




Verification and certification report form for CDM programme of activities
(version 01.0)

Complete this form in accordance with the "Attachment. Instructions for filling out the verification and certification report form for CDM programme of activities" at the end of this form.

VERIFICATION AND CERTIFICATION REPORT

Title of the programme of activities (PoA)	Gigawatt Global Programme of Activities	
UNFCCC reference number of the PoA	10202	
Version number(s) of the PoA-DD(s) applicable to this report	Version 5.0	
Version number of the verification and certification report	04	
Completion date of the verification and certification report	15/11/2017	
Monitoring period number	01	
Duration of this monitoring period	23/10/2015 - 28/02/2017 (first and last days included)	
Number and version number of the monitoring report to which this report applies	Monitoring report #1, version 05 of monitoring report.	
Coordinating/managing entity (CME)	Gigawatt Global Coöperatief U.A.	
Host Party(ies)	Host Party(ies) of the PoA	Is this a host Party to a CPA covered in this report?(yes/no)
	Rwanda	Yes
Sectoral scope(s)	Scope 1: Energy industries (renewable- / non-renewable sources)	
Selected methodology(ies)	Methodologies: ACM0002 <i>Grid-connected electricity generation from renewable sources</i> (version 16.0) and AMS-I.D <i>Grid connected renewable electricity generation</i> (version 18.0).	
Selected standardized baseline(s)	No standardized baseline has been selected.	
Total estimated GHG emission reductions or net GHG removals for this monitoring period in the included CPA(s) covered in this report	10,264 tCO ₂ e	
Total certified GHG emission reductions or net GHG removals for this monitoring period for the included CPA(s) covered in this report	12,369 tCO ₂ e	

Name of DOE	AENOR INTERNACIONAL S.A.U
Name, position and signature of the approver of the verification and certification report	 José Magro González Authorized person

SECTION A. Executive summary

AENOR INTERNACIONAL S.A.U., hereinafter AENOR, has performed the first verification of the PoA “Gigawatt Global Programme of Activities” (hereafter referred to as “the PoA”) registered by the UNFCCC with reference No. 10202 with regard to the relevant requirements for CDM PoA. The PoA is located in the geographical area of Rwanda. The objectives of this verification are to verify and certify emission reductions reported for the CPA-001 (ASYV 8.5MW Solar PV Project) included into the POA for the monitoring period of 23/10/2015 - 28/02/2017 (first and last day included); and to verify that the data reported are complete and transparent.

This report summarizes the findings of the verification of the PoA, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The registered PoA aims to support the development and implementation of utility scale solar photovoltaic (PV) projects in Rwanda, thereby displacing grid-connected, fossil fuel based electricity generation, by promoting grid-connected renewable energy based electricity generation. As such, the PoA will contribute in reduction of greenhouse gas (GHG) emissions.

This monitoring period includes the implementation and monitoring of one CPA, as part of registered PoA, within the territory of Rwanda:

- CPA 10202-0001: ASYV 8.5MW Solar PV Project (CPA-001).

Scope of the Verification

The verification, such as an independent and objective review, shall assess and verify that the implementation of the project activity and the steps taken to report emission reductions comply with the CDM criteria and relevant guidance provided by the CMP and the CDM Executive Board. The verification shall:

1. Ensure that the project activity has been implemented and operated as per the registered PoA and included CPAs and that all physical features (technology, project equipment, and monitoring and metering equipment) are in place. It is therefore necessary to carry out:

- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the monitoring plan and the registered PoA /1/ and included CPA /2/.
- A check of the monitoring equipment including calibration performance, sampling requirements and observations of monitoring practices against the requirements of the registered PoA and included CPAs and the selected methodology.
- A check that the manual operating provisions are duly followed (processes, routines, instructions, forms and the like).

2. Ensure that the final version of the monitoring report and other supporting documents provided are complete and verifiable and in accordance with applicable CDM requirements. It is therefore necessary to carry out a review of:

- Relevant documentation and conduct an on-site visit.
- Data and information presented to verify their completeness.
- Indicators that must be addressed in the monitoring plan.

- The monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of surveys including sampling requirements, the quality of metering equipment, and the quality assurance and quality control procedures.

3. Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology, carrying out:

- A review of information flows for generating, aggregating and reporting the monitoring parameters.
- A cross-check between information provided in the monitoring report and data from other sources such as plant log books, inventories, purchase records or similar data sources.
- A review of calculations and assumptions made in determining the GHG data and emission reductions.
- A review of the project documentation provided by the project participant to check that is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report submitted to the DOE. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.

4. Evaluate the data recorded and stored as per the monitoring methodology, carrying out:

- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

5. Identify and inform the project participants of any concerns related to the project's activity and operation conformance with the registered PoA and included CPAs. Project participants shall address the concerns and supply additional relevant information.

6. Provide a verification report to the project participants, the Parties involved and the CDM Executive Board. The report shall be made publicly available.

The verification is not meant to provide any consultancy services to the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring report.

AENOR, based on the Specific Instruction for the Validation, Verification and Certification of Clean Development Mechanism (CDM) Project Activities (IE/DTC/039) /3/, which is in turn based on the CDM validation and verification standard for Programme of Activities, version 01.0 /4/, has used a risk-based approach in the verification, focusing on the identification of significant risks for the generation of CERs and verifying the mitigation measures for these issues.

It is important to note that, AENOR is using the "Verification and certification report form for CDM project activities" version 01.0, because a new version of that form, applying the requirements of the CDM Validation and Verification Standard for project activities version 01.0 (VVS) has not been published on the UNFCCC website at the time of submission of this verification report. AENOR is applying the requirements of the CDM Validation and Verification Standard for project activities version 01.0 (VVS)

Verification Process

The verification was performed through means of the following the requirements of validation and verification standard for programme of activities version 01.0, the applied methodology, and relevant CDM rules. The process of the verification includes:

- i. A desk review of the monitoring report and all support documents.
- ii. Follow-up interviews and on-site inspection.
- iii. The resolution of outstanding issues and the issuance of the verification report and statement.

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

- The emission reduction calculations and the relevant data records.
- The calibration and maintenance records for the monitoring instruments
- The management systems to support the programme operation and monitoring.

The audit team took into consideration the registered PoA and included CPAs and verified that they have been adequately considered during this verification. The monitoring system is in place and the emission reductions are calculated without material misstatements.

Calibration evidence allowed the verification team to verify that all meters worked correctly during the monitoring period and when errors were detected conservative assumptions were applied.

A risk-based verification approach was employed to identify key risks to emission reduction estimations.

All Corrective Action Requests (CAR) and Clarification Actions (CL) have been checked by the verification team and have been adequately resolved.

In AENOR's opinion, the GHG emissions reductions for the monitoring period from 23/10/2015 to 28/02/2017, were calculated correctly and amount 12,369 tonnes of CO₂ equivalent on the basis of the approved AMS-I.D Grid connected renewable electricity generation (version 18.0)/6/ and the final version of the monitoring report and the formulae given in the registered PoA and included CPAs.

A risk based verification approach was employed to identify key risks to emission reduction estimations. During the on-site visit it was verified the quality assurance of the data concern in the calculation of the emission reduction. The installation of the project was also verified and the proper use of the meters and procedure controls were also tested.

On 22/09/2017 and 04/11/2017 the UNFCCC requested to modify the documentation since the Information and reporting check was found incomplete. As result of those requests, final version of this verification report was edited, and clarifications in the Monitoring Report were included, as well, by the project participant to be further clear.

Therefore, as result of the verification process, AENOR confirms that the project is implemented in accordance with the validated and registered PoA, included CPAs and the monitoring plan. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents.

Based on the information checked and evaluated, AENOR is able to certify that the emissions reductions from the PoA No. 10202 “Gigawatt Global Programme of Activities” during the period from 23/10/2015 to 28/02/2017 amount to 12,369 tonnes of CO₂ equivalent.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team leader and verifier	IR	García Madero	Mercedes	AENOR	Yes	Yes	Yes	Yes
2.	Verifier	IR	Medrano Gutierrez	Alfonso	AENOR	Yes	No	No	Yes

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Llorente Pérez	Elena	AENOR
2.	Approver	IR	Magro González	José	AENOR

SECTION C. Means of verification

AENOR verification team has considered the CDM requirements on materiality concept according to:

- Decision 9/CMP.7 Materiality standard under the clean development mechanism.
- CDM Validation and Verification Standard for programme of activities (VVS) version 01.0.
- Guideline: Application of materiality in verifications version 02.0 /5/.

