


**Validation report form for post-registration changes for CDM project activities**
**(Version 01.0)**

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for post-registration changes for CDM project activities" at the end of this form.

**VALIDATION REPORT ON POST-REGISTRATION CHANGES (PRCs)**

<b>Title and reference number of the project activity</b>	Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project
<b>Process track</b>	<input checked="" type="checkbox"/> Prior approval <input type="checkbox"/> Issuance <input type="checkbox"/> Renewal of crediting period
<b>Version number of the validation report on PRCs</b>	03
<b>Completion date of the validation report on PRCs</b>	28/10/2016
<b>Type(s) of PRCs</b>	<input type="checkbox"/> Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan to a registered project activity <input checked="" type="checkbox"/> Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline <input type="checkbox"/> Changes to the project design of a registered project activity <input type="checkbox"/> Types of changes specific to afforestation and reforestation project activities
<b>Version number of PDD to which this report applies</b>	14
<b>Project participant(s)</b>	<b>Rwanda:</b> Rwanda Energy Group Ltd (REG Ltd); <b>Netherlands:</b> Netherlands' Ministry of Infrastructure and the Environment (IenM); <b>Germany:</b> BASF SE; KfW; <b>Austria:</b> Kommunalkredit Public Consulting GmbH; <b>Denmark:</b> Maersk Olie og Gas A/S; DONG Naturgas A/S; Nordjysk Elhandel A/S; Danish Ministry of Climate, Energy and Building/Danish Energy Agency; Aalborg Portland A/S; <b>Sweden:</b> Goteborg Energi AB; <b>Italy:</b> Government of Italy - Ministry for the Environment,

	<p>Land and Sea;</p> <p>Belgium: Bruxelles Environnement – IBGE; Walloon Region: Walloon Air and Climate Agency;</p> <p>Spain: Kingdom of Spain - Ministry of Agriculture, Food and Environment and Ministry of Economy and Competitiveness; EDP - Energias de Portugal, S.A.; Endesa Generación, S.A.; Gas Natural SDG, S.A.; Hidroeléctrica del Cantábrico, S.A.;</p> <p>Finland: Ruukki Metals Oy;</p> <p>Norway: Statoil ASA; Statkraft Carbon Invest AS;</p> <p>Switzerland: Schweizerische Rückversicherungsgesellschafts AG (Swiss RE);</p> <p>Japan: Daiwa Securities Co., Ltd.; Fujifilm Corporation; Idemitsu Kosan Co., Ltd.; JX Nippon Oil &amp; Energy Corporation; The Okinawa Electric Power Corporation, Inc.;</p> <p>Luxembourg: Ministry of Sustainable Development and Infrastructure</p> <p>Bilateral and Multilateral Funds: International Bank for Reconstruction and Development (IBRD) as Trustee of the Community Development Carbon Fund (CDCF)</p>
<b>Host Party</b>	Rwanda
<b>Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)</b>	3
<b>Name of DOE</b>	Spanish Association for Standardization and Certification - AENOR
<b>Name, position and signature of the approver of the validation report on PRCs</b>	 <p>Luis Robles Olmos Manager of Climate Change Unit AENOR</p>

## SECTION A. Executive summary

The Spanish Association for Standardisation and Certification (AENOR) was contracted to perform the verification for the second monitoring period of the project activity “Rwanda: Electrogaz Compact Fluorescent Lamp (CFL) distribution project” (Registration Ref. No. 3404).

The project activity was implemented by the National Public Electricity utility, Electrogaz. The company changed its name in August 2009 for RECO RWASCO, in 2011 for EWSA and in 2013 as EWSA Ltd. In 2014 it was split into two entities namely REG Ltd and WASAC Ltd. The project entity's name is now REG Ltd.

The project activity was designed with two components:

- Component 1: Existing grid-connected customers will exchange incandescent lamps of a range of 25 to 100 watts for high-quality self-ballasted compact fluorescent lamps (CFLs) of a range up to 20 watts.
- Component 2: new REG Ltd customers will receive a capped number of CFLs with their new electricity meter at the time of the connection, as a “package”. Therefore, as the new customers did not have electric lighting spot in their unit before the connection to the grid, the CFLs are installed in new lighting spots, and there is no exchange with ICL in this case.

The CFL distribution project is implemented through several phases starting mid-2007 to 2010. A pilot phase (or phase 1) was completed in August-September 2007 with the distribution of 50,000 CFLs. A maximum of 2 CFLs were provided in exchange of incandescent lamps (ICLs). The second phase, started in September 2008, distributing 150,000 CFLs over the residential sector, up to 5 CFLs per household at a price of RWF200 (US\$0.37) per bulb and in exchange of incandescent lamps. The third phase (200,000 CFLs) and the fourth phase (400,000 CFLs) were implemented respectively by the middle of 2009 and the middle of 2010.

The light bulb distribution was made through the decentralized distribution outlets run by REG Ltd (named the antennas in Kigali or the stations in the rural areas of the rest of the country).

