctly describes the physical delineation of the proposed GS project activity, including which installations/processes are included within the geographical boundary of the project activity.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.3.2 .1	Does the PDD correctly describe the project boundary, including the physical delineation of the proposed GS project activity included within the project boundary?	Based on the site visit and review the FSR/02/ and public information about Panamanian Grid/12/, ERM CVS confirmed that the PDD correctly describes which installations/processes are included within the geographical boundary of the project activity. Although a diagram was included in the PDD that illustrates the project boundary, the content is not consistent according to the Guidance for completing the Small-Scale PDD on the section B.3. CL 01 has been raised requesting the content revision and completion. In response, the project boundary diagram was updated and improved. CL 01 was closed.	CL 01	OK
	Were any emission sources identified that will be affected by the project activity and are not addressed by the selected approved methodology? If so, was clarification of, revision to or deviation from the methodology approved in accordance with required procedures.	No emissions sources other than those addressed by the methodology were identified	OK	OK

Conclusion

The PDD correctly describes the project boundary, including the physical delineation of the proposed GS project activity, in compliance with the requirements of the selected baseline methodology, and this is consistent with site observations and other documentation provided. All sources and GHGs required by the methodology have been included within the project boundary. Where the methodology allows PPs to choose whether a source or gas is to be included within the project boundary, the PPs have sufficiently justified that choice. The justifications provided are reasonable, based on assessment of supporting documented evidence and site observations. The project boundary is justified for the project activity, based on ERM CVS's local and sectoral knowledge.

Baseline identification

ERM CVS reviewed the PDD to assess whether it correctly identifies the baseline for the proposed GS project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed GS project activity.

No alternative analysis is required if the approved methodology that is selected by the proposed GS project activity prescribes the baseline scenario.

The baseline identification has been validated as follows:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.4.1	Does the PDD identify the baseline, a scenario that represents the anthropogenic emissions by sources of GHG that would occur in the absence of the proposed GS project activity?	Yes. The PDD clearly identifies the baseline scenario as <i>the electricity delivered to the grid by the project activity that would have otherwise been generated by the existing grid-connected power plant and the addition of new power sources, as reflected in the combined margin</i> . This was confirmed by site visit, reviewing the FSR/02/ and checked with ASEP permission/08/	OK	OK
	Have the procedures/ steps to identify the most reasonable baseline scenario, as required by the methodology and applicable tools, been documented clearly in the PDD?	Since the baseline is specified by the methodology, no further procedures / steps to identify the most reasonable baseline scenario are required	OK	OK
	Are all feasible and credible alternatives identified including but not limited to all the potential scenarios listed in the methodology? Does the list of alternatives include the project activity undertaken without being registered as a CDM project?	Since the baseline is specified by the methodology, no further procedures / steps to identify the most reasonable baseline scenario are required	OK	OK
	Are realistic different configurations or combinations of alternatives that may be able to provide similar outputs and services considered?	Since the baseline is specified by the methodology, no further procedures / steps to identify the most reasonable baseline scenario are required	OK	OK
	Are all considered alternatives assessed for consistency with (enforced) mandatory laws and regulations?	Since the baseline is specified by the methodology, no further procedures / steps to identify the most reasonable baseline scenario are required	OK	OK
	Has the principle of conservativeness been applied in the selection of baseline scenario as per sections 2.2 and 3.5.2 of the GS Toolkit?	Since the baseline is specified by the methodology, ERM CVS confirmed that the baseline has been constructed in a conservative manner and there is no risk of artificially inflating the VERs received by the project.	OK	OK
	(a) If relevant to the methodology, have all applicable CDM requirements been taken into account in the identification of the baseline scenario? (b) Have all relevant national and/or sectoral policies and circumstances been taken into account, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector? Are the relevant national and/or sectoral policies and	(a) All applicable CDM requirements have been taken into account in the identification of the baseline scenario, which has been carried out in accordance with the methodology. (b) Not applicable since the baseline is specified by the methodology. ERM CVS has reviewed the policies and regulations checked which is consistent with the project activity scope/09/.	OK	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	circumstances identified and correctly considered in the PDD?			

Conclusion

Based on the site visit and documentary evidence to cross check the information contained in the PDD as referenced above, ERM CVS confirms that the baseline scenario has been correctly identified in line with the methodology, that all assumptions and data are correct, and that the identified baseline complies with all relevant national and/or sectoral policies and circumstances.

Algorithms and/or formulae used to determine emission reductions

ERM CVS has evaluated whether the steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring methodology.

ERM CVS conducted validation activities to determine whether the equations and parameters in the PDD have been correctly applied by comparing them to those in the selected approved methodology. Where the methodology provides for selection between different options for equations or parameters, ERM CVS confirmed that adequate justification has been provided (based on the choice of the baseline scenario, context of the proposed GS project activity and other evidence provided) and that the correct equations and parameters have been used, in accordance with the methodology selected.

ERM CVS verified the justification given in the PDD for the choice of data and parameters used in the equations. Where data and parameters will not be monitored throughout the crediting period of the proposed GS project activity but have already been determined and will remain fixed throughout the crediting period (ex-ante parameters), ERM CVS assessed that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed GS project activity and will result in a conservative estimate of the emission reductions. Where data and parameters will be monitored on implementation and hence become available only after validation of the project activity, ERM CVS confirmed that the estimates provided in the PDD for these data and parameters are reasonable (please see section 9 for details of the validation of the monitored parameters).

Ex Ante Data and Parameters

Each parameter required by the methodology and tool for this project type is listed and validated in detail as follows:

Parameter required as per methodology / tool	Description of the parameter (as per methodology/tool)	Is the parameter included in the PDD?	Title and description in the PDD line with the methodology / tool?	Data unit correctly expressed in PDD?	Value in PDD correct and provides for conservative estimate of Emission Reductions? How was this validated?	Measurement method correctly described in the PDD (if applicable)
EF _{CO2,grid,y}	CO ₂ emission factor of the grid in year y (tCO ₂ /MWh)	Yes	No	Yes	CAR 03 was raised to clarify the grid emission factor calculation method used. The PDD was revised to calculate the grid emission factor ex post, and hence the value given in the PDD is just an estimate for ex-ante emission reduction estimation purposes.	Following resolution of CAR 03, the grid emission factor is determined ex-post, therefore the value will be confirmed at the time of verification.

Parameter required as per methodology / tool	Description of the parameter (as per methodology/tool)	Is the parameter included in the PDD?	Title and description in the PDD line with the methodology / tool?	Data unit correctly expressed in PDD?	Value in PDD correct and provides for conservative estimate of Emission Reductions? How was this validated?	Measurement method correctly described in the PDD (if applicable)
					The value is based on data provided by the Centro Nacional de Despacho in Panama (www.cnd.com.pa). The value will be confirmed at the time of verification.	

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.5.1.1	Have the parameters required by the methodology / tools been correctly described in the PDD? Where the methodology provides for selection between different options for data and parameters; is the choice of data and parameters justified?	The grid emission factor for Panamanian National Grid is not consistent with the option provides by the methodology AMS-I.D and the Tool for calculating the EF for electricity system. CAR 03 has been raised. In the revised PDD, the ex post option is chosen to calculate the grid emissions factor, therefore the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. The method used to calculate the Operating Margin (OM) and Build Margin (BM) will also be determined ex-post prior to the first verification. CAR 03 was closed.	CAR 03	OK
	Have the different options and methodological choices in the methodology been correctly followed for the project? throughout all documentation? Is the selection of methodological choices properly justified, based on supporting evidence? Are the methodological choices referred to consistently throughout all documentation?	The methodological choices were not clearly justified and not consistent with the tool and methodology requirements. The sources of data were not provided. CAR 03 was raised. In the revised PDD, the ex post option is chosen to calculate the grid emissions factor, therefore the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. The method used to calculate the Operating Margin (OM) and Build Margin (BM) will also be determined ex-post prior to the first verification. CAR 03 was closed.	CAR 03	OK

Equations and calculations used to calculate emission reductions

The following steps are applied in the PDD to determine emission reductions, in accordance with the methodology and tools applied:

Baseline emissions

According to the methodology, the baseline emissions are to be calculated as follows

$$BE_y = EG_{BL,y} * EF_{CO2,grid,y} \quad (1)$$

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)

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

The emission factor shall be calculated in a transparent and conservative manner as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the Tool to calculate the Emission Factor for an electricity system.

Grid emission factor:

The PPs will apply the Tool to calculate the emission factor for an electricity system in order to calculate $EF_{CO2,grid,y}$. The ex post option is chosen to calculate the grid emissions factor, therefore the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. The method used to calculate the Operating Margin (OM) and Build Margin (BM) will also be determined ex-post prior to the first verification.

ERM CVS during the site visit confirmed that the project is Greenfield project, therefore all methodological options related to capacity addition or retrofit projects are not applicable.

Project emissions

According to the methodology, 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 ACM0002.

- 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. CO₂ emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion".

The power generation technology applied by the proposed project is not geothermal or hydro power, therefore project emissions are not to be considered as per the methodology

Leakage

The proposed project is a solar PV project which does not include the transfer of energy generating equipment from another activity, which is confirmed by checking the FSR/02/ and the EIA assessment /03/. Therefore leakage is not to be considered for the proposed project according to the methodology.

