




**Validation report form for renewal of crediting period for  
CDM project activities  
(Version 03.0)**

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

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the project activity</b>	Modelo del Callao Landfill Gas Capture and Flaring System UNFCCC ref. no: 5619
<b>Number and duration of the next crediting period</b>	Second crediting period (20/08/2019 to 19/08/2026)
<b>Version number of the validation report</b>	1
<b>Completion date of the validation report</b>	30/09/2020
<b>Version number of PDD to which this report applies</b>	7
<b>Project participants</b>	PETRAMAS S.A.C.
<b>Host Party</b>	Perú
<b>Applied methodologies and standardized baselines</b>	ACM0001: Flaring or use of landfill gas --- Version 19.0
<b>Mandatory sectoral scopes</b>	Sectoral Scopes: 13.-Waste handling and disposal; and 1.-Energy industries (renewable-/ non-renewable sources)
<b>Conditional sectoral scopes, if applicable</b>	-
<b>Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period</b>	344,880 tCO <sub>2</sub> e
<b>Name and UNFCCC reference number of the DOE</b>	AENOR INTERNACIONAL, S.A.U. UNFCCC ref. no: E-0021
<b>Name, position and signature of the approver of the validation report</b>	Jose Luis FUENTES PEREZ Climate change manager 

**SECTION A. Executive summary**

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PETRAMAS S.A.C. (hereinafter project participant) has commissioned AENOR to validate the renewal of project activity period “Modelo del Callao Landfill Gas Capture and Flaring System”. The objective of the validation process is to have an independent, third party assessment of the proposed project activity against the applicable CDM requirements. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country issues and criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria.

According to CDM Project Standard for project activities version 02.0, notification of renewal intention from project participants is no longer required, as long as the DOE submit a renewal request to the secretariat no earlier than 270 days prior to, but no later than one year after, the expiry of the crediting period, the project is valid for renewal and no penalty of "unclaimable period" would be required. And the grace period for the submission of renewal request for the existing registered project activities whose crediting period has expired but has not been renewed is set to be 30/09/2020. Therefore, the project is eligible for renewal of crediting period.

The objective of the project activity is to capture the landfill gas (LFG) and to flare and/or utilize it leading to GHG emissions reductions. The principal components of landfill gas (LFG) are methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>), both of which are greenhouse gases (GHG).

Prior to the start of the implementation of the project activity, there was no destruction of CH<sub>4</sub> neither through LFG combustion nor energy generation. Therefore, the scenario existing prior to the implementation of the project activity was no methane collection or destruction leading to CH<sub>4</sub> release into the atmosphere. The situation before the project implementation coincides with the baseline scenario.

During the first crediting period, the “Modelo del Callao Landfill Gas Capture and Flaring System” was developed as a landfill gas (LFG) collection and flaring project but the project has increased its waste input and during the second crediting period, the project is developing two phases:

- **Phase 1:** The first phase includes the construction and operation of a landfill gas (LFG) collection and flare system. The purpose of LFG flaring is to safely dispose of the flammable constituents, particularly methane, and to control odour nuisance, health risks and adverse environmental impacts. This phase has involved the investment in a highly efficient landfill gas collection system and the required enclosed flaring equipment.
- **Phase 2:** Once the LFG flow is proven to be steady (in terms of volume and quality) for the electricity generation, a second project phase would be carried out and a reciprocating engine facility will be installed. This phase would imply the installation of generating equipment that would combust the methane of the LFG in order to produce electricity.

During the first crediting period, the project had been operating under phase 1, it means only by flaring the landfill gas. It is expected that in second crediting period LFG would be used mainly for power generation, with any excess of LFG being flared. The second phase implies the installation of generating equipment that combust the methane of the LFG in order to produce electricity. Two (2) LFG Engines, with a capacity of 1.2 MW each (total generation capacity of 2.4 MW), were installed on 01/06/2018. Produced electricity will be dispatched to the national grid (SEIN).

The scope of the validation includes the assessment of updated sections of the PDD relating to the, the baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan and whether the project activity is using the version in force of approved methodologies and tools.

This validation concerns a project implemented by PETRAMAS S.A.C. in Peru to reduce emissions of CO<sub>2</sub> and CH<sub>4</sub> by generating electricity using LFG and flaring any excess of LFG. The objectives of the validation exercise are to confirm that the project meets the necessary CDM criteria, that the project follows the approved methodology, ACM0001, version 19, and that the proposals presented by PETRAMAS S.A.C in the PDD will lead to a realistic determination of the emission reductions.

All documents reviewed as part of the scope of the activity is detailed in the appendix 3. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. AENOR, based on the Specific Instruction for the Processing and Conducting of Validation, Registration, Verification and Certification of Kyoto Protocol CDM Project Activities (IE-DTC-039), has used a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation 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 PDD

The validation was performed through means of the following the requirements of CDM validation and verification standard for project activities, version 02.0, the applied methodology, and relevant CDM rules. The process of the validation included:

- i. Review of data and information;
- ii. Cross checks between information provided in the PDD and information from sources;
- iii. Review new relevant national and/or sectoral policies;
- iv. The resolution of outstanding issues;

### **Validation Process**

The project validation assessment for renewal of crediting period aims to be a risk-based approach and is based on the methodology developed in the CDM Validation and Verification Standard, an initiative of Designated and Applicant Entities, which aims to harmonise the approach and quality of all such assessments.

The validation for the renewal of the crediting period began in July 2019 when the PP provided the initial version of the PDD, and was concluded in September 2020, with the submission of the final validation report. The validation was performed in the manner of an audit, where, a desk review of the PDD was undertaken against the latest version of the approved methodology and CDM and other relevant criteria applying to the project.

As a final step of the validation, the validation report and the protocol have to undergo internal quality control by means of a technical review following the procedures of AENOR. The technical reviewer is a competent person from AENOR, independent of the team that carried out the validation of the project activity.

The Project Design Document submitted by the PP was reviewed against the approved methodology and against CDM and other relevant criteria. Additional background documents related to the project design, rules and regulations issued by the government and baseline were also validated.

The project participant was requested to address all validation findings and finally provided the validation team with sufficient evidence to determine that the applicable CDM requirements have been met. The project participant modified the initial updated PDD to resolve the validation team concerns and resubmitted a final version of the updated PDD. AENOR has prepared this report based on the final updated PDD.

All Corrective Action Requests (CAR) and Clarification Actions (CL) have been checked by the validation team and have been adequately resolved. All the validation findings are summarized in section C.5 below and documented in more detail in Appendix 4.

In AENOR's opinion the project activity correctly applies and meets the relevant UNFCCC requirements for the CDM project activities and the relevant host country criteria.