During the on-site visit, some corrections in the project description, and permanent changes to the monitoring plan were identified by the audit team. In accordance with paragraph 267 of the CDM Project Standard version 09.0, the project participant shall identify and document any actual or proposed changes to the operation, implementation and/or monitoring of the registered CDM project activity taking into account the types of changes described in appendix 1, which describes the types of changes that do not require prior approval by the Board. This validation report has been prepared in order to evaluate and to assess all the changes detected. The list of the changes detected is detailed below:

- Corrections:
  - To change the name of the project participant in accordance with the notification made to the UNFCCC. REG Ltd is used in the revised PDD replacing Electrogaz.
  - To list project participants as per the UNFCCC webpage since the registered PDD was not consistent.
  - To include the parameter fixed ex ante “Percentage of lamps of type i operating at the rated lifetime (Ri)” that was not listed in the registered PDD. It is a default value provided by applied methodology AMS.II.J version 07.
  - To update the list of parameters fixed ex ante and parameters to be monitored.
- Permanent changes:
  - To adopt all the requirements of methodology AMS-II.J version 07 to Component 1 and Component 2 as it was recommended by the SSCWG during the 50th meeting.
  - To include a sampling plan defined according to the Standard: Sampling and surveys for CDM project activities and programme of activities” version 05.0

This validation report has been prepared taking into account the different nature of the changes required (with and without prior approval by the Board), and in accordance with paragraph 157 of the PCP version 09, AENOR has combined the changes into just one request for approval. This validation report contains the description of the post registration changes, including their nature, extent of the non-conforming monitoring and the proposed alternative monitoring of the project activity, as well as any other complementary information required by the latest versions of the PCP, PS and VVS.

AENOR confirms that:

- The transfer of information from the old form of the PDD registered (F-CDM-SSC-PDD version 03.) into the new form under VVS track (F-CDM-SSC-PDD Version 08.0) is totally correct and materially the same.
- The proposed revision points have been described, and an assessment has been provided to substantiate the reason for each of the proposed revision points of the revised PDD using objective evidences.
- The changes regarding the monitoring of several parameters are necessary to ensure a conservative monitoring and a realistic approach. They are in accordance with the approved methodologies applicable to the project activity and they ensure the conservativeness of the emission reductions calculation.

For all the reasons stated above, it is AENOR opinion that prior approval by the Board is necessary for these post registration changes and therefore AENOR is submitting the post registration changes for acceptance by the Board including following documents:

- Revised PDD clean – version 14.
- Revised PDD with tracked changes – version 14.
- Validation report of the Post Registration of changes – version 03

## SECTION B. Validation team, technical reviewer and approver

The list of involved personnel and the qualification status are summarised in the table below.

### B.1. Validation team member

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)	Validation findings
1.	Team Leader	IR	GARCÍA MADERO	Mercedes	AENOR	√	√	√	√
2.	Validator	IR	MEDRANO GUTIERREZ	Alfonso	AENOR	√	√	√	√

### B.2. Technical reviewer and approver of the validation report on PRCs

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	GESTO VILACOBÁ	Jose Antonio	AENOR

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
2	Technical reviewer	IR	GONZÁLEZ GALÁN	M <sup>a</sup> Carmen	AENOR
3	Approver	IR	ROBLES OLMOS	Luis Fernando	AENOR

## SECTION C. Means of validation

### C.1. Desk review

The scope of the desk review process is to assess all changes from the project activity as described in the revised project design document, including their negative impact on the estimates of the emissions reductions, the level of accuracy of the monitoring activity, the additionality or scale of the project and the applicability and application of approved methodologies.

The following documents were reviewed as part of the scope of the activity:

- PDD /1/ and monitoring plan registered
- Methodology: ASM.II.C version 11.0 /2/.
- Methodology: ASM.II.J version 03.0 /3/.
- Methodology: ASM.II.C version 15.0 /17/.
- Methodology: ASM.II.J version 07.0 /16/.
- CDM Validation and Verification Standard, version 09.0 /4/.
- Clean Development Mechanism Project Cycle Procedure, version 09.0 /5/.
- Clean Development Mechanism Project Standard, version 09.0 /6/.
- Sampling and surveys for CDM project activities and programme of activities, version 05 /7/.
- Guidelines for sampling and surveys for CDM project activities and programme of activities, version 04 /8/.
- SS WG 50 meeting report /20/
- Associated documentation (design documentation, manufacturer documentation, internal procedures, etc.)
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board.
- The applied monitoring methodology, paying close attention to the frequency of measurements, the quality of metering equipment 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.

A complete list of all documents reviewed is attached in Appendix 3 of this report.