Emission Reduction

According to the methodology, the emission reductions over the crediting period are equal to baseline emissions minus project emissions and leakage. Based on above steps, project emissions and leakage are considered to be zero, so the emission reduction will be equal to the baseline emissions, and be calculated as follows:

$$ER_y = BE_y = EG_{BL,y} * EF_{CO2,grid,y}$$

Where

ER_y = Emission Reductions in year y (tCO₂/y)

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
7.5.2 .1	Has the PP correctly applied all relevant calculations as required by the methodology and associated tools? Is it fully explained how the procedures provided in the Methodology and applicable Tools are applied by the proposed project activity? (i.e. Are the required steps clearly followed?)	CAR 03 was raised to request correction and clear description of the emissions reduction calculations. Following revisions to the PDD, the ex post option is chosen to calculate the grid emissions factor, therefore the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. The method used to calculate the Operating Margin (OM) and Build Margin (BM) will also be determined ex-post prior to the first verification. CAR 03 was closed.	CAR 03	OK
	Where the methodology provides for selection between different options for equations; is every choice of options for calculating project emissions, baseline emissions and leakage offered by the methodology correctly justified in the context of the project activity and baseline scenario?	No, the methodological options to Grid Emission Factor calculation were not clearly justified. Please see CAR 03 The ex post option is chosen to calculate the grid emissions factor, therefore the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring. The method used to calculate the Operating Margin (OM) and Build Margin (BM) will also be determined ex-post prior to the first verification. CAR 03 was closed.	CAR 03	OK
	Are the methodological choices referred to consistently throughout all documentation?	Pending CAR 03. CAR 03 was closed. Methodological choices are now consistent throughout the documentation.	CAR 03	OK
	Are the formulae required for the determination of project emissions, baseline emissions and leakage correctly presented in a complete and transparent manner, enabling a complete identification of parameters to be used and / or monitored?	Pending CAR 03. As the grid emissions factor will be determined ex-post, and the methodological choices (i.e. selection of the option to determine the OM and BM) will be made ex-post, the formulae for the grid emissions factor are not listed in the PDD. CAR 03 was closed. The overall formula for the calculation of emission reductions is correctly stated in the PDD.	CAR 03	OK
	Are detailed calculations provided in a traceable spreadsheet showing relevant information? Is the table of emission reductions in the PDD (section B.6.4) consistent with the calculations?	The spreadsheet is not in line with all the requirements of the methodology and tool. The data are not traceable. The PDD are not consistent with the calculations. CAR 03 has been raised A revised spreadsheet correctly showing the emission reduction calculations was provided, and CAR 03 was closed. Detailed calculations of the grid emissions factor will only be done ex-post.	CAR 03	OK
	Can the calculation of emission reductions be replicated using the data and parameters supplied in the PDD?	Not applicable, as the grid emissions factor will be determined ex-post.	OK	OK

Conclusion

ERM CVS confirms that:

Based on the information reviewed and calculations reproduced by the validation team, ERM CVS confirms the following:

- (a) All assumptions and data used by the PPs are listed in the PDD, including their references and sources;
- (b) All documentation used by PPs as the basis for assumptions and the sources of data are correctly quoted and interpreted in the PDD;
- (c) All values used in the PDD are considered reasonable in the context of the proposed GS project activity;
- (d) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- (e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

8 Validation findings – Additionality

As per the GS Toolkit and the VVS, ERM CVS assessed the PDD to determine whether it clearly describes how the proposed GS project activity is additional, as supported by sufficient and appropriate evidence. In accordance with the GS Requirements VI.a.1, all GS project activities must be demonstrated to be additional, meaning that they shall reduce anthropogenic emissions of GHGs below those that would have occurred in the absence of the registered GS project. ERM CVS assessed and verified the reliability and credibility of all data, rationales, assumptions, justifications and documentation provided by PPs to support the demonstration of additionality in order to critically assess the presented evidence, using interviews with stakeholders, local knowledge and sectoral expertise. In undertaking this aspect of the validation, ERM CVS considered tools and documents provided by the GS and CDM Executive Board to demonstrate the additionality of proposed GS project activity, as well as specific complementary or alternative requirements included in the approved methodology. In the sections below, ERM CVS describes all steps taken, and sources of information used, to cross-check the information contained in the PDD on additionality. Where appropriate, we describe how the validation team determined that the documentation assessed is authentic.

Selection of the tool

As per the GS Toolkit ERM CVS assessed whether the project representative has selected and applied the correct tool for the demonstration of additionality, and whether GS mandatory guidance has been applied.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
8.1.1	Has the project representative selected and applied the correct tool for the demonstration of additionality	Gold Standard VER projects are required to use either a UNFCCC approved or Gold Standard approved additionality tool, although projects developed under the 'retroactive cycle' cannot claim for deemed additionality (positive list). The project is applying under the regular project cycle (not retroactive). Therefore additionality for the Project Activity has been demonstrated as per the Methodological tool: Demonstration of additionality of small scale project activities, version 12.0. Under the tool, documentation of barriers 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). Solar technologies (photovoltaic and solar thermal electricity generation) are included in the list. Therefore the project activity can be considered automatically additional.	OK	OK
8.1.2	Have GS mandatory guidance for the use of the UNFCCC tools for demonstration of additionality been applied as per GS Toolkit section 2.3?	Yes	OK	OK

Conclusion

ERM CVS confirms that additionality is correctly demonstrated in line with Gold Standard guidance.

Identification of alternatives

The approved methodology that is selected by the proposed GS project activity prescribes the baseline scenario and no further analysis is required. The methodology defines the baseline as 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 therefore no further assessment of baseline alternatives is required.

Conclusion

ERM CVS confirms that the baseline is correctly defined in the PDD in line with the methodology.

9 Validation Findings – Carbon Monitoring Plan

ERM CVS evaluated the monitoring plan for the proposed project to ensure that it is based on the approved monitoring methodology that has been applied. As per the VVS, ERM CVS applied a two-step process, based on review of the documented procedures, interviews with relevant personnel, project plans and any physical inspection, to assess:

a) *Compliance of the monitoring plan with the approved methodology::*

- (i) By means of document review, identify the list of parameters required by the selected approved methodology;
- (ii) Confirm that the monitoring plan contains all necessary parameters, that they are clearly described and that the means of monitoring described in the plan complies with the requirements of the methodology.

b) *The Implementation of the monitoring plan, taking into account:*

- (i) Whether the monitoring arrangements described in the monitoring plan are feasible within the project design;
- (ii) Whether the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed GS project activity can be reported ex post and verified.

Compliance of the monitoring plan with the approved methodology

The monitoring plan in the PDD includes all parameters necessary for monitoring of this type of project in accordance with the approved methodology that has been applied for this project. The parameters are clearly described and the means of monitoring described in the plan complies with the requirements of the methodology.

Completeness of monitoring parameters

The monitoring parameters required by the methodology and/or applicable tools for this type of project are:

Parameter Name	Parameter Description	Is the parameter appropriately included in the Monitoring Plan? (including justification and substantiation of information, data and evidence and explanation if any are excluded from the monitoring plan)
EG _{Facility, y}	Quantity of net electricity generation supplied to the grid as a result of the implementation of the CDM project activity in year y	The parameter was included into the Monitoring Plan. However, there is not clear if the electricity delivered to the grid is gross or net electricity supply. CL 02 was raised to request monitoring procedure clarification. The PDD was revised. It is made clear that the Quantity of net electricity supplied by the project activity to the grid is monitored. CL 02 was closed.
EF _{grid,CM,y}	Combined margin CO2 emission factor for the electricity system in year y	The parameter is appropriately included in the monitoring plan. It was included following the decision to set the grid emissions factor ex-post.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.1.1 .1	Are all required parameters (according to the methodology and tools) included in the monitoring plan?	Following the closure of CL 02, it has been confirmed that all required parameters (according to the methodology and tools) are included in the monitoring plan.	CL 02	OK
9.1.1 .2	Is the monitoring plan clear and consistent about how the parameters will be included (e.g. if they are mentioned in	Following the closure of CL 02, it has been confirmed that all required parameters (according to the methodology and tools) are consistently included in the monitoring plan.	CL 02	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	the text of the monitoring plan but not in the monitoring tables this is not acceptable)?			

Other parameters are not relevant to this project activity because the project activity does not imply retrofit or capacity addition of existing facility. ERM CVS confirmed that the project activity is Greenfield project during the site visit and relevant documents /03/08/

Conclusion

The monitored parameters included in the monitoring are complete and appropriate for monitoring of this project activity

Compliance of monitoring

For each parameter, ERM CVS has validated whether it has been addressed in accordance with the baseline and monitoring methodology.

Monitored Parameters	Parameter Names	
	EG _{Facility, y}	EF _{grid, CM, y}
Parameter Title correct?	Yes	Yes
Description in line with methodology/tool?	Yes	Yes
Data unit correctly expressed?	Yes	Yes
Source clearly referenced?	Yes	Yes
Correct value provided for ex ante estimation?	Yes	Yes
How has this value been verified?	FSR /02/	ER calculation spreadsheet /05/
Measurement method correctly described?	Yes	Yes
Measurement and recording frequency correctly described?	Yes	Yes
Correct reference to standards?	Yes – reference made to ‘national standards’. The current version of these has been reviewed /38/	Yes

Monitored Parameters	Parameter Names	
	EG _{Facility, y}	EF _{grid, CM, y}
Indication of accuracy provided?	Yes	Yes
QA/QC procedures described?	Yes	Yes
QA/QC procedures appropriate/in line with methodology/tool?	Yes	Yes

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.1.2 .1	Are all required parameters appropriately monitored in accordance with the methodology/tools?	The monitoring procedure for net electricity generated supplied to the grid need was not sufficiently clear. CL 02 was raised. The PDD was updated and the description of the monitoring plan was revised, and CL 02 was closed. Details of the meters were provided, as well as details of data collection, data recording, meter calibration, reporting and quality control. All required parameters are appropriately monitored in accordance with the methodology & tools.	CL 02	OK

Conclusion

The means of monitoring all relevant monitored parameters complies with the requirements of the methodology and applicable tools.

Implementation of the monitoring plan

ERM CVS evaluated the feasibility and sufficiency of the monitoring plan. The key components of the monitoring plan are as follows.