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

### 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/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	IR	Gonzales Toledo	Richard Daniel	AENOR PERU	Yes	Yes	Yes	Yes

### B.2. Technical reviewer and approver of the validation report for RCP

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	Arribas Alonso	Luis Javier	AENOR
2.	Approver	IR	Fuentes Perez	José Luis	AENOR

## SECTION C. Means of validation

### C.1. Desk/document review

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The desk review involved:

- CDM validation and verification standard for project activities, version 02.0 /1/
- CDM project standard for project activities, version 02.0 /2/
- CDM project cycle procedure for project activities, version 02.0 /3/
- ACM0001: Flaring or use of landfill gas --- Version 19.0 /4/
- Methodological tool: Emissions from solid waste disposal sites, Version 08 /5/
- Methodological tool: Project emissions from flaring, version 03.0 /6/
- Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, version 03.0 /7/
- Methodological tool: Tool to calculate the emission factor for an electricity system, version 07.0 /8/
- Table to calculate the emission factor for an electricity system /9/
- Methodological tool: Tool to determine the mass flow of a greenhouse gas in a gaseous stream, version 03.0 /10/
- Methodological tool: Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion, version 03.0 /11/
- Methodological Tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, Version 03.0.1 /12/
- Methodological tool: Positive lists of technologies, version 02.0 /13/
- Registered PDD, version 6 /14/

- Modelo del Callao Landfill Gas Capture and Flaring System - CDM PDD, version 1 (initial version) /15/
- Modelo del Callao Landfill Gas Capture and Flaring System - CDM PDD, versión 7 (final version) /16/
- Emission reduction calculation spreadsheet /17/
- Grid emission factor calculation spreadsheet /18/
- Lambda calculation spreadsheet /19/
- Hourly energy data generation for the interconnected system (data generation 2017, 2018 and 2019) /20/
- COES annual statistics (2017, 2018 and 2019) /21/
- IPCC guidelines for National Greenhouse Gas Inventories /22/
- Updated Modalities of Communication Statement /23/
- Legal representative confirmation /24/
- Authorization from Callao Municipality /25/
- MINEM Electric generation concession /26/
- Local regulation /27/ /28/ /29/ /30/ /31/ /32/
- Decision 3/CMP.1 and relevant decisions and guidelines from the EB. /33/

## C.2. On-site inspection

According to the paragraph 402 of validation and verification standard, the DOE shall apply the requirements in section 7.1.3 of VVS to validate the information provided by the project participant. Then, on-site inspection was performed on 28 August 2019

Duration of on-site inspection: 28/08/2019 to 28/08/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	<ul style="list-style-type: none"> <li>• Local permits</li> <li>• Changes in local regulation</li> <li>• Status of project activity</li> <li>• PDD updates</li> <li>• Project design</li> <li>• Technology, capacity of the project, auxiliary power units, etc.</li> <li>• Monitoring System.</li> <li>• Changes of project design</li> <li>• Recording of Monitoring data</li> </ul>	Project site	28/08/2019	Richard Daniel Gonzales Toledo

## C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Melendez	Adamo	PETRAMAS/ Chief of CDM	28/08/2019	<ul style="list-style-type: none"> <li>• Local permits</li> <li>• Changes in local regulation</li> <li>• Status of project activity</li> <li>• PDD updates</li> <li>• Project design</li> <li>• Changes of project design</li> </ul>	Richard Daniel Gonzales Toledo
2.	Ramirez	Santiago	PETRAMAS/ Chief of Power plant	28/08/2019	<ul style="list-style-type: none"> <li>• Project design</li> <li>• Technology, capacity of the project, auxiliary power units, etc.</li> <li>• Monitoring System</li> <li>• Monitoring</li> </ul>	Richard Daniel Gonzales Toledo

					<ul style="list-style-type: none"> <li>• systems Recording of Monitoring data</li> </ul>	
3	Garcilazo	Ivan	PETRAMAS/ Supervisor	28/08/2019	<ul style="list-style-type: none"> <li>• Project design</li> <li>• Technology, capacity of the project, auxiliary power units, etc.</li> <li>• Monitoring System</li> <li>• Monitoring systems</li> <li>Recording of Monitoring data</li> </ul>	Richard Daniel Gonzales Toledo

#### C.4. Sampling approach

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N/A

#### C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	<b>CAR 1</b>	-
Application and selection of methodologies and standardized baselines	-	<b>CAR 2</b>	-
Validity of original baseline or its update	-		-
Estimated emission reductions or net anthropogenic removals	-	<b>CAR 3</b>	-
Validity of monitoring plan	-	-	-
Crediting period	-	-	-
Project participants	-	-	-
Post-registration changes	-	-	-
Other (Updated MoC statement)	<b>CL 1</b>	-	-
<b>Total</b>	<b>1</b>	<b>3</b>	-

### SECTION D. Validation findings

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

<b>Means of validation</b>	The compliance of the PDD with the valid version of the form was checked through desk-review of last version of the PDD (version 7) /16/, last version of applicable form, which includes in its attachment the instructions for filling out it, CDM rules and references and supported documents provided by the project participants.
<b>Findings</b>	A corrective action request was raised reading this issue (CAR 1). All information regarding the findings are detailed in appendix 4.
<b>Conclusion</b>	<p>The PDD was completed in the version 11.0 of the form, latest version valid.</p> <p>The audit team checked that the information transferred to the later valid version of the PDD is materially the same as that in the registered PDD, except for the relevant sections, which were updated in accordance with the relevant requirements in the Project standard (sections of the PDD relating to the baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan and the crediting period using a baseline and monitoring methodology).</p> <p>In AENOR's opinion the final version of the PDD has been completed using the latest version of the applicable form and has followed the instructions for filling out attached at the end of the form.</p>

#### D.2. Application and selection of methodologies and standardized baselines

<b>Means of validation</b>	The audit team has determined that the valid version of the approved baseline and monitoring methodology selected by the project participants in the registered PDD.
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ACM0001: Flaring or use of landfill gas --- Version 19.0 has been used in the updated PDD for the renewal of the crediting period and it has been correctly considered. The applicability criteria required by the methodology and tools are discussed in the updated PDD and is summarized below:

Methodology applicability	Means of validation
a) Install a new LFG capture system in an existing or new (Greenfield) SWDS where no LFG capture system was or would have been installed prior to the implementation of the project activity; or	Since the landfill gas capture was not mandated by law prior to the implementation of the project activity (and it is not mandated neither at the time of the renewal of the crediting period under the new regulation), the project activity implies the installation of a new LFG capture system in the existing SWDS. This issue was confirmed during the on-site visit.
b) Make an investment into an existing LFG capture system to increase the recovery rate or change the use of the captured LFG, provided that: <ul style="list-style-type: none"> <li>i. The captured LFG was vented or flared and not used prior to the implementation of the project activity; and</li> <li>ii. In the case of an existing active LFG capture system for which the amount of LFG cannot be collected separately from the project system after the implementation of the project activity and its efficiency is not impacted on by the project system: historical data on the amount of LFG capture and flared is available.</li> </ul>	There was not an existing LFG capture system at the time of validation so no investment into such existing LFG capture system was made to increase the recovery rates and therefore applicability criteria. Then, this condition is not applicable. It was validated against registered PDD an during the on-site visit
c) Flare the LFG and/or use the captured LFG in any (combination) of the following ways: <ul style="list-style-type: none"> <li>i. Generating electricity;</li> <li>ii. Generating heat in a boiler, air heater or kiln (brick firing only) or glass melting furnace; and/or</li> <li>iii. Supplying the LFG to consumers through a natural gas distribution network.</li> <li>iv. Supplying compressed/liquefied LFG to consumers using trucks;</li> <li>v. Supplying the LFG to consumers through a dedicated pipeline;</li> </ul>	The project activity is expected to generate electricity (i). It was confirmed during the on-site visit.