“ASYV 8.5MW Solar PV Project (CPA-001)” is a small-scale CDM project activity achieving less than 30,000 tCO₂e per year; as such, a 5 per cent materiality threshold is applied for this verification as per paragraph 307 of CDM Validation and Verification Standard for Programme of activities version 01.0.

Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human error in the quantification of emissions	Low	Data used for the emissions reduction calculation are collected through automated systems so the risk for human error is reduced. Calculation spreadsheets are used to determine the emissions reductions.	<p>Verification has been focused on the assessment of:</p> <ul style="list-style-type: none"> • Quality of raw data and procedures for its collection. • Calculation spreadsheets. • Controls established to detect and correct any error or omission in monitoring parameters. • Monitoring procedures. • Reliability of internal and external data. • Internal data quality control for monitored parameters and metering systems. <p>The verification plan included a desk review, and interviews with relevant personnel.</p> <p>100% of data will be assessed, therefore sampling is not applicable.</p>

2	Undue reliance on a poorly designed information system, which may have few effective quality controls	Low	According to MR there are QC/QA procedures applied for monitoring parameters and data management.	<p>Verification has been focused on the assessment of:</p> <ul style="list-style-type: none"> • Quality of raw data and procedures for its collection. • Calculation spreadsheets. • Controls established to detect and correct any error or omission in monitoring parameters. • Monitoring procedures. • Reliability of internal and external data. • Internal data quality control and implementation of internal procedures for quality management. <p>The verification plan included a desk review and interviews with relevant personnel.</p> <p>100% of data will be assessed, therefore sampling is not applicable.</p>
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Consideration of materiality in conducting the verification

The verification has been performed through a desk review and interviews with relevant personnel.

The verification activities in which risks were assessed are the evaluations of:

- Monitoring system including calibration of meters.
- Calculation spreadsheets.
- Quality of raw data and procedures for its collection.
- Data flow.
- Data control procedures.

The risks identified were mitigated through the assessment of 100% of raw data and all sets of documents and calculation spreadsheets.

Some mistakes were identified and subsequently corrected. These findings are detailed in Appendix 4 and they were successfully closed. Therefore related identified mistakes as listed in findings in Appendix 4 to this report have been determined to be immaterial. All identified inconsistencies and clarification requests have been successfully closed.

Based on the assessment carried out, AENOR confirms with a reasonable level of assurance that the claimed emission reductions are free from material errors, omissions or misstatements.

C.1. Desk review

The desk review involved:

- Project documentation: Registered PoA and included CPA, revised CPA-DD /23/, validation report of registered PoA-DD /7/, validation report of included CPA /8/, initial version of monitoring report /9/ and final version of monitoring report /10/.
- CDM project standard for programme of activities, version 01.0 /11/.
- CDM PoA Monitoring report form version 01.0 and the instructions for filling it out /12/.

Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board.

The monitoring plan and the applied monitoring methodology, paying close attention to the frequency of measurements, the quality of metering equipment, sampling requirements and the quality assurance and quality control procedures

The data and information presented to verify their completeness, including the Monitoring Report and the measuring records of the different monitored parameters.

The influence of data management and the quality assurance and quality control system on the generation and reporting of emission reductions.

C.2. On-site inspection

Duration of on-site inspection: 29/05/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	<ul style="list-style-type: none"> • Confirmation of the on-site visit planning. • Verification of data generation. • Testing of monitoring equipment and observation of monitoring practices. • Verification of compliance of calibration frequency against original certificates. • Verification of sufficiency of monitoring plan. • Verification of internal data quality control • Crosscheck the information provided against monitoring report and data from monitoring system, plant log books, purchase records, etc. • Verification of controls established to detect and correct any error or omission in monitoring parameters. • Interview with power plant operators to confirm monitoring procedures. 	Project site	29/05/2017	Mercedes García Madero
2.	<ul style="list-style-type: none"> • Verification of different data of the PoA and included CPA and monitoring report. • Review of the monitoring report and emission reduction calculations. • Verification of sector regulation change. • Clarifications related to monitoring procedures. • Verification of electrical energy generation. • Internal procedures of the Quality Management System. • Verification of estimates and assumptions for determining GHG data. • Overall organizational structure for data management and flow of information. 	Project site	29/05/2017	Mercedes García Madero

C.3. Interviews

No	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Twagirimana	Twaha	Operation and Maintenance Technician SCATEC	29/05/2017	Verification of data generation.	Mercedes García Madero
2	Jung	Carsten	Consultant - Carbon Africa Limited	29/05/2017	Testing of monitoring equipment and observation of monitoring practices.	
3	Kerigu	Kevin	Consultant - Carbon Africa Limited	29/05/2017	Verification of compliance of calibration frequency against original certificates.	
4	Fichtenberg	Michael	Gigawatt cooperatif	29/05/2017	<p>Verification of internal data quality control.</p> <p>Verification of controls established to detect and correct any error or omission in monitoring parameters.</p> <p>Crosscheck the information provided against monitoring report and data from monitoring system, plant log books, purchase records, etc.</p> <p>Overall organizational structure for data management and flow of information.</p> <p>Verification of sector regulation change.</p> <p>Clarifications related to monitoring procedures.</p> <p>Verification of electrical energy generation.</p>	

C.4. Sampling approach

N/A

C.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form		CAR 5	
Remaining forward action requests from validation and/or previous verification			
Specific-case CPA(s) considered for verification and covered in this report			
Programme of activities			
Compliance of the programme implementation with the	CL 1		

registered PoA-DD	CL 2		
Implementation and operation of the management system	CL 5		
Post-registration changes			
<ul style="list-style-type: none"> Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline 			
<ul style="list-style-type: none"> Corrections 		CAR 6	
<ul style="list-style-type: none"> Inclusion of a monitoring plan in a registered PoA-DD (including its generic CPA-DD(s)) 			
<ul style="list-style-type: none"> Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline 			
<ul style="list-style-type: none"> Changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA 			
<ul style="list-style-type: none"> Types of changes specific to afforestation and reforestation activities 			
Component project activity(ies)			
Compliance of the CPA implementation with the included CPA design document	CL 1 CL 2		
Post-registration changes			
<ul style="list-style-type: none"> Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline 			
<ul style="list-style-type: none"> Corrections 			
<ul style="list-style-type: none"> Changes to the start date of the crediting period 		CAR 1	
<ul style="list-style-type: none"> Inclusion of a monitoring plan to an included CPA-DD 			
<ul style="list-style-type: none"> Permanent changes to the monitoring plan as described in the included CPA-DD, applied methodology, or applied standardized baseline 			
<ul style="list-style-type: none"> Changes to the programme design of the included CPA-DD 			
<ul style="list-style-type: none"> Types of changes specific to afforestation and reforestation component project activities 			
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline			
Compliance of monitoring activities with the registered monitoring plan			
<ul style="list-style-type: none"> Data and parameters fixed ex ante or at renewal of crediting period 			
<ul style="list-style-type: none"> Data and parameters monitored 	CL 4	CAR 2	
<ul style="list-style-type: none"> Implementation of sampling plan 			
Compliance with the calibration frequency requirements for	CL 3		

measuring instruments			
Assessment of data and calculation of emission reductions or net removals			
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks		CAR 3	
• Calculation of project GHG emissions or actual net GHG removals by sinks			
• Calculation of leakage GHG emissions			
• Summary of calculation of GHG emission reductions or net GHG removals by sinks			
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included specific-case CPA		CAR 4	
• Remarks on difference from estimated value in registered PDD			
Others (please specify)			
Total	5	5	0

SECTION D. Internal quality control

Following the completion of the assessment process by the verification team, all documentation undergoes an internal quality control through a technical review before the request for Issuance of CERs is submitted. The Technical reviewer is a qualified member of AENOR, independent from the team that carried out the verification of the project activity. The technical reviewer or the team appointed for the technical review is qualified in the technical area(s) and sectoral scope(s) of the project activity.