Operational and management structure

The PDD describes the organisational responsibilities for monitoring of the project activity. 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. An Electrician Operator takes the readings and stores them in an electronic database, a senior electrician operator verifies the readings and drafts the written statement for each month, and a general manager is responsible for signing off the monthly written monitoring statements.

The monitoring plan requires that all people that participate in the monitoring process are suitably qualified and trained in the operation and maintenance of the plant.

The measurement methods, recording procedures, meter maintenance and trouble-shooting procedures described in the monitoring plan are all included according to regulation and standards from Panamanian government /38/. No difficulties are anticipated in implementing the operational and management structure or the monitoring plan as a whole

Equipment:

Metering the net electricity supplied by the project activity to the grid will be carried out by bi-directional meters (main meter and back-up) with accuracy no lower than 0.2% which is in compliance with the relevant Panamanian industrial standard /38/.

Quality Assurance and Quality Control (QA/QC) of equipment and data:

The monitoring plan states that the electricity supplied by the project activity to the grid is measured using calibrated electricity meters. The parameter is monitored at the control room and crosschecked with review of the receipts of electricity sales.

Meter readings will be checked by the senior electrician operator, and the written meter reading statement will be signed off by the general manager monthly.

The PDD describes calibration and trouble-shooting procedures in the monitoring plan. The meters will be calibrated annually by the CND in Panama as per Panama law and manufacturer's specifications. The PDD contains sufficient description on how quality will be controlled and assured in the monitoring of emission reductions.

Feasibility of the monitoring plan:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
9.2.1	Are the arrangements described in the plan feasible and practical within the project design? Please consider: (a) operational and management structure, including responsibilities (b) Plans for maintenance and calibration of equipment (c) Plans for QA/QC of equipment and data (d) Installation of monitoring equipment (whether in place, or planned)	No. PDD version 1 does not properly develop the monitoring Plan according to the guidance for completing the PDD for small-scale CDM project activities. CAR 05 has been raised. The PDD was revised and the monitoring plan was updated. The operational and organisational structure is considered sufficient to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified The equipment setup is considered sufficient to carry out the monitoring requirements of the methodology, and the appropriate national standards have been followed. Calibration and maintenance plans are appropriate. The data management procedures are considered appropriate to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified. CAR 05 was closed.	CAR 05	OK

Conclusion

Based on the validation activities performed, ERM CVS concludes that:

- (a) The monitoring plan is fully in compliance with the requirements of the methodology;
- (b) The monitoring arrangements described in the monitoring plan are feasible within the project design;
- (c) The means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed GS project activity can be reported ex post and verified.

The assessment conducted by ERM CVS is by means of review of the documented procedures, interviews with relevant personnel, project plans and physical inspections of the proposed GS project activity site. In ERM CVS's opinion, the PPs are able to implement the monitoring plan.

10 Validation Findings – Local Stakeholder Consultation and Sustainability assessment

Stakeholder Consultation

As per Annex AB to GS V2.2 ('LSC Report Review – Checklist for DOEs'), for regular cycle project activities, ERM CVS assessed the issues that resulted from the Local Stakeholder Consultation (LSC), including Forward Action Requests raised by the Gold Standard during its LSC Report review.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
10.1.1	Have comments from local stakeholders that can reasonably be considered relevant at the activity level been pro-actively invited to the LSC? Refer to the invitee categories in the GS Toolkit Were the invitations tracked? Was the DNA or the national focal point notified about the project?	At the time of starting the validation, the PP had not undertaken the LSC process. Therefore, ERM CVS could not validate the LSC report or possible FARs that GS could raise during the LSC report review. The PP obtained approval from Gold Standard to undertake the validation site visit before the LSC report had been developed /13/. Nevertheless, during the site inspection ERM CVS interviewed residents of Vista Hermosa, the nearest small town to the project activity, concerning the project, its activities, and possible positive and negative impacts. CAR 06 has been raised to request the PP to develop the LSC according GS guidelines. A local stakeholder consultation meeting was conducted on 9 May 2014 in line with Gold Standard guidelines, at the church located in the town of Vista Hermosa. The LSC meeting had 27 participants including local inhabitants from Vista Hermosa and surrounding towns. Invitations were published via a radio announcement in a local radio station and issued individually to all members of the community. Flyers were posted in Villa Hermosa. Invitations were also hand delivered to the local authorities. The DNA was notified and invited. Invitations were tracked. /07/ CAR 06 was closed.	CAR 06	OK
10.1.2	Has this included a live meeting? Was the stakeholder consultation meeting planned and organised at suitable stage of the project? Was the date, time and location of the meeting appropriate?	Yes, a live meeting was held on 9 May 2014 /07/. This is considered to be at a suitable stage of project development because it was before financial close or construction start. The meeting was held in the nearest town, and the date, time and location of the meeting can be considered appropriate.	CAR 06	OK
10.1.3	Was a non-technical summary prepared in the most appropriate language? Is it clear and understandable to local stakeholders?	A non-technical summary was provided in Spanish /07/. It is clear and understandable and was explained to local stakeholders during the face-to-face meeting.	CAR 06	OK
10.1.4	Was the meeting well documented? Is the meeting in line with the host country requirements?	The meeting has been documented in an LSC report /07/. The meeting was in addition to consultation meetings held for the project environmental impact assessment process based on host country requirements.	CAR 06	OK
10.1.5	Were the safeguarding principles and sustainability indicators discussed and assessed during the	The safeguarding principles and sustainability indicators were discussed in the meeting /07/. The result was that the PP did not need to revisit the sustainable development matrix scoring because stakeholders provided the same scores to	CAR 06	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
	stakeholder consultation meeting?	the SD matrix indicators and also considered the proposed mitigation measures and parameters proposed by the project owner to be sufficient. /07/ ERM CVS subsequently raised comments on the scores to some of the sustainable development indicators, and hence the scores for some indicators in the consolidated SD matrix in the LSC report, and in the final version of the GS passport, are different to the preliminary scores determined prior to the LSC meeting and the scores determined in the meeting by stakeholders.		
10.1.6	Has due account been made for all relevant comments raised during the LSC? Have these been appropriately integrated and discussed in the Sustainability Monitoring Plan?	No comments requiring changes in the project design or sustainable development parameters were raised during the LSC.	CAR 06	OK
10.1.7	Was the stakeholder feedback round organised?	CAR 06 was raised because the stakeholder consultation (including stakeholder feedback round) had not been done at the time of validation start. The Gold Standard raised a FAR during its review of the LSC report: Forward Action Request #1: As part of the Stakeholder Feedback Round the PP shall seek actively the feedback from other stakeholder different to category code A, e.g. authorities on charge licenses or permits, municipality authorities, NGOs active in the region. Regardless the response receive, the PP shall demonstrate the best effort has been done to get feedback from other groups. For the stakeholder feedback round, the PP organised two types of consultation: firstly the stakeholders in category A were visited by the PP personnel, including Aguadulce's Mayor, Engineer of the Municipality of Agua Dulce, Manager of Water department, Vista Hermosa Organization, Committee of Water in Vista Hermosa, Director of School Eric del Valle, MiAmbiente, Instituto Nacional de Cultura (INAC), and the Ministry of Housing and Territorial Planning. These stakeholders were updated on the status of the project, and were invited to make comments or suggestions during the meetings and on an ongoing basis by telephone and email. Secondly, local stakeholders were invited to make comments in a comment book made available at the Vista Hermosa church, where the stakeholders are able to include all comments and questions that may appear during construction and operation of the project. The availability of the book has been discussed with the foreman at the construction site and with the clergy at the church, who were able to relay the information to all of the construction workers at the project site and to the local population. Subsequently the PP received one comment about the status of the road, on July 27, 2017. The PP finished the reparation of the road as response to the stakeholder comment – repair was completed on September 24, 2017. The PP has also set up a contact email address and phone number for any ongoing comments on the project from other stakeholders: Mr. Enrico Desiata +507 68966754 enrico.desiata@gmail.com or panasolar.generation@gmail.com This contact information was given in the invitation to the feedback round meetings as well as during the feedback round meetings.	CAR 06	OK

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
		ERM CVS confirmed through interview with the project developer that the description of the feedback round in the GS passport is correct. CAR 06 was closed.		
10.1.8	Have the approved/selected methods of Continuous Input/Grievance Mechanism from the LSC Report have been implemented on site and discussed in the GS Passport	A Continuous Input/Grievance comment book is available at the local church of Vista Hermosa. Telephone and email access has also been provided and is stated in the GS documentation.	OK	OK
10.1.9	Were the FARs raised in the LSC review by The Gold Standard addressed appropriately?	GS feedback on the LSC report was provided on 24 November 2014 /37/. GS raised the following FARs: FAR 1 was raised by the Gold Standard and addressed by the PP – please see above for details.	OK	OK

Conclusion

Based on the stakeholder interviews and document reviews undertaken, ERM CVS concludes that relevant local stakeholders were consulted, that the consultation undertaken is adequate, and due account was made for all relevant comments raised during the consultation. The stakeholders did not identify any serious concerns or significant negative impacts from the construction of the project

ERM CVS has therefore validated that the local stakeholder consultation is adequate.

Sustainability Assessment

ERM CVS validated whether the Do No Harm Assessment and Detailed impact assessment – sustainable development matrix – were completed in accordance with the GS guidance.

	Safeguarding Principles	Project risks and mitigation measures	Assessment by ERM CVS
10.2.1 (1)	The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people. The project is not complicity in Human Rights abuses.	The principle was not assessed according to GS guidelines. See CAR07 The principle has been properly assessed in the updated passport and CAR 07 was closed. The project is classified as low risk against this principle because the stakeholder consultations have not identified any objections to the project or concerns over human rights abuses. Panama has supported the United Nations Declaration on the Rights of Indigenous Peoples /26/ and other United Nations Human Rights treaties including the International Covenant on Civil and Political Rights, the Convention on the Elimination of All Forms of Discrimination against Women, the International Convention on the Elimination of All Forms of Racial Discrimination, the Convention on the Rights of the Child and	During the interviews with Local Authorities /IV1/IV2/IV5/ ERM CVS was able to confirm that all workers shall be contracted according to the law. Interviewees did not identify any issue related to cultural property or indigenous people. Therefore, the principle is considered to be sufficiently fulfilled by the project activity.