**C.2. On-site inspection**

Duration of on-site inspection: 27/04/2015 to 30/04/2015				
No.	Activity performed on-site	Site location	Date	Team member
1.	<p>A review of information flows for generating, aggregating and reporting the monitoring parameters.</p> <p>A cross-check between information provided in the Monitoring Report and data from REG Ltd. data base.</p> <p>A check of the monitoring practices against the requirements of the PDD and the selected methodologies.</p> <p>A review of calculations and assumptions made in determining the GHG data and emission reductions.</p> <p>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.</p> <p>Interviews with relevant personnel of REG. Ltd. to confirm that the operational and data collection procedures are implemented.</p> <p>Desk review including the data base and the surveys reports</p>	KN 82 st 3   PO Box 537 Kigali	27/04/2015	<p>Alfonso MEDRANO GUTIERREZ</p> <p>Mercedes GARCÍA MADERO</p>
2	A review of the sampling procedures performed by the PP.	KN 82 st 3   PO Box 537 Kigali	27/04/2015	<p>Alfonso MEDRANO GUTIERREZ</p> <p>Mercedes GARCÍA MADERO</p>
3	<p>An assessment of the implementation and operation of the project activity as per the registered PDD.</p> <p>Interviews with a sample of households in order to check the implementation and monitoring of the project activity.</p>	Different branches around Rwanda country.	28/04/2015-30/04/2015	<p>Alfonso MEDRANO GUTIERREZ</p> <p>Mercedes GARCÍA MADERO</p>

**C.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	MUGIRANEZA NGIRUMPATSE	Viateur	REG Ltd. Project coordinator	27/04/2015-30/04/2015	Assessment of the implementation and operation of the project activity as per the registered PDD.	<p>Alfonso MEDRANO GUTIERREZ</p> <p>Mercedes GARCÍA MADERO</p>
2	NIYONSENGA	Ildephonse	External consultant	27/04/2015	Sampling design and monitoring practise	<p>Alfonso MEDRANO GUTIERREZ</p> <p>Mercedes GARCÍA MADERO</p>

3	MARCOS HUIDOBRO	Patricia	World Bank	27/04/2015-30/04/2015	Assessment of the implementation and operation of the project activity as per the registered PDD.	Alfonso MEDRANO GUTIERREZ Mercedes GARCÍA MADERO
4	BOUKERCHE	Sandrine	World Bank	27/04/2015-30/04/2015	Assessment of the implementation and operation of the project activity as per the registered PDD.	Alfonso MEDRANO GUTIERREZ Mercedes GARCÍA MADERO

#### C.4. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form			
Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline			
Corrections		<b>CAR1</b>	
Changes to the start date of the crediting period			
Inclusion of a monitoring plan to a registered project activity			
Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline			
Changes to the project design of a registered project activity			
Types of changes specific to afforestation and reforestation project activities			
Others (please specify)			
<b>Total</b>	<b>0</b>	<b>1</b>	<b>0</b>

### SECTION D. Validation findings

#### D.1. Compliance with PDD form

<b>Means of validation</b>	<p>During desk review process, the compliance of the revised PDD (both in tracked-change and clean versions) with the valid version of the applicable PDD form and the <i>Instructions for filling out the PDD form</i> was checked.</p> <p>The project participant has used the latest version of the PDD form (version 08) for the revised PDD. All sections, titles, tables, have been revised and crosschecked against the <i>Instructions for filling out the PDD form</i> and they were correct.</p>
<b>Findings</b>	No finding has been detected regarding the use of the new form.
<b>Conclusion</b>	The proposed revised PDD has adopted the Project Design Document Form for Small Scale CDM Project of Activities (CDM-SSC-PDD-FORM) Version 08. AENOR has assessed the information included comparing with which was included in the registered PDD (CDM-SSC-PDD-FORM version 03) due to the fact that it was registered under the previous regulatory framework (VVM track). Once compared

	both versions, it is AENOR opinion that the information included in the new form is materially the same as the information in the registered PDD. The changes that are the subject of the request for approval have been highlighted.
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## D.2. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

<b>Means of validation</b>	By means of desk review no temporary deviation from the registered monitoring plan has been detected.
<b>Findings</b>	No finding has been raised
<b>Conclusion</b>	No temporary deviation from the monitoring plan has been detected.