The complete assessment prepared by the verification team is checked. The technical review team may raise Clarification Requests to the verification team and discuss these matters with Team Leader.

After the agreement of the responses on the Clarification Requests from the verification team as well as the PP(s), the finalized verification report is accepted and is authorized by the Climate Change Manager on behalf of AENOR for requesting issuance via the UNFCCC interface.

SECTION E. Verification opinion

Gigawatt Global Coöperatief U.A. has commissioned AENOR to carry out the first verification and certification of the emission reductions generated by PoA No. 10202 “Gigawatt Global Programme of Activities” in Rwanda for the period from 23/10/2015 to 28/02/2017.

The verification report comprises one CPA (10202-0001), which is included at the UNFCCC webpage. A single monitoring report has been prepared by the CME for the same in which implementation of referred CPA (10202-0001) along with monitoring results are included.

Verification is performed in accordance with the Validation and Verification Standard for Programme of Activities, version 01.0, and relevant decisions of the CDM EB and COP/MOP.

AENOR planned and performed the verification by obtaining the information and the explanations considered necessary that provided sufficient evidence to give reasonable assurance that the amount of GHG emission reductions for the reporting period, prepared on the basis of both the monitoring plan included in the registered PoA-DD and CPA-DD and the final monitoring report, is fairly stated.

AENOR conducted the verification having regard to the monitoring plan included in the registered PoA-DD and CPA-DDs, and the applied baseline as registered for the PoA. This assessment included:

- Checking whether the design of the PoA and its CPAs is implemented and installed as planned and described in the registered/included design documents
- Checking whether the provisions of the monitoring methodologies and the monitoring plan in the CPA-DDs were consistently and appropriately applied.
- Collection of evidence supporting the reported data

AENOR has verified whether the information included in the final monitoring report is correct and that the emissions reductions achieved have been determined correctly.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology AMS-I.D version 18 and the monitoring plan and formulae provided in the registered PoA-DD and CPA-DD.

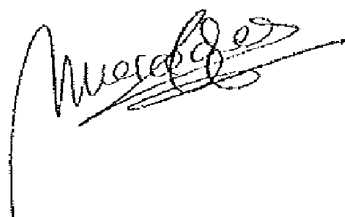
AENOR is able to certify that the emission reductions from the PoA No. 10202 “Gigawatt Global Programme of Activities” and CPA (10202-0001) for the period 23/10/2015 to 28/02/2017 amount to 12,369 tCO₂ equivalent.

SECTION F. Certification statement

The verification is based on the initial monitoring report, revised monitoring report and the monitoring plan as set out in the registered PoA-DD and CPA-DD, the validation report, the ER calculation spreadsheet and supporting documents made available to AENOR by the CME.

AENOR confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have assessed, we confirm that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

Madrid, 15rd November 2017



Mercedes García Madero

Team leader



José Magro González

Authorized person

SECTION G. Verification findings - General**G.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	<p>The verification team has checked all sections of the MR and confirms by means of comparison with the monitoring report form. On the other hand, the version 01 of the monitoring report was made publicly available on the UNFCCC website on 09/05/2017, and once all CARs and CLs were closed a final version of the monitoring report was edited.</p> <p>The final Monitoring Report is complete and meets all requirements of the Instructions for filling out the CDM programme of activities monitoring report form version 02.0 and CDM Project Standard for Programme of Activities version 01.0.</p>
Findings	CAR 5 - The template of the Monitoring Report used (version 01.0) is not the most recent one published by the UNFCCC (version 02.0, 07 June 2017)
Conclusion	<p>During the verification, no mistakes were identified related to the form, so that it can be confirmed that the monitoring report is complete and transparent and in accordance with the registered PoA-DD, generic CPA-DD, other relevant requirements as well as with the applicable monitoring report form published by the UNFCCC.</p> <p>Therefore, according to Paragraph 337 of VVS version 01.0, AENOR verification team confirm that the monitoring report was in compliance with relevant monitoring report form and instructions therein.</p>

G.2. Remaining forward action requests from validation and/or previous verification

This section is not applicable since no open issues from validation are detected.

G.3. Specific-case CPA(s) considered for verification and covered in this report

Reference number of the specific-case CPA included in the PoA as of the end of this monitoring period	Is the specific-case CPA considered for this verification? (yes/no)	Version number of the registered PoA-DD to which the specific-case CPA complies with	Confirmation that a request for issuance including the specific-case CPA has been published for the previous monitoring period (Y/N)
10202-001	Yes	05	No

SECTION H. Verification findings – Programme of activities**H.1. Compliance of the programme implementation with the registered programme design document**

Means of verification	<p>The verification team has performed an on-site inspection to the first CPA to verify if:</p> <ul style="list-style-type: none"> All physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM PoA are in place.
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	<ul style="list-style-type: none"> The CME has operated the programme as per the registered PoA-DD. <p>It has been checked if relevant technical equipment of the CPA has been implemented in accordance with the PoA-DD. Interviews with operational personnel have been carried out, management system records; maintenance records and related monitoring procedures were checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.</p> <p>In addition, it has been checked whether any observed deviations from the registered programme design have been correctly addressed as PRCs.</p> <p>During desk review and on-site visit, the assessment team verified the technology used at the project site through physical inspection and it was confirmed that procedures, approaches followed in the implementation and monitoring of the PoA were the same that those stated in the registered PoA-DD.</p>
Findings	<p>CL 1 – Technical documentation is required by the audit team to verify the implementation of the CPA:</p> <ul style="list-style-type: none"> - Energy Yield Assessment report - Standard Test Conditions - Single Line Diagram - Power Purchase Agreement <p>CL 2 – Documented evidence (Letter from the Utility, EUCL) to support the starting date of the operation of the component project activity is required.</p>
Conclusion	<p>During the on-site visit the audit team has verified the correct implementation of the component project activity, and documentation has been provided. The technical description included in the CPA is consistent with the documentation provided and the situation verified on site. The single line diagram dated on 13/11/2014 is provided which states the installation of 1,418 strings with 20 solar modules each one, therefore, finally 28,360 modules are installed in the project activity, type BYD300P6C-36 of 300 W, with 8 units of inverters that imply a peak power of 8,508 kWp. The number of modules installed was also verified during on site visit. A permanent change is requested since there is a slight difference in the number of panels, although there is no difference in the final installed capacity. The detail is included in the section I.2.5.</p> <p>The project proponent, Scatec Solar ASA is responsible for the operation of the Solar Plant, and the CME is Gigawatt Global Cooperatief, who is the coordinating entity of the Programme of Activities. Both of them participated during on site visit.</p> <p>The Letter from the Utility (Energy Utility Corporation Limited, EUCL) with reference number 11.07.23/256/14/DIR-MD/RN /13/ states that Commercial Operation Date (COD) has occurred with effect from 18th September 2014. Therefore, the audit team confirms that the project activity is completely operational as per the registered CPA-DD.</p> <p>Consequently, according to paragraph 341 of VVS for Programme of Activities version 01.0, AENOR verification team confirms that:</p> <ul style="list-style-type: none"> The implementation status is consistent with the registered latest version of the PoA-DD; The actual operation of the Programme is as per the registered latest version of the PoA-DD; Information (data and variables) provided in the monitoring report is in accordance with that stated in the registered latest version of the PoA-DD.

