Project Title	CTR Candeias Landfill Gas Project
Project Reference	1724.V1
Report Date	10 March, 2011
Client Name	International Bank for Reconstruction and Development (IBRD) as the Trustee of the Spanish Carbon Fund, World Bank Group
Client Address	1818 H Street, NW Washington, DC 20433 USA

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Version Control	Date
Version 01	13 January 2010 (Draft Validation Report)
Version 02	10 March 2011 (Final Validation Report for Brazilian DNA)

Project Title:	CTR Candeias Landfill Gas Project			
Project Location	Municipality of Jaboatão dos Guararapes in the Recife Metropolitan Area			
Country:	Brazil			
Project Parties	Brazil Kingdom of Spain			
Project Participants	Haztec Tecnologia e Planejamento Ambiental SA International Bank for Reconstruction and Development (IBRD) as the Trustee of the Spanish Carbon Fund			
Methodology used	ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities"			
Methodology version number	11			
Estimated Annual Average Emission Reductions	155,112			
Crediting Period Dates	01 August 2011 to 31 July 2018			
GSP PDD Version	Date: 19 June 2009 Version Number: 01 Start date of GSP: 07 October 2009		Final PDD Version	Date: 08 March 2011 Version Number: 10

Summary:

ERM CVS was commissioned by the World Bank Group to validate the project CTR Candeias Landfill Gas Project on the basis of UNFCCC criteria for the Clean Development Mechanism (CDM), as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board, including the Validation and Verification Manual.

The validation consisted of the following three phases: i) a desk review of the project design documents, ii) site assessment and follow-up interviews with project stakeholders and iii) the resolution of outstanding issues in various rounds and the issuance of the final validation report and opinion.

Based on the work performed, it is ERM CVS's opinion that the project as described in the Project Design Document Version 10, dated 08 March 2011 meets all necessary criteria and requirements of the CDM, correctly applies the methodology ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 and is expected to result in real, measurable and long term emission reductions.

The host Party LoA and Annex 1 Party LoA have not been issued yet and will be required prior to the submission of the project for registration by the CDM Executive Board.

Client:	The World Bank Group
Client Representative:	Mr Charles W. Peterson

Report approved by:		Signature
Name: Melanie Eddis		
Date: 10 March 2011		

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Abbreviations

A/R	Afforestation / Reforestation
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification Request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
COP	Conference of Parties
DNA	Designated National Authority
DOE	Designated Operational Entity
EIF	Environmental Impact assessment Form
GHG	Greenhouse Gas
GSP	Global Stakeholder Period
FAR	Forward Action Request
FSR	Feasibility Study Report
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
LFG	Landfill gas
LoA	Letter of Approval
MOP	Meeting of Parties
MP	Monitoring Plan
ODA	Official Development Assistance
OM	Operating Margin
PDD	Project Design Document
PP	Project Participant
SELIC	Sistema Especial de Liquidação e Custodia, or Special System of Clearance and Custody
UNFCCC	United Nations Framework Convention on Climate Change
VVM	CDM Validation and Verification Manual

1. Introduction

1.1. Validation Objective

The purpose of a validation is to provide a thorough independent third party assessment of proposed CDM project activities to ensure that the proposed CDM project activity meets all the identified and applicable criteria for registration of projects under the Clean Development Mechanism. In particular, the project's baseline, additionality demonstration, applicability to an approved CDM methodology, monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country 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. Validation is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Certified Emission Reductions (CERs). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board. The validation will result in a conclusion as to whether the project should be submitted to registration. The final decision on whether to register the project rests with Executive Board and the Parties involved.

1.2. Scope

The validation scope is defined as an independent and objective review of the Project Design Document (PDD) and associated documentation. The PDD and associated documentation is reviewed against the criteria and requirements stated in the CDM Validation and Verification Manual (CDM-VVM) (EB 55) and Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, as well as relevant decisions by the CDM Executive Board. The validation scope also included an assessment of completeness and accuracy of documentation, evaluation of evidences, information and assumptions made in the PDD and supporting documentation.

1.3. CDM Project Description

The CTR Candeias Landfill Gas Project (hereinafter referred to as 'project' or the 'project activity') is a landfill gas capture project located in the Municipality of Jaboatão dos Guararapes in the Recife Metropolitan Area. The project scenario is the installation and operation of a landfill gas collecting and pre-treatment system, enclosed flaring, power generation and grid connection system. The landfill gas collected through a network of pipes will pass through a pre-treatment system, where the moisture will be removed. The enclosed flaring system will operate when the volume of gas exceeds the capacity of the power generation system or when the power generation system is not in operation (e.g. maintenance, shutdown).

The baseline scenario and historical situation is the atmospheric release of landfill gas. ERM CVS were able to validate this based on the site visit, which took place before any construction works started on the proposed project therefore ERM CVS was able to observe the current situation at the landfill site, i.e. no flaring or utilisation of any landfill gas takes place. The baseline of the proposed project activity is further validated in section 3.3 of this report.

The description of the technology to be applied provides sufficient and transparent information to evaluate its impact on the greenhouse gas balance. The credibility of this information has been validated by reviewing the technical documentation of the proposed project including the Simplified Environmental Report [DR16], the Technical specifications of the Landfill Gas Enclosed Flare System provided by the equipment supplier ZTOF [DR24], evidence of the Lifetime of the project and hours of operation per year provided by GE Energy [DR29], a report entitled 'Executive Project of Muribeca Landfill. Capacity and lifetime' developed by Engecorps (Muribeca is the name of the road where the CTR Candeias Landfill project is to be implemented and was the name initially adopted for the project) [DR28], and the technical feasibility report of the proposed project [DR45].

1.4. Validation Personnel

Validation Team	Role	Coverage of sectoral scope	Coverage of technical area	Financial Expertise	Host country experience	Participated in site visit?
Braulio Pikman	Lead validator	√	√		√	√
Fernanda Michalischen	Validator			√	√	
Virginia Gante	Assessor under training					
Flavia Soares	Validator under training					√

Technical Review	Role	Coverage of sectoral scope	Coverage of technical area	Host country experience	Participated in site visit?
Jonathan Avis	Technical Reviewer	√	√		

Braulio Pikman has over 25 years of experience in GHG, energy and air quality related initiatives. He is a member of the CDM Methodologies Panel and has extensive experience with the oil and gas and energy sectors. His experience includes:

- Expert in thermal measurements, combustion, energy efficiency, Climate Change, CDM Methodologies related to LFG recovery, flares and renewable energy production.

- Coordinated the Thermal Measurements Laboratory of the Technological Research Institute of Sao Paulo for 10 years, working with Combustion & Gasification Experimental Diagnostics, Air Emissions Monitoring & Control, development of instrumentation for measurements in flames and Energy Conservation Projects to the Oil & Gas Sector, Mining, Petrochemical and also Pulp &Paper.
- Responsible for the energy conservation program of the National Petroleum Agency of Brazil from 2000 to 2002 regarding the industrial and Transportation Sectors in Brazil.
- Member of the Methodological Panel of the United Nations Framework Convention on Climate Change since June 2005.

Fernanda Michalischen is Master of Science in business administration from the University of São Paulo, with a specialization in Finance and Corporate Governance. She has worked in the financial area since 2003, in banks, the goods industry and consultancy. She has been working for ERM CVS since 2009 as a Financial Expert and has already participated in more than 20 validation projects in China, South Africa and Brazil.

Virginia Gante has over 5 years of experience in the field of energy efficiency and carbon projects. She developed Project Design Document (PDD) and CDM monitoring reports for different companies in the sector of biomass-to-energy, hydroelectricity, wind energy and landfill gas. She was involved in the grid emission factor calculations of Brazil, Chile and Nicaragua.

Flavia Soares, Is a chemical engineer with more than 10 years experience as a consultant in the environmental area, including the preparation of environmental licensing projects, assessments associated with sanitary landfills, solid waste management plans, municipal guidelines for urban cleansing, characterization of solid waste materials, technical/business proposals for participation in public invitations to bid, as well as technical sales of equipment for the treatment of solid waste materials generated by health services. Ms Soares is a lead assessor in the ERM Mergers and Acquisitions due diligence team, and has an excellent background in Brazilian Environmental Legislation. Ms Soares has worked as Coordinator of the implementation of an Air Emissions Management System (GHG and Criteria Pollutants) at Petrobras (Petróleo Brasileiro SA), as well as working on identifying GHG mitigation opportunities and screening of CDM projects for a range of clients, and participating in the development of GHG corporate policies. Ms Soares has developed the air emissions management report of Petrobras to communicate performance results to internal and external stakeholders, and has managed Vale´s 2008 GHG inventory, the development of Vale´s energy, air emissions and climate change indicators for the Global Reporting Initiative (GRI), as well as Vale´s Carbon Disclosure Project questionnaire

Jonathan Avis is CDM Business Manager for ERM CVS, and a GHG Auditor and Technical Reviewer with over 5 years experience in the carbon market. His previous work experience includes screening and due diligence of carbon projects, Project Design Document (PDD) development, quality assurance and technical review of CDM project documentation, the development of carbon monitoring plans, and management of carbon projects through the validation, registration and verification stages. He has worked on the development and quality control of carbon projects in numerous sectors including hydroelectricity, wind energy, landfill gas, waste gas and heat, coal mine methane, biomass-to-energy and composting. Since joining ERM CVS Jonathan has worked as a Technical Reviewer and GHG auditor on numerous CDM validations.

2. Methodology

The validation was carried out in accordance with the CDM Validation and Verification Manual (VVM), version 1.2 published at EB 55. The validation process employed standard auditing techniques and undertook necessary cross-checks and follow-up actions to ascertain the correctness of the information. The validation team included staff with experience in the relevant sectoral scopes and technical areas within the sectoral scope, and included local host country expertise, sectoral knowledge, and financial expertise. The validation report and associated documents have undergone a thorough technical review by ERM CVS before being submitted to the CDM Executive Board for registration. The validation consisted of the following key phases:

I. Upload of the PDD for Global Stakeholder Process (GSP) consultation, receipt of any comments from stakeholders (GSP started on 07 October 2009)

II. Desk review of documentation including PDD, methodology and key supporting documents and references

III. A visit to the project site, including interviews with personnel responsible for developing the project (the site visit took place on 24 November 2009)

IV. Development of a draft validation report, identifying non-compliances including Corrective Action Requests (CARs) and Clarification Requests (CLs), taking into account findings of the GSP, desk review and site visit / interviews

V. Resolution of outstanding issues (CARs and CLs) and development of a final validation report and validation opinion

2.1. Global Stakeholder Process

The PDD version 01 dated 19 June 2009 was uploaded for global stakeholder comments. The global stakeholder period was 07 October 2009 to 05 November 2009. Relevant information can be found at http://cdm.unfccc.int/Projects/Validation/DB/Z6F8YA153FF7RZVJ634PL3OSZQ6V4W/view.html

No public comments were received during the consultation period.

2.2. Desk Review

The validation is based on the review of documentation and interviews with various personnel. A detailed desk review of the PDD, methodology and all other associated documentation and references took place in advance of the site visit, and additional documents that were not available for the desk review were requested for review during the site visit.

A list of documents reviewed is included in Appendix A.

2.3. Site visit

The site visit took place on 24 November 2009. ERM CVS staff attending the site visit included Braulio Pikman (lead validator). and Flavia Soares (validator). The site visit included a tour of the physical project site, including the Landfill site, and the administration office where all the CDM team was interviewed and all documentation related to the project was presented to the validation team.

Interviews took place on site, via telephone or via email and include relevant stakeholders in the host country, personnel responsible for project design and implementation, and other stakeholders as applicable. Staff from the Facility and the CDM project team were interviewed, and document review took place at the conference room of the office.

A list of interviewees, and the main topics discussed with each can be found in appendix A.

2.4. Reporting

A checklist of the key requirements for validation is included as Appendix B. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet.
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.
- It must also list project components/issues not covered in the validation engagement

The protocol describes the following:

Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
The	The documents	This section is used to elaborate	This is either acceptable based on evidence	Indicates

requirements that the project should meet	used to check the answer to the checklist question	and discuss the conformance to the checklist question, and to explain the conclusion reached. It includes the means of validation, which explains how conformance with the checklist is justified. For example document review (DR) or interview (I). N/A means not applicable	provided (OK), or a *Corrective Action Request* (CAR) is required due to non-compliance with the checklist question. A request for *Clarification* (CL) is used when the validation team has identified a need for further clarification. A 'Minor Issue' may be recorded for typographical errors or similar minor errors that do not have an impact on the compliance of the project to the CDM rules but nevertheless should be corrected to improve clarity. A *Forward Action Request* (FAR) could be raised for issues to be addressed during first verification that do not form part of the registration requirements	whether the CAR or CL has been closed out (OK).

Remediation Form

Clarification Requests (CL), Corrective Action Requests (CAR) and Forward Action Requests (FAR), plus minor issues are raised in the draft validation protocol and detailed in a separate form using Table 3 (Appendix C). In this form, note is made of actions taken by the Project Proponent to close outstanding CARs and respond to CLs and Forward Action Requests:

Draft report corrective action, clarification, or forward action requests, or minor issues	**Reference to CDM Validation Protocol Checklist**	**Summary of project participants' response**	**Final conclusion**
List of CARs, CLs and FARs (and minor issues)	Reference to the validation protocol checklist question	Summary of response during the communication with the validation team	Summary of validation team responses and final conclusion.

Clarification Requests (CL): Where insufficient or unclear information is available and clarification or new information is required. A CL is raised specifying what additional information is required.

Corrective Action Requests (CAR): Where a non-conformance arises the Assessor shall raise a Corrective Action Request (CAR). A CAR is issued, where:

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

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

Forward Action Requests (FAR): FARs shall be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

A 'Minor Issue' may be recorded for typographical errors or similar minor errors that do not have an impact on the compliance of the project to the CDM rules but nevertheless should be corrected to improve clarity.

2.5. Internal Quality Control

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

3. Validation Findings

3.1. Main changes between the PDD version published for the global stakeholder comment period and the final version submitted for registration:

- Project description was further clarified;
- Inconsistencies relating to the technical parameters were corrected;
- Emission reductions calculation and results were revised and corrected;
- LPG consumption due to the project activity was taken into account;
- Further information incorporated on the project timeline to demonstrate that CDM was seriously considered in the decision to proceed with the project activity and real and continuing action had been undertaken in parallel to the implementation of the project activity;
- Further clarity and justification provided in demonstrating additionality of the project activity;
- Further information, sources and justifications provided relating to the electricity tariff applied in the financial analysis;
- A new investment analysis was performed using benchmark analysis;
- Additional information was presented in the common practice analysis;
- Further information was presented in the monitoring plan;
- Parameters T (temperature of the landfill gas) and P (pressure of the landfill gas) were removed from the monitoring plan since direct measurement of the normalised volume of landfill gas is adopted in the revised monitoring plan;
- Operational and management structure with respect to the monitoring aspects further clarified;
- All invited local stakeholders were included in the PDD;
- Expected starting date of the project activity was updated.

3.2. Approval and Participation Requirements

The project participants are *Haztec Tecnologia e Planejamento Ambiental SA*, authorised by Brazil, and *International Bank for Reconstruction and Development (IBRD) as the Trustee of the Spanish Carbon Fund*, authorised by Spain. The host Party, Brazil, and Annex I Party, Spain, have both ratified the Kyoto Protocol. Both Parties have established their respective Designated National Authorities (DNA) as per the participating requirements for CDM under the Kyoto Protocol. All project participants have been listed in a consistent manner in section A.3 of the PDD and the information is consistent with the contact details provided in Annex 1 of the PDD.

The host Party LoA and Annex 1 Party LoA have not been issued yet. Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development, and the written approval of voluntary participation from the DNA of Spain.

3.3. Project Design

Conformance of the PDD with EB guidelines

The PDD has been checked against the latest 'Guidelines for developing the Project Design Document' (version 7) and the latest template for the Project Design Document (version 3) available on the CDM website. ERM CVS has confirmed that the final PDD is in compliance with the template and guidelines.
ERM CVS has been able to confirm that the project description in the PDD is accurate and complete and provides sufficient description of the project activity.

Conformance of the project design in the PDD with source documents such as the FSR

The project description has been validated against the technical documentation of the proposed project including the Simplified Environmental Report [DR16], the Technical specifications of the Landfill Gas Enclosed Flare System provided by the equipment supplier ZTOF [DR24], evidence of the Lifetime of the project and hours of operation per year provided by GE Energy [DR29], a report entitled 'Executive Project of Muribeca Landfill. Capacity and lifetime'. developed by Engecorps (Muribeca is the name of the road where the CTR Candeias Landfill project is to be implemented and was the name initially adopted for the project) [DR28], the technical feasibility report of the proposed project [DR45], and the technical specifications of the equipment, specifically the Jenbacher gas engines [DR37, 41], as well as the design layout diagrams of the proposed project [DR 9, 10, 11, 12, 13, 14, 15]. The project has received the Installation Environmental License issued on 03 June 2010 by the CPRH Environmental Agency of Pernambuco [DR 35]. ERM CVS can confirm that the project design in the PDD is in conformance with the source documents.

Timeline and operational status of the project

The installation license has been issued on 03 June 2010. Installation and acquisition of the equipments detailed in the PDD have not been started yet at the time of validation report writing. It is expected, according to the project developer, that the project will start on 01 April 2011, which is the expected date for the purchase of the flare and the extractive system.

The expected lifetime of the project is 20 years, and this is consistent with the equipment lifetime as specified by the manufacturer of the flare, which has an expected lifetime of 20 years [DR 24]. The project lifetime is also consistent with the lifetime and service period of the engines, which have a total lifetime of 120,000 hours, i.e. 15 years (with an overhaul after 7.5 years) [DR 29], and which are planned to operate from year 2 to year 16 of the project (after which time there will not be sufficient gas to generate electricity). The project lifetime is consistent with the assessment period of the financial analysis.

Based on ERM CVS's local and sectoral knowledge, this lifetime is considered reasonable for a project of this type in the host country.

Permits and approvals:
ERM CVS has confirmed that the project activity has the relevant permits and approvals needed to be developed as a landfill gas capture project in the host country. ERM CVS has checked the relevant permits and approvals including:

- Simplified Environmental Report prepared by Novagerar Resíduos e Ecoenergia [DR 16]
- Environmental License issued by CPRH Environmental Agency of Pernambuco [DR 35]

The necessary permits and approvals were found to be in place in accordance with host country requirements and applicable national laws and regulations. Furthermore, the project description was found to be consistent between the final PDD, the site visit and the indicated documents.

Project location
The project site is located on Muribeca Road in the Municipality of Jaboatão dos Guararapes in the Recife Metropolitan Area, State of Pernambuco, Brazil. The power output by the project activity will be delivered to the National Power Grid. The location described in the final PDD accurately reflects the location of the project and has been validated during the site visit, and is consistent with the location of the project in the other documents including the Environmental License [DR35].

Applicability of selected methodology
The project activity applies the approved baseline and monitoring methodology ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities" Version 11. This is the most recent version of the methodology and is valid at the time of validation. The methodology also refers to the "Tool for demonstration and assessment of additonality" Version 05.2, "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13), "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" Version 01, "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" Version 05, "Tool to calculate the emission factor for an electricity system" Version 02, and the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" Version 02. These were the most recent versions of these tools valid at the time of validation. The chosen methodology is considered appropriate for the project activity and is found to be correctly applied based on the following aspects:

Table 1: Validation of the applicability criteria of the methodology

Applicability Criteria	How the applicability has been validated
The captured gas is flared	This has been validated based on the technical feasibility report of the project activity [DR 45], developed by Haztec and the Simplified Environmental Report [DR 16], developed by Novagerar Resíduos e Ecoenergia.
The captured gas is used to produce energy (e.g. electricity/thermal energy). Emission reductions can be claimed for thermal energy generation, only if the LFG displaces use of fossil fuel either in a boiler or in an air heater. For claiming emission reductions for other thermal energy equipment (e.g. kiln), project proponents may submit a revision to this methodology;	The captured gas is used to produce electricity. Thermal energy generation has not been claimed by the project participants, and it is not relevant to the project. This has been validated based on the technical feasibility report of the project activity [DR 45], developed by Haztec and the Simplified Environmental Report [DR 16], developed by Novagerar Resíduos e Ecoenergia.
The captured gas is used to supply consumers through natural gas distribution network. If emissions reductions are claimed for displacing natural gas, project activities may use approved methodology AM0053.	This is not applicable to the project, which has been confirmed by reviewing the design of the project, including the technical feasibility report of the proposed project [DR 45].

The applicability conditions of the relevant tools also apply. The project applies the following tools:

"Tool for demonstration and assessment of additonality", Version 05.2.

- The application of this tool is required by the methodology and no other specific applicability conditions apply.

"Tool to determine project emissions from flaring gases containing methane". (EB28 Annex 13).