## D.3. Corrections

<b>Means of validation</b>	<p><b>1. To change the name of the project participant in accordance with the notification made to the UNFCCC. REG Ltd is used in the revised PDD replacing Electrogaz.</b></p> <p>At the time of registration, REG Ltd was known as Electrogaz. The utility changed its name in August 2009 for RECO RWASCO, in 2011 for EWSA and in 2013 as EWSA Ltd. In 2014 it was split into two entities namely REG Ltd and WASAC Ltd. The project entity's name is now REG Ltd. The change does not impact project legal terms and implementation. For coherence in the document, only "REG Ltd" is used in the PDD to refer to the project entity. This change was notified to the UNFCCC on 30 April 2015, and this document has been checked by the audit team and names are consistent.</p> <p><b>2. To list project participants as per the UNFCCC webpage since the registered PDD was not consistent with it.</b></p> <p>The list of project participants included in the new revised PDD is consistent with list included in the UNFCCC webpage and supported with written approvals /10/ and authorizations /11/ of all the DNAs involved in the project activity and checked by the audit team. All this information is considered appropriate and consistent by the audit team.</p> <p><b>3. To include the parameter fixed ex ante "Percentage of lamps of type i operating at the rated lifetime (R<sub>i</sub>)" that was not listed in the registered PDD. It is a default value provided by applied methodology AMS.II.J version 07.</b></p> <p>The inclusion of this parameter is appropriate since it is required by the methodology and applied in the ex-ante calculation of the emission reductions. During the two first verifications this parameter has been correctly used in the calculations in accordance with the applied methodologies. Therefore, this correction improves the quality of the information included in the revised PDD and confirms that the calculations are made in accordance with the applied methodologies.</p> <p><b>4. To update the list of parameters fixed ex ante and parameters to be monitored.</b></p> <p>The order of the parameters fixed and monitored included in the registered PDD was not completely correct since there were several parameters monitored included in the section of parameters fixed at validation. Therefore, in order to improve the quality of the information stated in the revised PDD, the consistency with both applied methodologies, and to improve the transparency, these two sections have</p>
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	been modified and reorganized.
<b>Findings</b>	<p><b>CAR 1 – The list of parameters to be monitored during the crediting period included in section B.7.1 of the PDD is not complete according to the applied methodologies.</b></p> <p>Both sections in the revised PDD have been modified and improved, and they are in accordance with the applied methodologies.</p>
<b>Conclusion</b>	<p>It is confirmed by the audit team that the information regarding the project participants included in the revised PDD is consistent with letters of Approval and information hosted in the UNFCCC website.</p> <p>On the other hand, it is AENOR opinion that the edition of the sections B.6.2 and D.7.1 have been improved, completed and ordered in accordance with the applied methodology AMS.II.J. version 07 as it is justified below. The consistency and accuracy has been improved in the revised PDD. These parameters were taken into consideration in the calculations in accordance with the applied methodologies, so, the correction is requested to improve the consistency and clarity of the monitoring process of all the parameters involved in the estimate of the emission reduction calculations.</p> <p>AENOR confirms that according to paragraph 275 and Appendix 1 (paragraph 1) of the CDM Project Standard version 09.0 the corrections requested by the PP do not require prior approval by the EB because do not affect the design of the project activity.</p>

#### D.4. Changes to the start date of the crediting period

<b>Means of validation</b>	By means of desk review no changes to the start date of the crediting period has been detected.
<b>Findings</b>	No finding has been raised
<b>Conclusion</b>	No changes to the start date of the crediting period has been detected.

#### D.5. Inclusion of a monitoring plan to a registered project activity

<b>Means of validation</b>	Not applicable since the monitoring plan was included in the registered PDD.
<b>Findings</b>	Not applicable
<b>Conclusion</b>	Not applicable

#### D.6. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

<b>Means of validation</b>	<p>1) To adopt all the requirements of methodology AMS-II.J version 07 to Component 1 and Component 2 as it was recommended by the SSCWG during the 50<sup>th</sup> meeting.</p> <p><b><u>The reason why the adoption of all the requirements of methodology AMS-II.J version 07 to Component 1 is requested</u></b> is to apply the changes to Lamp Failure Rate (LFR<sub>i,y</sub>) calculation as may be indicated by ex post monitoring survey results according to the methods described in paragraph 30 of methodology AMS-II.J version 07 to allow claiming emission reductions for lamps that are still operational beyond the rated average lifetime.</p> <p>The Lamp Failure Rate (LFR<sub>y</sub>) is the percentage of lamps that have failed during a year. The rated lifetime is used to calculate the ex-ante Lamp Failure Rate as follows:</p>
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$$LFR_{i,y} = y * X_i * (100 - R_i) / (100 * L_i) = 0.5 * y * X_i / L_y$$

Where:

$LFR_{i,y}$  = Lamp Failure Rate for equipment type i in year y (fraction)

$L_i$  = Rated average life for equipment type i (hours)

$R_i$  = Percentage of lamps of type i operating at the rated lifetime ( use a value of 50)

$X_i$  = Number of operating hours per year for equipment type i ( hours)

y = Counter for year

The result of the third ex-post surveys carried out for the project activity, indicated that for Phase 1 and Phase 2, the lamp failure rates were 47.3% and 40% respectively at the rated lifetime of the lamps. As a consequence of the failure rate calculation in AMS-II.J. version 03, no CER could be claimed beyond the rated lifetime while energy savings are still being generated by the lamps that are still operation.

In order to avoid this situation and to allow to account for the ER to be generated until the end of the crediting period, the PP is requesting to apply changes to Lamp Failure Rate ( $LFR_{i,y}$ ) as may be indicated by ex post monitoring survey results according to the methods described in methodology AMS-II.J version 07.

According to paragraph 30 of methodology AMS-II.J version 07, changes to Lamp Failure Rate ( $LFR_{i,y}$ ) and treatment of differences between Rated Average Life and Average Life for adjustment of Net Electricity Savings (NESy): the Net Electricity Savings shall be modified for changes to the Lamp Failure Rate as may be indicated by ex post monitoring survey results. The modifications shall be made using the following methods:

- (a) Calculated  $LFR_{i,y}$  values in equation above shall be used for the periods when ex post monitoring surveys are not conducted;
- (b) However, when ex post monitoring surveys are conducted (i.e. year 1, 4, 7), actual failure rates determined through the survey shall be used instead of the calculated  $LFR_{i,y}$  values in equation (3);
- (c) For subsequent years beginning from the first calculation year after completion of the ex-post monitoring survey, a new value for  $L_i$  shall be determined using equation (3) and newly calculated values of  $LFR_{i,y}$  shall be used. The adjustment of  $L_i$  and  $LFR_{i,y}$  should be repeated every time when ex post monitoring surveys are conducted.