H.2. Implementation and operation of the management system

Means of verification	<p>The verification team has performed an on-site inspection to verify if:</p> <ul style="list-style-type: none"> • The CME implemented and operated the management system as per the registered PoA-DD. • The organizational structure and roles and responsibilities for monitoring are in line with the situation on the ground as observed during the site visit, <p>Interviews with operational personnel have been carried out, management system records and related monitoring procedures were checked in this context.</p> <p>In addition, it has been checked whether any observed deviations from the registered management system have been correctly addressed as PRCs.</p> <p>By means of review of the registered PoA-DD, validation report followed by an on-site inspection and interview with the CPAs implementers including personnel involved in the PoA, the verification team observed that, the operation of the management system of the PoA was carried out as per the registered PoA design.</p>
Findings	CL 5 – Quality management procedures and related documents are required.
Conclusion	<p>The CME has developed and is maintaining an electronic database, which will contain essential data and information about each CPA. The CME record keeping and document processes also incorporate quality management procedures which consist of:</p> <ol style="list-style-type: none"> 1) Establishing and maintaining a 'Quality Manual'; 2) Procedures for control of documents; and 3) Procedures for control of records. <p>Data base was verified during on site visit, the quality control of the documents is guaranteed, and the relevant information is included in it. Collection and management system implemented in the solar power plant is consistent with provisions stated in the registered CPA. Therefore, AENOR verification team confirms that the implementation and operation of the management system is consistent with the registered latest version of the PoA-DD.</p>

H.3. Post-registration changes**H.3.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline**

Not applicable.

H.3.2. Corrections

Not applicable.

H.3.3. Inclusion of a monitoring plan in a registered PoA-DD (including its generic CPA-DD(s))

Not applicable.

H.3.4. Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline

Not applicable.

H.3.5. Changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA

Not applicable.

H.3.6. Types of changes specific to afforestation and reforestation activities

Not applicable.

SECTION I. Verification findings – Component project activity(ies)

I.1. Compliance of the CPA implementation with the included CPA design document

Means of verification	<p>The verification team has performed an on-site inspection to verify if:</p> <ul style="list-style-type: none"> • All physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM CPA are in place. • The CME has operated the CPA as per the registered PoA-DD. <p>It has been checked if relevant technical equipment of the programme has been exchanged or modified during the monitoring period in PoA-DD, MR and calculation spreadsheet /14/ are applied.</p> <p>Interviews with operational personnel have been carried out, management system records; maintenance records and related monitoring procedures were checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.</p> <p>In addition, it has been checked whether any observed deviations from the registered programme design have been correctly addressed as PRCs.</p> <p>During desk review and on-site visit, the assessment team verified the technology used at the project site through physical inspection and it was confirmed that procedures, approaches followed in the implementation and monitoring of the PoA were the same that those stated in the registered PoA-DD.</p>
Findings	<p>CL 1 – Technical documentation is required by the audit team to verify the implementation of the CPA:</p> <ul style="list-style-type: none"> - Energy Yield Assessment report - Standard Test Conditions - Single Line Diagram - Power Purchase Agreement <p>CL 2 – Documented evidence (Letter from the Utility) to support the starting date of the operation of the component project activity is required.</p>
Conclusion	<p>During the on-site visit the audit team has verified the correct implementation of the component project activity, and documentation has been provided, Single line diagram /15/, Energy Yield Assessment /16/ and Power Purchase Agreement /17/. The technical description included in the CPA is consistent with the documentation provided and the situation verified on site. The single line diagram dated on 13/11/2014 is provided which states the installation of 1,418 strings with 20 solar modules each one, therefore, finally 28,360 modules are installed in the project activity, type BYD300P6C-36 of 300 W, with 8 units of inverters that imply a peak power of 8,508 kWp. Furthermore, the number of modules installed was also confirmed on site by the audit team. A permanent change is requested since there</p>

	<p>is a slight difference in the number of panels, although there is no difference in the final installed capacity. The detail is included in the section H.3.2.</p> <p>The project proponent, Scatec Solar ASA is responsible for the operation of the Solar Plant, and the CME is Gigawatt Global Cooperatief, who is the coordinating entity of the Programme of Activities. Both of them participated during on site visit.</p> <p>The Letter from the Utility (EDCL) with reference number 11.07.23/256/14/DIR-MD/RN/ states that Commercial Operation Date (COD) has occurred with effect from 18th September 2014. Thus, the audit team confirms that the project activity is completely operational as per the registered CPA-DD.</p> <p>Therefore, according to paragraph 341 of VVS version 01.0, AENOR verification team confirms that:</p> <ul style="list-style-type: none"> • The implementation status is consistent with the registered latest version of the PoA-DD; • The actual operation of the Programme is as per the registered latest version of the PoA-DD; • Information (data and variables) provided in the monitoring report is in accordance with that stated in the registered latest version of the PoA-DD.
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I.2. Post-registration changes

I.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

Not applicable

I.2.2. Corrections

The CME has identified one permanent change, considered as correction to the information fixed at registration, in accordance with paragraph 230 of the CDM Project Standard for Programme of Activities. The number of solar modules indicated in the registered CPA-DD version 05 is 28,340, nevertheless, finally, the number of installed modules is 28,360, but the capacity of them is the same, 300 W. The peak capacity remains the same; therefore, the scale of the project and the calculations of the emission reductions remains as they were registered using the methodology AMS-I.D. One CAR was raised during the validation process regarding the category of the changes proposed since it was considered as permanent change instead a correction of fixed information.

CAR 6 - The category of the changes required is not consistent with the Validation Report of the PRC neither with the Validation and Verification Standard for Programme of Activities, version 01.0

Once the CME modified the category of the change in a consistent way with the VVS for PoAs, the audit team using the on-site inspection and the documented reference determines that the final number of installed solar modules reflects the actual information of the project and the application of the methodology is not affected since the installed capacity fixed at registration remains the same.

For that reason, the audit team determines that the corrected information included in final version of the CPA-DD is an accurate reflection of actual information, and total installed capacity of the power plant and the emission reductions calculation and monitoring is not affected by the changes. Therefore, the corrected parameter is in accordance with the applied methodology and the registered monitoring plan in accordance with paragraph 257 of the CDM Validation and Verification Standard for programme of Activities.

It is important to note that, AENOR is using CDM-PoA-VCR-FORM version 01.0, because a new version of that form, applying the requirements of the CDM Validation and Verification Standard for Programmes of activities" version 01.0 (VVS) has not been published on the UNFCCC website at the time of submission of this validation report. AENOR is applying the requirements of the CDM Validation and Verification Standard for programmes of activities version 01.0 (VVS), nevertheless, note that the section of "Correction" is considered as permanent change in the VVS version 01, in a different way than in this form.

I.2.3. Changes to the start date of the crediting period

A change in the starting date of the crediting period of the CPA was requested to the UNFCCC Secretariat through an e-mail sent on 27th April 2017 by the coordinating entity. The change in the date is less than a year, therefore, in accordance with the paragraph 232 (a) of the CDM project standard for programmes of activities (version 01.0). A copy of the notification /20/ was sent to the audit team, and properly change was made in the UNFCCC webpage. CAR 1 was raised in order to modify accordingly the Monitoring Report.

I.2.4. Inclusion of a monitoring plan to an included CPA-DD

Not applicable.

I.2.5. Permanent changes to the monitoring plan as described in the included CPA-DD, applied methodology, or applied standardized baseline

The CME has identified two permanent changes to the registered monitoring plan:

1. Meter installation: The CPA-DD (version 05.0) states that a total of four meters will be installed. Three of them to measure the energy supplied to the grid and the fourth one to measure the electricity supplied from the grid. Nevertheless, only three meters have been installed:
 - Main meter: Operated by the CPA implementer.
 - Back-up meter: Operated by the Rwanda Energy Group (REG).
 - Auxiliary meter: Operated by REG to meter electricity use during the night time.

The main and back up meter measure the electricity supplied to the grid, and the auxiliary meter the electricity supplied from the grid. Therefore, the measurements of electricity supplied to and from the grid are guaranteed with these three meters. During on site visit, it has been verified and confirmed that the auxiliary meter is operated by the CPA implementer, and it is used to meter certain electrical loads as site building and lighting. But, this meter is not used for billing purposes. The main and back up meters are both bidirectional, and they measures exported and imported electricity to and from the grid.

2. Accuracy of the meters: In accordance with the registered CPA, the meters will be of class 0.5S for active and 2 for reactive. Nevertheless, the meters installed are more accurate being class 0.2S for active and 0.5S for reactive. During on site visit, the calibration certificates /18-19/ of the main and back-up meters are provided, and the higher accuracy has been checked.

Taking into consideration that the coordinating/managing entity is unable to implement the registered monitoring plan exactly the same as it was registered, the two identified modifications are considered in line with paragraph 236 of the “CDM project standard for programmes of activities” and considered as permanent changes to the monitoring plan.