	<p>d) Do not reduce the amount of organic waste that would be recycled in the absence of the project activity</p> <p>The methodology ACM0001 "Flaring or use of landfill gas" (Version 19.0) is only applicable if the application of the procedure to identify the baseline scenario confirms that the most plausible baseline scenario is:</p> <p>a) Atmospheric release of the LFG or capture of LFG and destruction through flaring to comply with regulations or contractual requirements, to address safety and odour concerns, or for other reasons; and</p> <p>b) In the case that the LFG is used in the project activity for generating electricity and/or generating heat in a boiler, air heater, glass melting furnace or kiln;</p> <p>i. For electricity generation: that electricity would be generated in the grid or in captive fossil fuel fired power plants; and/or</p> <p>ii. For heat generation: that heat would be generated using fossil fuels in equipment located within the project boundary.</p> <p>c) In the case of LFG supplied to the end-user(s) through natural gas distribution network, trucks or the dedicated pipeline, the baseline scenario is assumed to be displacement of natural gas.</p> <p>d) In the case of LFG from a Greenfield SWDS, the identified baseline scenario is atmospheric release of the LFG or capture of LFG in a managed SWDS and destruction through flaring to comply with regulations or contractual requirements, to address safety and odour concerns, or for other reasons.</p>	<p>The waste entering to the landfill is not managed through recycling; it is landfilled as it arrives to the landfill. Therefore, the project will not have any effect on the waste entering to the landfill. It was confirmed against Callao Municipality authorization.</p> <p>Project activity will generate electricity that will be dispatched to the grid system. Then, it complies with scenario b) – i. It was confirmed against MINEM Electric generation concession /26/</p>
	<p>PP ha included a summary on how each applied tool complies with applicability requirement as follow:</p>	



	Methodological Tool	Means of validation
	Emissions from solid waste disposal sites, version 08.0	It is applicable under Application A, since the CDM project activity mitigates methane emissions from a specific existing SWDS. Methane emissions are mitigated by capturing and flaring or combusting the methane.
	Project emissions from flaring, version 03.0	It is used to determine $PE_{flare,y}$ as required by the ACM0001
	Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, version 03.0	It is applicable for the purpose of calculating project emissions in case where a project activity consumes electricity from the grid (Scenario A of Section I of the Tool).
	Tool to calculate the emission factor for an electricity system, version 07.0.	It is applicable for calculating project and leakage emissions in case where a project activity consumes electricity from the grid.  For the project activity, since electricity will be sourced from the grid and electricity generation component to the grid has been added as design change, then the tool is applicable.
	Tool to determine the mass flow of a greenhouse gas in a gaseous stream, version 03.0	It is applicable for the purpose to determine to determine the mass flow of greenhouse gases.  The applications of this tool are methodologies where the flow and composition of residual or flared gases or exhaust gases are measured for the determination of baseline or project emissions, which is the case of the project activity, and then the tool is applicable.
	Tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion" (version 03.0)	It is applicable for calculating the project CO <sub>2</sub> emissions from the combustion of fossil fuels in cases where CO <sub>2</sub> emissions from fossil fuel combustion are calculated based on the quantity of fuel combusted and its properties.  For the current project activity, since the quantity of fuel combusted, and its properties are monitored, then the tool is applicable.
	Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" Version 03.0.1	This tool was used for the assessment of continued validity of the original baseline and its update when the renewal of the crediting period is conducted
	No standardized baseline is applied in this project activity.	
<b>Findings</b>	A corrective action request was raised reading this issue (CAR 2). All information regarding the findings are detailed in appendix 4.	

<b>Conclusion</b>	In accordance to paragraphs 404 (b) of VVS, the validation team has confirmed, after performing the desk review, that the baseline and monitoring methodology has been applied correctly as well as its associated tools and guidelines. In particular the validation team has reviewed the final PDD and associated documents (calculation spreadsheets and evidence provided by the PP for closing the corrective actions and clarifications), and previous PDD and previous validation report and information received in the interviews to assess the relevant information contained in the PDD for each applicability condition listed in the selected methodology. The chosen baseline and monitoring methodology is applicable to the project activity.
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### D.3. Validity of original baseline or its update

<b>Means of validation</b>	<p>The audit team checked if the original baseline is still valid or if it must be updated through an assessment of the following issues:</p> <ul style="list-style-type: none"> <li>a) The impact of new relevant national and/or sectoral policies and circumstances on the baseline, taking into account relevant guidance from the Board with regard to renewal of the crediting period of a registered CDM project activity, at the time of requesting renewal of crediting period of the project activity;</li> <li>b) The correctness of the application of the approved methodologies and, where applicable, the approved standardized baselines and the other methodological regulatory documents for the determination of the continued validity of the baseline or its update, and the estimation of GHG emission reductions or net anthropogenic GHG removals for the applicable crediting period of the registered CDM project activity.</li> </ul> <p>In the first case, validation team reviewed relevant applicable local regulation /27/ /28/ /29/ /30/ /31/ /32/. Validation team confirms that the general framework has not changed since PDD registration.</p> <p>In the second case it was reviewed the correct applicability of the methodology. Baseline and project emission have been updated for this crediting period. Validation team reviewed the spread sheet for calculating emission reduction /17/ and the grid emission factor /18/ /19/ and supporting evidences /20/ /21/ /22/ to confirm that PP has followed applicable methodology and tools.</p> <p>Validation team also reviewed whether PP has followed the instruction stated in the tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, in order to confirm that baseline is still valid.</p>
<b>Findings</b>	No finding was raised regarding this issue.
<b>Conclusion</b>	<p>In AENOR's opinion, the PPs have documented in the final version of the PDD the issues considered for assessing the validity of the baseline for the next crediting period in accordance with the requirements established in the tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" and the project standard.</p> <p>According to the step 1.1., the audit team could check the current baseline complies with all relevant mandatory national and sectorial policies.</p> <p>According to the step 1.2., the audit team could assess that there are no important changes in the market characteristics and the conditions used to determine the baseline emissions in the previous crediting period are still valid.</p> <p>The step 1.3. is not applied because the tool clarifies that it should be assessed "whether the remaining technical lifetime of the equipment that would have continued to be used in the absence of the project activity, as determined in the PDD, exceeds the crediting period for which renewal is requested" and the project activity does not increase the lifetime of the technical equipment during the crediting period.</p> <p>The step 1.4 and the validity of the data and parameters, applied methodology (ACM0001) was updated from version 11.0 to 19.0, in consequence the parameters</p>