	Safeguarding Principles	Project risks and mitigation measures	Assessment by ERM CVS
		the Convention on the Rights of Persons with Disabilities /27/.	
10.2.1 (2)	The project does not involve and is not complicit in involuntary resettlement.	The project will not result in any resettlement. The project is being built on private land formerly used for cattle grazing, confirmed during the validation site visit. The project is classified as low risk against this principle.	ERM CVS confirmed that the property where the project will be developed has no previous inhabitants or previous buildings on site. This was confirmed during the site visit and checked with satellite photos of 2013 /14/. The principle is considered to be adequately fulfilled by the project.
10.2.1 (3)	The project does not involve and is not complicit in the alteration, damage or removal of any critical cultural heritage.	There are no archaeological sites on the project site or the surrounding area according to the Archaeological Monitoring permit /28/. The project is classified as low risk against this principle.	ERM CVS confirmed through interviews with local authorities that the project will not result in the alteration, damage or removal of any critical cultural heritage. The Archaeological Monitoring permit /27/ has also been granted. The principle is considered to be adequately fulfilled by the project.
10.2.1 (4)	The project respects the employees' freedom of association and their right to collective bargaining and is not complicit in restrictions of these freedoms and rights	The GS passport did not correctly address this principle. See CAR 07. The updated GS passport includes a commitment to respect these rights. Such rights must be respected under Panamanian labour laws, and Panama has ratified ILO Conventions 87 and 98 on freedom of association and right to collective bargaining, respectively /29/. The project is classified as low risk against this principle.	During the interviews with Local Authorities /IV1/IV2/IV5/ ERM CVS was able to confirm that all workers shall be contracted according to the law, and freedom of association and right to collective bargaining will be respected. The principle is considered to be adequately fulfilled by the project.
10.2.1 (5)	The project does not involve and is not complicit in any form of forced or compulsory labour.	The GS passport did not correctly address this principle. See CAR 07. The updated GS passport includes a commitment to respect these rights. Such rights must be respected under Panamanian labour laws /30/. Panama has ratified ILO Conventions 29 and 105 on elimination of forced and compulsory labour /29/. The project is classified as low risk against this principle.	During the interviews with Local Authorities /IV1/IV2/IV5/ ERM CVS was able to confirm that all workers shall be contracted according to the law. ERM CVS during the site visit and interviews with local habitants confirmed that the region has a long tradition of formal and regular works and that the local authorities do not allow any form of forced or compulsory labour /IV6/IV7/IV8/IV9/. The principle is considered to be adequately fulfilled by the project.
10.2.1 (6)	The project does not employ and is not complicit in any form of child labour.	The GS passport did not correctly address this principle. See CAR 07. The updated GS passport includes a commitment to respect these rights. Such rights must be respected under Panamanian labour laws /30/. Panama has ratified ILO Convention 138 (minimum age) and convention 182 (worst form of child labour) under the ILO Declaration on Fundamental Principles and Rights at Work /29/. The project is classified as low risk against this principle.	ERM CVS confirmed that the project activity should comply with all Panamanian Labour Legislation, which prohibits child labour. During the site visit the validation team observed that local children all attend the local school. During the interviews with Local Authorities /IV1/IV2/IV5/ ERM CVS was able to confirm that all workers shall be contracted according to the law. The principle is considered to be adequately fulfilled by the project.
10.2.1 (7)	The project does not involve and is not complicit in any form of discrimination	The GS passport did not correctly address this principle. See CAR 07.	During the interviews with Local Authorities /IV1/IV2/IV5/ ERM CVS was able to confirm that all workers shall be contracted according to the law. Most

	Safeguarding Principles	Project risks and mitigation measures	Assessment by ERM CVS
	based on gender, race, religion, sexual orientation or any other basis.	The updated GS passport includes a commitment to respect these rights. Panama has ratified Convention 100 (equal remuneration) and convention 111 (Discrimination in employment/occupation) under the ILO Declaration on Fundamental Principles and Rights at Work /29/. The project is classified as low risk against this principle.	employment opportunities for local people from the project would be for construction activities for relatively low skilled workers, as was confirmed through an interview with the Major of Aguadulce /IV1/. The principle is considered to be adequately fulfilled by the project.
10.2.1 (8)	The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.	The GS passport did not correctly address this principle. See CAR 07. The updated GS passport includes a commitment to provide workers with safe and healthy working conditions in accordance with Panamanian labour laws. The project sponsor has developed health and safety procedures and commitments accordingly /31/. The project is classified as medium risk against this principle, and mitigation measures are proposed: proper annual trainings for all workers, and distribution and usage of protective equipment.	ERM CVS has reviewed the Project developer training and qualification procedures, which include procedures for health and safety risk assessment and hazard mitigation. Mitigation measures will ensure that staff are trained, and provided with adequate personal protective equipment (PPE). The principle is considered to be adequately fulfilled by the project.
10.2.1 (9)	The project takes a precautionary approach in regard to environmental challenges and is not complicit in practices contrary to the precautionary principle.	The GS passport did not correctly address this principle. See CAR 07. The updated GS passport addresses this safeguarding principle. The project is classified as low risk due to the fact that the project activity is a newly built solar PV power project, and will therefore have a very limited impact to air, soil, water and noise pollution. Waste will be properly removed and disposed, and dangerous chemical waste will not be produced. There will be a transmission line (partly above ground and partly buried), however the construction of this line will not require trees to be felled, and therefore the impact on the landscape can be minimised.	The impact of the project on the landscape was assessed in the approval process for the project under host country requirements /03/ and was deemed acceptable. The project has a waste management plan /39/ which confirmed that there will be no noticeable impact on soil. The principle is considered to be adequately fulfilled by the project.
10.2.1 (10)	The project does not involve and is not complicit in significant conversion or degradation of critical natural habitats, including those that are (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value or (d) recognised as protected by traditional local communities.	The GS passport did not correctly address this principle. See CAR 07. The updated GS passport addresses this safeguarding principle. The project is classified as low risk due to the fact that none of the mentioned critical natural habitats are impacted by the project.	ERM CVS confirmed during the site visit that the land was previously used as cattle grazing land. The project has undergone an environmental impact assessment /03/ which concluded there are no significant negative impacts to critical protected natural habitats. The principle is considered to be adequately fulfilled by the project.
10.2.1 (11)	The project does not involve and is not complicit in corruption.	The GS passport did not correctly address this principle. See CAR 07. The updated GS passport includes a commitment to not promote or be complicit in corruption. The project must abide by Panamanian laws and regulations, and Panama is a signatory of the UN Convention against Corruption	ERM CVS has confirmed that the company has an anti-bribery and corruption policy in place /33/, and confirmed that Panama is a signatory to the UN convention against corruption /32/. The principle is considered to be adequately fulfilled by the project.

	Safeguarding Principles	Project risks and mitigation measures	Assessment by ERM CVS
		/32/. The project is classified as low risk against this principle.	

Do no harm assessment:

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
10.2.2	Were the risks sufficiently assessed that the project could have harmful impacts, using safeguarding principles of the UNDP as set out in the GS Toolkit? Was guidance in Annex H, C and G sufficiently considered? Were any additional critical issues relevant for the project type and not covered by the safeguarding principles evaluated and added?	The “Do No Harm” assessment into the GS Passport was not developed according to the GS guidance. CAR 07 was raised requesting the PP to complete the analysis properly and provide relevant references for the risk assessment. The GS Passport was revised and the do no harm assessment was presented correctly. Guidance in annex H, C and G was applied. ERM CVS considers that there are no additional critical issues relevant for the project type and not covered by the safeguarding principles evaluated.	CAR 07	OK
10.2.3	Have appropriate mitigation measures been proposed where there is medium to high risk?	CAR 07 was raised to request the PP to revise the do no harm assessment. The GS Passport was revised and the final version of the Passport proposes appropriate mitigation measures for all principles where there is a medium or high risk posed by the project (specifically: provision of a safe and healthy working environment). CAR 07 was closed.	CAR 07	OK
10.2.4	Has the sustainable development matrix been fully completed? Are all twelve indicators considered?	The Passport considered all mandatory indicators. However the Detailed Impact Assessment is not consistent with the GS rules and guidelines. CAR 08 has been requested to correct and improve the Sustainability Matrix. The GS passport was updated and the SD matrix has been fully completed.	CAR 08	OK
10.2.5	Have appropriate wider boundaries been applied in the detailed impact assessment than the boundaries defined in the applied baseline and monitoring methodology?	The boundaries applied in the assessment were not clear in the original GS passport. See CAR 08. The Passport was revised and the analysis considers the impacts of the project including impacts beyond the physical boundaries of the project. CAR 08 was closed. Please see below for further details of the validation of the SD Matrix.	CAR 08	OK
10.2.6	Are the baseline situations described for the indicators appropriate? Are chosen parameters suitable? Assessment for each indicator is provided in the table below	The baseline indicators description was not included. The parameters have not been justified. See CAR 08 The Passport was revised and the baseline situations of the indicators are appropriate and the chosen parameters are considered suitable. CAR 08 was closed. Please see below for further details of the validation of the SD Matrix.	CAR 08	OK
10.2.7	Are the target value and scoring of the indicator appropriate? Assessment for each indicator is provided in the table below	The target value and scoring of each indicator in the original GS passport was not sufficiently justified. CAR 08 was raised. The GS passport was revised and the target values and scoring of the indicators in the final Passport is considered appropriate. CAR 08 was closed. Please see below for further details of how the SD matrix was validated.	CAR 08	OK