The revised monitoring plan is in compliance with the applied methodology since the calculations are not modified as consequence of the changes, and, the revised monitoring plan does not reduce the level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan.

The audit team states that proposed alternative monitoring is not likely to lead to a reduction in the accuracy of the calculation of GHG emission reductions since there is no modification in the calculation; and, taking into consideration that the meters installed are more accurate than those detailed in the registered CPA, the final accuracy of the monitoring is higher.

In conclusion, AENOR has verified that permanent changes comply with the relevant requirements in the “CDM project standard for programmes of activities” and the description included in the revised CPA-DD is consistent with the real situation and supported by documentation, line diagram and calibration certificates. For all those reasons, the audit team determines that permanent changes to the monitoring plan proposed are in compliance with the applied methodology AMS-I.D, do not reduce the level of accuracy of the monitoring compared with the requirements contained in the registered monitoring plan and therefore, comply with the relevant requirements in the “CDM project standard for programmes of activities”, version 01.0. This opinion has been included in a validation report of the PRC prepared by the audit team and submitted together with this verification report during the request for issuance.

I.2.6. Changes to the programme design of the included CPA-DD

Not applicable.

I.2.7. Types of changes specific to afforestation and reforestation component project activities

Not applicable.

I.3. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

Means of verification	<p>The ASYV 8.5MW Solar PV Project (CPA-001) is included under the generic CPA type I: Greenfield small-scale solar PV power plants/units in Rwanda applying automatic additionality (version 1.0). This type of CPA also applies the approved monitoring methodology AMS-I.D “Grid connected renewable electricity generation” - Version 18, and the monitoring plan of the CPA as stated in the Monitoring report is in accordance with that methodology.</p> <p>The verification team has checked the actual monitoring plan against the latest approved monitoring plan and monitoring methodology and applicable tools. Furthermore the verification team has checked monitoring system during the on-site inspection by means of comparison with the information given in the monitoring plan and monitoring methodology. Overall authority and responsibility for monitoring rests with the CME, which is also responsible for managing the emission reduction monitoring and verification process. The CPA implementing entity for the CPA 0001 has appointed the managing director with the overall responsibility for the CPA, assisted by the asset manager, site manager and associate officers, who was interviewed by the audit team during on site visit.</p> <p>By means of review of the registered PoA-DD, CPA-DD, validation reports followed by an on-site inspection and interview with the CPAs implementers including personnel involved in the PoA, the verification team observed that, the operation of the monitoring plan of the CPA was carried out as per the registered PoA design and applicable methodology.</p>
Findings	No CARs/CLs/FARs were raised in this section.
Conclusion	According to paragraph 342 of CDM Validation and Verification standard for programmes of activities version 01.0, AENOR verification team confirms that the monitoring plan complies with the applied methodology and the monitoring system and all applied procedures are completely in compliance to the latest approved monitoring plan and the methodology AMS-I.D, version 18.

I.4. Compliance of monitoring activities with the registered monitoring plan

I.4.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	<p>By means of comparison of the monitoring report and the emission reduction calculation with the latest version of the registered PoA-DD and CPA-DD, the verification team has checked whether the fixed ex-ante parameters have been correctly applied and detailed in the Monitoring Report and associated ER spreadsheets.</p> <p>The document review and the on-site visit revealed that a complete set of data for the specified monitoring period is available. The correctness of information provided in the monitoring report has been crosschecked against the registered PoA-DD and included CPA-DD.</p> <p>The ex-ante parameters detailed in the monitoring report in accordance with the registered monitoring plan of the CPA and related POA are:</p> <ul style="list-style-type: none"> • Net calorific value (energy content) of fossil fuel type i in year y ($NCV_{i,y}$). IPCC default values are used, as there is no specific data from the fuel suppliers of the power plants and also not regional default values. Applicable only to grid emission factor calculations. • CO₂ emission factor of fossil fuel type i in year y ($EF_{CO_2,i,y} / EF_{CO_2,m,i,y}$). IPCC default values are used, applicable only to grid emission factor calculation. • Net electricity generated by power plant/unit m in year y ($EG_{m,y}$). Data on electricity generation was obtained from EWSA, the utility company in Rwanda and owner of the power plants. This value was only used for the grid emission factor calculations. • Amount of fossil fuel type i consumed by power plant / unit m in year y Calculation of baseline emissions ($FC_{i,m,y}$). Data on fuel consumption for electricity generation obtained from EWSA, the utility company in Rwanda and only used for the grid emission factor calculation. • Average net energy conversion efficiency of power unit m in year y ($\eta_{m,y}$). Default values from the tool for average net energy of combined cycle engines. As the other fixed factors, it is only used for the grid emission factor. <p>These values are consistent with registered PoA and CPA. Verification of data generation, aggregation and recording in this case is not applicable since they are fixed parameters from the registered PoA-DD and CPA-DDs and used for the grid emission calculation, which value is: 0.66 tCO₂/MWh. The grid emission factor is correctly applied for the emission reduction calculations.</p>
Findings	<p>No CARs/CLs/FARs are raised in this section.</p>
Conclusion	<p>All data sources and assumptions are appropriate and calculations are correct as applicable to the proposed CPA, and will result in an accurate or otherwise conservative estimate of GHG emission reductions. Therefore, and according to paragraph 125 of VVS version 01.0, AENOR verification team confirms that the monitoring report and the emission reduction calculation spreadsheet have correctly considered the parameters fixed ex-ante, and no deviations have been observed.</p>

I.4.2. Data and parameters monitored

Means of verification	<p>During the verification, the only monitoring parameter (as listed in chapter B.7.1 of the PoA-DD and D.7.1 of the CPA-DD) have been verified with regard to:</p>
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- i. appropriateness of the applied measurement / determination method,
- ii. correctness of the values applied for ER calculation,
- iii. accuracy, and applied QA/QC measures.

Data and monitored parameter was verified through the on-site visit and desk-review. The monitoring system and all applied procedures are in compliance with the monitoring plan and the applied methodology AMS-I.D Version 18.0 based on the information included in the final monitoring report. The parameter monitored and the means of verification used are detailed as follows:

- **Quantity of net electricity generation supplied by the project plant/unit to the grid in year y ($EG_{\text{facility},y}$):** In accordance with the Monitoring Report, the quantity of electricity supplied to the grid is monitored continuously, measured hourly and recorded at least monthly. The auxiliary meter is read on a monthly basis by REG. The net electricity exported/supplied to the Rwandan grid is then calculated as the difference between the measured quantities of the grid electricity supplied to the grid and delivered from the grid to the project. The Metering Installation has been installed at the Interconnection Point, at a voltage of 15 kV, and has a main electronic meter that can be remotely interrogated, which has an electronic communication link and which is connected to the metering database of the Transmission Metering Administrator (TMA) or Distribution Metering Administration (DMA). The Metering Installation measures the amount and direction of Active Power/Energy and Reactive Power/Energy. The net electricity exported/supplied to the Rwandan grid is then calculated as the difference between the measured quantities of the grid electricity supplied to the grid and delivered from the grid to the project.

Records from the main meter of the quantity of electricity supplied by the project plant/unit to the grid are crosschecked against billing records /21/ of electricity to the utility company (Rwanda Energy Group). These billing records and the SCADA reports /22/ were verified during on site visit.

The project participant uses an emission reduction calculation spreadsheet, where production forecast, actual measured production, deemed delivered energy and total production are reported. This information is taken from the meters and Scada system. On the other hand, in the same spreadsheet it is reported the data registered in the invoices (Energy Sales EUCL (Invoiced)), and this information is used to crosscheck the data obtained from the meters. Net energy is calculated using the real data obtained in the meters (actual measured production minus plant energy consumption). Regarding the production of October 2015, the period from 23th October until 31 October is only considered in this month (to be consistent with the crediting period of the CPA) which is the actual measured production (286 MWh). The data is obtained from the Scada System (*Energy feed-in report*) and provided to the audit team, and is the sum of the daily data for the period 23/10/2015 until 31/10/2015. Finally the plant energy consumption is subtracted in order to obtain the net energy dispatched. This is considered appropriate, correct and consistent with the methodology and the crediting period.