- This tool is applicable under the following conditions:
- The residual gas stream to be flared contains no other combustible gases than methane, carbon monoxide and hydrogen;
    - The gas stream to be flared in the project activity is landfill gas, and the tool is designed to incorporate this type of gas. No other combustible gases other than methane, carbon monoxide and hydrogen are likely to be contained in the gas, based on ERM CVS technical knowledge.

- The residual gas stream to be flared shall be obtained from decomposition of organic material (through landfills, bio-digesters or anaerobic lagoons, among others) or from gases vented in coal mines (coal mine methane and coal bed methane).
    - The residual gas stream is obtained from a landfill

"Tool to calculate baseline, project and/or leakage emissions from electricity consumption" Version 01

- The tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption:
    - Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only. Either no captive power plant is installed at the site of electricity consumption or, if any on-site captive power plant exits, it is not operating or it can physically not provide electricity to the source of electricity consumption.
    - Scenario B: Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s).
    - Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s).
    - In the case of the project activity, electricity in the baseline is supplied by the grid. There is no captive power plant at the project site in the baseline.

"Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" Version 05

- The tool is not applicable to stockpiles.
    - The project takes place at a landfill not a stockpile. this was confirmed during the site visit.
- The tool is applicable in cases where the solid waste disposal site where the waste would be dumped can be clearly identified.
    - The waste that would be dumped has been clearly identified in the calculations. The actual quantity of methane extracted from the landfill will be monitored, so this tool is only used for the purposes of ex-ante estimation of emission reductions in the PDD.
- The tool is not applicable to hazardous wastes.
    - The landfill is a municipal landfill, not a hazardous waste disposal site. This has been validated during the site visit.

"Tool to calculate the emission factor for an electricity system". Version 02

- This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).
    - This is the case for the project activity – electricity generated from captured landfill gas substitutes grid electricity. This was confirmed based on the project design, including review of the technical feasibility report [DR 45]

"Tool to calculate project or leakage emissions from fossil fuel combustion" Version 02

- The tool can be used in cases where CO_2 emissions from fossil fuel combustion are calculated based on the quantity of fuel combusted and its properties
    - This is the case for the project activity – the quantity of fossil fuel combusted and its properties can be determined

Therefore the project meets all the applicability conditions of the applied methodology and tools, and the methodology and tools are correctly quoted.

Project boundary

The spatial extent of the project boundary includes the CTR Candeias landfill, the power generating equipment and the power plants connected physically to the electricity grid that the proposed project activity will affect (i.e. the National Power Grid as defined by the DNA). This was validated based on review of the technical feasibility report of the project activity [DR 45], simplified environmental report [DR 16] and information on the national power grid published by the Ministry of Science and Technology [DR 34]. This is correctly defined in the PDD in accordance with the methodology. The sources and gases included in the PDD are in accordance with the methodology ACM0001 v11. The identified boundary and the selected sources and gases are considered to be justified for the project activity and in accordance with the applied methodology.

The project activity is not expected to result in emissions other than those allowed by the methodology, and there are no greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.

Details of emission sources and gases included in the project boundary are illustrated below in the table:

Table 2: Emission sources and gases included in the project boundary

Emission Type	GHGs involved	Source
Baseline emissions	CO_2, CH_4	Emissions from decomposition of waste at the landfill site Emissions from electricity consumption within the National Power Grid
Project emissions	CO_2	Emissions from on-site electricity use from the National Power Grid and emissions from on-site fossil fuel consumption due to the project activity other than for electricity generation (for igniting the flare)
Leakage	n/a	No leakage needs to be considered when applying this methodology

3.4. Baseline

The project activity is the landfill gas capture and a power generation facility, with an enclosed flare as an alternative for when the electricity generator is not running or during shutdown and overcapacity situations. Thus the baseline scenario, in accordance with the methodology, must include determination of realistic and credible alternatives for the landfill gas use and power generation in the absence of the project activity. The methodology requires the use of step 1 of the latest version of the "Tool for the demonstration and assessment of additionality" Version 05.2, to identify all realistic and credible baseline alternatives.

ERM CVS has confirmed that the procedure contained in the methodology to identify the most reasonable baseline scenario has been correctly applied. Each step of the procedure described in the PDD was checked against the requirements of the methodology.

Step 1 involves identification of the most plausible baseline scenario from two alternatives for disposal/treatment of the waste (LFG1 and LFG2), and six alternatives for power generation (P1 through P6) as specified in the methodology. The PDD includes a discussion of each alternative and justification for inclusion/exclusion of the alternative for the baseline scenario.

Table 3: Validation of the inclusion / exclusion of baseline alternatives

Scenario	Included or excluded?	How the inclusion / exclusion of the scenario was validated.
LFG1: The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity	Included	It is plausible. This is interpreted as the project activity undertaken without CDM revenues. However there is no Brazilian regulation requiring the capture of landfill gas.
LFG2: Atmospheric release of the landfill gas or partial capture of landfill gas and destruction to comply with regulations or contractual requirements, or to address safety and odour concerns	Included	This is the situation prior to the implementation of the project activity. It is plausible. Atmospheric release of the landfill gas is the common practice in the sector.
P1: Power generated from landfill gas undertaken without being registered as CDM project activity	Included	This is interpreted as the project activity undertaken without CDM revenues. It is plausible, and complies with all legal and regulatory requirements.
P2: Existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant	Excluded	Heat generation is not included in the project activity and therefore this option does not represent a comparable baseline alternative providing the same outputs and services as the proposed project. Furthermore the power and heat needs of the site are small and the construction of a fossil fuel fired cogeneration plant is therefore neither realistic nor credible.
P3: Existing or construction of a new on-site or off-site renewable based cogeneration plant	Excluded	Heat generation is not included in the project activity and therefore this option does not represent a comparable baseline alternative providing the same outputs and services as the proposed project. Furthermore the power and heat needs of the site are small and the construction of a renewable based cogeneration plant is therefore neither realistic nor credible
P4: Existing or construction of a new on-site or off-site fossil fuel fired captive power plant	Excluded	The power demand of the site is very small and therefore this option would not represent an alternative of the same scale as the proposed project and would

		not provide comparable outputs and services. Based on ERM CVS's local and sectoral knowledge it is neither financially attractive nor a current practice in the sector and as the consumption of electricity from the grid is reliable and not expensive there is no likelihood of installing a captive power plant.
P5: Existing or construction of a new on-site or off-site renewable based captive power plant	Excluded	The power demand of the site is very small and therefore this option would not represent an alternative of the same scale as the proposed project and would not provide comparable outputs and services. Based on ERM CVS's local and sectoral knowledge it is neither financially attractive nor a current practice in the sector and as the consumption of electricity from the grid is reliable and not expensive there is no likelihood for installing a captive power plant.
P6: Existing and/or new grid-connected power plants	Included	This is the same as the situation prior to the implementation of the project activity. It is plausible.
H1 through H7: heat generation	Excluded	Heat generation is not contemplated by the project activity and therefore alternatives for heat generation are not considered. According to the 'Tool for the demonstration and assessment of additionality' Version 05.2, the PDD should identify realistic and credible alternative(s) that provide outputs or services (e.g. electricity, heat) with comparable quality, properties and application areas as the proposed CDM project activity.

Sub-step 1.b: consistency with mandatory laws and regulations. The PDD demonstrates that all remaining alternatives are consistent with mandatory laws and regulations. ERM CVS can confirm that there are no regulatory or contractual requirements mandated for a specific system for collection and destruction of methane in Pernambuco. Furthermore, all the existing Landfills installed in the State [DR47] do not adopt any mechanism to burn the gas produced by the Landfill, including passive flaring.

After completion of Step 1, the combinations of realistic and plausible scenarios included are: LFG2 & P6 (i.e. the pre-project scenario, where the landfill gas is vented to the atmosphere and the National Power Grid provides the equivalent electricity); and LFG1 & P1 (i.e. the project activity undertaken without CDM).

Step 2 involves the identification of the fuel for the baseline choice of energy source, taking into account the national and/or sectoral policies as applicable, and exclusion of baseline alternatives that involve fossil fuels that face supply constraints. The fuel for the baseline scenarios identified in Step 1 is electricity supplied from the grid, which comprises coal, gas, oil, and to a large extent renewable energy generation sources. Grid electricity faces no supply constraints in the project boundary. This has been validated based on local and sectoral knowledge and by observation during the site visit that the baseline facility had access to the grid.

Step 3 applies step 2 and step 3 of the "Tool for demonstration and assessment of additionality" Version 05.2. The PDD section B.5 presents the additionality evaluation using investment analysis, which excludes LFG1 & P1 (i.e., the project activity undertaken without CDM) as being financially unattractive. Thus, after Step 3, the only baseline scenario remaining is LFG2 & P6 (i.e., the pre-project scenario, where the waste gas is vented to the atmosphere and the National Power Grid provides the equivalent amount of electricity). (For further details of the validation of the investment analysis, please see section 3.5 below on additionality).

Based on the validation team's local and sectoral knowledge, and review of government documents [DR 31, 32, 33, 47] regarding landfills in the relevant geographical region (state of Pernambuco), it is confirmed that the selected baseline scenario with respect to landfill gas vented to the atmosphere is in compliance with all mandatory laws and regulations and is the prevailing practice in this sector in the relevant geographic region.

With respect to the power generation baseline, based on ERM CVS's local and sectoral knowledge the Brazilian Power Grid is unlikely to shift away from being dominated by hydroelectricity sources within the crediting period. The PDD provides a verifiable description of the identified baseline scenario, and have been cross checked against the information published by the DNA of Brazil [DR 34].

The assumptions and data used by the project participants are listed in the PDD, including their references and sources. The documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances related to the management of landfill sites, and local economic and technological circumstances are considered correctly in the assessment.
The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

3.5. Monitoring Plan

The project activity applies approved monitoring methodology ACM0001 v11. The methodology is applied correctly and transparently, and provides for accurate measurement of the emission reductions ex-post. The monitoring plan is in accordance with the methodology.

The following parameters are monitored for the project activity. The parameters, the associated monitoring equipment, the data management system, QA/QC and emergency or backup monitoring methods are clearly described in the PDD and the means of monitoring in the PDD complies with the requirements of the methodology ACM0001 v11.

Table 4: Parameters Monitored

Parameter	Description	Measurement methods
$LFG_{total,y}$	Total amount of landfill gas captured at normal temperature and pressure	Measured by a gas flow meter. Measured continuously, aggregated monthly and yearly.
$LFG_{flare,y}$	Amount of landfill gas flared at Normal Temperature and Pressure	Measured by a gas flow meter. Measured continuously, aggregated monthly and yearly.
$LFG_{electricity,y}$	Amount of landfill gas combusted in power plant at Normal Temperature and Pressure	Measured by a gas flow meter. Measured continuously, aggregated monthly and yearly.
$PE_{flare,y}$	Project emissions from flaring of the residual gas stream in year y	Calculated as per the "Tool to determine Project emissions from flaring gases containing Methane" (EB28 Annex 13)
w_{CH4}	Methane fraction in the landfill gas	Measured by continuous gas quality analyzer. Measured continuously, aggregated monthly and yearly.
$EF_{grid,CM,y}$ = $CEF_{elec,BL,y}$ = $EF_{EL,j,y}$	Combined margin emission factor	Calculated as per the "Tool to calculate the emission factor for an electricity system" v02
Operation of the energy plant	Operation of the energy plant in year y	Measured continuously, aggregated yearly
$PE_{EC,y}$	Project emissions from electricity consumption by the project activity during the year y	As per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" v01
$PE_{FC,y}$	Project emissions from LPG (pilot flame of the flare) consumption by the project activity during the year y	Calculated as per the "Tool to calculate baseline, project and/or leakage emissions from fossil fuel combustion" v02
T_{flare}	Temperature in the exhaust gas of the flare	The temperature in the exhaust gas will be measured continuously with a type N thermocouple and continuously monitored as described in the "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13). A temperature above 500 ºC indicates that a significant amount of gases is being burnt and that the flare is operational.
$tO_{2,h}$	Volumetric fraction of O_2 in the exhaust gas of the flare in the hour h	Monitored as per the "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13). An in situ LANDTEC Gas analyzer will be adopted. Measured continuously using a continuous gas analyzer.
$fv_{CH4,h}$	Volumetric fraction of methane in the residual gas in the hour h	Monitored as per the "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13). Measured continuously using a continuous gas analyser. The same basis (dry or wet) shall be considered for this measurement and the measurement of the volumetric flow rate of the residual gas (FVRG,h) when the residual gas temperature exceeds 60 ºC.
$FV_{RG,h}$	Volumetric flow rate of the residual gas in dry basis at Normal (NTP) Condition in the hour h	Monitored as per the "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13). Measured continuously using a flow meter. The same basis (dry or wet) shall be considered for this measurement and the measurement of the volumetric fraction of methane in the residual gas (fvCH4,h), when the residual gas temperature exceeds 60 ºC.
$fv_{CH4,FG,h}$	Concentration of methane in the exhaust gas of the flare in dry basis	Monitored as per the "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13).

	at normal conditions in the hour h	Measured continuously using a gas analyzer. Values to be averaged hourly or at a shorter time interval.
EL_{LFG}	Net amount of electricity generated using LFG	Measured continuously using an electricity meter.
$EC_{PJ,y}$	Quantity of electricity consumed by the project activity during the year y	Measured continuously using an electricity meter. Data will be aggregated annually as stated in the "Tool to calculate Project emissions from electricity consumption" v01
TDL_y	Average technical transmission and distribution losses in the grid in year y for the voltage level at which electricity is obtained from the grid at the project site.	Monitored annually as per the "Tool to calculate project emissions from electricity consumption" v01
FCi,j,y	Onsite combustion of fossil fuels (LPG) in flare ignition system during the year y	Measured continuously using volumetric meter as per the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 02
NCVi,y	Weighted average net calorific value of fuel type i (LPG) in year y	Obtained from fuel suppliers for each fuel delivery; a weighted annual average is calculated using those obtained values
EFCO2,i,y	Weighted average CO2 emission factor of fuel type i (LPG) in year y	As valued from the supplier are not available, the IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of chapter 1 of Vol 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories will be used

Parameters T (temperature of the landfill gas) and P (pressure of the landfill gas) were removed from the revised PDD since the monitoring plan adopts flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters. Therefore according to the methodology no separate monitoring of temperature and pressure of the landfill gas is necessary.

For each parameter, the following assessment has been performed:

Table 5: Assessment and validation of parameters monitored

Requirements	Conclusion				
	$LFG_{total,y}$	**$LFG_{flare,y}$**	**$LFG_{electricity,y}$**	**$PE_{flare,y}$**	**$EC_{PJ,y}$**
Title in line with methodology?	Yes	Yes	Yes	Yes	Yes
Data unit correctly expressed?	Yes	Yes	Yes	Yes	Yes
Parameter appropriately described?	Yes	Yes	Yes	Yes	Yes
Source clearly referenced?	Yes	Yes	Yes	Yes	Yes
Correct value provided for the purpose of PDD estimations?	Yes. The ex-ante estimations of methane generation were reviewed by ERM CVS and correctly follow the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05.	Yes	Yes	Yes. All calculations are presented in [DR 8] and were validated by the DOE using the default 90% destruction efficiency	Yes
Has this value been validated?	Yes, based on the annual waste inflow, the waste average composition and biogas collection efficiency, and equations provided	Yes, based on the biogas collected and sent to the generators. This is described in the PDD (ex-	Yes, based on the capacity to the generators purchased. This is based on the PDD and the generators	Yes	Yes, based on electricity consumption of equipment to be installed in the landfill and number of operating hours

	in the tool. This is described in the PDD (ex-ante estimation) and validated against DR1, DR6, DR8, DR24, DR28, DR37,	ante estimation) and validated against DR1, DR6, DR8, DR24, DR28, DR37,	quotations and has been validated against DR1, DR6, DR8, DR24, DR28, DR37,		per day. Calculation was performed based on design data of the equipment to be installed (various references) and hours of operation. Both are provided in [DR 8]
Measurement methods correctly described and in line with the methodology/tools?	Yes. The revised PDD states (parameter LFGtotal,y) that "The flow meter includes automatic measure of the Temperature and Pressure so the measure is expressed in normalized cubic meter". Therefore according to the methodology no separate monitoring of temperature and pressure of the landfill gas is necessary when using flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters.	Yes	Yes	Yes. Calculated as per the "Tool to determine Project emissions from flaring gases containing Methane" (EB28 Annex 13)	Yes
Correct reference to standards (i.e. for calibration and maintenance)?	Yes	Yes	Yes	Yes	Yes, using manufacturer's recommendations
Indication of accuracy provided?	Yes, assumed to be above 95%	Yes, assumed to be above 95%	Yes, assumed to be above 95%	n/a	Yes, assumed to be above 95%, according to national/international standards.
QA/QC procedures described?	Yes	Yes	Yes	Yes	Yes
QA/QC procedures appropriate?	Yes. In line with methodology requirements.	Yes. In line with methodology requirements.	Yes. In line with methodology requirements.	Yes	Yes

Requirements	**Conclusion**				
	w_{CH4}	**$EF_{grid,CM,y} = CEF_{elec,BL,y} = EF_{EL,j,y}$**	**EL_{LFG}**	**Operation of the energy plant**	**$PE_{FC,y}$**
Title in line with methodology?	Yes	Yes	Yes	Yes	Yes
Data unit correctly expressed?	Yes	Yes	Yes	Yes	Yes
Parameter appropriately described?	Yes	Yes	Yes	Yes	Yes

Source clearly referenced?	Yes	Yes	Yes	Yes	Yes
Correct value provided for the purpose of PDD estimations?	Yes	Yes	Yes	Yes	Yes
Has this value been verified?	Yes. The value is assumed to be 50% for the purposes of ex-ante estimations, which is in line with the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" (Version 05)	Yes. ERM CVS have confirmed the ex-ante value against the latest data published by the DNA of Brazil [DR 34]	Yes, this has been checked against the technical specifications of the project [DR3, DR28]	Yes. The estimated value (8,000 hours) is contained in the CER calculation spreadsheet [DR 8] and is reasonable based on the technical specifications of the project [DR 37, 39, 41]	Yes. The estimation of project emissions from fossil fuel combustion is validated in section 3.6 below.
Measurement methods correctly described and in line with the methodology/tools?	Yes	Yes	Yes	Yes	Yes
Correct reference to standards (i.e. for calibration and maintenance)?	Yes	Yes	Yes, using manufacturer's recommendations	Yes	Yes
Indication of accuracy provided?	Yes, assumed to be above 95%	n/a	Yes, assumed to be above 95%	n/a	Yes, assumed to be above 95%
QA/QC procedures described?	Yes	Yes	Yes	Yes	Yes
QA/QC procedures appropriate?	Yes	Yes	Yes	Yes	Yes

Requirements	**Conclusion**				
	$PE_{EC,y}$	**TDL_y**	**T_{flare}**	**$tO_{2,h}$**	**$fvCH4_{,h}$**
Title in line with methodology?	Yes	Yes	Yes	Yes	Yes
Data unit correctly expressed?	Yes	Yes	Yes	Yes	Yes
Parameter appropriately described?	Yes	Yes	Yes	Yes	Yes
Source clearly referenced?	Yes	Yes	Yes	Yes	Yes
Correct value provided for the purpose of PDD estimations?	Yes	Yes	Not applicable. No value is used in the ex-ante estimation of emission reductions.	Not applicable. A value is not used in the ex-ante estimations of emission reductions	Not applicable. A value is not used in the ex-ante estimations of emission reductions

Has this value been validated?	Yes. The estimation of project emissions from electricity consumption is validated in section 3.6 below.	Yes. The PDD adopts the default value according to the "Tool to calculate project emissions from electricity consumption" version 01. This has been confirmed against the tool.	Not applicable	Not applicable	Not applicable
Measurement methods correctly described and in line with the methodology/tools?	Yes	Yes	Yes	Yes, in line with the "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)	Yes, in line with the "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Correct reference to standards (i.e. for calibration and maintenance)?	Yes	n/a	Yes	Yes	Yes
Indication of accuracy provided?	n/a	n/a	Yes, assumed to be above 95%	Yes, assumed to be above 95%	Yes, assumed to be above 95%
QA/QC procedures described?	Yes	n/a	Yes	Yes	Yes
QA/QC procedures appropriate?	Yes	n/a	Yes	Yes	Yes

Requirements	**Conclusion**			
	$FV_{RG,h}$	**$fv_{CH4,FG,h}$**	**$FC_{i,j,y}$**	**$NCV_{i,y}$**
Title in line with methodology?	Yes	Yes	Yes	Yes
Data unit correctly expressed?	Yes	Yes	Yes	Yes
Parameter appropriately described?	Yes	Yes	Yes	Yes
Source clearly referenced?	Yes	Yes	Yes	Yes
Correct value provided for the purpose of PDD estimations?	Not applicable. A value is not used in the ex-ante estimations of emission reductions	Not applicable. A value is not used in the ex-ante estimations of emission reductions	Yes, the value was based on experience at other similar sites.	Yes, the value was provided by the fuel supplier.
Has this value been verified?	Not applicable	Not applicable	The value was validated based on the fuel consumption from other sites operated by the project developer [DR 57].	Yes [DR58]
Measurement methods correctly described and in line with the methodology/tools?	Yes, in line with the "Tool to determine project emissions from flaring gases containing methane". (EB28 Annex 13)	Yes, in line with the "Tool to determine project emissions from flaring gases containing methane". (EB28 Annex 13)	Yes, in line with the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 02	Not applicable
Correct reference to standards (i.e. for calibration and maintenance)?	Yes	Yes	Yes	Yes
Indication of accuracy	Yes, assumed to be	Yes, assumed to be	Yes, assumed to be	Not applicable. values

provided?	above 95%	above 95%	above 95%	will be provided by the fuel supplier
QA/QC procedures described?	Yes	Yes	Yes	Yes
QA/QC procedures appropriate?	Yes	Yes	Yes	Yes, LPG is supplied under national standards and is assured by the supplier and the stewards from the National Petroleum Agency of Brazil

Requirements	Conclusion
	$EF_{CO2,i,y}$
Title in line with methodology?	Yes
Data unit correctly expressed?	Yes
Parameter appropriately described?	Yes
Source clearly referenced?	Yes, since no fuel supplier data is available, IPCC data was chosen.
Correct value provided for the purpose of PDD estimations?	Yes, the IPCC default value at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of chapter 1 of Vol 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories are used.
Has this value been verified?	Yes
Measurement methods correctly described and in line with the methodology/tools?	Not applicable. IPCC values are used.
Correct reference to standards (i.e. for calibration and maintenance)?	Not applicable
Indication of accuracy provided?	Not applicable
QA/QC procedures described?	Yes
QA/QC procedures appropriate?	Yes

Equipment: An electricity meter for monitoring parameter EL_{LFG} will be installed at the power generation plant, and also an electricity meter for monitoring parameter $EC_{PJ,,jy}$ (quantity of electricity consumed by the project activity during the year y) will be installed. Flow meters will be installed to measure the quantity of landfill gas that is supplied for power generation and flare ($LFG_{total,y}$, $LFG_{flared,y}$, $LFG_{electricity,y}$). A volumetric flow meter will be used to measure the onsite consumption of LPG. A type N thermocouple will be used to monitor T_{flare}. A meter will be installed to monitor the operating hours of the energy plant. Also a gas analyzer will be installed for the monitoring parameters w_{CH4}, $t_{O2,h}$, $fv_{CH4,h}$, $FV_{RG,h}$, $fv_{CH4,FG,h}$. All meters will be maintained and calibrated according to the relevant national or international standard applicable at the time of monitoring. This equipment setup is considered sufficient to carry out the monitoring requirements of the methodology, and the appropriate national standards will be followed. The frequency of calibration as specified in the PDD will be line with manufacturer specifications.