AENOR confirms that the revised PDD has been appropriately updated to include all the procedures and requirements stated in AMS-II.J version 07 approved during EB89 to allow projects applying these methodologies that can still operate beyond the rated lifetime to continue earning emission reductions.

AENOR confirms that, according to paragraph 314 of the VVS version 09, the application of methodology AMS.II.J version 07 to the ERs calculation stated in the revised PDD does not impact the conservativeness of the monitoring, verification and calculation of ERs for the following reasons:

- Methodology AMS II.J was updated to version 07 by the EB to improve some issues related to monitoring and verification detected during the verification of different projects applying the older versions. The way to calculate  $LFR_{i,y}$  in previous versions of this methodology did not allow to the PPs to account for the ERs beyond the rated lifetime, while energy savings were still being generated by the lamps that are still operation. Therefore, it is AENOR opinion that applying the new version of the methodology is more accurate due to the fact that the ERs to be requested would be in line with the actual energy savings generated by the lamps, that would not have been considered applying the previous versions.
- All the procedures stated in methodology AMS II.J version 07 have been properly explained and applied in the revised PDD. The project meets all the applicability conditions which are the same than the ones stated in AMS II.J version 03.
- The monitoring plan and the equations used in both versions of the methodology (version 03 and version 07) to calculate the ERs are exactly the same, the only difference between them is the option introduced by paragraph 30 of version 07 to allow the use of the results that may be indicated by ex post monitoring survey results to calculate parameter  $LFR_{i,y}$ .

- Apart from parameter  $LFR_{i,y}$ , the other parameters are monitored in the same way using both versions of the methodology and therefore there are not significant differences in the way to calculate ERs between both versions.

AENOR has validated that for the ex-ante calculation of the parameter  $LFR_{y,i}$  the default value of  $R_i$  of 50% proposed by the applied methodology has been properly applied. AENOR has also validated the ex-ante ERs calculation included in the revised PDD /19/ and concludes that the new calculation is conservative and consistent with the applied methodology.

Finally, AENOR confirms that the revised PDD has been properly updated and complies with all the requirements of the new version of the methodology, AMS II.J version 07.

On the other hand, it is noted, that this project is located in a Least Developed Country, Rwanda, and using the real value of the LFR will help to To incentivize the implementation of this type of project to reduce GHG emissions, not increasing the cost of monitoring to implement the project activity in a sector considered as a priority by the EB ([http://cdm.unfccc.int/EB/051/eb51\\_repan11.pdf](http://cdm.unfccc.int/EB/051/eb51_repan11.pdf))

The reasons why the adoption of all the requirements of methodology AMS-II.J version 07 to Component 2 is requested are summarized below:

**a) *The difficulties to monitor parameter  $O_i$  “Average annual operating hours of the devices of the group of I baseline devices”.***

According to AMS II-C version 11 this parameter shall be monitored continuously using run time meters to be installed in a sample equal to 0.1% of the total CFLs distributed. This is considered a costly monitoring system, difficult to implement in the particular case of this project located in a LDC like Rwanda. However, if methodology AMS-II.J version 07 would be applied to Component 2, a default value of 3.5 hours could be applied to this parameter as it has been applied to Component 1.

Practically, the only difference between Component 1 and Component 2 is that Component 2 is for installation of energy efficient lamps in the premises of new REG customers while Component 1 is for the replacement of existing incandescent lamps. Other than that, the two components are implemented in same areas supplied by the same national grid and households have the same lighting needs. The operating hours of the lamps in these households are reasonably deemed the same. Therefore, it is justified to apply the same default operating hours for the two components.

AENOR confirms that the use of a default value in both components of the project activity will avoid costly monitoring system and the ex post monitoring effort will be substantially reduced. There is greater certainty with respect to the likely amount of CER generation for implementer, facilitating a conservative calculation of emission reductions.

On the other hand, adopting 3.5 h as default value add on the conservativeness in the ER calculation. In fact, in the previous verification process, AENOR verified a value of 4.4 hours for the average of operating hours in Component 2, which clearly demonstrates that the default value of 3.5 hours is conservative.

**b) *The difficulties to perform annual checks of a sample of non-metered systems to ensure that they are still operating.***

According to paragraph 14 of AMS II-C version 11, annual checks shall be made in order to obtain the percentage of functioning non-metered CFLs used to discount the energy savings and thus emission reductions. However, as per AMS-II.J (Version 07), ex-post surveys for Component 1 shall be conducted once in the first year of installation, and then once every 3 years. In order to be consistent with component 1 and to reduce substantially the cost of carrying out annual surveys the PP is requesting to carry out the monitoring surveys of both components at the same time and once every 3 years as it is allowed by paragraph 29 of methodology AMS-II.J version 07

AENOR verified that during these surveys, the viability and longevity of the CFLs are evaluated as well as capturing other information in relation to the use of CFLs

per household.