As per the PPA, main and back-up meter have to comply with an accuracy class for 0.2S for active power and 0.5 for reactive power. Calibration Certificates were provided to the audit team, and it is confirmed that calibration of the meters is carried out in accordance with the PPA and relevant industry standards.

All data and supporting evidences were verified, which include:

- Registered PoA-DD and CPA-DD

	<ul style="list-style-type: none"> • Validation Reports • Final version of Monitoring Report • Data from SCADA system • Billing records from the utility company • Calibration certificates of electricity meters/ • Spreadsheet for emission reductions calculation
Findings	<p>CAR 2 – The emission reduction calculations are not consistent with the billing records provided to the audit team.</p> <p>CL 4 – Billing records of electricity are required in order to verify the net electricity supplied to the grid. Records of electricity consumed by the project plant/unit was derived from the billing records sent to the CPA implementing entity from the utility company are also required.</p>
Conclusion	<p>The net electricity exported/supplied to the Rwandan grid is calculated as the difference between the measured quantities of the grid electricity supplied to the grid and delivered from the grid to the project, in accordance with the registered POA-DD. Two separate metering installations are in place to measure the following:</p> <p>(a) The quantity of electricity supplied by the project plant/unit to the grid; and</p> <p>(b) The quantity of electricity delivered to the project plant/unit from the grid</p> <p>Quality control procedures have been applied in accordance with the monitoring plan. Therefore, and according to paragraphs 346 of VVS version 01.0, AENOR verification team confirms that:</p> <ul style="list-style-type: none"> • The registered monitoring plan has been properly implemented and followed by the coordinating/managing entity. • The monitoring has been carried out in accordance with the monitoring plan and the registered PoA-DD and CPA-DDs. • The only parameter required by the monitoring plan has been measured and determined without material misstatements and in line with all applicable standards and relevant requirements. • The equipment used for monitoring is i controlled and calibrated in accordance with the registered monitoring plan, the applied methodology, and national standards. • Monitoring results are consistently recorded as per the approved frequency and, • Quality assurance and quality control procedures have been applied in accordance with the registered monitoring plan.

I.4.3. Implementation of sampling plan

Means of verification	Not applicable since no sampling is used.
Findings	N/A

Conclusion	N/A
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I.5. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	<p>AENOR has verified the information stated in all the calibration certificates of the different equipment installed in the project and also their technical specifications from manufacturers in the current verification process. Calibration certificates of main (1610/3P4W-CT-0/5261.2) and back up (RSB/NMD/04/01/37/046) meters are provided and they are appropriate.</p> <p>The auxiliary meter is not used for billing, therefore, not used for the monitoring of emission reductions.</p> <p>Two process of calibration were made in both meters. The first one was made by the manufacturer in 2015. The second one was made on 12/07/2016 in the case of the main meter, and on 01/10/2016 in the case of the back-up meter. Both certificates are consistent, and they include they are class 0.2 and 0.5 meters. The serial numbers are the same that checked by the audit team during the site visit:</p> <ul style="list-style-type: none"> • Main meter: 3505510704191 • Back up meter: 3505510704209 • Auxiliary meter: 3505510704217 <p>The entities that perform the calibration are Sanas Laboratory 143, Power Meter Technics (Pty) Ltd and Power and energy laboratory. Entities accredited by the Rwanda Standards Board. In accordance with CPA-DD the frequency of the testing/calibration of the meter will be done according to the requirements stipulated in the PPA. The PPA states that the calibration shall be made at interval not less than 90 days. Processes of calibration made are therefore consistent with the registered CPA and no delay has been detected.</p>
Findings	CL 3 – Calibration Certificates of the main and back up meters are required by the audit team.
Conclusion	AENOR verified that the equipment mentioned above have been calibrated in accordance with monitoring plan on dates referenced as AENOR has checked with the calibration certificates provided, therefore, in accordance with paragraph 350 of the CDM Validation and Verification Standard for Programme of Activities version 01.0.

I.6. Assessment of data and calculation of emission reductions or net removals

I.6.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	<p>The emissions reductions are calculated in accordance with the methodology AMS-I.D “Grid connected renewable electricity generation” - Version 18. A spreadsheet has been also provided to the audit team which states that the baseline emissions are calculated using the formulae:</p> $BE_y = EG_{PJ,y} \times EF_{grid,y}$ <p>The Emission Factor of the grid ($EF_{grid,y}$) was determined ex-ante as a combined margin emission factor, consisting of the combination of operating margin ($EF_{OM,y}$) and build margin ($EF_{BM,y}$) emission factors with a fixed value of 0.66 tCO₂/MWh.</p> <p>According to the Monitoring Plan, the “$EG_{PJ,y}$” is be measured with meters installed at the site in which the plant's lines connect with the national grid. The energy generation of the project activity is obtained in accordance with the monitoring plan of the registered PoA and CPA, considering the measurements of the main energy meter. Therefore, the baseline emission for this monitoring period is:</p>
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	$BE_y = 18,745 \text{ MWh} \times 0.66 \text{ tCO}_2\text{e/MWh}$ $BE_y = 12,369 \text{ tCO}_2\text{e}$ <p>During the verification the calculation of baseline GHG emissions has been checked and the verified issues are:</p> <ul style="list-style-type: none"> • Transparency: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spread sheet. • Correctness: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions. • Conservativeness: it has been checked that the calculations have been performed in the excel spreadsheets using the whole number of decimals, and the final amount has been conservatively rounded down.
Findings	<p>CAR 3 – A mistake in the ER spreadsheet is detected: The start date of the first crediting period is stated as 1-ene-2016, which is not consistent with the starting date detailed in the Monitoring Report. On the other hand the calculations of the grid emission factor are included in the monitoring of the emission reductions.</p>
Conclusion	<p>According to paragraph 358 of VVS version 01.0, AENOR verification team confirms that:</p> <ul style="list-style-type: none"> • A complete set of data for the monitoring period is available. • Information on the baseline GHG emission calculation provided in the monitoring report has been cross-checked with other sources as billing records and also SCADA reports. • Calculations of baseline emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology. • Operational data collection and processing obligations from the operator follows the monitoring plan. • There are no assumptions in emission calculations. • Appropriate emission factor, IPCC default values and other reference values have been correctly applied • No errors, miscalculations, omissions, misstatements or incomplete information has been identified. • The first day when CERs are being claimed is correctly specified in the Monitoring report.

I.6.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	According to the applied methodology and due to the fact that registered PoA and CPAs consists of a solar power plant, there are no Project Emissions ($PE_y=0$).
Findings	N/A
Conclusion	N/A

I.6.3. Calculation of leakage GHG emissions

Means of verification	No leakage emissions are considered since the CPA is not a biomass project activity.
Findings	N/A
Conclusion	N/A

I.6.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	<p>According to the baseline methodology, emissions reductions are calculated as follows:</p> $ER_y = BE_y - PE_y$ <p>PP has developed a spreadsheet in order to calculate the baseline emission and emission reductions. After reviewing the spreadsheet and all the documents referred to in this report, AENOR was able to verify the net amount of emission reductions, for the monitoring period, 23/10/2015 - 28/02/2017.</p> <p>The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately:</p> <ul style="list-style-type: none"> • Total baseline emissions, • Total project emissions, • Total leakage, • Total emission reductions. <p>It has been assessed whether the values are correct or need to be revised.</p> <p>The verification team checked and recalculated the ER calculation sheet and confirms that the values as specified in the ER summary table are correct. The confirmed value of total GHG emission reductions is 12,369 tCO₂e.</p>
Findings	No CARs/CLs/FARs were raised in this section.
Conclusion	<p>AENOR was able to confirm that the calculations are based on authentic data SCADA and billing records from REA for the PoA and CPA. The spreadsheet used to calculate the emission reductions (CER) calculations and all figures were tracked, checked and found to be consistent.</p> <p>Finally, according to paragraph 358 of VVS version 01.0, AENOR verification team confirms that:</p> <ul style="list-style-type: none"> • A complete set of data for the monitoring period is available. • Information provided in the monitoring report has been cross-checked with