Data: The net electricity supplied to the grid (EL_{LFG}) and electricity consumed by the project activity ($EC_{PJ,y}$) can be cross checked against invoices. Moreover, the sum of the methane fed to the flare and to the power plant will be compared annually with the total quantity of methane captured. The lowest value must be used. The data will be recorded monthly and archived electronically. Records will be kept for two years after the end of the crediting period or the last issuance of CERs for the project activity, whichever occurs later. The data management procedures are considered appropriate to fulfill the monitoring requirements of the methodology and to ensure that emission reductions can be verified.

Organisation: The PDD describes the responsibilities for project management and monitoring, including the role of the monitoring manager, project team, and internal inspection. The PDD also states that a training programme will be developed for all employees and that only trained and skilled staff will work on the project. The provisions of the monitoring plan are considered sufficient to ensure that emission reductions can be accurately quantified ex-post. The detailed organisational structure (i.e. roles and responsibilities) to be implemented by the project developer in order to implement the monitoring plan will be finished when the project starts operation and shall be checked during verification.

Quality Assurance and Quality Control: The PDD contains information on how quality will be controlled and assured in the monitoring of emission reductions. The QA/QC procedures described in the PDD include, for example, backup of recorded data, periodic controls of monitoring records to check any deviations from the estimated emission reductions, periodic reports to evaluate performance, corrective actions in case of deviations, malfunctions or equipment breakdown, and site audits. These QA/QC procedures are considered sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.

Feasibility of the monitoring plan: Based on the review of the monitoring plan in the PDD ERM CVS can conclude that the monitoring plan is feasible within the project design and that the project participants will be able to implement the monitoring plan. This can be concluded because the monitoring plan describes properly the procedures and instruments to be adopted. The expected accuracy, frequency of measurements and monitoring procedures are properly described and they comply with the requirements of the methodology.

3.6. Additionality

Start date

In the original PDD the starting date of the project activity was defined as October, 2009 without any further explanation. Since this is not in line with the Glossary of CDM Terms, CAR6 was raised. The Project Proponent has changed the starting date of the project activity to 01 April 2011, which is the expected date for the purchase of the flare and extraction system. Based on interviews and the site visit, ERM CVS can confirm that at the time that validation started, no equipment had been ordered, no contract had been signed for construction services and no expenditures had been committed to project implementation apart from preliminary studies or costs incurred by CDM such as validation services, therefore CAR6 was closed. The project activity is therefore a new project activity with a starting date after 02 August 2008 in line with the 'Guidelines on the demonstration and assessment of prior consideration of the CDM' (version 03, EB 49). The project activity start date had not taken place prior to the start of validation. Since the PDD has been published for global stakeholder consultation before the start date, no prior consideration notifications to the DNA or UNFCCC are required.

Prior consideration of the CDM and timeline of real and continuing actions to secure CDM status

Since the start date of the project activity had not yet taken place prior to the start of validation, ERM CVS can confirm that CDM has been seriously considered prior to the starting date of the project. In addition, ERM CVS has reviewed evidence of the following additional actions for CDM consideration, in line with the planning of the proposed project activity, and ERMCVS can confirm that the information presented in the PDD is correct:

Table 6: Project actions related to CDM consideration

Project Timeline	Dates	Evidence
PIN approval by the World Bank	August 15, 2006	[DR2]
Signature of the Letter of Intent (LOI) with the World Bank	February 14, 2007	[DR36]
Signature of Emission Reduction Purchase Agreement (ERPA)	November 19, 2008	[DR38]
Simplified environmental report for the project activity	September 2009	[DR16]
Technical feasibility report for the project activity	October, 2010	[DR 45]

Identification of alternatives

The alternatives to the project have been discussed in the PDD in accordance with the methodology ACM0001 v11 and the "Tool for demonstration and assessment of additionality" Version 05.2. The validation of the identification of alternatives is validated in more detail in section 3.3 of this report.

The combinations of realistic and plausible scenarios included are: LFG2 & P6 (i.e. the pre-project scenario, where the landfill gas is vented to the atmosphere and the National Power Grid provides the equivalent electricity); and LFG1 & P1 (i.e. the project activity undertaken without CDM). The project activity undertaken without CDM is shown to be financially unattractive and the baseline alternative to the project activity is therefore the absence of investment and the continuation of the current situation (i.e. landfill gas is vented to the atmosphere and the equivalent electricity is provided by the National Power Grid).

It is confirmed that these scenarios are in compliance with the host Party's laws and regulations and no national and/or sectoral policies and circumstances contradict the selected baseline scenario. According to Brazilian Legislation, each state is responsible for the environmental license process and requirements for landfills, definition of their own laws and minimum standards. CTR Candeias is located in Pernambuco State and the environmental agency of the state (CPRH) does not require the landfill to install any landfill gas collection and flare system, including passive flaring [DR19, 31, 32, 47]. The common practice in the state was found to be no capture or utilisation of landfill gas, including no passive flaring [DR 47].

As described in section 3.3 of this report, ERM CVS has validated selection of alternatives and considers listed alternatives to be credible and complete.

Additionality determination

Investment analysis was the method used to determine additionality and the analysis was developed based on the "Tool for demonstration and assessment of additionality" Version 05.2.

The financial analysis was assessed by the validation team, including assessment of the spreadsheet [DR26] and evidences relating to the input values to the financial analysis. The analysis was also assessed in detail against the 'Guidelines on the assessment of investment analysis' (version 3.1) by a financial expert who has specific expertise in the assessment of financial analysis for CDM projects.

Investment analysis:

Determine appropriate analysis method

The project activity undertaken without CDM revenues was assessed using benchmark analysis (option II of the investment analysis), which has been considered appropriate by ERM CVS, as the project activity generates revenues from other sources than CERs (meaning option I, simple cost analysis, is not applicable) and the PPs do not have comparable investment alternatives other than installing or not installing the project plant (meaning option II, investment comparison analysis, is not applicable).

Apply Benchmark Analysis:

Determination of the benchmark: A Project IRR benchmark was clearly identified by the PPs as the benchmark used. The benchmark is justified with official third party supporting evidence for its conservativeness: the provided reference to substantiate the choice of the benchmark is the SELIC rate (Sistema Especial de Liquidação e Custodia, or Special System of Clearance and Custody, the Banco Central do Brasil's (Brazilian Central Bank's) basic lending rate [DR53], which represents the expected return of a low-risk investment fund in Brazil. In the first PDD provided, the benchmark used to demonstrate additionality was 15% without further explanation. The PPs were asked to provide evidence on the rate [CAR7] and the revised PDD adopts 10.25% as the benchmark rate, the basic interest rate published by the Central Bank of Brazil in June 2010. The benchmark rate is therefore valid at the time of validation and is applicable at the expected time of investment decision (starting date of the project activity). The benchmark was validated against SELIC historical data on the Brazilian Central Bank web site [DR53]. The SELIC rate is a pre-tax nominal benchmark and the IRR calculated is expressed in nominal terms, therefore neither interest rate payments nor income taxes were considered in the calculations.

To confirm the suitability of the benchmark applied in the investment analysis, ERM CVS has:

a) Determined that the type of benchmark applied is suitable for the type of financial indicator presented
   - The financial indicator presented is a project IRR which is appropriate for the benchmark chosen, as the SELIC reference rate applies to financings backed by federal bonds and can be considered a Brazilian risk free rate. Any other rate that could be used as benchmark, such as a sector specific rate of return, would include other implied risks. Therefore, the SELIC can be used as a benchmark against project IRR, and would be more conservative than any other applicable benchmark;
   - The benchmark presented is a pre-tax benchmark, which is consistent with the calculations, which do not include income tax;
   - The benchmark presented is in nominal terms, which is consistent with the calculations – that include inflation adjustment.
b) Ensured that any risk premiums applied in determining the benchmark reflect the risks associated with the project type or activity;
   - The benchmark represents the return of a risk-free investment in Brazil. It does not take into account additional sector-specific risk premiums, and this makes the benchmark more conservative and therefore this is accepted
   - The benchmark is considered conservative by ERM CVS's local and financial experts, since any other benchmark would have taken into account a risk premium and then would result in a higher rate than the one chosen. Therefore even though the benchmark is not specific to the technology or sector, because it represents the expected rate of

return of risk-free investments in Brazil and does not consider additional risk premiums for investing in a relatively risky sector such as waste management/energy recovery, it is considered to be conservative.

c) Determined whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark

- Based on ERM CVS's local and financial expertise, and based on review of other projects in the host country, the SELIC rate is commonly applied as the standard benchmark in Brazil
- Due to the conservativeness of the benchmark, it is reasonable to assume that no investment would have been made at a rate of return lower than the benchmark

Calculation and comparison of financial indicators: The PDD accurately presents the results of the financial analysis, which are in accordance to the spreadsheet provided. The Investment analysis is conducted over a period of 21 years, including 20 years operational lifetime plus 1 additional year of construction time. ERM CVS confirmed the operational lifetime by review of the specifications from the flare and generator manufacturers [DR 29], [DR 24]. Although the landfill stops receiving waste after 2022, the LFG collection and use operates until the end of the 20 year lifetime.

In order to avoid idle electricity generation equipments due to the "bell shape" curve of LFG generation, a module of three generators operates for 15 years, with a major overhaul in the middle, and another module of three generators operates for 7.5 years only. This is consistent with the lifetime of the project activity defined by the technical lifetime of the flare, which can be used for 20 years. The extraordinary maintenance costs for the first module of engines in year 10 serve to guarantee its operations for a further 60,000 hours. The evidence to support the technical lifetime of the equipment and the maintenance costs includes technical information from suppliers in the quotations provided [DR3 and DR41] and also from a technical report [DR28]. The evidence to support the input values to the financial analysis is validated in further detail below.

The currency used in the investment analysis was US Dollars; Since the benchmark provided is determined in Reais (Brazilian currency, BRL), to be accurate to financial theory, the PPs were asked to change the free cash flow currency to Reais. The values of equipments, presented in USD, and engines cost and maintenance, presented in EUR, were both then converted to BRL for the FCF calculations. The exchange rates used for the investment analysis are: 1.80 R$/US$ and 2.20 R$/Euro, which are dated on June 30, 2010 and were confirmed by review of the Brazilian Central Bank website [DR50].

Overall, the provided FCF is comprehensive and properly considers all of the relevant costs and revenues of the project. The IRR calculated for the project activity is 5.20%, which is significantly below the benchmark of 10.25% and hence it can be concluded that the project is additional.

Input Parameters

Investment Costs (CAPEX): Recent CAPEX values from suppliers' quotations were used to develop the investment analysis (see table below) considering the fact that the starting date of the project activity had not yet happened before the validation process was completed. The quotations are considered to be reliable and credible evidence for the investment costs since they are from independent third party sources and are specific to the equipment to be used for the project activity. The values provided are valid at the time of validation and the expected time of investment decision (starting date of the project activity: expected 01 April 2011) since the quotations were provided in 2010.

The total investment cost is consistent with the values provided in the quotations reviewed by ERM CVS. The documentary evidence validated to check the investment costs is listed in the table below:

Table 7: Investment costs

Description	Evidence	Reference
Drill services (year 0)	Comercial Proposal for the installation of the vertical gas collection system, from Perfurasolo Drill Services	[DR4]
Pipes & connections (year 0)	Comercial Proposal for the pipes and conections from Apuã	[DR42]
Ongoing investment in drill & pipelines, years 1-12	Complementary Technical report for CTR Candeias project, from Haztec	[DR45]
Flare and blower system	Request for the energy and flaring system to Landtec. by Eduardo Gaiotto and Jamie Tooley; and Budget costs provided by Landtec.	[DR6] [DR7]
Engines (per set)	Comercial proposal from GE energy Jenbacher for engines	[DR3]

The project has not yet started construction at the time of validation, therefore invoices or receipts or updated financial reports were not available to cross check the CAPEX costs. In order to cross-check the CAPEX values, the following CDM projects were identified through the UNEP Risoe Centre website [DR56] as registered landfill gas to electricity CDM projects using the ACM0001 methodology for which data on investment costs is available in the UNEP Risoe database [DR56] or in the documentation published on the CDM website. The investment costs per unit of installed capacity of the project were compared to previous registered projects around the world, as illustrated in the following table. Although the other projects take place in

different countries and regions, the costs are considered comparable since the technology exists throughout the world and is generally produced by international manufacturers.

Table 8: Investment costs of previously registered landfill gas to electricity projects globally (data from UNEP Risoe [DR56] and cdm.unfccc.int)

Title	Region	Host country	Installed capacity MWel	Invest-ment Million US$	Invest-ment US$/kW
Nanning Landfill Gas to Energy Project	Asia & Pacific	China	3.9	4.4	1,134
Xiamen Dongfu Landfill Gas-to-Energy Project	Asia & Pacific	China	3.5	4.1	1,176
Methane capture and destruction on Calle 100 landfill in Havana and Gascon landfill in Santiago de Cuba. Bundle CDM project	Latin America	Cuba	3.0	3.7	1,217
Huaycoloro landfill gas capture and combustion	Latin America	Peru	5.7	7.0	1,221
Tianjin Shuangkou Landfill Gas Recovery and Electricity Generation	Asia & Pacific	China	5.0	6.1	1,226
Monterrey II LFG to Energy Project	Latin America	Mexico	5.3	6.6	1,236
Kunming - Wuhua Landfill Gas to Energy Project	Asia & Pacific	China	3.3	4.3	1,294
Huizhou Landfill Gas Recovery and Utilization Project	Asia & Pacific	China	3.0	4.0	1,327
Tecamac – EcoMethane Landfill Gas to Energy Project	Latin America	Mexico	2.0	3.0	1,533
Shenzhen Xiaping Landfill Gas Collection and Utilization Project	Asia & Pacific	China	8.0	12.6	1,575
Dalian Maoyingzi Landfill Gas Recovery for Power Generation Project	Asia & Pacific	China	4.0	6.4	1,610
Metro Clark Landfill Gas Capture System	Asia & Pacific	Philippines	6.5	10.8	1,663
Tultitlan – EcoMethane Landfill Gas to Energy Project	Latin America	Mexico	1.3	2.2	1,679
Suzhou Landfill in Anhui Province Gas Utilization Project	Asia & Pacific	China	2.0	3.4	1,719
Kunming Dongjiao Baishuitang LFG Treatment and Power Generation Project	Asia & Pacific	China	1.5	2.6	1,741
Hefei Longquanshan Landfill Gas Power Generation Project	Asia & Pacific	China	3.2	5.8	1,827
Shenyang Laohuchong LFG Power Generation Project	Asia & Pacific	China	3.0	5.7	1,910
Krubong Melaka LFG Collection & Energy Recovery CDM Project	Asia & Pacific	Malaysia	2.0	4.1	2,052
Landfill Gas Recovery and Utilization at Bukit Tagar Sanitary Landfill, Hulu Selangor in Malaysia	Asia & Pacific	Malaysia	3.0	6.2	2,081
Hunan Loudi Miaopu Landfill Gas to Power Project	Asia & Pacific	China	1.0	2.2	2,119
Bionersis Project Thailand 1	Asia & Pacific	Thailand	2.0	4.2	2,119
Meizhou Landfills Gas Recovery and Utilization as Energy	Asia & Pacific	China	2.0	4.6	2,287
Shandong Qingdao Xiaojianxi Landfill Gas Utilization Project	Asia & Pacific	China	3.2	7.5	2,358
Fuzhou Hongmiaoling Landfill Gas to Electricity Project	Asia & Pacific	China	2.5	6.0	2,420
Biogas Technology Group Ras Al-Khaimah Landfill Gas to Energy Project	Middle-East	United Arab Emirates	2.0	4.9	2,441
Phuoc Hiep I sanitary Landfill gas CDM project in Ho Chi Minh City	Asia & Pacific	Vietnam	3.0	8.1	2,694
Quezon City Controlled Disposal Facility Biogas Emission Reduction Project	Asia & Pacific	Philippines	0.7	1.9	2,712
Landfill biogas extraction and combustion plant in El Inga I and II landfill (Quito, Ecuador)	Latin America	Ecuador	2.0	5.5	2,750
Luoyang Landfill Site LFG Recovery to Electricity Project	Asia & Pacific	China	1.4	3.7	2,753
PT Navigat Organic Energy Indonesia Integrated Solid Waste Management (GALFAD) Project in Bali, Indonesia	Asia & Pacific	Indonesia	9.6	27.4	2,854
Nanchang Maiyuan Landfill Gas Recovery and Utilisation Project	Asia & Pacific	China	3.0	9.0	3,002
Coyula Landfill Gas Project	Latin America	Mexico	1.0	4.3	4,300
Gorai Landfill closure and Gas Capture Project, Mumbai, India	Asia & Pacific	India	3.0	14.1	4,704
Landfill Gas Capture and Power Generation Project in Tbilisi	Europe & Central Asia	Georgia	0.8	5.2	6,499
AVERAGE					2,213

In addition to this global comparison, ERM CVS has also compared the CAPEX costs of other similar projects registered or under validation in Brazil:

Table 9: Investment costs of landfill gas to electricity projects registered, or under validation, in Brazil (data from UNEP Risoe [DR56] and cdm.unfccc.int):

Ref.	Title	Host country	Status	Sub-type	MWel (in 2012)	Invest-ment MUS$	Invest-ment US$/kW
373	São João Landfill Gas to Energy Project (SJ)	Brazil	Registered	Landfill power	20.0	63.6	3,180.0
911	ESTRE Itapevi Landfill Gas Project (EILGP)	Brazil	Registered	Landfill power	3.0	3.1	1,032.3
1626	Feira de Santana Landfill Gas Project	Brazil	Registered	Landfill power	1.0	0.9	900.0
4211	Manaus Landfill Gas Project	Brazil	At Validation	Landfill power	19.2	50.6	2,637.4
n/a	Projeto de Gas de Aterro TECIPAR – PROGAT	Brazil	At Validation	Landfill power	6.5	1.7	268.3
n/a	Corpus/Araúna – Landfill Biogas Project.	Brazil	At Validation	Landfill power	1.0	6.0	6,021.3
AVERAGE							2,339.9

The Capex/kW of the project activity is US$ 2,299, and for previous registered projects globally it ranges between US$ 1,134 and US$ 6,499, with an average of US$ 2,213. For other similar projects registered or under validation in Brazil, the CAPEX ranges from 900 to 6,021.3 US$/kW, with an average of 2,339.9 US$/kW. Therefore the investment costs of the project activity are well within the range of previously developed projects and close to the average value both globally and in the host country. Therefore this cross check supports the conclusion that the investment costs are reasonable.