AENOR confirms that, using a longer survey interval will result in higher failure rate values as the lamps depreciation rate increases over time. Hence, the emission reductions derived for Component 2 will be conservative and lower than (or equal) to the emission reductions using annual checks of non-metered lamps as required by AMS-II.C. version 11- For instance, the formula to calculate the lamp failure rate in AMS-II.J indicates that the failure rate is time dependent and increase over time. The result of the third ex-post surveys carried out for the project activity, indicated that for Phase 1 and Phase 2, the lamp failure rates were 47.3% and 40% respectively at the rated lifetime of the lamps. Therefore, these results confirm that the percentage of lamps that are not working increase from one survey to another.

Finally, AENOR has also validated the ex-ante ERs calculation /19/ included in the revised PDD and concludes that the new calculation is conservative and consistent with the applied methodology, AMS-II.J version 07.

**2) To include a sampling plan defined according to the Standard: Sampling and surveys for CDM project activities and programme of activities” version 05.0**

The registered PDD included the procedures for conducting the surveys stated in paragraph 17 of methodology AMS-II.J, version 03, however, in order to improve the procedures for surveying and to make them consistent with the CDM Standards, the PP has decided to update the registered PDD in order to include the provisions stated in the Standard: “Sampling and surveys for CDM project activities and programme of activities” version 05.0.

AENOR has verified that the surveys carried out for the first and second monitoring period /14/ complied with the requirements stated in the registered PDD and the applied methodology AMS-II.J, version 03. The last survey used to monitor parameters within the second monitoring period was carried out in September 2013. That survey was the last survey designed according to the procedures stated in methodology AMS-II.J, version 03. The PP is requesting to apply this PRC to the next surveys to be carried out from September 2013 to the end of the crediting period.

AENOR considers that since that survey was already carried out and it was consistent with the requirements applied in the registered PDD that were in force that time, the change proposed is appropriate. Therefore the accuracy of the survey carried out before September 2013 were in line with the requirements of the applied methodology and PDD and in the future.

AENOR has verified that the updated sampling plan included in the revised PDD has been designed in accordance with the “Standard: Sampling and surveys for CDM project activities and programme of activities” version 05 and the “Guideline: Sampling and surveys for CDM project activities and programmes of activities.

AENOR has verified that the objective of the sampling plan is to determine the lamp failure rate on which basis the percentage of lamps that are still operating will be derived to discount the emission reductions. As such ex-post monitoring surveys will be implemented to collect the needed data on a sample of lamps to calculate the lamp failure rate following the monitoring requirements described in AMS-II.J.

AENOR verified that a 90/10 confidence/precision will be used as the criteria for reliability of sampling efforts as per the “Standard for Sampling and Surveys for CDM Project activities and Programme of Activities” version 05.0.

AENOR verified that a simple random sampling method will be used and applied to each Phase separately so that the failure rate is derived for each phase. Each element of the sample will be drawn randomly from the total population. The sample size is calculated using the confidence level of 90% with 10% relative precision /18/. In accordance with the “Guidelines for sampling and surveys for CDM project activities and programme of activities”, Version 04.0, the equation to give the approximate required sample size is:

$$n = \frac{1.645^2 (1 - p)}{0.1^2 \times p}$$

Where:

	<ul style="list-style-type: none"> <li>• <math>n</math> Sample size</li> <li>• <math>p</math> Expected proportion of CFLs that are still operating (minimum 0.50 in all groups)</li> <li>• 1.645 Represents the 90% confidence required</li> <li>• Represents the 10% relative precision</li> </ul> <p>The sample size of CFL to be surveyed is therefore:</p> $(1.6452 \times 0.5) / (0.12 \times 0.5) = 271$ <p>Therefore, it is considered that the project participant has modified the monitoring plan applying the sampling guidelines from the UNFCCC in order to improve the accuracy of the information to be verified. After reviewing all evidence required to the project participants, the audit team considers that the corrected information is an accurate reflection of the actual project information.</p>
<b>Findings</b>	No finding has been detected.
<b>Conclusion</b>	<p>AENOR confirms that the revised PDD has been appropriately updated to take into consideration the modifications explained above, so, the permanent changes proposed are considered to be appropriate because:</p> <ul style="list-style-type: none"> <li>• The default value of 3.5 hours/day is more conservative than the value monitored during the first monitoring period (4.4 hours/day).</li> <li>• Using a longer interval to survey is conservative since it implies higher failure rate values.</li> <li>• Allowing the results of the same surveys to be used for both components will improve the consistency of the sampling process and will reduce the costs.</li> <li>• The reducing of the cost of monitoring parameter <math>O_i</math> "Average annual operating hours of the devices of the group of <math>I</math> baseline devices" will allow to implement the project activity in a sector considered as a priority by the EB (<a href="http://cdm.unfccc.int/EB/051/eb51_repan11.pdf">http://cdm.unfccc.int/EB/051/eb51_repan11.pdf</a>)</li> <li>• The changes requested by the PP, related to the use of AMS-II.J version 07 were suggested by the SSCWG during the 50th meeting.</li> <li>• The ex-ante ERs calculation has been properly updated to comply with the requirements of the applied methodology.</li> <li>• The sampling plan included in the revised PDD complies with the requirements stated in the "Standard for Sampling and Surveys for CDM Project activities and Programme of Activities" version 05.0 and the "Guidelines for sampling and surveys for CDM project activities and programme of activities", Version 04.0.</li> </ul> <p>AENOR confirms that according to paragraphs 284-287 and Appendix 1 (paragraphs 4 and 5) of the CDM Project Standard version 09.0 the permanent changes requested by the PP require prior approval by the EB.</p>