Sustainable development matrix:

Indicator	Are chosen parameters suitable?	Is the scoring of the indicator appropriate?	Are appropriate mitigation measures proposed where the score is negative?
Air quality	No monitored parameters, because the project is scored neutral for this indicator.	Yes – neutral score given that the impact of the project on emissions from other power plants cannot be determined accurately	n/a
Water quality and quantity	No monitored parameters, because the project is scored neutral for this indicator.	Yes – the project is given a neutral score for this parameter given that, as a solar PV plant, the project will not consume large quantities of water for construction or operation and will generate minimal waste water, and will not alter the seasonal creek running through the site.	n/a
Soil condition	No monitored parameters, because the project is scored neutral for this indicator.	A neutral score is given, due to the fact that water and soil conservation will be emphasized during and after construction, according to the waste management and disposal plan established in the Environmental Impact Assessment Study Report /03/.	n/a
Other pollutants	No monitored parameters, because the project is scored neutral for this indicator.	A neutral score is given due to the fact that waste materials will be collected and sent for proper disposal, and measures will be in place to minimise noise during the construction phase. The impact of the project on pollution is considered to be minimal. ERM CVS has reviewed the EIA /03/ and the waste management plan /33/.	n/a
Biodiversity	No monitored parameters, because the project is scored neutral for this indicator.	The Environmental Impact Study /03/ confirms that the land was previously covered in sparse vegetation and there will be no significant impacts on biodiversity, including bird life. The land on which the project will take place has sparse vegetation with no beneficial use, according to section 3.2 Categorization, Criterion II of /. The Environmental Impact Study was reviewed /03/ and confirmed the project has minimal impacts on biodiversity. A neutral score is therefore considered appropriate. Therefore no mitigation measures are proposed.	n/a
Quality of employment	The chosen parameters are payroll information of employees, and number of technical or health and safety staff training events.	A positive score is considered appropriate given that the project will create employment. As this is the first such solar project in Panama, specific training will be delivered to staff. Health and safety training will also be provided.	No mitigation measures are proposed because the impact is scored as positive. The relevant parameters concerning payroll information and training are included in the sustainability monitoring plan.
Livelihood of the poor	The chosen parameter is availability and use of water tank for the community. This is considered suitable since this is a commitment made to the local community during the project planning stages. This parameter can be definitively monitored.	A positive score is considered appropriate given that the project will create employment opportunities, and will also contribute a water storage tank and pump to the local community and provide electricity for its operation.	No mitigation measures are proposed because the impact is scored as positive. The relevant parameters concerning employment, and the provision of a water storage tank and pump, are included in the sustainability monitoring plan.

Indicator	Are chosen parameters suitable?	Is the scoring of the indicator appropriate?	Are appropriate mitigation measures proposed where the score is negative?
Access to affordable and clean energy services	Specific parameters are not identified because the project is given a neutral score.	A neutral score is considered to be appropriate. Although the project will provide clean energy, the total impact on the composition of the Panamanian grid will be small.	n/a
Human and institutional capacity	The chosen parameters are Number of employees in skilled jobs. Proportion of locally hired (employees that lives near the Project) employees will be monitored. Number of trainings sessions per year given to all the employees, according to the policies established in the document training and qualification "Procedimiento General Formación y Capacitación (PG-06)". The parameters are considered appropriate to monitor the impact on human and institutional capacity.	A positive score is considered appropriate given that the project will invest in training employees and develop their skills. As this is the first such solar project in panama, specific training will also be delivered to staff. Health and safety training will also be provided.	No mitigation measures are proposed because the impact is scored as positive. The relevant parameters concerning number of skilled jobs, proportion of people locally hired, and the number of training sessions provided to employees, are included in the sustainability monitoring plan.
Quantitative employment and income generation	The chosen parameters are number of jobs and the staff salary level, and the proportion of locally hired people (employees that live near the Project). The parameters are considered appropriate.	A positive score is considered appropriate given that the project will create jobs.	No mitigation measures are proposed because the impact is scored as positive. The relevant parameters concerning number of jobs and the staff salary level, and the proportion of locally hired people, are included in the sustainability monitoring plan.
Access to investment	Specific parameters are not identified because the project is given a neutral score.	A neutral score is considered to be appropriate. Although the project will provide clean energy, the total impact on fuel imports in Panama will be small.	n/a
Technology transfer and technological self-reliance	Specific parameters are not identified because the project is given a neutral score.	A neutral score is considered to be appropriate. Although the project is expected to be the first solar PV project of its kind in Panama, other projects are under development.	n/a

Conclusion:

The do no harm assessment and sustainable development matrix have been developed in line with relevant Gold Standard requirements and guidelines.

Sustainability Monitoring Plan

ERM CVS has evaluated whether the sustainability monitoring plan is complete and appropriate for the type and scale of the project.

	Question	Validation findings (including justification and substantiation of information, data and evidence)	Draft OK/ CAR/CL	Final OK/ Not OK
10.3.1	Does the sustainability monitoring plan cover all non-neutral indicators?	The validation of sustainability Plan should be done once PP presents the improvement and correction on the Do No Harm and Sustainability assessments. Pending CAR 07 and CAR 08 Following revision of the documents by the PP, the sustainability monitoring plan was confirmed to cover all non-neutral indicators.	CAR 07 CAR 08	OK
10.3.2	Are mitigation and compensation measures in place to prevent violation or the risk of violating safeguarding principles of the Do No Harm Assessment that have been indicated as having a risk?	The validation of sustainability Plan should be done once PP presents the improvement and correction on the Do No Harm and Sustainability assessments. Pending CAR 07 and CAR 08 Following revision of the documents by the PP, no mitigation measures have been proposed, since the project is scored neutral or positive for all indicators.	CAR 07 CAR 08	OK
10.3.3	Does the monitoring plan address stakeholder concerns?	Specific stakeholder concerns about the project did not require any changes to the SD monitoring plan. ERM CVS raised a number of comments on the SD monitoring plan, and these have now been addressed. Gold Standard comments raised in the review of the LSC have been taken into account.	OK	OK

For each sustainability indicator, ERM CVS has validated whether it has been addressed in accordance with the GS rules and guidance.

Monitored Parameters	Indicator	
	Quantitative employment and income generation	Quality of employment
Are chosen parameters appropriate for the indicator?	Yes	Yes
Is current status or expected status under the baseline appropriate? How was it validated?	Yes. It is logical that without the project, the jobs created by the project would not exist.	Yes. It is logical that without the project, the skills training created by the project would not exist.
Is the future status suitable?	Yes	Yes
Are the means to monitor the indicator suitable, clear and proportionate to the size of the project?	Yes	Yes
Is the frequency of monitoring appropriate?	Yes	Yes

Monitored Parameters	Indicator	
	Human and institutional capacity	Livelihood of the poor
Are chosen parameters appropriate for the indicator?	Yes	Yes
Is current status or expected status under the baseline appropriate? How was it validated?	Yes. It is logical that without the project, the skills training created by the project would not exist.	Yes. It is logical that without the project, the water tank donated by the project would not exist.
Is the future status suitable?	Yes	Yes
Are the means to monitor the indicator suitable, clear and proportionate to the size of the project?	Yes	Yes
Is the frequency of monitoring appropriate?	Yes	Yes

Conclusion

The Sustainable Development monitoring plan has been developed in line with GS guidance.

Appendix A: Documents and Interviewees

A.1 DOCUMENT LIST

Reference number	Date	Document Title and version number (if applicable)
01	01 September 2013 27 February 2019	Project Design Document for the proposed project Version 01 (for GSP) Version 04 (final).
02	12 January 2013	Feasibility Study Report (FSR) for the Project prepared by Panasolar Generation S.A.
03	March 2013 30 April 2013	Environmental Impact Assessment (EIA) Environmental Impact Assessment for Photovoltaic Power Generation of 9,9 MW in Borough of El Roble, City of Aguadulce, Cocle Province, Panama ANAM, Resolution ARAC-IA_042 2013 approval of EIA report for the Photovoltaic Power Generation of 9,9 MW Project
04	12 July 2013	ANAM Letter No legal requirement for EIA or Environmental Permission for Transmission Line
05	26 August 2013 14 March 2018	ER calculation spreadsheet Version 01 Version 6
06	20 January 2014 21 June 2018	GS Passport Version 01 Version 03
07	23 May 2018	LSC report Version No.: 3
08	11 July 2013	ASEP – Resolution 6299 – Provisional Permission to Install, Operation and Utilization of Photovoltaic Park in Panama – Panasolar for power generation
09	10 June 2013	Law 37 – Regulation of incentives to promote the construction, installation and operation of photovoltaic power plants in Panama.
10	Webpage	Empresa de Generación Eléctrica S.A – Sarigua Photovoltaic Project 2.4 MW http://egesa.net/contenido/instalaciones/proyectos/
11	Webpage	CND – National Dispatch Centre http://www.cnd.com.pa/index.php
12	Webpage	ETESA – Interconnected Electrical System http://www.etsa.com.pa/index.php