Overhaul of first set of engines: The first set of engines reaches the end of its 60,000 hour useful operating life [DR29]. In order for the engines to continue being used for another 60,000 hours they must be overhauled [DR29]. ERM CVS has validated the costs of this overhaul against a quotation from the equipment manufacturer, GE Energy, for the overhaul costs [DR41]. These costs are also considered reasonable based on ERM CVS's local, technical and financial expertise.

Operation & Maintenance Costs / **Administrative Costs:** The operation and maintenance costs consist of O&M costs for the landfill gas extraction and flaring system, O&M costs for the electricity generation system, and administrative costs for the project.

A total of R$ 354,240 fixed per year is considered as operation & maintenance costs related to the LFG system, which includes the salary of 6 people needed to run the LFG system (i.e. 1 Project Supervisor, 1 Electric-mechanical Technician, and 4 Operational technicians) [DR40]. The salaries are based on 2010 values, and are in accordance with market values according to ERM CVS's local knowledge and experience. Even though the electricity generation stops in 2026, when gas levels are too low, the project activity continues with gas flaring until 2030, and therefore general O&M costs are still applicable to the project activity throughout its lifetime.

In addition, a total of R$ 576,000/year (fixed) and an additional R$ 36.00/MWh (variable) are considered as operation & maintenance costs related to the electricity generation. The evidence provided is a quotation from a supplier for the project activity itself [DR39] and confirms the O&M costs as R$ 48,000 per month (fixed costs) and R$ 36.00/MWh (US$ 20.00) (variable costs).

As Administrative Expenses for the project, a total of R$180,000 per year is considered and includes the salary of 4 people needed to administer the project as a whole (i.e. 1 Project Supervisor, 1 Electric-mechanical Technician, and 2 Operational technicians), and also includes other minor expenses [DR 40]. These administrative costs are considered reasonable based on ERM CVS's local, sectoral and financial knowledge.

The project has not yet started construction at the time of validation, therefore invoices or receipts or updated financial reports were not available to cross check the CAPEX costs. Therefore the O&M costs were compared with other similar registered projects generating electricity from landfill gas registered under methodology ACM0001, for which data is available. The average O&M costs of the most recent CDM registered projects under the methodology ACM 0001 were used as a comparison and cross check for the project activity O&M costs per MWh generated. The following chart shows the comparison and indicates that the project activity O&M costs are in line with other CDM approved projects. The two grey lines indicate the O&M cost range for the project activity, which varies between US$ 26.05 and US$ 29.42 per MWh, due to fixed and variable costs.

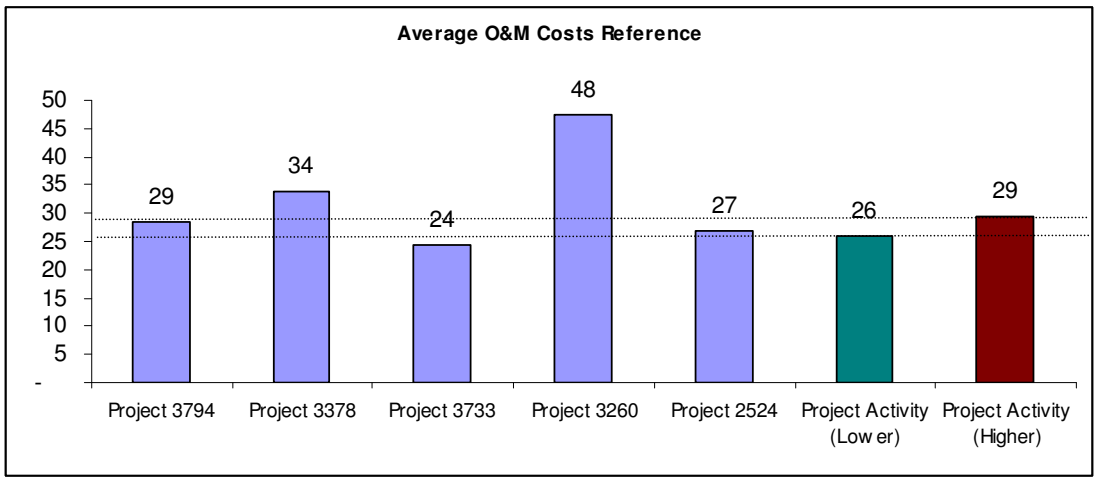

Figure 1. Comparison of O&M costs of other similar registered projects generating electricity from landfill gas registered under methodology ACM0001, for which data is available

The comparison indicates that the O&M costs are reasonable compared to the range of costs observed on other similar projects that have recently been developed.

Insurance Costs: Insurance costs of 0.177% per year of total investment are considered. Given the fact that the project has not yet started construction, this figure is an estimation based on the insurance costs of other similar installations developed by the PPs in the host country. ERM CVS has reviewed the insurance policy that the company has for all its assets. The policy confirms the cost level and shows that when the company invests in new assets, they will include them in the same insurance policy. This was considered reasonable, and furthermore the cost is within the range that would be expected based on ERM CVS's financial and local knowledge. Therefore the insurance cost is considered reasonable and credible.

Depreciation rate and Residual Value: ERM CVS has confirmed that the depreciation rate is appropriate by reviewing the Brazilian federal standard for the depreciation rate of electrical equipment [DR 25]. The first set of engines reaches the end of its technical lifetime after 15 years of operation and hence has no residual value remaining at the end of the assessment period. The second set of engines remains in working order at the end of the assessment period, and therefore a residual value is calculated as the remaining value of the second set of engines after the annual equipment depreciation (10% per year over 7 years) is subtracted. The table below represents the lifetime of both group of engines across the project activity period:

Table 10: Lifetime of the two groups of engines

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
First Group of Engines		1	2	3	4	5	6	7	7.5/0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5
Second Group of Engines							1	2	3	4	5	6	7	7.5		

No residual value was considered for pipelines, blowers, pre-treatment, flare and monitoring system, since this equipment has reached the end of its technical lifetime by the end of the assessment period, which was considered reasonable after 20 years of usage of this kind of structure, based on ERM CVS's technical knowledge. The calculation of residual value is in line with standard accounting practice in Brazil. ERM CVS can therefore confirm that the residual value of the project is appropriate and correctly calculated.

Revenues

Electricity Tariff: The project has not yet started construction and does not yet have a signed power purchase agreement or agreed electricity price for sale of electricity to the grid. The electricity tariff used in the investment analysis is based on the highest value registered in the latest Alternative Energy Auction in Brazil (R$ 148.39/MWh), as of 26 August 2010, which involves starting supply in 2013 [DR49; DR59]. The tariff was adjusted correctly by inflation in the free cash-flow provided.

The lack of database information to estimate the electricity tariff was verified based on ERM CVS's local and sectoral knowledge, and consequently the use of the 2010 tariff level was considered appropriate. Further details of the validation of the electricity tariff are presented in the sensitivity analysis section below.

Revenues are not being calculated for the 4 last years of project activity during which the project operates only the flare, because there is not enough gas to maintain the generators, as discussed in the validation of the project description in section 3.2 above.

Electricity generation and plant load factor: The amount of electricity expected to be produced was calculated according to the technical parameters i.e. the expected landfill gas generation and capture from the landfill, the capacity of the engines to be installed, and the operating hours of 8,000 hours per year – the technical parameters were validated against the technical documentation of the project including the Simplified Environmental Report [DR16], the Technical specifications of the Landfill Gas Enclosed Flare System provided by the equipment supplier ZTOF [DR24], evidence of the Lifetime of the project and hours of operation per year provided by GE Energy [DR29], a report entitled 'Executive Project of Muribeca Landfill. Capacity and lifetime' developed by Engecorps (Muribeca is the name of the road where the CTR Candeias Landfill project is to be implemented and was the name initially adopted for the project) [DR28], and the technical feasibility report of the proposed project [DR45]. ERM CVS reviewed the calculations of landfill gas generation and capture and electricity generation [DR8] and can confirm that they are in line with the methodology and tools and that the technical input parameters are in line with the documentary evidence reviewed.

The designed operating hours have been validated against the detailed design of the project through the documented technical specifications of the gas engines from GE Jenbacher [DR37], the commercial proposal for the plant maintenance from Benco Energia [DR39], and an estimate for the overhaul of the gas engine provided by GE Energy [DR41].The plant load factor (8,000 hours/year = 91.3%) is therefore consistent with the plant load factor determined by a third party contracted by the project participants (e.g. an engineering company), i.e. the equipment supplier GE Energy. The plant load factor is therefore consistent with the requirements of the EB Guidelines for the reporting and validation of plant load factors (EB 48, Annex 11).

Inflation: Since the chosen benchmark (SELIC rate) is a pre-tax nominal rate, the FCF considered an estimated inflation rate of 4.5% per year, based on the Brazilian Government inflation rates target [DR 51], which was applied to the electricity tariff, administrative costs, O&M costs and investment.

This rate is based on the Brazilian Central Bank target inflation rate for 2010, 2011 and 2012, and also the target rate since 2005 [DR51]. The reference is considered correct since it is widely accepted in Brazil as a forecast for long-term inflation.

Taxes: The PP correctly applied the appropriate taxes related to the electricity generation in Brazil on revenues (Profit Participation Contribution (PIS) of 1.65% and Social Security Financing Contribution (COFINS) of 7.6%) [DR52]. Income taxes (corporate income tax (IRPJ) of 25% and social contribution tax (CSLL) of 9%) [DR55] do not apply to the chosen benchmark [DR53].

Use of values from Feasibility Study Reports: No third party feasibility study report containing financial input values was developed for the project. A simplified environmental report was developed by Novagerar in September 2009 [DR16] but includes only technical information about the landfill. A technical feasibility report was developed by Haztec in October 2010 [DR45], but no investment assessment was included in the report. Since the project has not started yet, PPs were asked to provide recent information and evidence for the investment analysis [see CL6]. These parameters and their respective evidence were discussed above.

The values used in the financial analysis are considered valid at the time of validation and the expected time of investment decision (which is planned to take place in April 2011), given that the quotations presented are all dated July 2010, which is sufficiently recent to conclude that the values would not have materially changed.

Sensitivity Analysis

A sensitivity analysis was conducted on the most relevant parameters of costs and revenues and the results show that reasonable variations are not likely to undermine additionality. All parameters representing more than 20% of costs or revenues were included. An analysis of the impact of variations of +/-10% has been presented by the PPs, and an analysis of the degree of variation in each parameter needed for the IRR to reach the benchmark was also presented and validated. The results of the sensitivity analysis are presented in the table below, and show that the additionality is still demonstrated in every scenario.

Table 11: Results of the sensitivity analysis

	Variation and respective IRR	
Parameter	**+10%**	**-10%**
Electricity price	9.22%	0.36%
O&M and Administrative Costs	2.54%	7.54%
Investment costs	3.46%	7.21%

The following individual threshold values were also calculated and included in the PDD:

Parameter	**Variation to reach benchmark**
Electricity price	+13%
O&M and Administrative Costs	-23%

Investment	-23%

Electricity tariff:

The price assumed for the electricity tariff is based on the latest available Alternative Energy Auction (R$ 148.39/MWh) in Brazil dated on 26 August 2010, as described above. In order to reach the benchmark, the electricity tariff would have to be 13% higher than this. Electricity prices vary according to region, demand, generation type and power plant capacity. An auction for the kind of energy that is going to be sold by the PPs happened only twice, in 2007 and 2010. Therefore it is difficult to make assumptions on the tariff used in the project. However, considering the historical prices for all other sources of energy in Brazil's Northeast region it is possible to see that the price level assumed by the PPs is among the highest ones of the market (except for January 2008 prices, when the market went through a crisis due to a long period of very low rainfall). The historical electricity price for other generation sources in the northeast region of Brazil is presented in the graphic below, based on the database of the Electricity Energy Commercialization Bureau (CCEE - Câmara de Comercialização de Energia Elétrica) [DR49; DR59]. The average price paid to all power plants in the Northeast Region grid between 2003 and 2010 was R$ 61/MWh, much lower than the electricity price assumed for the project activity financial analysis.

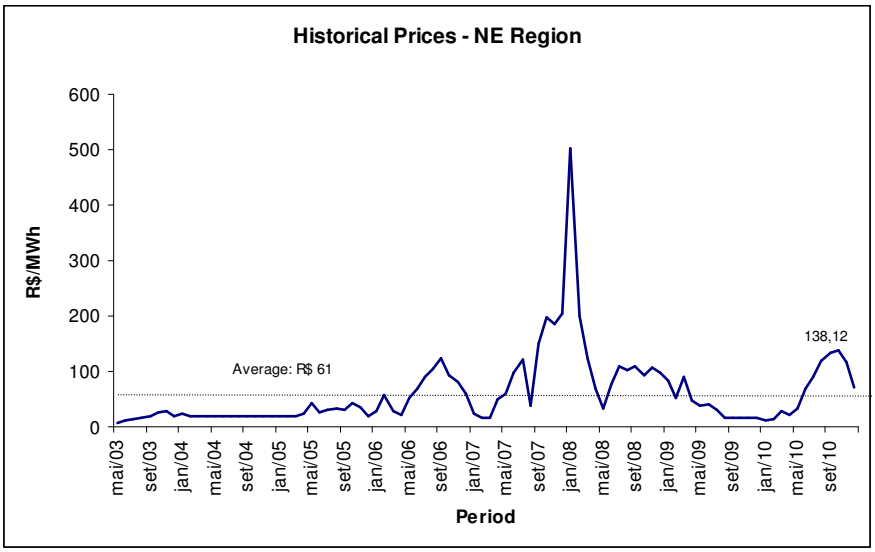

Figure 2: Historical electricity prices for other generation sources in the northeast region of Brazil

O&M and Administrative costs

A decrease in annual O&M and administrative costs is unlikely to undermine additionality, since a decrease of 23% is needed to make the IRR reach the benchmark threshold. Such a decrease is considered unlikely given that these costs are likely to increase in line with inflation. ERM CVS has reviewed the rate of inflation in the host country (4.5% target to 2011 according to official data from the Central Bank [DR51]) to confirm that it is unlikely that annual running costs will decrease to the extent where the IRR reaches the benchmark.

Investment costs

A decrease in investment costs is unlikely to undermine additionality, since a decrease of 23% is needed in order to make the IRR reach the threshold. Such a decrease is considered unlikely given that these costs are based on quotations received from suppliers as validated above, and given the fact that prices are only likely to increase in line with inflation. ERM CVS has reviewed the rate of inflation in the host country (4.5% target to 2011 [DR51]) to confirm that it is unlikely that investment costs will decrease to the extent where the IRR reaches the benchmark.

Investment analysis conclusion:

ERM CVS has confirmed that all underlying assumptions in the investment analysis are appropriate and the financial calculations are correct.

Common Practice Analysis

A common practice analysis has been carried out in order to complement the investment analysis presented in the PDD. The geographical scope of the analysis is limited to the State of Pernambuco. The references [DR31] [DR32] [DR33] [DR47] were validated, and no similar project were identified. ERM CVS has been able to confirm the following:

a) The geographical scope was defined in the PDD in compliance with the regulatory area of influence. Every landfill in the country is regulated by the State where it is located meaning each State defines the regulatory framework for activities like waste disposal [DR 16]. The simplified Environmental Report is a document prepared for the State Government and the Operating License is issued by this authority. Therefore, the DOE validated the relevant geographical area for the common practice analysis as being the State of Pernambuco.

b) The common practice in the relevant geographic region was assessed by reviewing the description of the 6 landfills operating in the State of Pernambuco according to the reference [DR47] that provides information of Landfills in Brazil per State and is an official database. All the existing Landfills in the State were found to be operating in a condition equivalent to the State regulation that is described by the baseline scenario for the underlying project activity, i.e. no LFG capture and flaring/utilisation activities [DR31, 32, 33, 47].

c) Based on [DR47] it was possible to determine that all the other Landfills in the Sate of Pernambuco do not recover methane and do not even adopt any passive flaring mechanism.

d) Therefore, based on the evidences observed [DR 31, 32, 33, 47], ERM CVS is able to conclude that the project activity is not common practice in the relevant geographic region and furthermore, it is the first LFG capture and utilisation/flaring project in the region.

Based on the above, ERM CVS has confirmed that the proposed CDM project activity is not common practice.

3.7. Calculation of GHG Emission Reductions

The GHG emission reductions (ER) achieved by the project activity are calculated in accordance with the methodology ACM0001 v11. Emission Reductions (ER) are equal to baseline emissions (BE), minus project emissions (PE). No leakage effects need to be accounted for under this methodology.

Baseline emissions:

Baseline emissions (BE in tCO_2) are calculated using the following formula, as per ACM0001 v.11:

$$BE_y = \left(MD_{project,y} - MD_{BL,y}\right) * GWP_{CH4} + EL_{LFG,y} \cdot CEF_{elec,BL,y} + ET_{LFG,y} * CEF_{ther,BL,y}$$

The baseline emissions in a given year "y" (BE_y) are the difference between the amount of methane actually destroyed/combusted during the year ($MD_{project,y}$) and the amount of methane that would have been destroyed/combusted during the year in the absence of the project activity ($MD_{BL,y}$), times the approved Global Warming Potential value for methane (GWP_{CH4}), plus the net quantity of electricity displaced during the year (EG_y) multiplied by the CO_2 emissions intensity of the electricity displaced ($CEF_{electricity,y}$). Thermal energy is not included in the scope in this project.

The $MD_{project,y}$ is estimated ex-ante using the formula:

$MD_{project,y} = BE_{CH4,SWDS,y}/GWP_{CH4}$

The baseline emissions $BE_{CH4,SWDS,y}$ are estimated ex-ante as per the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" v 05 and are calculated as:

$$BE_{CH4,SWDS,y} = \varphi \cdot (1-f) \cdot GWP_{CH4} \cdot (1-OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^{y} \sum_{j} W_{j,x} \cdot DOC_j \cdot e^{-k_j \cdot (y-x)} \cdot \left(1 - e^{-k_j}\right)$$

The parameters determined ex-ante are detailed below (in parameters determined ex-ante).

The $MD_{project,y}$ is calculated ex-post by metering the actual quantity of methane captured and destroyed once the project activity is operational, using formula below:

$MD_{project,\ y} = MD_{electricity,y} + MD_{flared,y} + MD_{thermal,y} + MD_{PL,y}$

The sum of the LFG fed to the flare ($MD_{flared,y}$) and fed into the power plant ($MD_{electricity,y}$) will be compared annually with the total quantity of methane captured. The lowest value will be used as $MD_{project,y}$. There is no thermal energy ($MD_{thermal,y}$) produced under this project activity and no methane sent to a pipeline ($MD_{PL,y}$). The expected efficiency of the degassing system which will be installed in the project activity (40%), as well as the conservatively estimated flare efficiency (90%) have both been taken into account while estimating the ex ante estimation of $MD_{project,y}$, and ERM has validated that these values are reasonable and consistent with the technical specifications of the project [DR16, DR45].

$MD_{electricity,y} = LFG_{electricity,y} * w_{CH4,\ y} * D_{CH4}$

The quantity of methane destroyed by flaring is calculated using the following equation:

$MD_{flared,y} = LFG_{flare,y} * w_{CH4,\ y} * D_{CH4} - PE_{flare,y} / GWP_{CH4}$

$w_{CH4,y}$, D_{CH4} and GWP_{CH4} are determined ex-ante, and are validated below. The parameters $LFG_{flare,y}$ and $PE_{flare,y}$ are determined ex-post and the values applied for the ex-ante estimation of emission reductions in the PDD are validated above (parameters monitored).

As the regulatory or contractual requirements do not specify $MD_{BL,y}$, it is calculated as: $MD_{BL,y} = MD_{project,y} * AF$.

There are no regulatory or contractual requirements mandated for collection and destruction of methane in Pernambuco state [DR47]. Furthermore, all Landfills installed in the State [DR47] do not adopt any mechanism to burn or utilise any of the gas produced by the landfill, including passive flaring. Given that the baseline, as validated on site and discussed in more detail in section 3.3 of this report, and the common practice in the region, as validated in more detail in section 3.5 of this report, is zero flaring or use of any of the landfill gas, the adjustment factor (AF) was considered to be zero.