	<p>have been updated. In addition, PP has added a component to the project activity: A power plant, in order to supply electric energy to the grid. Then, PP has updated baselines emission and project emissions taking into account last version of applicable methodology and tools. Validation team reviewed the spreadsheet of grid emission factor calculation /17/ and confirms that the IPCC default values have been updated accordingly for the second crediting period.</p> <p>According to Step 2.1: The baseline for the second crediting period have been updated, as per applied methodology ACM0001 "Flaring or use of landfill gas"(version 19.0), due to the fact that PP has added the electric generation component to the project activity.</p> <p>According to the step 2.2. IPCC default values have to be updated in the current baseline. Validation team confirmed that PP has followed the guidance stated in step 1.4 to update the parameters. They are in accordance to applicable methodology and applicable tools.</p> <p>By applying steps 1.1, to 1.4 of the Tool, it has been confirmed that the current baseline continues to be valid for the second crediting period.</p> <p>By applying step 2.1 and 2.2 of the tool; it has been confirmed that the current baseline and the data and parameters have been properly updated.</p> <p>Finally, following the instruction of validity assessment tool; PP has updated baseline and the data and parameters. Validation team confirmed that it was updated in accordance to applied methodology and tool.</p>
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#### D.4. Estimated emission reductions or net anthropogenic removals

<b>Means of validation</b>	<p>The audit team checked that the estimated GHG emission reductions in the updated PDD comply with the applicable requirements in the Project standard, and the valid version of the methodologies and tools that are applicable to the registered CDM project activity.</p> <p>The final version of the PDD describes the application of the baseline methodology, which is in conformance with the approved methodology ACM0001: Flaring or use of landfill gas, version 19.0 /4/. The entire calculation process is described in sections B.6.1 and B.6.3 of the PDD. Following is summarized the key results:</p> <p>According to the applied mythology emissions reduction is calculated as:</p> $ER_y = BE_y - PE_y$ <p>Where,</p> <p><math>ER_y</math> Emission reductions in year <math>y</math> (tCO<sub>2</sub>/y)  <math>BE_y</math> Baseline Emissions in year <math>y</math> (tCO<sub>2</sub>/y)  <math>PE_y</math> Project emissions in year <math>y</math> (tCO<sub>2</sub>/y)</p> <p><b><u>Baseline emissions</u></b></p> $BE_y = BE_{CH_4,y} - BE_{EC,y} - BE_{HG,y} - BE_{NG,y}$ <p>Where:</p> <p><math>BE_y</math> Baseline Emissions in year <math>y</math> (tCO<sub>2</sub>e/y)  <math>BE_{CH_4,y}</math> Baseline emissions of methane from the SWDS in year <math>y</math> (tCO<sub>2</sub>e/yr)  <math>BE_{EC,y}</math> Baseline emissions associated with electricity generation in year <math>y</math> (tCO<sub>2</sub>e/yr)  <math>BE_{HG,y}</math> Baseline emissions associated with heat generation in year <math>y</math> (tCO<sub>2</sub>e/yr)</p>
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$BE_{NG,y}$  Baseline emissions associated with natural gas use in year  $y$  (tCO<sub>2</sub>e/yr)

Due to the project activity does not involve heat generation neither use of natural gas, these baseline emission equals to zero. Baseline emissions of methane from the SWDS are determined, based on the amount of methane that is captured under the project activity and the amount that would be captured and destroyed in the baseline. Baseline emission associated to electricity generation is calculated based on power installed capacity and operation and operation hours. Calculation process is detailed in section B.6.1 of PDD.

Period Year	$BE_{CH_4,y}$ (tCO <sub>2</sub> e)	$BE_{EC,y}$ (tCO <sub>2</sub> e)	$BE_y$ (tCO <sub>2</sub> e)
1	267,547	9,969	277,516
2	289,157	9,969	299,126
3	311,546	9,969	321,515
4	334,112	9,969	344,081
5	357,999	9,969	367,968
6	380,321	9,969	390,290
7	404,205	9,969	414,174
<b>Total</b>	<b>2,344,887</b>	<b>69,783</b>	<b>2,414,670</b>
<b>Average</b>	<b>334,984</b>	<b>9,969</b>	<b>344,953</b>

#### Project emissions

$$PE_y = PE_{EC,y} + PE_{FC,y}$$

Where:

$PE_y$  Project emissions in year  $y$  (tCO<sub>2</sub>e/y)  
 $PE_{EC,y}$  Emissions from consumption of electricity due to the project activity in year  $y$  (t CO<sub>2</sub>e/yr).  
 $PE_{FC,y}$  Emissions from consumption of fossil fuels due to the project activity, for purpose other than electricity generation, in year  $y$  (tCO<sub>2</sub>e/yr).

For ex-ante calculation fuel consumption has been considered equal to 0. Then, this value will be updated during the verification. Project emission from electricity consumption has been calculation based on measure data of project activity.

Period Year	$PE_{EC,y}$ (tCO <sub>2</sub> e)	$PE_{FC,y}$ (tCO <sub>2</sub> e)	$PE_y$ (tCO <sub>2</sub> e)
1	72	0	72
2	72	0	72
3	72	0	72
4	72	0	72
5	72	0	72
6	72	0	72
7	72	0	72
<b>Total</b>	<b>72</b>	<b>0</b>	<b>504</b>
<b>Average</b>	<b>72</b>	<b>0</b>	<b>72</b>

Validation team reviewed the emission reduction calculation spreadsheet /17/, the grid emission factor calculation spreadsheet /18/, the Lambda calculation spreadsheet /19/, hourly energy data generation for the interconnected system (data generation 2017, 2018 and 2019) /20/ and COES annual statistics (2017, 2018 and 2019) /21/. Also, validation team reviewed applied tools /5/ /6/ /7/ /8/ /9/ /10/ /11/ /12/

in order to confirm that selected equations and parameters were used in accordance to the methodology ACM0001.

In the case of the Lambda calculation, the UNFCCC official excel spreadsheet "Table to calculate the emission factor for an electricity system (version 04.0) has been used. In the case of  $\lambda_{2017}$  and  $\lambda_{2018}$ , lambda values are N/A in the official excel spreadsheet as there is not intersection and it is considered that  $\lambda=0$ . In the case of  $\lambda_{2019}$ , there is intersection and the value is 0.00273. AENOR validation team reproduced calculations and arrived to the same conclusions.

Validation team confirms that all spreadsheet is opened, traceable and emission reductions have been calculated following the methodology and applied tools in a conservative manner. Then, total emission reduction for second crediting period (ex-ante) are:

Year	Baseline emissions (t CO <sub>2</sub> e)	Project emissions (t CO <sub>2</sub> e)	Emission reductions (t CO <sub>2</sub> e)
1	277,516	72	277,443
2	299,126	72	299,054
3	321,515	72	321,443
4	344,081	72	344,009
5	367,968	72	367,895
6	390,290	72	390,217
7	414,174	72	414,102
<b>Total</b>	<b>2,414,670</b>	<b>504</b>	<b>2,414,163</b>
<b>Annual average over the crediting period</b>	<b>344,953</b>	<b>72</b>	<b>344,880</b>

#### Findings

A corrective action request was raised reading this issue (CAR 3). All information regarding the findings are detailed in appendix 4.