Reference number	Date	Document Title and version number (if applicable)
13	30 January 2014	GS communication (Ivan Hernandez) approving the site visit during 5 and 6 of February without LSC report
14	2013	Google Maps Satellite Photos 2013 year.
15	website	International Labour Organization – Ratification for Panama http://www.ilo.org/dyn/normlex/en/f?p=1000:11200:0:::P11200_INSTRUMENT_SORT,P11200_COUNTRY_ID:2,102792#Occupational_safety_and_health
16	No Date	Solar Panel Distributions on Panasolar property. Basic Draw – EIA study.
17	No Date	Project General Localization_ Panasolar Generation Project
18	9 November 2012	Public Deed No. 1556 certifying the Panasolar Property to install Panel Solar for Solar Farming.
19	14 August 2009	Decree Law 123 - Environmental Impact assessment regulations.
20	24 June 2014	Evidence of land purchase 'Escritura Finca Llano Sanchez'
21	12 July 2016	Evidence of equipment purchase '1st payment Purchase equipment'
22	1 August 2017	Construction start confirmation document
23	21 December 2017	Financial closure evidence document
24	12 July 2016	Contract to access the Panamanian National Interconnected System (Sistema de Transmision) signed by Empresa de Transmision Electrica, S.A. and Panasolar Generation S.A
25	24 November 2014	Gold Standard feedback on the LSC report (email exchange between Ivan Hernandez of the Gold Standard Foundation and Christian Giles with the LSC review for Panasolar Photovoltaic Project (GS3556))
26	Checked 17 August 2018	United Nations Declaration on the Rights of Indigenous Peoples – webpage http://unbisnet.un.org:8080/ipac20/ipac.jsp?profile=voting&index=.VM&term=ares61295
27	Checked 17 August 2018	UN Human Rights – Office of the High Commissioner: status of ratification of Human Rights conventions and treaties https://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=133&Lang=EN
28	4 July 2017	Archaeological Monitoring permit given to PANASOLAR from the National Institute of Culture (INAC), Resolution No. 157-17 DNPH
29	Checked 17 August 2018	ILO – status of ratification of treaties and conventions http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:102792
30	Checked 17 August 2018	Panamanian Labour Code http://cetippat.gob.pa/wp-content/uploads/2017/05/co%CC%81digo-detrabajo.pdf
31	12 August 2017	Project developer training and qualification procedures "Procedimiento General Formación y Capacitación (PG-06)" – including procedures for health and safety risk assessment and hazard mitigation.
32	Checked 17 August 2018	UN Convention against Corruption - Ratification Status

Reference number	Date	Document Title and version number (if applicable)
		https://www.unodc.org/unodc/en/corruption/ratification-status.html
33		Project developer anti-bribery and corruption policy
34	9 March 2018	Project waste management plan (PG-PE-10 Plan de gestion integral de residuos v3.2)
35	20 August 2017	Aguadulce Municipality: Construction Permission notice
36	22 August 2018	THESAN USA Corp: technical study simulating electricity generation from the PV panels
37	2017	Schweitzer Engineering Laboratories, Inc.: Technical specifications of the SEL-735 Power Quality and Revenue Meter
38	Accessed 5 March 2019	Centro Nacional de Despacho: CAMBIOS REALIZADOS AL REGLAMENTO DE OPERACIÓN (Panamanian electricity monitoring/calibration standard)
39	9 March 2018	Waste management plan of the project, version 02 - PG-PE-10 Plan de gestion integral de residuos 3.2
40	July 11, 2013	Signed Contract between Anaconda Carbon and Panasolar AC-Panasolar-sig-12-07-13
41	November 22, 2013	ERM CVS Contract Gold Standard; ERM CVS GHG Terms and Conditions
42	27 January 2014	ERM CVS validation plan
43	5-6 February 2014	As documented in the ERM CVS validation report
44	7 March 2014	ERM CVS draft validation report
45	May 2, 2014	Letter from the Administrator General of the Republic of Panama to Panasolar, authorising the project to be developed
46	June 4, 2014	Letter from Panasolar to ETESA
47	30 June 2014	ERM CVS has reviewed the email exchange between Enrico Desiata and the Gold Standard Foundation confirming that the registry account request has been received
48	1 July 2014	ERM CVS has reviewed the email exchange between Christian Giles and Ivan Hernandez of the GSF
49	14 July 2014	EERM CVS has reviewed the email exchange between Miguel Cortes, ERM CVS, and Sergio Degener, Anaconda Carbon. There was further email correspondence on this issue between 15 and 19 July 2014.
50	17 July 2014	ERM CVS has reviewed the email exchange between Enrico Desiata and the Gold Standard Foundation confirming that the documentation was submitted on 17 July 2014
51	6 August 2014	ERM CVS has reviewed the email exchange between Christian Giles and the Gold Standard Foundation requesting an update on the status
52	8 September 2014	ERM CVS has reviewed the email exchange between Christian Giles and Ivan Hernandez of the Gold Standard Foundation confirming that the registry account is working
53	1 October 2014	ERM CVS has reviewed the email exchange between Panasolar and the Gold Standard Foundation
54	October 22, 2014	Letter from Panasolar to ETESA

Reference number	Date	Document Title and version number (if applicable)
55	March 2, 2015	Letter from ETESA to Panasolar
56	27 July 2015:	Email exchange between Christian Giles, President, Anaconda Carbon and Jonathan Avis, CDM Business Manager, ERM CVS
57	August 5, 2015	Letter from the National Authority on Public Services (Autoridad Nacional de los Servicios Publicos) to Panasolar
58	September 14, 2015	Letter from the National Authority on Public Services (Autoridad Nacional de los Servicios Publicos) to Panasolar
59	July 12, 2016	Connection contract with ETESA No. GG-97-2016
60	July 27, 2016	Letter from the National Authority on Public Services (Autoridad Nacional de los Servicios Publicos) to Panasolar
61	3 October 2016	Email exchange between Jonathan Avis, ERM CVS, and Christian Giles, Anaconda Carbon
62	16 February 2017	Email exchange between Jonathan Avis, ERM CVS, and Christian Giles, Anaconda Carbon
63	September 2, 2017	Signed contract extension between Anaconda Carbon S.A. and Panasolar Generation S.A. 'Prorroga Contrato entre Anaconda Carbon S.A. y Panasolar Generation S.A.'
64	September 28, 2017	Panasolar_Panasolar GS VAL_WAC Extension_28Sep17-_FULLY_EXECUTED
65	9 October 2017:	Email exchange between Christian Giles, Anaconda Carbon, and Jonathan Avis, ERM CVS
66	June 18, 2018	Works management report from Ecotek to Panasolar (INFORME DE AVANCE DE OBRAS (JUNIO 2018) PARA LA GERENCIA DEL PROYECTO E INGENIERÍA DEL PROPIETARIO PANASOLAR GENERATION S.A. 9,9 MW)
67	July 15, 2018	Bill of Lading for Ocean Transport of project equipment from Maersk Line; includes a list of the project equipment and shipping information
68	20 November 2018	Local Stakeholder Consultation Report Feedback from Gold Standard
69	3 December 2018	CAR & CL responses from the project developer provided to ERM CVS
70	December 11, 2018	Letter from the National Authority on Public Services (Autoridad Nacional de los Servicios Publicos) to Panasolar
71	May 16, 2019	PANASOLAR-9-2019 (Solicitud - Puesta en Marcha Panasolar)
72	July 4, 2019	Comissioning Report by Thesan Renewable Energy for the Panasolar PV Power Plant
73	5 July 2019	Email exchange between Jonathan Avis, ERM CVS, and Christian Giles, Anaconda Carbon
74	15 July 2019	ERM CVS Final Validation Report
75	3 Nov 2021	Request for registration

A.2 INTERVIEWS

Reference	Name	Title & Organisation	Main topics discussed
IV1	Omar Cornejo	Major Aguadulce City	Project Activity perception and stakeholder consideration
IV2	Maximo Tuñon	Eng Civil Works Aguadulce City Department	Project Activity perception and regulatory framework
IV3	Carlos Trejos	Director Llano Sanchez Subestation ETESA	Project Activity perception, Connection project activity requirements, Monitoring, Grid Emission Factor Calculation
IV4	Hector Tejada	Director of ANAN Aguadulce Regional Office	Project Activity perception environmental status, environmental concerns and stakeholders.
IV5	Rubén Correa	Field Supervisor ANA Aguadulce Regional Office	Environmental status, environmental concerns and stakeholders
IV6	Oswaldo Tuñon Reyes	Habitant Vista Hermosa, Neighbour Project Activity	Project Activity perception, community concerns and stakeholder consultation
IV7	Alba Torres	Habitant Vista Hermosa and Leader for Community Water Supply System	Project Activity perception, water supply, community concerns and stakeholder consultation
IV8	Celso Reyes	Community Store Seller, Habitant Vista Hermosa, Neighbour Project Activity	Project Activity perception, community concerns and stakeholder consultation
IV9	Dianis Torres	Habitant Vista Hermosa, Neighbour Project Activity	Project Activity perception, community concerns and stakeholder consultation
IV10	Enrico Desiata	Panasolar Generation Project Owner	Project Activity Description, EIA, LSC, Do No Harm Assessment, Regulatory Issues
IV11	Christian Giles	CDM Consultant, Anaconda Carbon	PDD, GS Passport, Additionality, EF calculation, LSC, Do no Harm Assessment, ER calculation

Appendix B: Remediation Form

Corrective Action Requests (CARs), Clarification Requests (CLs) and Forward Action Requests (FARs)

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
CAR 01 Please clarify the starting date of the project activity, and the date of first submission of the project activity to Gold Standard. Please update the Passport and PDD where relevant.	5.1.4	The start date of project activity was on July 12, 2016 with the equipment order. The date of submission was on November 20, 2018. See document shared "PANASOLAR LSC Review_Final_Round_20112018" and a copy of the E-mail PSS and PDD updated	The PP updated the PDD to provide more detail on the timeline of project development in order to demonstrate the start date, i.e. the earliest date of implementation or real action on the project activity. ERM CVS has checked the evidence of the date of land purchase (24 June 2014) /20/, equipment purchase (12 July 2016) /21/, construction start (1 August 2017) /22/ and financial closure (21 December 2017) /23/. In line with the CDM glossary of terms, the start date should be the earliest date of implementation or real action on the project. Land purchase is not considered to be the start date because this represented a small proportion of the total costs, and the land could be re-sold if the project was not built. Land acquisition was necessary to proceed with detailed planning of the project activity, but did not in itself represent the start date of the project. This is reflected in the fact that financial closure was only achieved later. The start date of the project is considered to be the purchase of equipment on 12 July 2016. This is considered reasonable given that this cost is not reversible, and is the earliest significant financial expenditure on the project. CAR 01 was closed.
CAR 02	6.3.1	1. List and details of technologies and equipment is updated in the PDD.	The PDD was updated to provide more detailed information provided on the technical description. The