	<p>other sources from the national utility;</p> <ul style="list-style-type: none"> • Calculations of baseline emissions, and project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology. • The summary table in the MR has been filled correctly and the values are in line with the related emissions reduction calculation spreadsheet. • There are no assumptions in emission calculations. • Appropriate emission factor, IPCC default values and other reference values have been correctly applied.
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Specific-case CPA reference number	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Results achieved in the period up to 31 December 2012	Results achieved in the period from 1 January 2013 onwards	Results achieved in the entire monitoring period
CPA 0001	12,369	0	0	0	12,369	12,369
Total	12,369	0	0	0	12,369	12,369

I.6.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included specific-case CPA

Means of verification	<p>Reviewing the registered PoA and CPAs, ex-ante annual emission reductions were 10,264 tCO₂e; The CDM registration date for this CPA is 23rd October 2015, which marks the start of the crediting period. The selected monitoring period runs from this date to the latest monthly data available on electricity generation i.e. 28 February 2017. Comparing the same period of one year, the result is that the actual values achieved by the project activity is 9,322. Therefore, actual emission reductions are slightly lower compared to ex-ante forecasts due to lower irradiation levels as initially anticipated. The comparison of actual GHG emission reductions with estimates in registered PoA-DD and CPA-DDs has been checked and re-calculated by the verification team.</p>
Findings	<p>CAR 4 – The comparison of GHG emission reductions is not correctly included since the length of both periods is different, and therefore, they are not comparable.</p>
Conclusion	<p>AENOR verification team confirms that a comparison of actual GHG emission reductions or net anthropogenic GHG removal of the project activity achieved during this monitoring period with the estimates in the registered PoA-DD and CPA-DDs has been provided. The verification team considers the calculation of the comparison is correct.</p>

Specific-case CPA reference number	Value estimated in ex ante calculation in the included CPA-DD(s)		Actual values achieved by the specific-case CPA(s) during this monitoring period		
	Year	Emission reductions (tCO ₂ e)	From	To	Emission reductions (tCO ₂ e)
CPA 0001	23 October 2015 – 28 February 2017	12,369	23 October 2015	28 February 2017	13,441
Total	12,369		13,441		

I.6.6. Remarks on difference from estimated value in registered PDD

Means of verification	The audit team checked the measure registers and other operational registers during the on-site visit. Moreover, the hourly generation of the project is included in the spreadsheets, and was crosschecked by the audit team against the original data of the national utility. In this way, the audit team found that the electrical generation of the project, during this monitoring period, the project has produced lower energy than declared in the PoA and CPA for the same period. This lower generation is due to the lower capacity factor achieved during this monitoring period.
Findings	No CARs/CLs/FARs were raised in this section.
Conclusion	In AENOR's opinion, the difference between estimated ERs in the registered PoA and CPAs has been correctly justified in final version of the monitoring report. The emissions reductions for the monitoring period have been correctly determined in the calculation spreadsheets. Therefore, the difference is considered reasonable.

Appendix 1. Abbreviations

Abbreviations	Full texts
AENOR	AENOR INTERNACIONAL S.A.U.
ACM0002	Grid-connected electricity generation from renewable sources, version 16.0.0.
AMS-I.D	Grid connected renewable electricity generation, version 18.0.0
CAR	Corrective action request
CDM	CDM Clean Development Mechanism
CDM-EB	CDM Executive Board
CER	Certified Emission Reduction(s)
CL	Clarification Request
CME	Coordinating or Managing Entity
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
COD	Commercial Operation Date
CO ₂	Carbon Dioxide
CO ₂ e	Carbon dioxide equivalent
CPA	Component project activity
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board of the CDM of the Kyoto Protocol
ER	Emission Reductions
EUCL	Energy Utility Corporation Limited
FAR	Forward action request
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
MWh	Megawatt hour
N/A	Not applicable
PoA	Programme of Activities
CPA-DD	Component project activity design document form
PoA-DD	Project Design Document form
PP	Project participants
PRC	Post-registration changes
PS	Clean Development Mechanism Project Standard for programme of activities (Version 01.0)
REA	Rwanda Energy Group
tCO ₂ e	Carbon dioxide equivalent tonnes

UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM Validation and Verification Standard for Programme of Activities (version 01.0)

Appendix 2. Competence of team members and technical reviewers

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for the CPA "ASYV 8.5MW Solar PV Project (CPA-001)".

Madrid, 15/11/2017

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the verification process of the above mentioned project activity:

Name: Mercedes GARCÍA MADERO

CDM Team Leader: Yes

CDM Verifier: Yes

CDM Technical Reviewer: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

TA 1.2. Renewables



Jose Magro
Authorised person

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for the CPA "ASYV 8.5MW Solar PV Project (CPA-001)".

Madrid, 15/11/2017

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the verification process of the above mentioned project activity:

Name: Alfonso MEDRANO GUTIERREZ

CDM Team Leader: N/A

CDM Verifier: Yes

CDM Technical Reviewer: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

TA 1.2. Renewables



Jose Magro
Authorised person

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for the CPA "ASYV 8.5MW Solar PV Project (CPA-001)".

Madrid, 15/11/2017

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the verification process of the above mentioned project activity:

Name: Elena LLORENTE PÉREZ

CDM Team Leader: N/A

CDM Verifier: N/A

CDM Technical Reviewer: Yes

External Technical Expert: N/A

Technical areas related with the project activity:

TA 1.2. Renewables



Jose Magro
Authorised person

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	CME	Registered PoA-DD	08/10/2015	UNFCCC
2	CME	Registered CPA 0001	08/10/2015	UNFCCC
3	AENOR	Specific Instruction for Validation, Verification and Certification of Clean Development Mechanism (CDM) Project Activities (IE/DTC/039)	-	AENOR
4	CDM-EB	CDM validation and verification standard for programme of activities, version 01.0 (EB93-A08-STAN)	03/03/2017	UNFCCC
5	CDM-EB	Guideline: Application of materiality in verifications version 02.0	CDM-EB69-A06-GUID	UNFCCC
6	CDM-EB	ACM0002 Grid-connected electricity generation from renewable sources (version 16.0.0) and AMS-I.D Grid connected renewable electricity generation (version 18.0).-	--	UNFCCC
7	ERM	Validation report of the CDM-PoA Gigawatt Global Programme of Activities, version 02.	13/10/2015	UNFCCC
8	ERM	Validation Report of the CDM Component Project Activity CPA ASYV 8.5MW Solar PV Project (CPA-001), version 02.	13/10/2015	UNFCCC
9	CME	Monitoring Report version 01	04/04/2017	CME
10	CME	Monitoring Report version 05	14/10/2017	CME
11	CDM-EB	CDM project standard for programme of activities, version 01.0 (CDM-EB93-A07-STAN)	03/03/2017	UNFCCC
12	CDM-EB	Attachment. Instructions for filling out the CDM PoA Monitoring report form version 02.0	07/06/2017	UNFCCC
13	EUCL	Letter from the Energy Utility Corporation Limited, EUCL, with reference number 11.07.23/256/14/DIR-MD/RN	18/09/2014	CME
14	CME	2017 04 17 GWG MP1 ER Calculations v2	06/07/2017	CME
15	CME	Single Line Diagram	13/11/2014	CME
16	CME	Energy Yield Assessment report	08/01/2014	CME
17	CME	Power Purchase Agreement	2013	CME
18	SCATEC	Calibration certificates of electricity main meter 1610/3P4W-CT-0/5261.2	01/10/2016	CME
19	EUCL	Calibration certificates of electricity back up meter RSB/NMD/04/01/37/046	12/07/2016	CME

CDM-PoA-VCR-FORM

20	CME	Notification from the UNFCCC of the approval of the change of starting date of crediting period	04/05/2017	CME
21	SCATEC	Billing records and invoices	2015 - 2017	CME
22	EUCL	SCADA reports	2015-2017	CME
23	SCATEC	Revised CPA-DD – version 07	14/11/2017	CME

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
CME response				Date: DD/MM/YYYY
Documentation provided by the CME				
DOE assessment				Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	CL 1	Section no.	3	Date: 23/05/2017
Description of CL				
Technical documentation is required by the audit team to verify the implementation of the CPA:				
<ul style="list-style-type: none"> - Energy Yield Assessment report - Standard Test Conditions - Single Line Diagram - Power Purchase Agreement 				
Project participant response				Date: 30/05/2017
Following documentation has been provided: <ul style="list-style-type: none"> • Energy Yield Assessment report, including the Standard Test Conditions • Single Line Diagram • Power Purchase Agreement 				
Documentation provided by project participant				
See section below.				
DOE assessment				Date: 30/05/2017
The technical description included in the CPA is consistent with the documentation provided and the situation verified on site. Therefore, CL is clarified.				