#### D.7. Changes to the project design of a registered project activity

<b>Means of validation</b>	By means of desk review no changes to the project design has been detected.
<b>Findings</b>	No finding has been raised.
<b>Conclusion</b>	No changes to the Project design has been detected.

#### D.8. Types of changes specific to afforestation and reforestation project activities

<b>Means of validation</b>	Not applicable
<b>Findings</b>	Not applicable

Conclusion	Not applicable
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**SECTION E. Internal quality control**

Following the completion of the assessment process by the validation team, all documentation undergoes an internal quality control through a technical review before submission to the CDM-EB. The technical reviewer is a qualified member of AENOR, independent from the team that carried out the validation of the post registration changes. The technical review team has collectively all the competence required including the technical area(s).

## SECTION F. Validation opinion

AENOR was contracted to perform the verification of the CDM project activity: "Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project" (Registration Ref. No. 3404) for the monitoring period from 1<sup>st</sup> August 2012 to 31<sup>st</sup> March 2014, and during the on-site visit, the post-registration changes were identified by the audit team.

AENOR has performed the validation of the proposed changes according to the approved methodology AMS.II.J version 07, and CDM Validation and verification Standard (Version 09), CDM Project Standard (version 09) and Project cycle procedure (Version 09).

AENOR planned and performed its work to obtain the information and explanations considered necessary to provide sufficient evidence to give reasonable assurance that the level of accuracy of GHG emission reductions, prepared on the basis of the monitoring plan included in the revised PDD compared with registered monitoring plan of the project is not adversely affect. This assessment included:

- Collection of evidence supporting the reported data.
- Checking whether the provisions of the revised monitoring plan, were consistently and appropriately applied.

This revision improves the accuracy of information provided and consistency in the revised PDD and the monitoring plan.

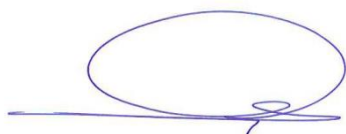
Furthermore, AENOR confirms that:

- The transfer of information from the old form of the PDD registered (F-CDM-SSC-PDD version 03) into the new form under VVS track (F-CDM-SSC-PDD Version 08.0) is totally correct and materially the same.
- The proposed revision points have been described, and an assessment has been provided to substantiate the reason for each of the proposed revision points of the revised PDD and management system, using objective evidences.
- The changes regarding the monitoring of several parameters are necessary to ensure a conservative monitoring and a realistic approach. They are in accordance with the approved methodologies applicable to the project activity and they ensure the conservativeness of the emission reductions calculation.

AENOR has combined the changes into just one request for approval taken into consideration the different nature of the changes required (with and without prior approval by the Board).

For all the reasons stated above, it is AENOR opinion that prior approval by the Board is necessary for these post registration changes and therefore AENOR is submitting the post registration changes for acceptance by the Board.

Madrid, 28<sup>th</sup> October 2016



Luis Robles Olmos

Authorized person



Mercedes García Madero

Validation Team Leader

## Appendix 1. Abbreviations

Abbreviations	Full texts
AENOR	Spanish Association for Standardisation and Certification
AMS.II.C	Demand-side energy efficiency activities for specific technologies
AMS.II.J	Demand-side activities for efficient lighting technologies
CAR	Corrective action request
CDM	Clean development mechanism
CDM-EB	CDM Executive Board
CER	Certified emission reduction
CL	Clarification request
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNA	Designated national authority
DOE	Designated operational entity
ER	Emission reduction
FAR	Forward action request
GHG	Greenhouse gas(es)
MoV	Means of verification
MP	Monitoring Plan
MR	Monitoring report
MW	Megawatt
PCP	Clean Development Mechanism Project Cycle Procedure (Version 09.0)
PDD	Project Design Document
PP	Project participants
PS	Clean Development Mechanism Project Standard (Version 09.0)
tC	Carbon tonnes
tCO <sub>2</sub> eq	Carbon dioxide equivalent tonnes
UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM Validation and Verification Standard version 09.0



## Appendix 2. Competence of team members and technical reviewers

### CERTIFICATE OF QUALIFICATION

**Subject:** Validation of PRC and Technical Review Team for “Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project”

Madrid, 28<sup>th</sup> October 2016

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 validation process of the above mentioned project activity:

Name: **Mercedes García Madero**

CDM Team leader: Yes


CDM Validator: Yes

CDM Verifier: Yes

External Technical Expert: No

Technical areas related with the project activity:

T.A 3.1 Energy demand.