Ex-ante estimation of the amount of methane destroyed during the year, in tones of methane (MDproject,y)

The ex-ante estimation of the amount of methane destroyed during the year is estimated as per the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05, where $BE_{CH4,SWDS,y}$ represents the methane emissions generated during the year y from the disposal of waste at the solid waste disposal site during the period from the start of the project activity to the end of the year y (tCO_2e).

ERM CVS has checked all calculations by a thorough review of the Emissions Reduction Spreadsheet [DR8]

The EL_{LFG} was estimated as 33,960 MWh/y (2012 – 2016), 48,159 MWh/y (2017) and 28,798 MWh (01/01/2018-31/07/2018), based on the number of engines installed and the operating hours. The installed capacity of engines has been based on the estimated quantity of landfill gas that will be generated by the site [DR16, 45]. The ex-ante estimations of methane generation were reviewed by ERM CVS and correctly follow the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05. The calculations are based on the annual waste inflow, the waste average composition and biogas collection efficiency, and the equations provided in the tool. The input values to the calculations are validated in the 'parameters determined ex-ante' section below and in section 3.4 concerning monitored parameters above.

Grid emissions factor: The $CEF_{elecy,BL,y}$ is determined ex-post, the current value used for the ex-ante estimations is 0.1635 tCO_2e/MWh, which was confirmed using the data and calculations provided by the Brazilian DNA [DR 34].

Project emissions:

Project emissions (PE in tCO_2) are calculated using the following formula:

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

The project emissions in a given year "y" (PE_y) are the emissions from consumption of electricity in the project activity plus the emissions from LPG consumption ($PE_{FC,j,y}$).

A diesel generator was observed at the landfill site during the site visit (which took place before any implementation or construction of the proposed project had started) and mentioned in the first version of the PDD uploaded in the UNFCCC website. However it was subsequently clarified that this generator is not related to the project and will not be used as part of the project activity scenario. Although the project is not yet constructed, ERM CVS confirmed that a diesel generator is not included in the technical plan of the project activity described in the PDD and therefore there are no project emissions from diesel consumption.

Project emissions from electricity consumption ($PE_{EC,y}$) are calculated following the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", version 01. Scenario A applies to the project, since electricity is supplied by the grid in the case when the project electricity plant is not operating.

$$\mathrm{PE}_{EC,y} = \sum_j EC_{PJ,j,y} \cdot EF_{EL,j,y} \cdot \left(1 + TDL_{j,y}\right)$$

The parameters included in the equation are explained in the tool, equation 1. The PDD correctly applies the tool to calculate project emissions from electricity consumption. In order to determine the emission factor for electricity generation ($EF_{EL,j/k/l,y}$), the PPs select option A1 (Calculate the combined margin emission factor of the applicable electricity system, using the procedures in the latest approved version of the "Tool to calculate the emission factor for an electricity system" (version 02) ($EF_{EL,j/k/l,y} = EF_{grid,CM,y}$).

Grid emissions factor: The $EF_{BL,y}$ ($EF_{grid,CM,y}$) is determined ex-post, the current value used for the ex-ante estimations is 0.1635 tCO_2/MWh, which was confirmed using the data and calculations provided by the Brazilian DNA [DR 34].

Project emissions from fossil fuel combustion ($PE_{FC,j,y}$) are calculated as per the Tool to calculate project or leakage emissions from fossil fuel combustion v 02 as follows:

$PE_{FC,j,y} = FC_{i,j,y} * COEF_{i,y}$

Where
$FC_{i,j,y}$ is the quantity of fossil fuel i (LPG) combusted in process j (flare ignition) during year y (m^3) (estimated at 2.07E-06 m^3), based on monitored and verified consumption of LPG by similar equipment installed at a project site run by the same project developer.
$COEF_{i,y}$ is the CO_2 emission coefficient of the LPG (tCO_2/ m^3 fuel)

COEFi,y is calculated following Option B of the tool, which is considered appropriate since ERM CVS can confirm based on its own research that the necessary data on the chemical composition of the specific fuel to be consumed at the site (LPG) is not available for the geographical region (state of Pernambuco):

$COEF_{i,y} = NCV_{i,y} * EF_{CO2i,y}$
Where
$NCV_{i,y}$ Is the weighted average net calorific value of the fuel type i (LPG) in year y
$EF_{CO2i,y}$ Is the weighted average CO_2 emission factor of fuel type i (LPG) in year y

Leakage:
No leakage effects need to be accounted for under this methodology.

Conclusion:
The assumptions and data used to determine the emission reductions are listed in the PDD and all the sources have been checked and confirmed by ERM CVS, and the calculations can be replicated. Based on the information reviewed it can be confirmed that the sources used are correctly quoted and interpreted in the PDD, the calculations are complete, and that the numbers are reasonable and accurate. The steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring methodology ACM0001 v11 and the methodology has been correctly applied. ERM CVS can therefore confirm that:

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

Parameters determined ex-ante
The following parameters are set ex ante in the PDD and have been validated in detail below:

Table 12: Validation of parameters determined ex-ante

Regulatory requirements relating to landfill gas	Regulatory requirements relating to landfill gas
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, the source is publicly available information of the host country's regulatory requirements relating to landfill gas, such as ABNT, NBR (Brazilian Association of Technical Norms, Brazilian Norm) and Regional Legislation from Pernambuco.
Correct value provided?	ERM CVS can confirm that there are no regulatory or contractual requirements mandated for a specific system for collection and destruction of methane in Pernambuco. Furthermore, all the Landfills installed in the State [DR47] do not adopt any mechanism to burn the gas produced by the Landfill, including passive flaring.
Has this value been verified?	The information was validated as above [DR47]
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

GWP_{CH4}	Global warming potential of CH_4
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, the source is IPCC
Correct value provided?	Yes, 21
Has this value been verified?	Yes, the value has been verified against data published by IPCC, and as per "Tool to determine project emissions from flaring gases containing methane"

	(EB28 Annex 13).
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

D_{CH4}	Methane density
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, tCH_4/m^3CH_4
Appropriate description?	Yes, Methane density
Source clearly referenced? (appropriate?)	Yes, IPCC
Correct value provided?	Yes, 0.0007168
Has this value been verified?	Yes, the value has been verified against data indicated in ACM0001 v11
Choice of data correctly justified?	Yes, at standard temperature and pressure (0 degree Celsius and 1,013 bar)
Measurement method correctly described?	NA

$BE_{CH4, SWDS,y}$	Methane generation from the landfill in the absence of the project activity at year y
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, tCO_2e
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, calculated as per the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05
Correct value provided?	Yes, various
Has this value been verified?	Yes, the verification occurred by auditing the calculation spreadsheet and reproducing the calculation externally [DR 8]
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

φ	Model correction factor to account for model uncertainties
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, as per the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05
Correct value provided?	Yes, 0.9
Has this value been verified?	Yes, the value has been verified against data indicated in "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 5
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

OX	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, as per the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05
Correct value provided?	Yes, 0.1
Has this value been verified?	Yes, the value has been verified against data indicated in "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 5
Choice of data correctly justified?	Yes, applied for managed solid waste disposal sites that are covered with oxidizing material such as soil or compost
Measurement method correctly described?	NA

F	Fraction of methane in the SWDS gas (volume fraction)
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 0.5
Has this value been verified?	Yes, the value has been verified against data indicated in "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05
Choice of data correctly justified?	Yes, this factor reflects the fact that some degradable organic carbon does not degrade, or degrades very slowly, under anaerobic conditions in the SWDS. A default value of 0.5 is recommended by IPCC.
Measurement method correctly described?	NA

f	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, landfill site
Correct value provided?	Yes, 0
Has this value been verified?	Yes
Choice of data correctly justified?	Yes, the methane is vented to the atmosphere prior to the project activity. This was validated during the site visit and by reviewing DR 47.
Measurement method correctly described?	NA

Z	Number of samples collected during the year x
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes, as per the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05
Source clearly referenced? (appropriate?)	Yes, Waste characterization study, Candeias landfill, 2010 [DR 46]
Correct value provided?	Yes, 3
Has this value been verified?	Yes [DR 46]
Choice of data correctly justified?	Yes
Measurement method correctly described?	Yes

DOC_f	Fraction of degradable organic carbon (DOC) that can decompose
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 0.5
Has this value been verified?	Yes, the value has been verified against data indicated in "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

MCF	Methane correction factor
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, IPCC 2006 Guidelines for National Greenhouse Gas Inventories

Correct value provided?	Yes, 1
Has this value been verified?	Yes, the value has been verified against data indicated in "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05, for anaerobic managed solid waste disposal sites with controlled placement of waste and cover material.
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

DOC_j	Fraction of degradable organic carbon (by weight) in the waste type j
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Correct value provided?	Yes, various for each type j in wet basis
Has this value been verified?	Yes, the value has been verified against data indicated in "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

K_j	Decay rate for the waste type j
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Correct value provided?	Yes, various for each type j for tropical and wet area
Has this value been verified?	Yes, the value has been verified against data indicated in "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" version 05
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

E_{DS}	Efficiency of the degassing system which will be installed in the Project Activity
Title in line with Methodology?	This parameter was included in the PDD although it is not required in the methodology. This provides for a more reasonable and conservative estimate of emission reductions.
Data unit correctly expressed?	Yes, %
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, this has been confirmed by review of the environmental report for the proposed project [DR 16]
Correct value provided?	Yes, 40
Has this value been verified?	Yes
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

W_x	Total amount of organic waste prevented from disposal in year x (tons)
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, tonnes
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, [DR17, DR 28]
Correct value provided?	Yes, 11 million
Has this value been verified?	Yes, the value was confirmed by review of DR 28 and the emission reduction calculation spreadsheet [DR8]
Choice of data correctly justified?	Yes

Measurement method correctly described?	NA

$p_{n,j,x}$	Weight fraction of the waste type j in the sample n collected during the year x
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, %
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes, [DR 46]
Correct value provided?	Yes, various of each waste type j
Has this value been verified?	Yes, the value was confirmed by review of DR 46
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

MM_{CH4}	Molecular mass of methane
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 16.04
Has this value been verified?	Yes, as per “Tool to determine project emissions from flaring gases containing methane” (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

MM_{CO}	Molecular mass of carbon monoxide
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 28.01
Has this value been verified?	Yes, as per “Tool to determine project emissions from flaring gases containing methane” (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

MM_{CO2}	Molecular mass of carbon dioxide
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 44.01
Has this value been verified?	Yes, as per “Tool to determine project emissions from flaring gases containing methane” (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

MM_{O2}	Molecular mass of oxygen
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 32.00
Has this value been verified?	Yes, as per “Tool to determine project emissions from flaring gases containing methane” (EB28 Annex 13)

Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

MM_{H2}	Molecular mass of hydrogen
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 2.02
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

MM_{N2}	Molecular mass of nitrogen
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 28.02
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

AM_c	Atomic mass of carbon
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 12.00
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

AM_h	Atomic mass of hydrogen
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 1.01
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

AM_o	Atomic mass of oxygen
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 16.00

Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

AM_n	Atomic mass of nitrogen
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, kg/kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 14.01
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

P_n	Atmospheric pressure at normal conditions
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, Pa
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 101,325
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

R_u	Universal ideal gas constant
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, $Pa.m^3/kmol.K$
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 8,314.472
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

T_n	Temperature at normal conditions.
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, K
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 273.15
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

MF_{O2}	O_2 volumetric fraction of air
Title in line with Methodology?	Yes
Data unit correctly expressed?	NA
Appropriate description?	Yes

Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 0.21
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

MV_n	Volume of one mole of any ideal gas at normal temperature and pressure
Title in line with Methodology?	Yes
Data unit correctly expressed?	Yes, m^3/Kmol
Appropriate description?	Yes
Source clearly referenced? (appropriate?)	Yes
Correct value provided?	Yes, 22.414
Has this value been verified?	Yes, as per "Tool to determine project emissions from flaring gases containing methane" (EB28 Annex 13)
Choice of data correctly justified?	Yes
Measurement method correctly described?	NA

3.8. Environmental and Sustainable Development Impacts

A Simplified Environmental Report dated September 2009 [DR 16] was presented, assessed and found to be acceptable. No significant environmental impacts have been identified. An Environmental License from CPRH Environmental Agency of Pernambuco [DR 35] dated 03 June 2010 was provided and verified. ERM CVS can confirm, by means of review of these documents, that the project participants have undertaken an analysis of environmental impacts according to the procedures required by the host party.

The host Party LoA and Annex 1 Party LoA have not been issued yet. Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development.

3.9. Comments by Local Stakeholders

Local and relevant stakeholders were invited to comment on the proposed project activity on 16 Jul 2009 before the submission of the project to validation on 07 October 2009. The project participants followed the procedures set out by the DNA of Brazil and sent letters to the local stakeholders that could reasonably be considered relevant for the proposed project activity. No comments were received from the stakeholders.

ERM CVS has reviewed copies of the letters sent to the stakeholders. A copy of the PDD was also available for consultation on the website of the project developer http://www.haztec.com.br. Letters were sent to the following stakeholders:

- Prefeitura Municipal de Jaboatao dos Guararapes–-PE / Municipal Administration of Jaboatao dos Guararapes–-PE.
- Secretaria Municipal de Meio Ambiente de Jaboatao dos Guararapes–-PE / Municipal Secretariat of Environment of Jaboatao dos Guararapes–-PE.
- Camara dos Vereadores de Jaboatao dos Guararapes–-PE / Municipal Legislation Chamber of Jaboatao dos Guararapes–-PE.
- CPRH - Agencia Estadual de Meio Ambiente e Recursos Hidricos do Pernambuco / Environmental State Agency of Pernambuco
- Ministerio Publico do Estado do Pernambuco / Public Ministry of Pernambuco State.
- Forum Brasileiro de ONGs (FBOMS) / Brazilian NGO Forum.
- ABES – Rio – Associacao Brasileira de Engenharia Sanitaria e Ambiental / Brazilian
- Association of Sanitary and Environment Engineering.
- Ministerio Público Federal (Federal public Ministry, MPF)
- Centro de estudos e apoio ao desenvolvimento de comunidades (CEDECOM), an NGO that works with poor communities in Brazil including waste pickers

The stakeholder consultation description in the PDD has been verified against copies of the letters sent to stakeholders [DR 21] and ERM CVS can confirm that the description in the PDD is correct and that the stakeholder consultation was in line with CDM and host country requirements. Comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity have been invited. The project participants have not received any comments. ERM CVS was therefore able to determine that the stakeholder consultation was adequate.

3.10. Additional Findings

None.

4. Conclusion and Validation Opinion

Project Title	CTR Candeias Landfill Gas Project
Basis of validation	ERM CVS based its validation work on: • CDM approved monitoring methodology ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 • Project Design Document version 01 dated 19 June 2009, and the revised PDD version 10 dated 08 March 2011 • CDM Validation and Verification Manual (version 1.2) • ERM CVS's internal CDM validation methodologies and protocols • CDM decisions and guidance issued by the CDM Executive Board • UNFCCC criteria for the Clean Development Mechanism • Host Country criteria for the Clean Development Mechanism
Responsibilities of ERM CVS	ERM CVS is responsible to provide a thorough independent third party assessment of the proposed CDM project activity to ensure that the proposed CDM project activity meets all the identified and applicable criteria for registration of projects under the CDM.
Responsibilities of Project Participants	Haztec Tecnologia e Planejamento Ambiental SA and the International Bank for Reconstruction and Development (IBRD) as the Trustee of the Spanish Carbon Fund ('the World Bank') are responsible for preparing the PDD, supporting documentation and providing all necessary evidences to support the information included in the PDD.
Activities performed	ERM CVS conducted its activities in accordance with the CDM Validation and Verification Manual, version 1.2. The validation consisted of a review of project documentation, a site visit, interviews with relevant personnel, cross checking and ascertaining information through other reliable sources and on its sectoral, regional and local expertise, and resolution of CLs and CARs pertaining to the project activity.
ERM CVS Conclusion	ERM Certification and Verification Services has performed the validation of the CTR Candeias Landfill Gas Project against the criteria for the Clean Development Mechanism as set out by the Conference of the Parties and the UNFCCC CDM Executive Board, and host country criteria. The validation employed standard auditing techniques, and a validation protocol checklist was used to carry out the validation. The project is a landfill gas capture project located in the Municipality of Jaboatão dos Guararapes in the Recife Metropolitan Area. The host party is Brazil, and the Annex 1 Party for the project activity is Spain. Both parties fulfil the criteria for participation in the CDM. The validation has provided sufficient evidence to demonstrate that the project activity is not the baseline scenario, and that emission reductions would be additional to what would have taken place in the absence of the CDM project activity. The project meets the applicability criteria and correctly applies the approved methodology ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11, and is therefore expected to result in real, measurable and long term reductions in greenhouse gas emissions. The monitoring plan provides for the collection and archiving of data sufficient to ensure that emission reductions can be verified. Nothing came to our attention to suggest that the project, if implemented as described, would not result in emission reductions of 155,112 tCO_2e per year on average over the first crediting period. It is the opinion of ERM CVS that the CTR Candeias Landfill Gas Project as described in the PDD version 10 dated 08 March 2011, meets all stated criteria of the CDM, correctly applies the methodology ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities" version 11, and is expected to result in real, measurable and long term emission reductions. Letters of approval are yet to be received from the host Party or Annex 1 Party.
Signed on behalf of ERM CVS	
Name:	Melanie Eddis
Date:	10 March 2011

Appendix A: DOCUMENTS & INTERVIEWEES

DOCUMENT LIST

Reference	Date	Document Title
DR 1	19 Jun 2009 08 March 2011	PDD sent to global stakeholder consultation. Novagerar Ecoenergia. version 1 Final PDD version 10 dated 08 March 2011
DR 2	15 Aug 2006	PIN approval date supporting document. The World Bank. PIN approval date supporting document.doc
DR 3	25 Jun 2010	Comercial proposal from GE energy Jenbacher for 03 x 1, 415 kW - 4,2 MW. Benco Energia. GE Energy Jenbacher – Haztec – Proposta comercial.pdf
DR 4	24 Jun 2010	Comercial Proposal for the installation of the vertical gas collection system. Perfurasolo. Drill Services. Doc
DR 5	02 Jun 2010	Insurance proposal for the Water and Sewer System and offices. Marsh Corretora de Seguros. Haztec insurance.pdf
DR 6	24 Jun 2010	Request for the energy and flaring system to Landtec. Eduardo Gaiotto and Jamie Tooley. LANDTEC Email.pdf
DR 7	30 Jun 2010	Landtec Budget costs Landtec. CTR - Candeias LANDTEC.pdf
DR 8	02 Mar 2010	CERs Estimate for the CTR Candeias project activity. The World Bank. LC.Brazil.Novagerar.Candeias.ERCal (Mar 2).xls
DR 9	15 Aug 2009	CTR Candeias Design for the existing scenario. Novagerar Resíduos e Ecoenergia. Cand_C1-Layout1.pdf
DR 10	15 Aug 2009	CTR Candeias Design for the project scenario. Novagerar Resíduos e Ecoenergia. Cand_C2-Layout1.pdf
DR 11	15 Aug 2009	CTR Candeias Design for the project scenario. Novagerar Resíduos e Ecoenergia. Cand_C3-Layout1.pdf
DR 12	15 Aug 2009	CTR Candeias Design for the project scenario. Novagerar Resíduos e Ecoenergia. Cand_C4-Layout1.pdf
DR 13	15 Aug 2009	CTR Candeias Design for the project scenario. Novagerar Resíduos e Ecoenergia. Cand_C6-Layout1.pdf
DR 14	15 Aug 2009	CTR Candeias Design for the project scenario. Novagerar Resíduos e Ecoenergia. Cand_C7-Layout1.pdf
DR 15	15 Aug 2009	CTR Candeias Design for the project scenario. Novagerar Resíduos e Ecoenergia. Cand_C8-Layout1.pdf
DR 16	Sep 2009	Simplified Environmental Report- SER, for CTR Candeias. Novagerar Resíduos e Ecoenergia. Relatório ambiental - Biogas – CANDEIAS – Rv 03.pdf
DR 17	2010	Historic Residues control for the CTR Candeias landfill. Novagerar Resíduos e Ecoenergia. Controle de residuos 2007 e 2008.xlsx and Controle de resíduos CTRC 2009.xls.
DR 19	2007	Overview of the Brazilian Solid Residues, Chapter 4: Urban Solid Waste. ABRELPE. Current Practice Evidence.pdf
DR 21	16 Jul 2009	Letters sent to stakeholders as indicated in the PDD, with the receipt proof. Novagerar Resíduos e Ecoenergia. Letters sent to stakeholders.pdf
DR 22	09 Dec 2009	Social Contract for Ecopesa Ambiental Ltda. Haztec is included as a partner in Ecopesa and Novagerar is excluded. 5ª Alteração Contratual Ecopesa incluindo Haztec 09122009.pdf
DR 23	28 Sep 2010	Chronogram for CTR Candeias implementation. Haztec. Cronograma CTR Candeias - Biogás - RV Setembro 2010.pdf
DR 24	-	Technical specifications of the Landfill Gas Enclosed Flare System. provided by the equipment supplier ZTOF. Flare spec ZTOF JZ.pdf
DR 25	31 Dec	Annual depreciation rate and lifetime for equipments and other goods.