CL ID	CL 2	Section no.	3	Date: 23/05/2017
Description of CL				
Documented evidence (Letter from the Utility) to support the starting date of the operation of the component project activity is required				
Project participant response				Date: 30/05/2017
The Letter from the Utility (EDCL) is provided to the audit team.				
Documentation provided by project participant				

Letter from the Utility	
DOE assessment	Date: 30/05/2017
The Letter from the Utility (EDCL) with reference number 11.07.23/256/14/DIR-MD/RN states that Commercial Operation Date (COD) has occurred with effect from 18 th September 2014. Since the starting date of the operation of the power plant is supported by an official documentation, this CL is clarified.	

CL ID	CL 3	Section no.	6.2	Date: 23/05/2017
Description of CL				
Calibration Certificates of the three meters are required by the audit team.				
Project participant response				Date: 30/05/2017
The Calibration Certificates have been provided.				
Documentation provided by project participant				
<ul style="list-style-type: none"> Calibration Certificate of the main meter: 1610/3P4W-CT-0/5261.2 Calibration Certificate of the Back-up RSB/NMD/04/01/37/046 				
DOE assessment				Date: 30/05/2017
Calibration Certificates of the main and back up meters are provided and both of them are involved in the emission reduction calculation. The auxiliary meter is not used for billing, therefore, not used for the monitoring of emission reductions. Two process of calibration were made in both meters. The first one was made by the manufacturer, and the second one was made on 12/07/2016 in the case of the main meter, and on 1/10/2016 in the case of the back-up meter. Both certificates are consistent, and they include they are class 0.2 and 0.5 meters. The serial numbers are the same that checked by the audit team during the site visit:				
<ul style="list-style-type: none"> Main meter: 3505510704191 Back up meter: 3505510704209 Auxiliary meter: 3505510704217 				
Both Certificates are valid until one year later; therefore, this CL is closed .				

CL ID	CL 4	Section no.	6.2	Date: 23/05/2017
Description of CL				
Billing records of electricity are required in order to verify the net electricity supplied to the grid. Records of electricity consumed by the project plant/unit was derived from the billing records sent to the CPA implementing entity from the utility company are also required.				
Project participant response				Date: 30/05/2017
Billing records have been provided.				
Documentation provided by project participant				
DOE assessment				Date: 30/05/2017
Billing records for the whole monitoring period have been provided, and the SCADA readings have been checked on site. Two discrepancies have been detected regarding the months of January and February 2017 and it implies 246 MWh not considered. The emission reduction calculation shall be reviewed.				
Project participant response 2				Date: 06/07/2017
Revised emission reduction calculation spreadsheets have been provided.				
Documentation provided by project participant 2				
2017 04 17 GWG MP1 ER Calculations v2.xls				
DOE assessment 2				Date: 07/07/2017

New version of the calculations has been provided and it is correct and consistent with the billing records and SCADA registers. Therefore, **CAR is closed**.

CL ID	CL 5	Section no.	9	Date: 23/05/2017
Description of CL				
Quality management procedures and related documents are required.				
Project participant response				Date: 30/05/2017
All the documents involved in the emission reductions monitoring are included in the Electronic Database.				
Documentation provided by project participant				
-				
DOE assessment				Date: 30/05/2017
Data base has been verified during on site visit. The quality control of the documents is guaranteed, and the relevant information is included in the database. Therefore, CL is clarified .				

Table 3. CAR from this verification

CAR ID	CAR 1	Section no.	4.2	Date: 23/05/2017
Description of CAR				
The change of the starting date of the crediting period requested by the CME is not included in the correct section of the Monitoring report.				
Project participant response				Date: 30/05/2017
The change has been included in new version of Monitoring Report				
Documentation provided by project participant				
GWG CDM MR				
DOE assessment				Date: 30/05/2017
The CME has prepared a new version of the Monitoring report, and the change to the starting date of the crediting period is detailed in corresponding section, therefore, CAR 1 is closed .				

CAR ID	CAR 2	Section no.	8	Date: 23/05/2017
Description of CAR				
The emission reduction calculations are not consistent with the billing records provided to the audit team.				
Project participant response				Date: 06/07/2017
Revised emission reduction calculation spreadsheets have been provided.				
Documentation provided by project participant 2				
2017 04 17 GWG MP1 ER Calculations v2.xls				
DOE assessment 2				Date: 07/07/2017
New version of the calculations has been provided and it is correct and consistent with the billing records and SCADA registers. Therefore, CAR is closed .				

CAR ID	CAR 3	Section no.	8	Date: 23/05/2017
Description of CAR				
A mistake in the ER spreadsheet is detected: The start date of the first crediting period is stated as 1-ene-2016, which is not consistent with the starting date detailed in the Monitoring Report. On the other hand the calculations of the grid emission factor are included in the monitoring of the emission reductions.				
Project participant response				Date: 06/07/2017
Revised emission reduction calculation spreadsheets have been provided.				
Documentation provided by project participant 2				
2017 04 17 GWG MP1 ER Calculations v2.xls				
DOE assessment				Date: 07/07/2017
Dates have been modified in the new version of the spreadsheets. Nevertheless, the data included in the MR, section G.2 is not consistent with the excel spreadsheets, specifically the net electricity generation of January and February of 2017.				
Project participant response #2				Date: 20/07/2017
The change is included in the new version of the Monitoring Report.				
Documentation provided by project participant #2				
Monitoring Report revised version				
DOE assessment #2				Date: 21/07/2017
The change is appropriate, therefore, CAR is closed.				

CAR ID	CAR 4	Section no.	8.5	Date: 23/05/2017
Description of CAR				
The comparison of GHG emission reductions is not correctly included since the length of both periods is different, and therefore, they are not comparable.				
Project participant response				Date: 06/07/2017
The comparison has been modified using one year, 2016. Actual emission reductions are slightly lower compared to ex-ante forecasts due to lower irradiation levels as initially anticipated.				
Documentation provided by project participant				
Version 02 of the monitoring report				
DOE assessment				Date: 07/07/2017
Sections H.5 and H.6 of the Monitoring Report are newly edited. The comparison of GHG emission reductions with estimates in the included CPA-DD is correct and consistent. Therefore, CAR is closed.				

CAR ID	CAR 5	Section no.	8.5	Date: 01/06/2017
Description of CAR				
The template of the Monitoring Report used (version 01.0) is not the most recent one published by the UNFCCC (version 02.0, 07 June 2017)				
Project participant response				Date: 20/07/2017
The monitoring report now uses the most recent version i.e. version 02.0 of the CDM-PoA-MR-FORM				
Documentation provided by project participant				
Monitoring Report revised version				
DOE assessment				Date: 21/07/2017
The form used is appropriate, CAR is closed.				

CAR ID	CAR 6	Section no.	4.2	Date: 15/11/2017
Description of CAR				
The category of the changes required is not consistent with the Validation Report of the PRC neither with the Validation and Verification Standard for Programme of Activities, version 01.0				
Project participant response				Date: 15/11/2017
As result of the call made with the Secretariat to clarify				
Documentation provided by project participant				
Monitoring report Version 05 CPA-DD version 07				
DOE assessment				Date: 15/11/2017
As result of the incomplete detected during the <i>Information and Reporting Check</i> an inconsistency between the requirements stated in the CDM Validation and Verification Standard for Programme of Activities, and the forms for Validation of PRC and verification of POAs was detected. The concept of correction in the form is not considered as permanent changes. For that reason, the change in the number of installed solar panels was considered at the beginning as a permanent change instead a correction of the fixed information. The final revision of the documentation correctly address the categories of the changes, therefore, CAR is closed.				