#### Conclusion

In AENOR's opinion, PP has documented, in the final version of the PDD and the spreadsheets, the calculation data, formulae and information of the estimated GHG emission reductions in accordance with the requirements of the latest approved version of the methodology and tools applied to the determination of the emission reductions and the project emissions.

The methodology for calculating emission reductions is transparently documented in the latest version of the PDD and it complies with existing good practice.

The PDD clearly documents how each equation is applied and the actual calculations are clearly presented in the annexed spreadsheets. The selection of parameters and GHG calculations is complete and transparent. The accuracy of the calculations has been verified. The emissions estimated can be replicated using the data and parameter values provided and supporting files submitted for validation. Data sources have been validated by AENOR.

AENOR has validated that data and assumptions considered are listed in the PDD and spreadsheet calculations are consistent with stated data. Furthermore, AENOR has reproduced the calculation in a clear and transparent manner to obtain the same results, which confirms that the baseline methodology has been correctly applied.

Therefore, AENOR, based on the above assessment, confirms that:

- All assumptions and data used by the project participant is listed in the PDD, including their references and sources;
- All documentation used by project participant as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;

	<ul style="list-style-type: none"> <li>• All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;</li> <li>• The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions; and</li> <li>• All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.</li> </ul>
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#### D.5. Validity of monitoring plan

<b>Means of validation</b>	<p>The audit team checked that the monitoring plan in the updated PDD complies with the applicable requirements in the Project standard, and the valid version of the methodologies and tools that are applicable to the registered CDM project activity.</p> <p>The parameter included in the monitoring plan to be monitored during the second crediting period are summarized following:</p> <p><i>Management of SWD</i> Project participants should refer to the original design of the landfill to ensure that any practice to increase methane generation have been occurring prior to the implementation of the project activity.</p> <p>Any change in the management of the SWDS after the implementation of the project activity should be justified by referring to technical or regulatory specifications.</p> <p>Annually monitored.</p> <p><math>\rho_{reg,y}</math> <i>Fraction of LFG that is required to be flared due to a requirement in year y.</i></p> <p>Information of the host country's regulatory requirements relating to LFG, contractual requirements, or requirements to address safety and odour concerns. For ex ante calculations, a default value of 0 has been chosen as per ACM0001 / Version 19.0, Step A2, Case 2 c), eq. 9.</p> <p>Value applied: 0 (dimensionless). Annually monitored. The updated PDD describes measurements methods and procedures which are correct.</p> <p><math>V_{LFG,total,y,db}</math> <i>Volumetric flow of total landfill gas which is sent to flare and used for electricity generation in year y on a dry basis</i></p> <p>Measured by a flow meter.(m<sup>3</sup> dry gas/h). Values are provided in updated PDD and they are several.</p> <p>The measurement method will be based in the thermal principle of the thermal mass flowmeter. The readings will be gathered automatically by an automatic data collection system.</p> <p>The accuracy of the measurement equipment will be 1% full scale.</p> <p>The calibration will be carried out yearly or at the frequency required by the manufacturer following the recommended procedures. The monitoring frequency is continuously.</p> <p>No separate monitoring of temperature and pressure is necessary since flowmeters that automatically express LFG volumes in normalized cubic meters will be used.</p> <p><math>V_{LFG,sent\_flare,y,db}</math> <i>Volumetric flow of landfill gas which is sent to flare in year y on a dry basis</i></p> <p>Measured by a flow meter (m<sup>3</sup> dry gas/h). Several values applied and provided in the updated PDD.</p> <p>The measurement method will be based in the thermal principle of the thermal mass flowmeter. The readings will</p>
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		<p>be gathered automatically by an automatic data collection system.</p> <p>The accuracy of the measurement equipment will be 1% full scale.</p> <p>The calibration will be carried out yearly or at the frequency required by the manufacturer following the recommended procedures. The monitoring frequency is continuously.</p> <p>No separate monitoring of temperature and pressure is necessary since flowmeters that automatically express LFG volumes in normalized cubic meters will be used.</p> <p><i>Volumetric flow of landfill gas which is used for electricity generation in year y on a dry basis.</i></p> <p>Measured by a flow meter (m<sup>3</sup> dry gas/h). Values applied are provided in the updated PDD. They are several.</p> <p>The measurement method will be based in the thermal principle of the thermal mass flowmeter. The readings will be gathered automatically by an automatic data collection system.</p> <p>The accuracy of the measurement equipment will be 1% full scale.</p> <p>The calibration will be carried out yearly or at the frequency required by the manufacturer following the recommended procedures. The frequency of monitoring is continuously.</p> <p>No separate monitoring of temperature and pressure is necessary since flowmeters that automatically express LFG volumes in normalized cubic meters will be used.</p>
	$V_{LFG,EL,y,db}$	
	$Maintenance_y$	<p><i>Maintenance events completed in year y</i></p> <p>Record the date that maintenance events were completed in year y. Records of maintenance logs must include all aspects of the maintenance including the details of the person(s) undertaking the work, parts replaced, or needing to be replaced, source of replacement parts, serial numbers and calibration certificates.</p> <p>The monitoring frequency will be annual.</p>
	$T_t$	<p><i>Temperature of the gaseous stream in time interval t</i></p> <p>Measured by a flow meter in K. The measurement method will be based in the thermal principle of the thermal mass flowmeter. The readings will be gathered automatically by an automatic data collection system.</p> <p>The accuracy of the measurement equipment will be 1% full scale.</p> <p>Data will also be aggregated monthly/yearly.</p> <p>The calibration will be carried out yearly or at the frequency required by the manufacturer following the recommended procedures.</p> <p>The applicability condition related to the gaseous stream flow temperature being below 60°C is adopted and therefore, this parameter must be monitored continuously to assure the applicability condition is met.</p>
	$P_t$	<p><i>Pressure of the gaseous stream in time interval t</i></p> <p>Measured by a flow meter in Pa. The measurement method will be based in the thermal principle of the thermal mass flowmeter. The readings will be gathered automatically by an automatic data collection system.</p>