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
The content of Section A of the PDD is not consistent with the CDM guidelines for completing the PDD. - The list and details of technologies and equipment involved on PA and how the same types and levels of services has been provided on baseline is not clear - The average lifetime of the project activity equipment based on manufacturer's specifications with capacity, panels specification, load factors and efficiencies. Please provide the relevant justification of the Load Factor calculation. - There is no description of the monitoring equipments and their location - The Transmission Line with Llano Sanchez ETESA Substation is not described	6.4.2.1 6.4.2.4 6.4.2.5	2. Maximum Power (Pnom Total): 12.111 MW Annual Production: 19661MWh Load Factor: 18.53% 3. The description of the monitoring equipment and their location is now added in the PDD. 4. The Transmission Line with Llano Sanchez ETESA Substation is now described in the PDD	project description has been validated against the feasibility study for the project /02/. CAR 02 was closed.
CAR 03 The Grid Emissions Factor calculation is not consistent with the directions of the Tool to calculate the emission factor for an electricity system. Please correct and provide relevant evidence to support the calculations.	7.1.1 7.5.1 7.5.2	The Grid Emissions Factor calculation will be calculated ex post. The PDD has been modified accordingly.	The grid emission factor is now determined ex-post, therefore the value will be confirmed at the time of verification. CAR 03 was closed

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
CAR 04 The first of its kind assessment is not consistent with the Guidelines on additionality of first-of-its-kind project activities and PP does not support the conclusion with relevant evidences. The PP has proposed applying automatic additionality based on the 'positive list' of technologies, as per the Methodological tool: Demonstration of additionality of small scale project activities, version 12.0. The PDD should be updated accordingly.	8.1.1 8.4.1 8.4.2	PDD has been modified and no longer includes mention of this additionality.	The 'first of its kind' argument for additionality has been removed from the PDD. CAR 04 was closed.
CAR 05 The Monitoring Plan in the PDD is not consistent with CDM requirements. Please complete according to the Guidance for completing the PDD, and provide any relevant evidence.	9.2.1	Monitoring plan has been modified accordingly.	The operational and organisational structure for monitoring has been described, and is now considered sufficient to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified. The equipment setup has been described in the revised PDD and is now considered sufficient to carry out the monitoring requirements of the methodology, and the appropriate national standards have been followed. Calibration and maintenance plans are appropriate. The data management procedures have also been included, and are considered appropriate to fulfil the monitoring requirements of the methodology and to ensure that emission reductions can be verified. CAR 05 was closed.

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
CAR 06 Please develop the LSC process according to the GS toolkit Version 2.2 Annex J and provide the LSC Report with GS revision process. Please also guarantee that Grievance Mechanism will be implemented and modify the Sustainability Monitoring Plan taken into account the relevant stakeholder comments.	10.1 10.1.1 10.1.2 10.1.3	GSPP mentions in detail that the grievance mechanism will be implemented.	The LSC report has been completed in line with Gold Standard guidelines – please see section 10 of the validation report above. The continuous Input / Grievance mechanism has been described in the revised GS passport. The process includes an expression process book available at the local church of Vista Hermosa. This was confirmed during discussions during the validation site visit. Telephone and email access is also provided, and the contact information provided corresponds to the project owner, located in Panama which facilitates contact in person if needed. This contact information was given in the invitation to the stakeholder feedback round as well as during the feedback round itself. The sustainability monitoring plan has been correctly set out in the revised GS passport and includes monitoring of all non-neutral indicators. Please refer to section 10 of the validation report for further details of how this was validated. CAR 06 was closed.
CAR 07 The Do No Harm assessment was not developed according to the GS guidance on the Annex H Toolkit. PP shall review and complete with providing relevant references the assessment showing the relevant risk analysis in the context of Panama	10.2.1 10.2.2	DNH assessment has been modified. If there is anything in it that is not clear please specify.	The do no harm assessment has been modified to be in line with the GS guidance. Please refer to section 10 of the validation report for details of how this was validated. CAR 07 was closed.
CAR 08	10.2.4	SD Matrix has been corrected and modified accordingly	The sustainable development assessment has been revised and is now in line with GS guidelines. The matrix has been completed fully, references have been

Corrective Action Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
The Impact Assessment does not carry out with GS requirements and guidance. The assessment does not consider into the others the following aspects: - The matrix has not been developed correctly and there are many mistakes in the table. The GS toolkit version 2.2 was not followed. - The sustainability indicators lack references and some assessments are not consistent with the EIA. - The passport does not describe the baseline indicators situation and relevant parameters have not been justified - The presence of critical vegetation areas and water bodies that may cross the property has not been considered in the assessment. - The assessment does not include the Transmission line.	10.2.5 10.2.6 10.2.7		provided, and the content is consistent with the EIA and the references provided. The baseline situation of the indicators is described, impacts on vegetation and water are considered, and the transmission line is also considered in the assessment. Please refer to section 10 of the validation report for details on how this was validated. CAR 08 was closed

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
CL 01 The PDD does not include clear justification of the following topic : a) Clear description of project boundary according to the guidance for completing the small-scale PDD.	7.2.1 7.3.2.1	Diagram with project boundary is in the PDD.	A clear description of the project boundary has been included in the PDD. CL 01 was closed.
CL 02 The description in the monitoring plan of net electricity generation supplied to the grid is not consistent with the Methodology. The PP should clarify and provide relevant evidence for the following: a. The net electricity monitoring procedure according to the Methodology AMS-I.D. b. Type and technical specification of Electricity Meters that it would be installed according to the Panamanian Industrial Standard. c. Correct the name and description of monitored parameters	9.1.1	The monitoring plan of net electricity generation has been modified and updated accordingly.	The monitoring plan has been modified to correctly describe the monitoring of net electricity generated by the project. The monitoring plan is in line with the methodology. The type and accuracy of the meters is stated, and is in line with Panamanian regulations. The name and description of the monitored parameter is in line with the methodology. CL 02 was closed.
CL 03 The PP should explain in detail the legal permission status of project	6.4.2.1	All the legal permission are completed. The connection of the project will be on April 15, 2019.	The legal status of the project has been explained. The project is now commissioned.

Clarification Requests	Ref. to Question Number	Summary of PPs' response	Final conclusion
activity and provide a tentative schedule for construction permission before Aguadulce Municipality and Final ETESA permission.			CL 03 was closed.
CL 04 The project shall clarify how the requirements of version 2.0 of the Transition Requirements to GS4GG have been respected, specifically how the project undertook continuing actions to secure carbon revenue: "The VVB shall validate the following documentary evidence provided by project developer/CME (as applicable): i. Valid contract(s) with project consultants, ii. Emission Reduction Purchase Agreements (ERPAs) or other documentation related to the sale of the potential ERs, iii. Evidence of agreements or negotiations with a VVB for validation services, iv. A chain of correspondence on the project with the Designated National Authority (DNA) of the host country and/or the Gold Standard Secretariat."	GS review Comment/Request 1	Details of meaningful actions to secure Gold Standard registration, including correspondence and evidence documents, have been provided to ERM CVS, and this has been described in the GS comment document.	Please refer to Appendix C where ERM CVS's validation findings are set out in detail. CL closed.

Forward Action Requests	Ref. to Section Number	Summary of PP's response	Final conclusion
None			

In addition some editorial and minor changes to the PDD were made by the PP that had no relevance on compliance with GS requirements.

Appendix C: Validation findings against version 2.0 of the Transition Requirements to GS4GG

ERM CVS has validated compliance with the requirements of section 3.1.12 of the transition requirements as follows:

- a) **The project engaged a VVB (ERM CVS) and submitted the request for registration/design review on 3 Nov 2021 (before 23/11/2021).**
- b) **The Project Developer undertook continuing and real actions to secure Design Certification.**

The development of the project suffered significant delays and setbacks due to approval and financing issues on the ground. Nevertheless throughout this time real and continuing actions were taken to secure Gold Standard certification. The table below shows the timeline of project development, and the reasons for the delay to the underlying project, as well as the GS milestone, and hence the need to extend the contract with the carbon consultant and with the VVB ERM CVS.

ERM CVS has validated that the September 02, 2017 Contract extension between Anaconda Carbon and Panasolar is a valid contract with project consultants (as per point (i) of the requirements 'Valid contract(s) with project consultants') and clearly demonstrates continuing actions to secure carbon revenue.

ERM CVS has also validated the fact that the September 28, 2017 Extension Contract between ERM CVS and Panasolar is clear evidence of agreements or negotiations with a VVB for validation services. This was preceded by negotiations over email, dated 16 February 2017: email from ERM CVS, informing the project developer that a contract extension (including additional fee) would required to complete the validation, and the reply from Christian Giles, Anaconda Carbon, on 17 February accepting the need for the contract extension and negotiating the payment terms. The contract extension is a contract for validation services; the reason that an extension was needed was due to the delay in the validation and the increase in costs that this imposed upon the VVB. The fact that the project negotiated, and paid for, the contract extension, is a clear demonstration of the projects continuing actions to secure carbon revenues.

ERM CVS also notes that validation activities were ongoing between January and late November 2014. For example the LSC report was uploaded to the GS registry on 17 November 2014 and GS comments were received on 25 November 2014. The gap between these activities and the email negotiations (and indeed the signature of the contract extension itself) was less than 3 years.