Luis Robles Olmos  
Climate Change Manager

## CERTIFICATE OF QUALIFICATION

**Subject:** Validation of PRC and Technical Review Team for “Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project”

Madrid, 28<sup>th</sup> October 2016

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 validation process of the above mentioned project activity:

Name: **Alfonso Medrano Gutierrez**

CDM Team leader: Yes

CDM Validator: Yes

CDM Verifier: Yes

External Technical Expert: No

Technical areas related with the project activity:

T.A 3.1 Energy demand.

A handwritten signature in black ink, consisting of a large, loopy 'L' followed by a series of smaller, connected loops and a final horizontal stroke.

Luis Robles Olmos

Climate Change Manager

## CERTIFICATE OF QUALIFICATION

**Subject:** Validation of PRC and Technical Review Team for “Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project”

Madrid, 28<sup>th</sup> October 2016

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 validation process of the above mentioned project activity:

Name: **Jose Antonio Gesto Vilacoba**

CDM Team leader: Yes

CDM Validator: Yes

CDM Verifier: Yes

External Technical Expert: No

Technical areas related with the project activity:

T.A 3.1 Energy demand.

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Luis Robles Olmos

Climate Change Manager

## CERTIFICATE OF QUALIFICATION

**Subject:** Validation of PRC and Technical Review Team for “Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project”

Madrid, 28<sup>th</sup> October 2016

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 validation process of the above mentioned project activity:

Name: **M<sup>a</sup> Carmen González Galán**

CDM Team leader: Yes

CDM Validator: Yes

CDM Verifier: Yes

External Technical Expert: No

Technical areas related with the project activity:

T.A 3.1 Energy demand.

A handwritten signature in black ink, consisting of a large, loopy 'O' followed by a horizontal line and some smaller, less distinct strokes.

Luis Robles Olmos

Climate Change Manager

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	RECO Ltd.	Registered PDD Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project  Revised PDD Rwanda Electrogaz Compact Fluorescent Lamp (CFL) distribution project	Version 12 – February 2010  Version 13 – 13/11/2015	UNFCCC
2	UNFCCC	Methodology: AMS.II.C Demand-side energy efficiency activities for specific technologies	Version 11.0	UNFCCC
3	UNFCCC	Methodology: AMS.II.J Demand-side activities for efficient lighting technologies	Version 03.0	UNFCCC
4	UNFCCC	CDM Validation and Verification Standard	Version 09.0.	UNFCCC
5	UNFCCC	Clean Development Mechanism Project Cycle Procedure.	Version 09.0.	UNFCCC
6	UNFCCC	Clean Development Mechanism Project Standard	Version 09.0.	UNFCCC
7	UNFCCC	Sampling and surveys for CDM project activities and programme of activities	Version 04.1	UNFCCC
8	UNFCCC	Guidelines for sampling and surveys for CDM project activities and programme of activities	Version 03.1	UNFCCC
9	UNFCCC	Instructions for filling out the validation report form for post-registration changes for CDM project activities	Version 01.0	UNFCCC
10	UNFCCC	Letters of Approval of: Rwanda, Netherlands, Germany, Austria, Denmark, Sweden, Italy, Belgium, Spain, Finland, Norway, Switzerland, Japan and Luxembourg.		UNFCCC
11	UNFCCC	Written authorizations of: Rwanda, Netherlands, Germany, Austria, Denmark, Sweden, Italy, Belgium, Spain, Finland, Norway, Switzerland, Japan and		UNFCCC

		Luxembourg		
12	UNFCCC	EB 85 report, para. 56		UNFCCC
13	UNFCCC	meeting report of the CDM-SSCWG48		UNFCCC
14	Ildephonse Niyonsenga	First, second and third phases post installation survey-final report	September 2013	RECO Ltd.
15	RECO Ltd.	Terms of reference of the survey		RECO Ltd.
16	UNFCCC	Methodology: AMS.II.J Demand-side activities for efficient lighting technologies	Version 07.0	UNFCCC
17	UNFCCC	Methodology: AMS.II.C Demand-side energy efficiency activities for specific technologies	Version 15.0	UNFCCC
18	RECO Ltd	Sample size calculation spreadsheets		RECO Ltd
19	RECO Ltd	ERs calculation_Rwanda_August2016		RECO Ltd
20	UNFCCC	SS WG 50 meeting report		UNFCCC

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

Table 1. CL from this validation

CL ID	xx	Section no.		Date: DD/MM/YYYY
Description of CL				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 2. CAR from this validation

CAR ID	1	Section no.		Date: 04/08/2016
Description of CAR				
The list of parameters to be monitored during the crediting period included in section B.7.1 of the PDD is not complete according to the applied methodologies.				
Project participant response				Date: 09/08/2016
Section B.7.1 in the revised PDD has been modified and improved, and it is in accordance with the applied methodologies.				
Documentation provided by project participant				
Revised PDD.				
DOE assessment				Date: 10/08/2016
A new request for correction has been included in this report. New version of the revised PDD has been edited in order to improve the quality of the information stated in the revised PDD, the consistency with both applied methodologies, and to improve the transparency. The reorganization of the parameters is considered appropriate, and therefore, this CAR is closed.				

Table 3. FAR from this validation

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