	<p>The accuracy of the measurement equipment will be 1% full scale.</p> <p>Data will also be aggregated monthly/yearly</p> <p>The applicability condition related to the gaseous stream flow temperature being below 60°C is adopted and therefore, this parameter must be monitored continuously to calculate saturation absolute humidity (mH<sub>2</sub>O,t,db,sat)</p> <p>The calibration will be carried out yearly or at the frequency required by the manufacturer following the recommended procedures.</p> <p><math>v_{CH_4,t,db}</math></p> <p><i>Volumetric fraction of CH<sub>4</sub> in a time interval t on a dry basis</i></p> <p>Data will be recorded by Continuous gas analyser operating in dry-basis (m<sup>3</sup> CH<sub>4</sub>/m<sup>3</sup> dry gas). The value applied is 50%.</p> <p>Volumetric flow measurement should always refer to the actual pressure and temperature.</p> <p>The measurement method will be based in the NDIR (Non-Dispersed Infrared) method of the continuous gas analyzer. The readings will be gathered automatically by an automatic data collection system.</p> <p>The monitoring frequency is continuously.</p> <p>The accuracy of the measurement equipment will be 2% full scale.</p> <p>The responsible person/entity for the measurement will be the project participant.</p> <p>The calibration will be carried out yearly or at the frequency required by the manufacturer following the recommended procedures</p> <p><math>EG_{PJ,y}</math></p> <p><i>Amount of electricity generated using LFG by the project activity in year y</i></p> <p>The readings will be gathered automatically by an electricity meter in MWh, and the project participant will be receiving the corresponding bills, which will be used as the monitoring data source.</p> <p>Values applied are several as PDD details. It will be calculated from continuous measurement using electricity meters.</p> <p>The accuracy of the measurement equipment will be 1% of maximum reading.</p> <p>The responsible person/entity for the measurement will be the project participant.</p> <p>The calibration will be carried out yearly or at the frequency required by the electricity company.</p> <p><math>EG_{EC,y}</math></p> <p><i>Amount of electricity consumed by the project activity in year y</i></p> <p>The readings will be gathered automatically by an electricity meter in MWh, and the project participant will be receiving the corresponding bills, which will be used as the monitoring data source.</p> <p>Values applied are several as PDD details. It will be calculated from continuous measurement using electricity meters.</p> <p>The accuracy of the measurement equipment will be 1% of maximum reading.</p>
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		<p>The responsible person/entity for the measurement will be the project participant.</p> <p>The calibration will be carried out yearly or at the frequency required by the electricity company</p>
	$Op_{engine,h}$	<p><i>Operation of the engine that consumes the LFG</i></p> <p>For the engine using the LFG, the plant is operating in hour h by monitoring the product generated by the engine (i.e Net quantity of electricity generated using LFG).</p> <p>The value applied for ex ante determination has been considered to be 1 for 8,000 h/year.</p> <p>The frequency of monitoring is hourly.</p>
	$Op_{flare,h}$	<p><i>Operation of the flare that consumes the LFG</i></p> <p>For the enclosed flare using the LFG, the plant is operating in hour h by monitoring, at least, the flame detection system. The flame detection system is used to ensure that the equipment is in operation since the control system of the equipment ensures that the enclosed flare will stop if no flame is detected</p> <p>The value applied for ex ante determination has been considered to be 1 for 8,000 h/year.</p> <p>The frequency of monitoring is hourly.</p>
	$Flame_m$	<p><i>Flame detection of flare in the minute m</i></p> <p>Measured using a Ultra Violet detector or Infra-Red or both (flame on or flame off).</p> <p>The flame detection system is used to ensure that the equipment is in operation since the control system of the equipment ensures that the enclosed flare will stop if no flame is detected</p> <p>The value applied for ex ante determination has been considered to be 1 for 8,000 h/year.</p> <p>The frequency of monitoring: Once per minute. Detection of flame recorded as a minute that the flame was on, otherwise recorded as a minute that the flame was off.</p>
	$PE_{EC,y}$	<p><i>Project emissions from electricity consumption by the project activity during the year y</i></p> <p>Calculated as per the "Tool to calculate baseline, project and or leakage emissions from electricity consumption" in tn CO<sub>2</sub>. the value applied is 72 tnCO<sub>2</sub>. Measured continuously.</p>
	$FC_{i,j,y}$	<p><i>Quantity of fuel type i combusted in process j during the year y</i></p> <p>It will be measured at continuously (Mass or volume unit per year (e.g. ton/yr or m<sup>3</sup>/yr)) using either mass or volume meters. In cases where fuel is supplied from small daily tanks, rulers can be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year and have a book of control for recording the measurements (on a daily basis or per shift);</p> <p>The value applied is 0 and it will be monitored continuously.</p>
	$T_{EG,m}$	<p><i>Temperature in the exhaust gas of the enclosed flare in minute m</i></p> <p>It is measures in °C with a frequency of once per minute. It is not used in calculations. The measurement method will be based in the thermoelectric principle of the</p>

	<p>thermocouple. The readings will be gathered automatically by an automatic data collection system.</p> <p>The accuracy of the measurement equipment will be 1.1°C.</p> <p>The responsible person/entity for the measurement will be the project participant.</p> <p>The calibration or replacement will be carried out yearly or at the frequency required by the manufacturer following the recommended procedures</p>
<b>Findings</b>	No findings were raised regarding this issue.
<b>Conclusion</b>	<p>In AENOR's opinion, PPs have documented, in the monitoring plan of the final version of the PDD, all requirements established by the latest approved version of the methodology and tools applied to determine the emissions reductions of the project activity.</p> <p>All parameters to be monitored applicable to the proposed project activity, required by the applicable methodology and associated tools have been quoted in the final version of the PDD. In addition, the quality control and quality assurance to apply for monitoring activities, including the metering equipment, calibration requirements have also been detailed.</p> <p>All necessary changes have been appropriately reflected in the updated PDD, the monitoring plan in the updated PDD is in compliance with the applied monitoring methodology, and the monitoring arrangements described in the updated PDD can be implemented and are feasible within the project design</p> <p>Authority and responsibilities are well defined, and Quality Assurance and Quality Control procedures are managed in order to reduce the uncertainties of the emissions reduction monitored.</p> <p>Provisions of calibration frequencies of all the equipment involved in the monitoring are included in the PDD and are deemed as appropriate by the DOE team because they are defined according to CDM rules and local regulations, energy metering equipment will be calibrated every tree year.</p>

#### D.6. Crediting period

<b>Means of validation</b>	<p>The crediting period for this project activity is 21 years renewable every 7 years</p> <p>The 1<sup>st</sup> crediting period of the project activity goes from 20/08/2012 to 19/08/2019. The start date of the second crediting period commences on the day immediately after the expiration of the 1<sup>st</sup> crediting period: 20/08/2019.</p>
<b>Findings</b>	No findings were raised on this issue
<b>Conclusion</b>	<p>The validation team confirms that the description of next crediting period in the PDD complies with applicable requirements of project standard.</p> <p>Furthermore, according to paragraph 412 of VVS for project activities version 02.0, AENOR validation team confirms that the correct crediting period has been applied in the updated PDD.</p>

#### D.7. Project participants

<b>Means of validation</b>	<p>Audit team checked whether the names of the project participants included in the updated PDD are consistent with the names of the project participants in the latest version of the MoC statement /23/.</p> <p>Validation team, also, validated the identity of project participants, the entity and focal points included in the Modalities of Communication (MoC) statement by legal representative confirmation /24/</p>
<b>Findings</b>	A clarification (CL1) this issue (CL 1). All information regarding the findings are detailed in appendix 4.