In order to demonstrate this more clearly, ERM CVS below presents further evidence of milestones, including the negotiation of continuation of the validation activities, which took place in-between the initial validation activities in 2014 (up to and including GS Passport and PDD uploaded to Gold Standard registry on 1 October 2014 and GS feedback being received on the initial documents uploaded to the GS registry on 24 November 2014, and the Email from Jonathan Avis, ERM CVS, informing the project developer that a contract extension (including additional fee) would required to complete the validation, due to the delay in closing out the CARs and CLs on 16 February 2017 and the reply from Christian Giles, Anaconda Carbon, on 17 February accepting the need for the contract extension and negotiating the payment terms (when the invoice should be paid – in advance or afterwards) (Evidence of agreements or negotiations with a VVB for validation

services) and also the extension Contract between ERM CVS and the project representatives being agreed and signed on 28 September 2017. ERM CVS also sets out the further milestone after that point leading up to version 2 of the validation report being finalised (dated 15 July 2019).

In conclusion, there was **less than a 3 year gap** between the validation activities 2014 and negotiations with the VVB for continuation of the validation services in 2017. There is a clear and continuing trail of communications between the VVB and the project participants throughout this period, demonstrating the ongoing need for Gold Standard validation. **As the gap between documented evidence is less than 3 years, ERM CVS concludes that continuing and real actions were taken to secure carbon revenue for the Project.**

ERM CVS has validated the following documentary evidences and timeline:

DATE	EVENT	Evidence Validated
July 11, 2013	Contract signed between the project developer Panasolar and carbon consultant Anaconda Carbon to develop the project as a carbon offset project under Gold Standard, including developing the PDD and all other supporting documents for the Gold Standard application, and taking the project through the Gold Standard validation and registration process. The contract with Anaconda Carbon covers the sale of potential emission reduction credits from the project, including a commercial agreement on the share of proceeds from the sale of such credits under a future ERPA.	Signed Contract between Anaconda Carbon and Panasolar AC-Panasolar-sig-12-07-13
November 22, 2013	Signed Contract between the VVB ERM CVS and Panasolar to validate the project under Gold Standard. <u>Evidence of agreements or negotiations with a VVB for validation services.</u>	ERM CVS Contract Gold Standard; ERM CVS GHG Terms and Conditions
27 January 2014	Validation Plan sent to Panasolar by ERM CVS	ERM CVS validation plan
5-6 February 2014	Validation site visit by ERM CVS	As documented in the ERM CVS validation report

7 March 2014	Draft validation report by ERM CVS, including initial list of clarification requests and corrective action requests	ERM CVS draft validation report
May 2, 2014	1st private Generation License, authorization for the development, construction and operation of the 9.9MW/AC Photovoltaic plant PANASOLAR, issued by the public services regulation (ASEP)	Letter from the Administrator General of the Republic of Panama to Panasolar, authorising the project to be developed
June 4, 2014	Panasolar sent a formal letter to ETESA containing all the documentation needed to sign the Interconnection Agreement, as previously agreed. However ETESA asked for an agreement to be reached with other generators to invest to increase the capacity of the substation. Panasolar disputed that as not in line with the host country regulations.	Letter from Panasolar to ETESA
June 24, 2014	Land Purchase	Land purchase agreement 'Escritura finca llano sanchez'
30 June 2014	Panasolar applies to open a Gold Standard registry account	ERM CVS has reviewed the email exchange between Enrico Desiata and the Gold Standard Foundation confirming that the registry account request has been received
1 July 2014	Email exchange between Panasolar and Gold Standard concerning what grid emission factor to apply for the project. On 7 July 2014 the decision about the grid EF was communicated to ERM CVS by email	ERM CVS has reviewed the email exchange between Christian Giles and Ivan Hernandez of the GSF
14 July 2014	ERM CVS reviews the latest grid emission factor calculations and provides comments to Panasolar	EERM CVS has reviewed the email exchange between Miguel Cortes, ERM CVS, and Sergio Degener, Anaconda Carbon. There was further email correspondence on this issue between 15 and 19 July 2014.
17 July 2014	Panasolar submits all required documents requested in order to open the Gold Standard registry account	ERM CVS has reviewed the email exchange between Enrico Desiata and the Gold Standard Foundation confirming that the documentation was submitted on 17 July 2014

6 August 2014	Panasolar chases Gold Standard Foundation for an update on whether the documents have been reviewed and the account approved	ERM CVS has reviewed the email exchange between Christian Giles and the Gold Standard Foundation requesting an update on the status
8 September 2014	Gold Standard confirms that the registry account is now open	ERM CVS has reviewed the email exchange between Christian Giles and Ivan Hernandez of the Gold Standard Foundation confirming that the registry account is working
1 October 2014	GS Passport and PDD uploaded to Gold Standard registry	ERM CVS has reviewed the email exchange between Panasolar and the Gold Standard Foundation
October 22, 2014	Panasolar accepted all the new conditions that ETESA imposed, but ETESA changed idea once again and no response from ETESA to the Letter was received.	Letter from Panasolar to ETESA
24 November 2014	GS feedback received on the initial documents uploaded to the GS registry	ERM CVS has reviewed the email exchange between Ivan Hernandez of the Gold Standard Foundation and Christian Giles with the LSC review for Panasolar Photovoltaic Project (GS3556)
March 2, 2015	ETESA communicates that they unilaterally assigned the contract to expand the capacity of the substation to another generator.	Letter from ETESA to Panasolar
27 July 2015:	Email exchange between Christian Giles, President, Anaconda Carbon and Jonathan Avis, CDM Business Manager, ERM CVS: ERM CVS requested an update on the status of the project and whether validation should be closed or continue. The reply from Mr Christian Giles was that they would resume work. <u>Evidence of agreements or negotiations with a VVB for validation services.</u>	Email exchange between Christian Giles, President, Anaconda Carbon and Jonathan Avis, CDM Business Manager, ERM CVS
August 5, 2015	The ASEP (regulator) granted the first extension of the Generation License (because they recognized that Panasolar were unjustifiably prevented from interconnecting to the national grid)	Letter from the National Authority on Public Services (Autoridad Nacional de los Servicios Publicos) to Panasolar
September 14, 2015	The ASEP (regulator) granted the second extension of the Generation License	Letter from the National Authority on Public Services (Autoridad Nacional de los Servicios Publicos) to Panasolar

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July 12, 2016	Signing of the connection between Panasolar and ETESA	Connection contract with ETESA No. GG-97-2016
July 27, 2016	The ASEP (regulator) granted the third extension of the Generation License	Letter from the National Authority on Public Services (Autoridad Nacional de los Servicios Publicos) to Panasolar
3 October 2016	Email exchange between Jonathan Avis, ERM CVS, and Christian Giles, Anaconda Carbon, giving an update on the status of the project and its validation. <u>Evidence of agreements or negotiations with a VVB for validation services</u>	Email exchange between Jonathan Avis, ERM CVS, and Christian Giles, Anaconda Carbon
16 February 2017	Email from Jonathan Avis, ERM CVS, informing the project developer that a contract extension (including additional fee) would be required to complete the validation, due to the delay in closing out the CARs and CLs. Reply from Christian Giles, Anaconda Carbon, on 17 February accepting the need for the contract extension and negotiating the payment terms (when the invoice should be paid – in advance or afterwards). <u>Evidence of agreements or negotiations with a VVB for validation services</u>	Email exchange between Jonathan Avis, ERM CVS, and Christian Giles, Anaconda Carbon
1 August 2017	Construction start confirmation document	Construction start confirmation document
September 2, 2017	Contract extension between Anaconda Carbon and Panasolar	Signed contract extension between Anaconda Carbon S.A. and Panasolar Generation S.A. 'Prorroga Contrato entre Anaconda Carbon S.A. y Panasolar Generation S.A.'
September 28, 2017	Extension Contract between ERM CVS and Panasolar	Panasolar_Panasolar GS VAL_WAC Extension_28Sep17-_FULLY_EXECUTED
9 October 2017:	Email exchange between Christian Giles, Anaconda Carbon, and Jonathan Avis, ERM CVS, providing an update on the status of the project construction and expressing the project developer's desire to finish the validation as soon as possible. <u>Evidence of agreements or negotiations with a VVB for validation services</u>	Email exchange between Christian Giles, Anaconda Carbon, and Jonathan Avis, ERM CVS
December 21, 2017	Financial Closure	Commitment Letter_(Financial Closure)

June 18, 2018	Construction Begins	Works management report from Ecotek to Panasolar (INFORME DE AVANCE DE OBRAS (JUNIO 2018) PARA LA GERENCIA DEL PROYECTO E INGENIERÍA DEL PROPIETARIO PANASOLAR GENERATION S.A. 9,9 MW)
July 15, 2018	Order of equipment	Bill of Lading for Ocean Transport of project equipment from Maersk Line; includes a list of the project equipment and shipping information
20 November 2018	Local Stakeholder Consultation Report Feedback from Gold Standard under GS Version 2.2	Local Stakeholder Consultation Report Feedback from Gold Standard
3 December 2018	Responses to outstanding CARs and CLs, raised by ERM CVS, were provided by the project developer	CAR & CL responses from the project developer provided to ERM CVS
December 11, 2018	The ASEP (regulator) granted the forth extension of the Generation License	Letter from the National Authority on Public Services (Autoridad Nacional de los Servicios Publicos) to Panasolar
27 February 2019	Project Design Document Version 4	Project Design Document Version 4
May 16, 2019	Connection to the national grid (SIN)	PANASOLAR-9-2019 (Solicitud - Puesta en Marcha Panasolar)
July 4, 2019	Commissioning	Commissioning Report by Thesan Renewable Energy for the Panasolar PV Power Plant
5 July 2019	Email from Jonathan Avis, ERM CVS, to Christian Giles, Anaconda Carbon, informing that the validation report had been finalized and had been sent to the Decision maker for review and signature	Email exchange between Jonathan Avis, ERM CVS, and Christian Giles, Anaconda Carbon
15 July 2019	Final validation report signed	ERM CVS Final Validation Report version 2.0
3 Nov 2021	The project submitted the request for registration/design review to Gold Standard	Request for registration