	1998	Receita Federal Brasil,.pdf
DR 26	01 Mar 2010	Financial Spreadsheet for Candeias project. FA – CANDEIAS Mar 1 2011.xls
DR 27	EB 47	Approved consolidated baseline methodology ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities"
DR 28	July 2006	Executive Project of Muribeca Landfill. Capacity and lifetime. Report No: 832-SAP-PEM-RT-E100. Engecorps. [Muribeca is the name of the road where the CTR Candeias Landfill project is to be implemented and was the name initially adopted for the project] CTR candeias Proj Executivo pag 60-61.pdf
DR 29	21 Sep 2010	Report on the lifetime of the project and hours of operation per year. GE Energy and Haztec. Email of GE Power.pdf
DR 30	16 Jul 2009	Manual for Submitting CDM Projects to the Interministerial Commission on Global Climate Change. Ministry of Science and Technology. http://www.mct.gov.br/index.php/content/view/37146.html Manual for submitting.pdf
DR 31	2007	Diagnoses of the Urban Solid Residues Management. Brazilian Ministry of the Cities. diagRS2007.zip
DR 32	2007	Overview of the Brazilian Solid Residues, Chapter 3: Analytical Summary. ABRELPE. 3_síntese.pdf
DR 33	2000	National Sanitary Resource, 2000. IBGE. pnsb.pdf
DR 34	19 Jun 2009	2009 Baseline Emission Factors for National Power Grid in Brazil. Ministry of Science and Technology. http://www.mct.gov.br/index.php/content/view/307492.html
DR 35	03 Jun 2010	Installation license for Candeias project, validity on 04/06/2011. CPRH, Pernambuco. LI CPRH Ecopesa Biogás.pdf
DR 36	30 Mar 2007	Letter of Intent: Potential Purchase of Emission Reductions Nova Gerar, landfill gas to power umbrella project. The World Bank. LoI.pdf
DR 37		Jenbacher gas engines. Technical Specification. GE Jenbacher. Motor JMS 420 GS-B.L.pdf
DR 38	19 Nov 2008	Spanish Carbon Fund, CDM CERs Purchase Agreement. Novagerar Eco-Energia and International Bank for Reconstruction and Development, as trustee of the Spanish Carbon Fund. Nova Gerar Agreement TF 93336.pdf
DR 39	29 Sep 2010	Commercial Proposal for the plant maintenance. Benco Energia. O&M - HAZTEC - Proposta Técnica e Comercial Rv 3.pdf
DR 40	20 Out 2010	Salary range for Candeias management resources. Haztec. O&M and Administration costs reference.pdf
DR 41	20 Sep 2010	Email with an estimate for the Overhaul (engine JMS 420 GS-B.L Biogas 1.415 kW or similar). GE Energy and Haztec. Overhaul Motores JMS 420.pdf
DR 42	11 Mai 2010	Comercial Proposal for the pipes and conections. Apuã. Pipes and Conections Quote.pdf
DR 43	29 Sep 2009	Environmental permit proof. CTR Candeias. proof request env permit.pdf
DR 44	24 Sep 2009	Environmental permit proof. CTR Candeias. proof simplied env report delivered to Ministry.pdf
DR 45	Oct 2010	Complementary Technical report for CTR Candeias project. Haztec. Relatorio – Biogas – Complementar – Candeias.pdf
DR 46	29 Nov 2010	Gravimetric characterization of the residues at CTR Candeias. Haztec. Relatório análise gravimétrica.pdf
DR47	2008	Diagnoses of the Urban Solid Residues Management. Published by the Brazilian federal Sanitary National Information System - SNIS. DiagRS2008.xls
DR48	2010	Database of waste management activities in Brazil (illustrating technology transfer from Annex 1 country). Published by the Brazilian federal Sanitary National Information System - SNIS. DiagRS2008.xls

DR49	2007	Electricity Price information provided by Camara de Comercializacao de Energia Eletrica (Electric Power Commercialization Chamber or CCEE). CCEE is the official civil organization responsible for carrying out wholesale transactions and commercialization of electric power within the National Interconnected System. http://www.ccee.org.br/StaticFile/Arquivo/biblioteca_virtual/Leiloes/1_leilao_fontes_alternativas
DR50	2010	Exchange rates - BCB (Brazilian Central Bank) http://www4.bcb.gov.br/pec/conversao/conversao.asp
DR51	2010	Historic inflation rates - BCB (Brazilian Central Bank) http://www.bcb.gov.br/Pec/metas/TabelaMetaseResultados.pdf
DR52	2010	PIS/COFINS tax rate http://www.receita.fazenda.gov.br/PessoaJuridica/PisPasepCofins/RegIncidencia.htm, (PIS and COFINS)
DR53	2010	SELIC rates published by the Brazilian Central Bank http://www.bcb.gov.br/?COPOMJUROS
DR54	2010	LPG fuel supplier technical data.pdf http://www.ultragaz.com.br/pt/Institucional/O_gas_LP/Vantagens_do_GasLP/Default.aspx
DR55	2010	Income tax rates in Brazil http://www.receita.fazenda.gov.br/aliquotas/ContribCsll/Aliquotas.htm (CSLL) and http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr32a34.htm (IRPJ).
DR56	01 March 2011	UNEP Risoe CDM Pipeline database http://cdmpipeline.org/
DR57	2008	Nov I Monitoring Report 2008.pdf (Project Registration Number 0008)
DR58	23 SET 2010	LPG Fuel supplier tech data.pdf http://www.ultragaz.com.br/pt/Institucional/O_gas_LP/Vantagens_do_GasLP/Default.aspx
DR59	26 August 2010	Electricity Price information provided by Camara de Comercializacao de Energia Eletrica (Electric Power Commercialization Chamber or CCEE). CCEE is the official civil organization responsible for carrying out wholesale transactions and commercialization of electric power within the National Interconnected System Resultado do leilão_Agosto2010.pdf

List of interviewees

Date	Name	Position	Subject Discussed
24 Nov 2009	Fabio Mello	Operational Responsible – Candeias Landfill	Operational Information
24 Nov 2009	Eduardo Gaiotto	Host Party Responsible – Haztec	Operational Information, PDD clarification
24 Nov 2009	Chuck Peterson	Party Project Responsible – World Bank	Operational Information, PDD clarification
24 Nov 2009	Fernanda Tartaruga	Licence Process Responsible – Candeias Landfill	Relatório Ambiental - Biogás - CANDEIAS.doc – (Translation = “Simplified environmental report” (SER)
24 Nov 2009	Fernando Luca	Landfill Administration Manager – Candeias Landfill	Operational Information
29 Nov 2010	Manuel Luengo	Carbon Finance Specialist – World Bank	Investment Analysis

Appendix B: CDM Validation Protocol Checklist

DR = Document Review (refers to number on Document List)
OK = acceptable
SV = Site Visit
CAR = Corrective Action Request
IV = Interview (refers to number on List of Interviewees)
CL = Clarification Request
FAR = Forward Action Request
NA = Not Applicable

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
1.	**PDD Format (**CDM VVM EB 55 para. 55 - 57)			OK/CAR/CL	OK/ NOT OK
1.1	Is the PDD prepared in accordance with the latest template and guidance by the CDM EB? http://cdm.unfccc.int/Reference/PDDs_FORMS/PDDs/index.html	DR1	Yes, the PDD was prepared using the latest template (Version 03) and is in accordance with the latest version (Version 07) of the guidelines for completing the PDD, with the exception of the issues identified in the CARs below. Name of the Organization, E-mail, and address of the Host Party in PDD is not consistent with the documentation presented during the site visit.	CAR 1 CAR 2	OK
1.2	Does the language make sense and is it clear?	DR 1	It is necessary to use internationally accepted standard format for values in the PDD, where 1,000 represents one thousand and 1.0 represents one.	CAR 15	OK
2.	**Project Title**	PDD A.1			
2.1	Does the used project title clearly enable identification of the unique CDM activity?	DR 1	Yes, the project title is “CTR Candeias Landfill Gas Project” and enables the identification of the unique CDM project activity.	OK	OK
2.2	Is the version number and the date given? Is this consistent with the project’s timeline?	DR 1	Yes, the PDD submitted for validation is version 01, dated June 19, 2009, consistent with project’s timeline.	OK	OK
3.	**Project Description (**CDM VVM EB 55 para. 58-64)	PDD A.2			
3.1	Does the PDD contain a clear description of the project activity, with regard to its nature and technical implementation? Does Section A2 include: a. A brief summary of the technology employed,	DR1 DR16 SV IV	The PDD description of the project activity was checked for accuracy and consistency against the “simplified environmental report” (SER), a physical site inspection, and through interviews with the project developer. a. Yes, the technology to be employed in the project activity is	CL 1 CL 20 CL 30	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	b. A brief summary of the sources and gases included in the project boundary c. The PP's opinion regarding the contribution of the project to sustainable development		described, including the flare and the electricity generation. However, the estimated emissions reduction is not mentioned and the "SER" provides a different number for the estimated amount of waste disposal. In addition there is no description of the quantity, specification and use of each technology (diesel generator, flare and power house), and there is no information on what entity is the owner of the landfill. No reference was found that Candeias landfill receives solid waste from Cabo de São Agostinho e Paulista municipality, as claimed in section A.2 of the PDD. b. Yes, the major sources of emissions in the project and in the baseline are mentioned. However, a diesel (captive) electricity generator identified on-site during the validation visit is not mentioned. Furthermore, the baseline and existing scenarios shall be clearly described in sections A.2 and A.4.3 c. Yes, the contribution of the project to sustainable development is mentioned including a description of the social benefits. The contribution to the sustainable development of the host Party must be confirmed by the Brazilian DNA. Please refer to CL 30.		
3.2	Does the description deliver a transparent overview of the project activities and cover all relevant elements?	DR 1 SV IV	Yes, the description provides a transparent overview of the project activities and the relevant elements such as waste quantity generation, LFG capture and flaring activities as well as energy generation. A diesel generator was found to be operational every day replacing peak grid electricity supply (self consumption only). In one diagram of the PDD this generator is included. However, it is neither mentioned in the project description nor in the equations.	CL 1 CL 20 CAR 5	OK
3.3	Has a physical site inspection been undertaken to confirm that the description in the PDD reflects the proposed CDM project activity?	DR 1 SV IV	Yes, a physical site inspection took place on 24th November, 2009, including interview with the project developer. The description of the project is in line with site observations except for the diesel electricity generator.	OK	OK
3.4	Does section A.2 also indicate the baseline situation, and the historical situation at the facility, if this is different to the baseline?	DR1 SV IV	Yes. The scenario existing prior to the start of the project activity is described and is the same as the baseline scenario, which is implementation of the landfill with uncontrolled release of methane to the atmosphere. However this has to be described clearly in the PDD.	CAR 16	OK
3.5	If the proposed CDM Project Activity takes place in an existing facility, installation or process, or modifies an existing facility, installation or process, is a complete and clear description of that facility, installation or process	DR1 DR16 SV IV	A description of the CTR Candeias Sanitary landfill is provided in the PDD, including the age, lifetime, size, and waste handling capacity of the landfill. The information was confirmed by means of an on site inspection, review of the environmental report, and	CL 2 CL 3	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	given?		interviews with staff from the project developer. However please refer to CL 2 and CL 3		
3.6	How has this description been validated?	DR 1, DR16 SV	The description has been validated by site visit, the PDD and by the environmental report.	OK	OK
3.7	Is the description of the existing facility, installation or process consistent with information provided in other parts of the PDD such as common practice and baseline selection?	DR1	Yes the description of the existing facility is consistent with other sections of the PDD including the baseline scenario and the common practice.	OK	OK
3.8	Is all information provided in the project description consistent with information provided in later sections of the PDD?	DR1 SV	All information presented is consistent with details provided by the later sections of the PDD.	OK	OK
4.	**Technical Description**	**PDD A.4**			
	Location of Project	PDD A.4.1			
4.1	Does the information provided on the location of the project activity allow for a clear identification of the site(s)? How was the site location confirmed? (e.g. site visit, planning documents)	DR1 SV	Coordinates of the project site are provided in PDD. The information for the project location is also described in the SER. The location was confirmed during the site visit.	OK	OK
	Category/ Sectoral Scope	PDD A.4.2			
4.2	Is the category (sectoral scope) of the project activity indicated and correct?	DR1	The sectoral scope of the project activity is identified and indicated in the PDD (Scope 13, waste handling and disposal). Scope 13 is correctly indicated in line with the methodology however Scope 1"Energy Industries (Renewable/non-renewable sources)" was not included.	CAR 17	OK
	Technology to be Employed by the Project Activity	PDD A.4.3			
4.3	Is there a clear description of the baseline scenario, as identified in section B.4? This should include: a. An indicative list of the equipment(s) and systems that would have been in place in the absence of the project activity (if any) b Information about the age and average lifetime of the baseline facility based on manufacturer's specifications and industry standards (if applicable) c Installed capacities, load factors and efficiencies of the baseline facility (if applicable) d An explanation of how the same types and levels of services provided by the project activity would have been provided in the baseline scenario.	DR1 DR16 DR8 DR 28	The PDD A.4.3 contains a description of the baseline scenario, and this has been checked for accuracy and consistency against the "SER", during the physical site inspection, and through interviews with the project developer. The description is sufficient, except for the issues listed below: a No, there is no clear description of the baseline facility and the equipment related to the baseline operation. The diesel generator is also not mentioned. b Yes, the expected lifetime of the landfill is provided, and has been validated against the simplified environmental report, and the expected starting date for operation is included. c No, the information required in this item is provided in section A.2 but could be further detailed d No, there is no reference to how the electricity generated by	CL 2 CL 3 CL 13	OK OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
			the project was to be provided in the baseline scenario. The information is elsewhere, however. Electricity would be supplied by the grid. details of the electricity grid are given in the PDD and have been checked against the information provided by the DNA of Brazil [DR 34].		
4.4	If the scenario existing prior to the start of the implementation of the project activity is different from the selected baseline scenario, is there a clear description of the pre-existing scenario, with a list of the equipment(s) and systems in operation at that time?	DR 1	The selected baseline scenario is the same as the situation existing prior to the start of the implementation of the project activity; however this information is not clearly stated at the PDD.	CL 21	OK
4.5	Is the technology to be employed by the project activity clearly described and is it consistent with information provided elsewhere in the PDD? a. List of main technologies involved b. List of main equipment and installations c. The lifetime of the project equipment d. Monitoring equipment and its location e. Capacities, load factors and efficiencies (where relevant) f. The emissions sources and the greenhouse gases involved in the project activity g. Existing and forecast energy and mass flows and balances h. Interaction with processes/equipment outside the project boundary, if any, is stated.	DR1; DR 16	The PDD contains a clear description of the project technology, and this has been checked for accuracy and consistency against the SER, during the physical site inspection, and through interviews with the project developer., except for the issues listed below a. OK. b. The main equipment and installations are listed, however the diesel generator is missing. Furthermore, it is not clear how many flares, generators and backup – generators will be installed in the power house. c. No. Project equipment lifetime is not indicated. d. OK e. No. Flare capacity and technical description is not indicated. Electricity generators using LFG are described f. Emission sources and GHGs are not stated in this section, however they are adequately described in section B.3. g. No. Energy and mass flows and balances are not stated, except for the LFG electricity generators. h. Yes, it is said that the electricity generators will deliver electricity to the grid although the equipment to adjust the electricity generated to the grid is not mentioned in the PDD (it was mentioned during the site visit). It shall also be mentioned in the PDD.	CL 3 CL 4 CL 13	OK
4.6	Does the description of the technology to be applied provide sufficient and transparent input/ information to evaluate its impact on the greenhouse gas balance?	DR1 DR16	No, The description of the technology to be applied does not provide sufficient information to evaluate its impact on the greenhouse gas balance, as per the issues raised as CLs 1- 3	CL1 CL2 CL3	OK OK
4.7	Does the implementation of the project activity require any technology transfer from Annex-1-countries to the host country(ies)?	DR 1 DR 16	The PDD does not clearly state whether the project requires any technology transfer from annex-I-countries to Brazil.	CL 22	OK
4.8	Does the project use state of the art technology and / or	DR 1	The technology represents a significantly better performance in	CL 5	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	does the technology result in a significantly better performance than any commonly used technologies in the host country? Is the technology implemented by the project activity environmentally safe?	DR 16	the Northeast region of Brazil since it is the first landfill potentially delivering electricity in the province and the technology is not common practice in the country. Furthermore, the technology implemented by the project activity is environmentally safe. The project has undertaken a Simplified Environmental Report that the PP states has been submitted for approval of the Local Environmental Agency. However, no evidence of submission was shown.		
4.9	Is the project technology likely to be substituted by other or more efficient technologies within the project period?	DR 1 DR 16	The project activity uses advanced technology that is unlikely to be substituted by other more efficient technologies during the project period, based on ERM CVS's local and sectoral knowledge.	OK	OK
4.10	Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period? Is information available on the demand and requirements for training and maintenance?	DR 1 DR 16	According to the project owner representatives, the staff responsible for operation and maintenance of the system shall be trained prior to the implementation of the project. A training program shall be prepared and evidences (certificates, participation lists) regarding training of personnel involved in the CDM project activity will be submitted to the DOE during the first verification. However the details of training are not sufficiently clearly described in the PDD.	CAR 3	OK
4.11	Is a schedule available for the implementation of the project and are there any risks for delays?	DR 1 SV	Evidence in terms of schedule was neither provided for key events of the project nor for equipment purchase. Furthermore, the overall schedule for the project implementation was not available.	CAR 4	OK
	Public Funding	PDD A.4.5			
4.12	Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	DR 1, DR 2, DR 16, DR 22	According to project participant there is no public funding involved in the project. This has been validated against the environmental report and the social contract for the project activity.	OK	OK
4.13	If the project involves public funding from an Annex 1 country, have the annex 1 parties involved provided an affirmation that such funding does not result in a diversion of official development assistance?	DR 1	Not applicable	OK	OK
5.	**Approval and Participation (**CDM VVM EB 55 para.44 – 50 and para. 51 - 54)	PDD A.3			
5.1	Are project participants listed in tabular form in section A.3 of the PDD? Is this information consistent with the contact details provided in Annex 1 of the PDD and other project documentation (Letters of Approval and Modalities of	DR 1, DR 16 SV	Name of the Organization, E-mail, and address of the Host Party PP in PDD should be made consistent with the documentation presented during the site visit. The identification of the project participants as private or public entities has not been done in the PDD.	CAR 1 CL 23	OK OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	Communication)?				
5.2	Has the Host Party provided a Letter of Approval (LoA) with clear referencing and supporting documentation? Does the LoA confirm: ○ Ratification of the Kyoto Protocol ○ Voluntary Participation ○ Contribution to Sustainable Development ○ Reference to the precise project title in the PDD	DR 1 SV	The host Party LoA has not been provided yet	CL 30	TBC
5.3	Was the LoA received directly from the DNA or from the project participants? Has the Host Party LoA been issued by the respective DNA? How has this been confirmed?		See item 5.2.	CL 30	TBC
5.4	Has the Annex I Party provided a Letter of Approval (LoA) with clear referencing and supporting documentation? Does the LoA confirm: ○ Ratification of the Kyoto Protocol ○ Voluntary Participation ○ Contribution to Sustainable Development ○ Reference to the precise project title in the PDD	NA	The Annex 1 LoA has not been provided yet.	CL 30	TBC
5.5	Was the LoA received directly from the DNA or from the project participants? Has the Annex I Party LoA been issued by the respective DNA? How has this been confirmed?		See item 5.4.	CL 30	TBC
5.6	If either LoA contains additional specification or conditions of the project activity, then has the request for registration been based on the documents specified in the LoA?		See item 5.4	CL 30	TBC
5.7	If the LoA references a specific version of the Validation Report and this version cannot be submitted, then has either of the following been submitted? a) a statement indicating final LoA has not been received or b) an updated Validation Report		See item 5.4	CL 30	TBC
6.	**Baseline and Monitoring Methodology** (CDM VVM EB 55 (para. 65-92))	PDD B			
	Title and reference of the approved baseline and monitoring methodology?	PDD B.1			
6.1	Are the number, version and reference of the methodology clearly and correctly stated? Has the methodology been previously approved by the	DR 1	Yes. The selected methodology is clearly and correctly stated, and is the most recent version of the approved consolidated baseline and monitoring methodology ACM0001 v11.	OK	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	CDM Executive Board? http://cdm.unfccc.int/Reference/Procedures/Meth_proc02_v13.pdf		"Consolidated baseline methodology for landfill gas project activities", valid at the time of validation, as confirmed against the CDM website.		
6.2	Are the Tools applicable to the methodology correctly referenced, including the correct version number(s) valid at the time of registration submission?	DR 1	The GSP PDD references to: • Version 05.2 – "Tool for demonstration and assessment of additionality" • Version 01 (EB28 Annex 13) –"Tool to determine project emissions from flaring gases containing methane". • Version 4- "Tool for determining methane emissions avoided from disposal of waste at a solid waste disposal site" [N.B. this was subsequently updated to version 05] • Version 02 "Tool to calculate the emission factor for an electricity system". • Version 01- "*Tool to calculate baseline, project and/or leakage emissions from electricity consumption*" The PDD do not reference the following tools referenced in the methodology: • Combined tool to identify the baseline scenario and demonstrate additionality. • Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion. When referring to the tool and methodology, the complete name of the tool and its version is required to be included.	CAR 18	OK
	Justification for the choice of methodology and why it is applicable	PDD B.2			
6.3	Have any sources of greenhouse gas emissions been identified by the DOE, within the project boundary following project implementation, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, and which are not addressed by the applied methodology?	DR 1 SV	During the site visit, the DOE identified the existence of a Diesel generator which is used to generate electricity to be consumed on site during peak hours. No other information regarding this equipment except its existence and operation regime was provided. All other identified emission sources are included in the PDD	CAR 5	OK
6.4	Is the methodology fully applicable to the proposed project? For each of the applicability criteria: a. Is the criterion discussed in the PDD? b. Is compliance provable? c. Is evidence provided in the PDD to prove applicability? d. Has compliance with the criterion been verified (by	DR 1, DR 16	The choice of the methodology is correctly justified in the PDD, except for the issues listed below: a. In section B.2 It shall be indicated and justified if option a) and c) from applicability criteria of ACM0001 is applicable or not. Moreover indicate in this section if the thermal energy indicated in option b) is considered. b. Justify why the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" has not been applied	CL 24	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	checking evidence provided, sector/ local knowledge etc)?		to this project activity. c. No specific documents are cited in the PDD in this section however applicability has been demonstrated through a site visit and review of the simplified environmental report (SER) d. Yes, the applicability of the methodology has been checked by means of a site visit and review of the technical report of the project activity. The baseline is the atmospheric release of the gas and the project involves flaring of the gas and use of the gas to generate electricity.		
6.5	Was there a request for clarification, revision or deviation made for the adopted methodology in relation to the proposed project activity? If so, were the correct procedures provided by the CDM EB followed?	DR 1	The project is in conformity with all applicability criteria of the methodology and no request was issued.	OK	OK
	Description of sources and gases included in the project boundary	PDD B.3			
6.6	Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM project activity, in compliance with the requirements of the selected baseline methodology, and is this consistent with site observations and other documentation provided?	DR 1	Diesel generator is in the chart of the project boundary but is neither described in the boundary, nor in the project description. Furthermore, the emissions calculations do not account for this emission source	CAR 5	OK
6.7	**Baseline emissions:** Have all sources and GHGs required by the methodology been included within the project boundary? For each potential source: a. Are source(s) and gases discussed by the PDD? b. Is inclusion / exclusion justified? c. Is explanation/ justification sufficient? d. Is the inclusion/ exclusion consistent with the monitoring plan?	DR 1	The PDD description of the project boundary correctly applies the definition provided by the Methodology. a. Yes. b. Yes; c. Yes d. Yes;	OK	OK
6.8	**Project emissions:** Have all sources and GHGs required by the methodology been included within the project boundary? For each potential source: a. Are source(s) and gases discussed by the PDD? b. Is inclusion / exclusion justified? c. Is explanation/ justification sufficient? d. Is the inclusion/ exclusion consistent with the monitoring plan?	DR 1	a. Yes, with the exception of the fact that a diesel generator is in the chart of the project boundary but is neither described in the boundary, nor it the baseline or project situation. b. Yes, with the exception of the diesel generator c. Yes, with the exception of the diesel generator d. Yes, with the exception of the diesel generator	CAR 5	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
6.9	If the methodology allows project participants to choose whether a source or gas is to be included within the project boundary, have the project participants sufficiently justified that choice? Is the justification reasonable, based on assessment of supporting documented evidence and corroborated by observations if required?	DR 1	Sources are correctly included in the project boundary in line with the methodology. The methodology allows PPs to exclude some sources for simplification – this is correctly presented in the PDD. Emissions from electricity consumption are included and the PP has stated that electricity is consumed from the grid in the baseline scenario. ERMCVS has validated that the site is connected to the grid. However the diesel generator observed on site is not described in the definition of the boundary. See CAR 5. Emissions from thermal generation are correctly excluded as this is not part of the proposed project. On-site fossil fuel consumption due to the project activity other than for electricity generation is included in the GSP PDD (Fossil fuel (LPG – Liquefied Petroleum Gas) is used for the ignition of the flare system).	CAR 5	OK
6.10	For large scale projects, is a diagram given to illustrate the project boundary, including all the key equipment, systems and flows of mass and energy, as well as the emissions sources and gases included in the project boundary?	DR 1	A diagram is given, but the following issues are identified: a) As discussed above the diesel oil generator is included in the diagram but is not discussed in the rest of the PDD.	CAR 5	OK
6.11	Overall, is the identified boundary and the selected sources and gases justified for the project activity?	DR 1	The diesel generator has not been included. The exclusion of the diesel generator has not been sufficiently justified.	CAR 5	OK
	Description of how the baseline scenario is identified and description of the identified baseline scenario	PDD B.4			
6.12	Does the PDD identify the baseline, a scenario that represents the anthropogenic emissions by sources of GHG that would occur in the absence of the proposed CDM project activity?	DR 1	Yes, except for the issues listed below. The complete description of the alternatives is provided in the subsequent section B.4 and section B5 (additionality) is incomplete. The PDD contains a clear description of the baseline scenario options and the selected baseline scenario in the additionality section and this has been checked for accuracy and consistency against the "SER" and the site visit during the physical site inspection and through interviews with the project developer. Except for the issues listed below that are in some cases described in different sections of the PDD and in other cases are simply not mentioned anywhere: • The baseline equipment should be described in more detail. Many data on equipment presented in the PDD does not represent either the baseline or the project. An existing fossil fuel generator was disregarded although it is shown in Figure 2: Flowchart of the project boundary. • No information on the lifetime of the landfill and its current	CL 2 CAR 19	OK OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
			operational status • No information is provided on how the electricity delivered by the project would have been produced in the absence of the project		
6.13	Have the procedures/ steps to identify the most reasonable baseline scenario, as required by the methodology and applicable tools, been documented clearly in the PDD? Are all feasible and credible alternatives identified, including but not limited to all the potential scenarios listed in the methodology?	DR 1	The procedure for identification of the baseline scenario in ACM0001 has not been followed exactly. Please refer to CAR 19	CAR 19	OK
6.14	Are realistic different configurations or combinations of alternatives that may be able to provide similar outputs and services considered?	DR 1	Three alternatives to the project activity are identified, however the PDD lacks a conclusion on the combinations of baseline scenarios for electricity production and LFG treatment.	CAR 19	OK
6.15	Are all considered alternatives assessed for consistency with (enforced) mandatory laws and regulations?	DR 1	Yes. The PDD states that all the scenarios considered are compliant with applicable laws and regulations. ERM CVS can confirm, based on its sectoral and local knowledge, that there are no regulations in Brazil mandating the flaring or utilisation of landfill gas, and that this is not common practice in the absence of CDM incentives.	OK	OK
6.16	Does the list of alternatives include the project activity undertaken without being registered as a CDM project?	DR 1	Yes	OK	OK
6.17	If alternatives are excluded: ▪ Is it shown that at least one credible and feasible alternative does not face a barrier? Is this reasonable? • If the remaining alternatives include the project undertaken without CDM, is sufficient justification provided to demonstrate the validity of the barrier? Is sufficient justification provided to demonstrate that the CDM alleviates the identified barriers that prevent the project? How has this been verified?	DR 1	Alternative 1 (the landfill operator would invest in landfill gas capture and flaring not undertaken as a CDM project activity) is excluded on the basis that it is not financially attractive, since there are costs but no revenues. This is self evidently the case. Since there are no regulations requiring the flaring of gas it is reasonable to exclude this alternative and no further evidence is required. Alternative 2 (the landfill operator would maintain the present activities according to the common practice of not flaring the landfill gas) is not excluded. Alternative 3 (the landfill operator would invest in landfill gas capture and utilization to produce electricity for commercial purposes) is assessed by means of an investment analysis. This is validated in section 7 below.	OK	OK
6.18	If barriers are used to exclude baseline alternatives, can the barriers be considered real, i.e. is sufficient evidence/ justification provided to support every exclusion of alternatives? Is it reasonable?	DR 1	Not applicable	NA	NA