<b>Conclusion</b>	In AENOR's opinion no entities other than those authorized as the project participants of the proposed CDM project activity are included the PDD. AENOR validation team confirms that the information of the PPs has been correctly indicated in the updated PDD.
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#### D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents <sup>1</sup>	N	-	-
Corrections	N	-	-
Change to the start date of the crediting period	N	-	-
Inclusion of a monitoring plan	N	-	-
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N	-	-
Changes to the project design	Y	1	30/09/2020
Changes specific to afforestation and reforestation project activities	N	-	-

#### SECTION E. Internal quality control

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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 project activity. The technical reviewer or the team appointed for the technical review are qualified in the technical area(s) and sectoral scope(s) of the project activity.

#### SECTION F. Validation opinion

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AENOR has performed the validation (renewal of crediting period) of the project activity "Modelo del Callao Landfill Gas Capture and Flaring System" in Peru. The validation of renewal of crediting period was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following four phases: i) Review of data and information; ii) Cross checks between information provided in the PDD and information from sources; iii) Review new relevant national and/or sectoral policies; iv) the resolution of outstanding issues and the issuance of the final validation report and opinion. In the course of the validation process, 3 corrective actions and 1 clarification were raised; all have been successfully closed.

The calculation of ex-ante emission reductions is carried out in a transparent and conservative manner, so the project activity is likely to achieve the average estimated amount of emission reductions of 344,880 tCO<sub>2</sub>e per year over the 2<sup>nd</sup> renewable crediting period.

The review of the project design documentation and additional documents related to baseline and monitoring methodology, and the subsequent background investigation, follow-up interviews and review of comments by parties and stakeholders have provided AENOR with sufficient evidence to validate the fulfilment of the stated criteria.

<sup>1</sup> Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

The conclusions can be summarised in detail as follows:

- The updated PDD has been completed using the valid version of the applicable PDD form, following the instructions therein. Also, the information transferred to the later version of the PDD is materially the same as the registered PDD;
- The emission reduction has been carried out in a transparent and conservative manner, following the approved methodology ACM0001: Flaring or use of landfill gas, version 19.0.
- The PDD is in line with all relevant host country criteria of Peruvian DNA and with all relevant UNFCCC requirements for CDM.
- The names of the project participants in the updated PDD are consistent with the names of the project participants in the latest version of the MoC statement;
- The monitoring plan are transparent and adequate.

In AENOR's opinion, the project activity correctly applies and meets the relevant UNFCCC requirements for the CDM project activities and the relevant host country criteria.

Madrid, 30 September 2020



Richard Daniel GONZALES TOLEDO  
Team Leader



Jose Luis FUENTES PEREZ  
Climate change Manager

## Appendix 1. Abbreviations

Abbreviations	Full texts
ACM0001	Large-scale consolidated methodology flaring or use of landfill gas, version 19.0
BM	Build margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Action
CM	Combined margin
CO <sub>2</sub>	Carbon dioxide
COES	Economic operation committee (dispatch centre)
DNA	Designated National Authorities
DECISION 17/CP.7	Modalities and Procedures for a Clean Development Mechanism as Defined in Article 12 of the Kyoto Protocol
DOE	Designated operational Entity
DR	Desk review
EB	Executive Board of the CDM of the Kyoto Protocol
EF	Emission factor
GHG	Greenhouse Gasses
GSC	Global stakeholder consultation
GWh	Electrical Giga Watt hour
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MINEM	Ministry of energy and mines from Perú
MoC	Modality of Communication
MP	Monitoring plan
MW	Megawatt
OM	Operating margin
PC	CDM project cycle procedure for project activities, Version 02.0
PDD	Project Design Document
PP	Project participant
PS	CDM project standard for project activities, version 02.0
RCP	Renewal of crediting period
tCO <sub>2</sub> e	Carbon dioxide equivalent tonnes
UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM validation and verification standard for project activities, version 02.0

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

### *CERTIFICATE OF QUALIFICATION*

Subject: Validation and Technical Review Team for “Modelo del Callao Landfill Gas Capture and Flaring System”

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: Richard Daniel GONZALES TOLEDO

CDM Team Leader: Yes

CDM Validator: Yes

CDM Verifier: N/A

CDM Technical Reviewer: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

Energy industries (renewable - / non-renewable sources) and waste handling and disposal

Madrid, 30/09//2020



Jose Luis Fuentes  
**Climate change manager**

***CERTIFICATE OF QUALIFICATION***

Subject: Validation and Technical Review Team for “Modelo del Callao Landfill Gas Capture and Flaring System”

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: Luis Javier ARRIBAS ALONSO

CDM Team Leader: N/A

CDM Validator: N/A

CDM Verifier: N/A

CDM Technical Reviewer: Yes

External Technical Expert: N/A

Technical areas related with the project activity:

Energy industries (renewable - / non-renewable sources) and waste handling and disposal

Madrid, 30/09//2020

A handwritten signature in blue ink, appearing to read 'JL Fuentes', with a stylized flourish at the end.

Jose Luis Fuentes  
**Climate change manager**

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UNFCCC	CDM validation and verification standard for project activities,	version 02.0	UNFCCC website
2	UNFCCC	CDM project standard for project activities	version 02.0	UNFCCC website
3	UNFCCC	CDM project cycle procedure for project activities,	version 02.0	UNFCCC website
4	UNFCCC	ACM0001: Flaring or use of landfill gas	version 19.0	UNFCCC website
5	UNFCCC	Methodological tool: Emissions from solid waste disposal sites	version 05.0	UNFCCC website
6	UNFCCC	Methodological tool: Project emissions from flaring	version 03.0	UNFCCC website
7	UNFCCC	Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation	Version 03.0	UNFCCC website
8	UNFCCC	Methodological tool: Tool to calculate the emission factor for an electricity system	version 07.0	UNFCCC website
9	UNFCCC	Table to calculate the emission factor for an electricity system	version 04.0	UNFCCC website
10	UNFCCC	Methodological tool: Tool to determine the mass flow of a greenhouse gas in a gaseous stream	version 03.0	UNFCCC website
11	UNFCCC	Methodological tool: Tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion	version 03.0	UNFCCC website
12	UNFCCC	Methodological Tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period	version 03.0.1	UNFCCC website
13	UNFCCC	Methodological tool: Positive lists of technologies	version 02.0	UNFCCC website
14	PP	Registered PDD	version 6	UNFCCC website
15	PP	Modelo del Callao Landfill Gas Capture and Flaring System - CDM PDD	05/02/2019	PP
16	PP	Modelo del Callao Landfill Gas Capture and Flaring System - CDM PDD, version 7	29/09/2020	PP



17	PP	Emission reduction calculation spreadsheet	-	PP
18	PP	Grid emission factor calculation spreadsheet	-	PP
19	PP	Lambda calculation spreadsheet	-	PP
20	COES	Hourly energy data generation for the interconnected system (data generation 2017, 2018 and 2019)	-	COES website
21	COES	COES annual statistics (2017, 2018 and 2019)	-	COES website
22	IPCC	IPCC guidelines for National Greenhouse Gas Inventories	-	IPCC website
23	PP	Modalities of Communication Statement	-	PP
24	PP	Legal representative confirmation	-	PP
25	Peruvian government	Authorization from Callao Municipality	-	Municipality of Callao
26	MINEM	Electric generation concession		MINEM
27	MINEM	Law N° 27314: General Law of Solid Residues		MINEM
28	MINEM	Legislative Decree No. 1278, which approves the Law on Solid Waste Management		MINEM
29	MINEM	Electricity Concession Law (N° 25844)	-	MINEM
30	MINEM	Regulation of the Electric Concessions Law (DS N° 009-93-EM)	-	MINEM
31	MINEM	Promotion of investment for the generation of electricity with renewable energies (DS N° 024-2013-EM)	-	MINEM
32	MINEM	Law establishing the mechanism to ensure the supply of electricity to the regulated market (Law N° 29179)	-	MINEM
33		Decision 3/CMP.1 and relevant decisions and guidelines from the EB		UNFCCC

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

**Table 1. CL from this validation**

<b>CL ID</b>	01	<b>Section no.</b>	D.7	<b>Date:</b> 22/07/2020
<b>Description of CL</b>				
Project participant is requested to confirm whether MoC statement is up to date (refer to paragraph 288 of project standard). Also, it shall be provided the evidence to confirm that the names of the project participants included in the updated PDD are consistent with the names of the project participants in the latest version of the MoC statement.				
<b>Project participant response</b>				<b>Date:</b> 09/09/2020
Appendix 1 of the updated version of the PDD (02) has been corrected including the contact person of the current Modalities of Communications published in the UNFCCC website: Jorge Zegarra.				
<b>Documentation provided by project participant</b>				
Updated PDD				
<b>DOE assessment</b>				<b>Date:</b> 18/09/2020
PP is requested to provided additional evidence, in order to confirm that all corporate and personal details, including specimen signatures, included in the MoC, are still valid and accurate.				
<b>Project participant response</b>				<b>Date:</b> 24/09/2020
Legal representation document for PETRAMAS and Registration of Legal Person have been provided as evidence to confirm that the contact and signatory details are still valid according the MOC.				
<b>Documentation provided by project participant</b>				
Legal representation evidence PETRAMAS JORGE ZEGARRA REATEGUI Registration Legal Person				
<b>DOE assessment</b>				<b>Date:</b> 29/09/2020
PP has confirmed last version of MoC statement is update and the information included in the PDD is in accordance to the registered MoC. The, CL is closed				

**Table 2. CAR from this validation**

<b>CAR ID</b>	01	<b>Section no.</b>	D.1	<b>Date:</b> 22/07/2020
<b>Description of CL</b>				
According to the project standard, version 02 (paragraph 279), PDD must be updated in section relating to relating to the baseline, estimated GHG emission reductions or net anthropogenic GHG removals, the monitoring plan and the crediting period, applying selected methodologies. However, included information regarding project description and additionality are different from registered PDD version 6, dated on 01/06/2015, which is publicly available on UNFCCC website.				
<b>Project participant response</b>				<b>Date:</b> 09/09/2020
The project description and additionality section of the PDD was updated because the project is currently under Phase 2 and 2 power engines have been installed on 01/06/2018 with a total nameplate capacity of 2.4 MW. Section A.3 and B.5 have been updated to indicate that the Phase 2 is currently in operation, including technical specifications and capacity that can be evidenced with the document "Central Electrica Callao_Osinergmin". The total installed capacity is below the 10 MW limit for the automatic additionality as per paragraph 21 in section 5.3.1 of the ACM0001 "Flaring or use of landfill gas" (Version 19.0). an updated pdd is provided along with other evidence.				
<b>Documentation provided by project participant</b>				

Updated PDD Electric Plant Callao_Osinergmin Project Compendium-GTE-Operation-october-2018 Advance notice of new RER auction PRC justification_PETRAMAS
<b>DOE assessment</b>
<b>Date:</b> 29/09/2020
Final version of the PDD has been updated in accordance to the project standard. Also, has provide clean and track changes PDD in order to request the port registration changes. Issues requested to be corrected have been well addressed, Then, CAR is closed.

<b>CAR ID</b>	02	<b>Section no.</b>	D.2.	<b>Date:</b> 22/07/2020
<b>Description of CAR</b>				
According to project standard (paragraph 279, a), the project participants shall use the valid version of the methodologies and methodological tools applied in the registered PDD. However, PP has not applied version in force for the methodology (ACM0001, version 19); some tools; also, project design document form is not the last applicable version (version 11.0).				
<b>Project participant response</b>				<b>Date:</b> 09/09/2020
PDD has been updated considering the last version (19) of the methodology ACM0001. The methodological tools have been updated to their last version as well in the updated PDD. The version of the PDD form has been updated to the last version (11).				
<b>Documentation provided by project participant</b>				
Updated PDD				
<b>DOE assessment</b>				<b>Date:</b> 29/09/2020
PP has updated the PDD considered all requested information of applied methodology. Then CAR is closed				

<b>CAR ID</b>	03	<b>Section no.</b>	-	<b>Date:</b> 22/07/2020
<b>Description of CAR</b>				
Project participant has not provided evidence regarding emission reduction calculation; ie. <ul style="list-style-type: none"> <li>Waste Input from data</li> <li>Grid Emission Factor (listed in appendix 4)</li> <li>Hours of generators (listed in appendix 4)</li> <li>Hours of blowers (listed in appendix 4)</li> </ul>				
<b>Project participant response</b>				<b>Date:</b> 09/09/2020
<ul style="list-style-type: none"> <li>Waste Input from data</li> </ul> <p>"Actual Waste Input_Callao" is provided as evidence for waste input raw data, matching with the input values used in the ER calculations</p> <ul style="list-style-type: none"> <li>Grid Emission Factor (listed in appendix 4)</li> </ul> <p>Grid emission factor has been updated for the second crediting period and calculation evidence is provided in the documents . The ER Calculation spreadsheet and PDD have been updated using the current value for the grid emission factor.</p> <ul style="list-style-type: none"> <li>Hours of generators (listed in appendix 4)</li> <li>Hours of blowers (listed in appendix 4)</li> </ul> <p>For the ex-ante calculation of 8,000 hours / year, it is considered a standard in the operation of plants in landfill sites. See point "10.2.1.5 Limit values for exhaust composition" of the document "Power plants layout with Gas Engines" using the "Warranty period of 8000 operating hours or 1 Year "</p>				
<b>Documentation provided by project participant</b>				

Updated PDD	
Lambda calculation: sources of hourly data from COES	
Lambda calculation 2017-2019_UNFCCC tool	
200924_EF_Peru_2019_v2	
ER_Calculation	
Electricity imports: sources of annual imports from COES	
Petramas reports with primary source of waste input	
<b>DOE assessment</b>	<b>Date: 29/09/2020</b>
PP has corrected all spreadsheets in accordance to applied methodology and tools. All supporting evidence were provided. Then, CAR is closed	

Table 3. FAR from this validation

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