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
6.19	Can the barriers be considered preventative, i.e. do they really prevent the alternatives from taking place?	DR 1	Not applicable	NA	NA
6.20	If Investment Analysis is used to exclude baseline alternatives, has it been correctly applied? Are assumptions and input values reasonable and sufficiently justified?	DR 1	The PDD relies on Investment comparison analysis when the most appropriate method is a benchmark analysis since doing nothing is an option available to project participants.	CAR 7	OK
6.21	Is a transparent version of the analysis provided (i.e. financial analysis spreadsheets) and is in compliance with the 'guidelines on the assessment of investment analysis)?	DR 1	No the investment analysis is not in compliance with the guidelines. See section 7 below for further details.	CAR 19	OK
6.22	Have all relevant national and/or sectoral policies and circumstances been taken into account? Are they listed in the PDD?	DR 1	Yes. The PDD describes the relevant national and/or sectoral policies and circumstances. ERM CVS can confirm that there are no regulations in place imposing any methane fraction destruction.	OK	OK
6.23	Does the PDD provide a verifiable description of the baseline scenario, including a description of the technology/ activities that would have been employed in the absence of /the CDM project?	DR 1	The baseline scenario, which is the same as the scenario existing prior to the implementation of the project, is described in the PDD, however some further clarification is required. Please refer to the CARs and CLs raised above.	CARs CLs	OK
6.24	Does the identified baseline scenario reasonably represent what would occur in the absence of the proposed project activity?	DR 1	To be confirmed based on the resolution of the issues raised above	CARs CLs	OK
7.	**Additionality (**CDM VVM EB 55 (para.94-121))	PDD B.6			
	a) Prior consideration of the CDM	*PDD C.1.1*			
7.1	Is the start date defined in accordance with the "Glossary of CDM terms"? What evidence is provided to verify that this was the official start date? Is this considered reliable and reasonable?	DR 1 DR 2 DR 3 DR 4 DR 5 DR 6 DR 7	No evidence of the Prior consideration of CDM was provided. PDD states that the start date of the project is October, 2009. Documentation of this date shall be provided and an explanation shall be included in the PDD. The quotation of equipments (Biogas collection system and flare) is dated from August, 2006, and was not conducted for the Candeias Landfill. The quotes provided refer to different projects and capacities.	CAR 6 CL 6	OK
7.2	Is it a new project activity (start date on or after August 2008) or an existing project?	DR 1	Based on the stated start date, it is a new project activity. However the start date is to be confirmed – please see CAR 6	CAR 6	OK
7.3	**For a new project** which does not require a new methodology and has not published its PDD for stakeholder comments prior to the start date, then: a. Have the project proponents informed the DNA and/or UNFCCC secretariat in writing? How has	DR 1	The project is a new project, and does not require a new methodology and had published its PDD for stakeholder comments prior to the stated start date. However the start date is to be confirmed – please see CAR 6 and CL 7	CAR 6 CL 7	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	this notification been verified? (i.e. confirmation from the DNA or UNFCCC) b. Was the notification made within 6 months of the project activity start date? c. Does the letter/ notification indicate the precise geographic location and provide a brief description of the proposed project? d. Have the project proponents informed the DNA and/ or UNFCCC secretariat of the progress of the project activity every subsequent two years after the initial notification?				
7.4	**For an existing project** which has a start date prior to the publication of the PDD for global stakeholder comments, has the project proponent provided the following: a. Evidence of awareness of the CDM prior to the project activity start date and that the benefits of the CDM were a decisive factor in the decision to proceed with the project? (e.g. Board minutes, notes etc) Is this sufficient? b. Reliable evidence that demonstrates real actions were taken to secure CDM status in parallel with the project's implementation? (e.g. contracts with consultants for CDM/PDD/methodology services, ERPAs, correspondence with CER buyers, DOEs, DNAs or the UNFCCC). Is this sufficient?	DR 1	Not applicable.	OK	OK
	b) Identification of alternatives (Additionality Tool)	*PDD B.5*			
7.5	Is the assessment of alternatives in compliance with the requirements of the methodology and the relevant tool(s) (e.g. the Tool for the demonstration and assessment of additionality)? Is the assessment consistent with section B.4?	DR 1	See additional comments above as presented in 6.11.	CAR 19	OK
	c) Investment Analysis				
7.6	Has an investment analysis been used to demonstrate additionality? Is Investment analysis appropriate in this case to demonstrate the investment decision? (i.e. is financial attractiveness the key investment criteria?)	DR 1	Yes, an investment analysis has been used to demonstrate additionality. It is appropriate for a private sector developer.	OK	OK
7.7	Has the project activity and investment decision been clearly defined/ framed? That is, has the CDM project	DR 1, DR 26	Yes, Landfill installation costs are not part of the project activity investment analysis	OK	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	activity been defined separately from the overarching project or facility and is the investment decision in this case clearly framed? (e.g. is the project to 'make cement' or is it to 'supply fuel to a cement factory'?)				
7.8	Has the appropriate analysis Option been chosen? (as per the *Guidance on the Assessment of Investment Analysis*) • If **Option I** is chosen (simple cost analysis), is it demonstrated that the alternatives produce no economic benefits other than CDM income? • If **Option II** is chosen (investment comparison), does the proposed baseline scenario leave the PP no other choice than to make an investment to supply the same and (or substitute) products or services? • If **Option III** is chosen, is it appropriate in this case?	DR 1	Only one credible and plausible alternative has been identified for the project (P6). Alternatives P1, P4 and P5 were considered "not economically conceivable". Further Explanations shall be provided. The identified alternative to the project activity is doing nothing. Therefore the PP shall clarify why a benchmark analysis is not applied.	CL 8 CAR 7	OK
7.9	Is the most suitable financial indicator clearly identified (Project or Equity IRR, NPV, cost benefit ratio, or (levelised) unit cost)?	DR1	See additional comments above as presented in section 7.8.	CAR 7	OK
7.10	If **Option I** is chosen: Are the assumptions consistent for all alternatives assessed? If not, are the differences justified?	DR 1	Not applicable as the project activity has revenue - other than CERs revenues.	OK	OK
7.11	If **Option II** is chosen (investment comparison analysis): Are the assumptions for all alternatives compared consistent (including discount rates if applicable)?	DR 1	The financial indicator used to compare the alternatives was NPV. However, benchmark analysis should be applied since doing nothing is also an option available to PPs and is the remaining baseline scenario. Evidence of the 15% discount rate shall be provided. Evidence of equipment quotation shall be provided. The information in the quotation is different from that provided in the "SER". Table 1 in section B.5 of the PDD states an installation of a 3 MW power generation system. This is inconsistent with other parts of the PDD.	CL 6 CAR 7 CAR 8	OK OK
7.12	If **Option III** is chosen: *Benchmark (BM) or Discount Rate (DR)* a. If an IRR indicator is used, is the choice of BM type consistent with the type of IRR calculated? (e.g. a Project IRR benchmark is appropriated for a WACC or Project IRR analysis; an Equity IRR benchmark is appropriate for an Equity IRR analysis)	DR 1	Benchmark analysis is the appropriate method to assess additionality : a. NPV analysis is applied. The discount rate selected is not justified. Please refer to CL 6. b. It was not justified. c. It was not justified. d. It was not justified. e. It was not justified.	CAR 7 CL 6	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	b. Is the BM or DR value justified with supporting evidence for its appropriateness? c. Is an appropriate BM or DR value chosen that is relevant for the sector (i.e. electricity generation, cement manufacture, yeast manufacture, hydropower etc)? d. Is an appropriate BM or DR value chosen that is relevant for the project activity (i.e. for this investor, country, risk of project, time of investment decision)? e. Is the chosen benchmark conservative and in line with other BM or DRs used in current or previous projects by the same investor? (including the BM or DR used in Feasibility Studies or other financial analyses of the project activity)				
7.13	*Source of BM or DR* If an external BM or DR has been used: a. Is the BM or DR based on publicly available data sources? Have these data sources been validated? Are the assumptions underlying the referenced BM or DR also applicable to this project?	DR 1	Benchmark evidence was not provided.	CL 6	OK
7.14	*Source of BM or DR* If an internal company BM or DR has been used: a. Is the project participant the only possible investor in the project? b. Is it sufficiently demonstrated that the internal benchmark has been used for similar projects with similar risk or would have been used for similar projects in the same sector and country/region? c. How has this been validated? d. Has a lower BM or DR been used in previous investment decisions by the project participant (in this project or similar others)? If so, are there verifiable circumstances that have led to a change in the BM or DR? e. Is the chosen BM or DR value appropriate in comparison with other comparable publicly available comparable BM and DRs? Is the BM or DR consistent with others used in similar	DR 1	Benchmark evidence was not provided.	CL 6	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	projects (and validated by CVS)?				
7.15	*Risk Premiums* a. Are risk premiums applied in the development of the BM or DR? If so, are they reasonable and justified? How has this been validated?	DR 1	Benchmark evidence was not provided.	CL 6	OK
	Assumption and Input Values, calculations				
7.16	Are all references made in the investment analysis correctly referenced/ sourced? Have these sources been verified?	DR 1	No spreadsheet provided. Further evidence to support the input values to the financial analysis is required.	CL 6	OK
7.17	Have values from a **feasibility study report** (FSR) approved by national authorities been used? If so: a. Has the FSR been the basis of the decision to proceed with the investment in the project? How has this been verified? b. Are the values used in the PDD and associated annexes valid and consistent with the FSR? c. At the time of the investment decision, are the input values from the FSR valid and applicable (based on specific local and sectoral expertise and knowledge)?	DR16	No feasibility study report including financial input values was provided.	CL 11	OK
7.18	*Technical assumptions* a. Are the technical assumptions reasonable? b. Are the assumptions adequately supported by evidence/ justification? c. What evidence has been provided to support critical technical assumptions? Have **technical assumptions** and input values been verified by: assessing them against the available evidence and expertise; cross-checking the parameters against 3rd party or publicly available sources; reviewing feasibility reports; reviewing information of other similar projects; reviewing project information presented in permit applications etc; referring to a sector or technical expert; etc?	DR 1	No spreadsheet provided.	CL 6	OK
7.19	*Financial Assumptions* a. Are the revenue and price financial assumptions reasonable?		No spreadsheet provided.	CL 6	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	b. Are the assumed costs reasonable? Do they all accrue to the CDM project activity only (rather than to other parts of the facility)? c. Are all the assumed taxes applicable for the different alternatives and applicable for the whole assessment period? d. Are the assumptions adequately supported by evidence/ justification? What evidence has been provided to support critical financial assumptions? Have the financial assumptions and input values been verified by checking them against feasibility studies, quotes, receipts, third-party forecasts, annual reports, and financial analyses (such as those presented to banks), etc?				
7.20	*Timing of assumptions* e. Are all assumed input values valid for the time of the investment decision? f. Are all capex costs valid at the time of the investment decision? Are there any sunk costs? g. Are all revenues and costs reasonable for the whole period as forecast? h. Are changes in costs or revenues scheduled or likely? Have such changes been incorporated and justified? i. Are the costs and revenues entered in the correct year when they will occur?		The time of the start date of the project activity (and hence the investment decision) needs to be clarified – please refer to section 7.1. Further evidence to support the input values is required in order to assess their validity. Capex: further evidence to support the investment costs is required. No sunk costs are included in the analysis however this shall be confirmed once a traceable spreadsheet is provided. Electricity sale tariff of 170 BRL/MWh was assumed in calculations. The period of estimation and source of data must be provided. The correctness of the year in which the costs and revenues are entered shall be confirmed once a traceable spreadsheet is provided.	CAR 6 CL 6 CL 10	OK
7.21	*Revenues* Are all benefits of all the assessed alternatives incorporated in the analysis? (e.g. including revenues from by-products, reduced costs etc; consult with sector expert)		No spreadsheet provided.	CL 6	
7.22	*Costs* Are all costs of all the assessed alternatives incorporated in the analysis? (e.g. including permit and licence costs, transport costs etc; consult with sector expert)	DR 1	More recent data for the costs of the Biogas collection system and flare must be considered and new evidence shall be provided, since the technology/prices/conditions could have changed since the values provided were determined.	CAR 10	OK
7.23	Are there any policies, subsidies, incentives, grants, tax breaks etc that apply to any of the alternatives? Are these incorporated in the analysis?		No spreadsheet provided. However based on ERM CVS's local and sectoral knowledge there are no incentives in the host country that are applicable to the project activity.	CL 6	

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	(refer to *Clarifications on the consideration of national and /or sectoral policies and circumstances in baseline scenarios*, currently located at http://cdm.unfccc.int/EB/022/eb22_repan3.pdf)				
7.24	Is the assumed **period of assessment** appropriate? How has this been demonstrated? (i.e. based on economic lifetime of equipment/ assets or other dependent factors)	DR 2 DR 6 DR 7	The investment data provided for the Biogas collection system and flare are dated from more than 3 years before (August, 2006; November, 2006) and were not quoted for Candeias Landfill. The prices were taken in the exact Reals (Brazilian currency) amount at that time. More recent data must be considered and new evidence shall be provided, once the technology/prices/conditions could have changed since then. The value of "Other equipments (Pipes, Conections, Valves, Pumps)" in was simply added to the "Biogas collection system and flare". Recently data and documentation shall be provided. The correctness of the period of assessment shall be assessed once a traceable spreadsheet is provided.	CL 6 CL 9	OK
7.25	Is any **residual value** of the project activity assets included in the analysis? Are residual value assumptions reasonable and justified and consistent with local accounting rules, international best practice and industry experience?	DR 1	No spreadsheet provided.	CL 6	
	Calculations				
7.26	Has the project participant supplied unprotected and traceable spreadsheet versions of all investment analysis?	DR 1	No spreadsheet provided.	CL 6	OK
7.27	From the investment analysis provided, is it possible to reproduce the results?	DR 1	No spreadsheet provided.	CL 6	OK
7.28	Have the listed input values been consistently applied in all calculations?	DR 1	No spreadsheet provided.	CL 6	OK
7.29	Are the computations/ formula correct? (this includes the computations implicit in input values, such as technical calculations of the amount of energy demanded or sold etc)	DR 1	No spreadsheet provided.	CL 6	OK
7.30	*Depreciation* a. Are deprecation costs applied to depreciable assets only (not land)? b. Are the depreciation and major repair and maintenance costs consistent with the assessment period and the residual values? c. Are depreciation costs/ periods consistent with	DR 1	The calculation of depreciation should be further substantiated.	CL 6	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	local accounting regulations? d. Are **depreciation** costs (and other non-cash items) related to the project activity excluded (not deducted) from net Cash Flow used for calculating the financial indicator (e.g. IRR, NPV)?				
7.31	*Tax* a. Is the treatment of **taxation** consistent with the chosen benchmark or discount rate? (i.e. taxation should only be treated as an expense in the IRR/NPV calculation if the chosen BM or DR is intended for post-tax calculations? For post-tax BMs or DRs: b. Are interest costs included in the calculation of net taxable income and thus tax? c. Are interest costs calculated in accordance with the *Guidance on the Assessment of Investment Analysis* d. Are depreciation costs included in the calculation of net taxable income and thus tax?	DR 1	No spreadsheet provided.	CL 6	OK
7.32	*Interest costs* If a Project IRR has been used, are the costs of financing expenditures (i.e. loan repayments and interest) excluded from the calculation of Project IRR? (financing costs should not be deducted from Net Cash Flow) If an Equity IRR has been used, is the debt portion of the investment cost excluded as a cash outflow and the interest costs and principal repayments included as costs?	DR 1	No spreadsheet provided.	CL 6	OK
7.33	**Recommenced project:** If the implementation of the project ceased and then recommenced due to consideration of the CDM, then: a. Are input values valid and applicable at the time of making the decision to recommence the project? b. Are capital costs incurred prior to the revised project activity start date input as the recoverable value of the assets (limited to the potential reuse/ resale of tangible assets)? c. How has the fair market value of the capital expenditures been calculated and validated? (e.g.	DR 1	Not applicable	n/a	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	by chartered specialists). Is this fair market value reasonable and justified?				
7.34	**Sensitivity analysis**: f. Are all variable and critical costs and revenues in the analysis included in the sensitivity analysis? g. Is the assessed range of variations reasonable in light of the reliability of the estimated input values and the likely range? h. If some variations create scenarios that change the conclusion/ result of the analysis, how likely/ probable are such scenarios (in the opinion of the DOE)? i. Is the sensitivity analysis possible to reproduce?	DR 1	Sensitivity Analysis is not included in the PDD.	CL 6 CAR 9	OK OK
	d) Barrier Analysis (VVM EB 55 para. 115 – 118)	*PDD Step 3*			
7.35	Has a barrier analysis been used?	DR 1	No barrier analysis was provided.	NA	NA
7.36	Is a complete list of credible, feasible and legally compliant alternatives identified?	DR 1	No barrier analysis was provided.	NA	NA
7.37	Is a complete list of barriers that prevent the alternatives and the proposed CDM project activity from occurring identified?	DR 1	No barrier analysis was provided.	NA	NA
7.38	Do any such identified barriers have a clear and direct impact on the financial returns of the project activity? (these are not barriers and should be assessed in the investment analysis)	DR 1	No barrier analysis was provided.	NA	NA
7.39	Are the identified barriers real and substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics? How has the reliability and credibility of the sources and assumptions used been assessed?	DR 1	No barrier analysis was provided.	NA	NA
7.40	For each barrier, is at least one of the following types of evidence provided that is relevant and substantiates the indentified barrier? (a) Relevant legislation, regulatory information or industry norms; (b) Relevant (sectoral) studies or surveys (e.g. market surveys, technology studies, etc) undertaken by universities, research institutions, industry associations, companies, bilateral/multilateral institutions, etc;	DR 1	No barrier analysis was provided.	NA	NA

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	(c) Relevant statistical data from national or international statistics; (d) Documentation of relevant market data (e.g. market prices, tariffs, rules); (e) Written documentation of independent expert judgments from industry, educational institutions (e.g. universities, technical schools, training centres), industry associations and others.				
7.41	Is the proposed project taking place in a least developed country (LDC)? In this case it is sufficient to transparently describe the relevant barriers, as less stringency is needed with regards to data availability in the actual demonstration of barriers. Projects in LDCs are not bound by the provisions in the 'Guidelines for objective demonstration and assessment of barriers' (questions 7.42 to 7.45) and may use other approaches that are more adapted to the local circumstances.	DR 1	No barrier analysis was provided.	NA	NA
7.42	If demonstrating barriers related to the lack of access to capital, technologies and skilled labour, do the project proponents provide information on the nature of the companies and entities involved in the financing and implementation of the project in accordance with guideline 4 of the 'Guidelines for objective demonstration and assessment of barriers'? How has this information been validated? Does the information on the nature of the companies/entities involved lend credibility to the claimed barriers relating to lack of access to capital, technologies or skilled labour?	DR 1	No barrier analysis was provided.	NA	NA
7.43	Has the PP demonstrated, for each of the barriers, that in similar circumstances (in similar industries/sectors, in companies of similar size and ownership structure, in similar projects) the barriers actually prevented the implementation of other project(s)? Note that this approach is not mandatory and that other approaches to enhance objectivity of barrier analysis may also be pursued. (Guideline 3 of the 'Guidelines for objective demonstration and assessment of barriers')	DR 1	No barrier analysis was provided.	NA	NA
7.44	If barriers related to increased risks of damage (i.e. that	DR 1	No barrier analysis was provided.	NA	NA

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	the equipment is damaged due to technological barriers, lack of know-how etc.) are claimed, have these been quantified by the calculation of probability of loss and loss expenses, and can the underlying data and assumptions can be objectively and transparently justified? Note: This quantitative approach to barriers is an option in case sufficient data is available, as a limited number of projects may have the data to follow this approach (Guideline 5 of the 'Guidelines for objective demonstration and assessment of barriers').				
7.45	If PPs claim investment barriers, does the PDD demonstrate that the financing of the project was assured only due to the benefits of the CDM? Is it demonstrated that the loan approval (or other significant financing decision(s)) by the lender takes explicitly the CDM registration into account? (Guideline 6 of the 'Guidelines for objective demonstration and assessment of barriers').		No barrier analysis was provided.	NA	NA
7.46	Based on the evidence reviewed, and conservative interpretations of this evidence, can it be confirmed that the identified barriers are real?	DR 1	No barrier analysis was provided.	NA	NA
7.47	Based on the evidence reviewed, and conservative interpretations of this evidence, can it be confirmed that the identified barriers actually prevent the implementation of the proposed CDM project activity by the project participant or other potential project participants? How has this been validated?	DR 1	No barrier analysis was provided.	NA	NA
7.48	Is at least one of the alternatives remaining (i.e. is not prevented by the barriers)?How has this been validated?	DR 1	No barrier analysis was provided.	NA	NA
7.49	Is it clearly explained how approval of the project in the CDM would enable the proposed project activity to surmount the barrier, in an objective way? Is the rationale reasonable and justified with transparent and documented evidence, and conservative interpretations of this evidence?	DR 1	No barrier analysis was provided.	NA	NA
7.50	Overall, is the Barrier Analysis presented credible and compliant with the applicable Tools?	DR 1	No barrier analysis was provided.	NA	NA
	e) Common Practice Analysis (VVM EB 55 para. 119 – 121)	*PDD Step 4*			
7.51	Is the proposed project activity a 'first of its kind'? Has	DR 1	No, the project activity does not claim the barrier first of its kind	OK	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	sufficient evidence been provided to validate this claim, and how have we validated this evidence?				
7.52	Has common practice analysis been undertaken and fully described in the PDD?	DR 1	Yes.	OK	OK
7.53	Is the geographical scope of the common practice analysis appropriate for the assessment related to the project activity's technology or industry type? If a region other than the host country is chosen, is this appropriate?	DR 1	Yes. Brazil was selected as the geographic relevant area in the GSP PDD, which was considered acceptable. [However please note that this was subsequently changed to the state of Pernambuco. This is considered appropriate since the environmental regulation is determined by the state where the project is installed].	OK	OK
7.54	Has the scope of the comparison been defined correctly, i.e. how are 'similar' projects defined and is the definition of 'similar' appropriate, i.e. the same country/region, broadly similar technology, similar scale, take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.	DR 1, DR47	The PDD does not describe how 'similar' projects are defined.	CL 12	OK
7.55	Have all comparable projects been included in the common practice analysis? Has the PP provided documented evidence and, where relevant, quantitative information? How was this assessed (by the DOE)?	DR 1	The GSP PDD states that there are no similar activities happening in Brazil, however it is not clear how similar projects have been defined, or what the source of this information is. Therefore it is not possible to conclude whether all comparable projects have been included in the analysis.	CL 12	OK
7.56	If non availability of data has been used as a reason to exclude consideration of similar projects, how has this been validated?	DR 1	Not applicable.	NA	NA
7.57	Have similar and operational projects other than CDM project activities been undertaken in the region?	DR 1, DR47	PDD states that there are only 6 Landfills with power generation in Brazil and all of them are CDM Projects. The source of this information is missing.	CL 12	OK
7.58	Are these widely observed and commonly carried out? If so: a. How have the essential distinctions with the proposed CDM project activity been assessed, e.g. that explain why the similar activities enjoyed certain benefits that rendered it financially /economically attractive (e.g., subsidies or other financial flows) and which the proposed project activity cannot use or did not face the barriers faced by the proposed project? Are such distinctions considered fundamental? b. Are such distinctions verifiable, i.e. justified with	DR 1	To be confirmed based on the issues identified above. Please refer to CL 12	CL 12	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	sufficient evidence? c. If inaccessibility of data is the reason why some projects have not been included in the analysis, is justification of this claim provided?				
7.59	Overall, is the proposed CDM project activity considered common practice?	DR 1	To be confirmed based on the issues identified above. Please refer to CL 12	CL 12	OK
8.	**Emissions Reductions (CDM VVM EB 55 para 89 - 93)**	PDD B.6			
	Explanation of methodological choices				
8.1	Is it explained how the procedures provided in the Methodology and applicable Tools are applied by the proposed project activity? *(i.e. Are the required steps clearly followed?)*	DR 1	Yes. The required procedures established in the Methodology and the applicable Tools are clearly followed.	OK	OK
	Project emissions:				
8.2	Is every choice of options for calculating **project emissions** offered by the methodology correctly justified? Is this justification in line with the situation as evidenced by site visits, local knowledge and supporting documentation?	DR 1 DR 8	The choices are adequately explained and justified. However, the data used for calculations (ex-ante) belong to other projects. Furthermore, again the role of the diesel generator was disregarded.	CL 13	OK
8.3	Are the formulae and parameters required for the determination of **project emissions** correctly presented, enabling a complete identification of parameters to be used and / or monitored?	DR 1	The required procedures established in the Methodology and the applicable Tools are clearly followed. However the PDD mentions two different versions of the IPCC Guidelines. Provided all information is available in the last version of the IPCC Guidelines, those are the ones to be adopted.	CAR 11	OK
	Baseline emissions:				
8.4	Is every choice of options for calculating **baseline emissions** offered by the methodology correctly justified? Is this justification in line with the baseline scenario?	DR 1	The required procedures established in the Methodology and the applicable Tools are clearly followed. However no evidence regarding waste composition was provided. No evidence of the Emission Coefficient of power displaced in the Grid/other uses was provided.	CL 14 CL 15	OK
8.5	Are the formulae and parameters required for the determination of **baseline emissions** correctly presented, enabling a complete identification of parameters to be used and / or monitored?	DR 1 DR 8	The waste composition that was not referenced. No evidence of the Emission Coefficient of the off-grid power displaced was provided. (1) The AF shall be estimated to determine $MD_{BL,y}$, following ACM0001. (2) The definition of the parameter $BE_{CH4,SWDS,y}$ shall be the same as indicated in the "tool to determine methane emissions avoided from disposal of waste at solid waste disposal site".	CL 14 CL 15 CL 25	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
			(3) The parameters that will not be monitored in the crediting period shall not be valued in section B.6.1. but in section B.6.3. (4) In section B.6.1 the formula used to determine the W_x and $p_{n,j,x}$ was not presented. (5) It shall be indicated which value will be adopted (from two) to determine $MD_{project,y.}$ (6) The parameter $EC_{PJ,y}$ is not included in the monitoring methodology procedure of the "Tool to calculate project emissions from electricity consumption" as indicated in section B.7.1. (7) Clarify why the parameters f, z of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" were not included in section B.7.1. (8) The version of the "Tool to calculate the emission factor for an electricity system" shall be updated in Annex 3. (9) The tool to calculate the emission factor for an electricity grid shall be followed detailing each step.		
8.6	Are the applicable Tools and methods to calculate parameters correctly applied?	DR 1	Yes. The required procedures established in the Methodology and the applicable Tools are clearly followed, with the exception of the issues identified above.	CL 14 CL 15 CL 25	OK
8.7	Are the applicable parameters and equations correctly applied?	DR 1	Yes.	OK	OK
	Leakage:				
8.8	Are all potential sources of leakage correctly identified in accordance with the applied Methodology?	NA	No leakage effects need to be accounted under this methodology	OK	OK
8.9	Are the formulae required for the determination of leakage emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?	NA	No leakage effects need to be accounted under this methodology	OK	OK
8.10	Are the applicable Tools and methods for calculating leakage correctly applied?	NA	No leakage effects need to be accounted under this methodology	OK	OK
8.11	Are the applicable parameters and equations correctly applied?	NA	No leakage effects need to be accounted under this methodology	OK	OK
	Emissions Reductions:				
8.12	Are the parameters and equations used to calculate emission reductions applicable? Are the applicable parameters and equations correctly applied?	DR 1	The required procedures established in the Methodology and the applicable Tools are clearly followed, with the exception of the issues identified above. However No evidence regarding reference to the data adopted for waste composition and the	CL 13 CL 14 CL 15	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
			Emission Coefficient of power displaced in the off-grid use, were provided.		
	Data and Parameters	PDD B.6.2			
8.13	Is the list of parameters presented in chapter B.6.2 of the PDD considered to be complete with regard to the requirements of the applied methodology?	DR 1	Yes. The required steps per the Methodology and the applicable Tools are clearly followed.	OK	OK
8.14	What evidence is available to validate the accuracy and appropriateness of assumptions, data and parameters used in the calculation of **project emissions**? Are the values used considered reasonable in the context of the proposed CDM project activity?	DR 1	For a detailed assessment of the parameters please refer to the validation report, section entitled 'parameters determined ex-ante'.	OK	OK
8.15	For each parameter: a. Title in line with Methodology? b. Data unit correctly expressed? c. Appropriate description? d. Source clearly referenced? (and appropriate?) e. Correct value provided? f. Has this value been verified? g. Choice of data correctly justified? h. Measurement method correctly described?	DR 1	Yes. The required steps per the Methodology and the applicable Tools are clearly followed, with the following exceptions: a. The parameter E_{DS} was not found in any methodology/tool. There is no reference in sections B.2 and B.6.1 of the use of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", so justify the inclusion of the parameter $NCV_{i,y}$ and $EF_{CO2,i,y}$ in section B.6.2. The data/parameter that will be monitored shall bemoved to section B.7.1. The data/parameter cell shall be completed exactly as in the methodology. The parameters $LFG_{flare,y}$ and $FV_{RG,h}$ / w_{CH4} and fv_{CH4} shall not be considered equivalent as the units are different. The table format used for W_X shall be revised. b. The data units shall be completed exactly as in the methodology. c. The descriptions shall be completed exactly as in the methodology. d. No. No evidence of biogas consumption per MWh was provided. No evidence regarding reference data adopted for waste composition and the Emission Coefficient of power displaced in the off-grid use, were provided. e. Because the reference for data used is not provided, it is not possible to check the adequacy of such data. When there is no value applied (for example for the regulatory requirements relating to landfill gas), the value shall be left in blank. When there is a value applied (for example parameter $BE_{CH4,SWDS,y}$) the value shall be completed. f. No. Verification is not possible due to lack of reference to the adopted data. The value applied in the operation of the energy plant shall be consistent in the PDD sections	CL 14 CL 15 CL 16 CL 26	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
			(8,400 or 8,760 hours). g. No. Verification is not possible due to lack of reference to the adopted data. The justification of the choice of data and any comment shall be completed following the tool/methodology applied (for example, parameter OX, MCF, TDLy). h. Yes.		
8.16	Will the data and parameters result in a conservative estimate of emissions reductions?	DR 1	To be confirmed based on the resolution of the issues identified above.	CL 13 CL 14 CL 15 CL 16 CL 26	OK
	Ex-ante calculation of emission reductions	PDD B.6.3			
8.17	Is the projection based on the same procedures as used for future monitoring?	DR 1	The projections (ex-ante) are based on the FOD model while the future monitoring will be based on methane flow measurement. However this is in line with the methodology and is appropriate for a landfill gas project.	OK	OK
8.18	Are the GHG calculations documented in a complete and transparent manner?	DR 1	Yes. The required procedures established in the Methodology and the applicable Tools are clearly followed, with the exception of the issues identified above..	CL 13 CL 14 CL 15 CL 16 CL 26	OK
8.19	Are detailed calculations provided in a traceable spreadsheet showing relevant information?	DR 1	Yes, a traceable spreadsheet was provided.	OK	OK
8.20	Can the calculation of baseline emissions be replicated using the data and parameters supplied in the PDD?	DR 1	Yes, the spreadsheet calculations can be replicated.	OK	OK
8.21	Is the data provided in this section consistent with data as presented in other chapters of the PDD?	DR 1	The section B.6.3 shall be revised, following the section B.6.1 and B.6.2. All the values applied for the parameters indicated in the section B.6.1 shall be presented in the section B.6.3. In section B.6.3, the formula used for the BEy shall be revised and also the formula used to determine the project emission from electricity consumption shall be provided. The unit used for the $EC_{PJ,i,y}$ is not correctly presented.	CL 27	OK
	Summary of ex-ante estimation of emission reductions	PDD B.6.4			
8.22	Is the form/ table required for the indication of projected emission reductions correctly applied? And is the data	DR 1	Yes. The table is provided and is consistent with other sections of the PDD.	OK	OK

<table>
<tr><th></th><th>Checklist Question</th><th>Reference</th><th>Comment</th><th>Draft Conclusion</th><th>Final Conclusion</th></tr>
<tr><td></td><td>provided in this section consistent with data as presented in other chapters of the PDD?</td><td></td><td></td><td></td><td></td></tr>
<tr><td>8.23</td><td>Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?</td><td>DR 1</td><td>The projection is in line with the envisioned time schedule for the project's implementation and the indicated crediting period. However it shall be clarified if the starting date of the crediting period and explanation of the choice shall be given.</td><td>CL 28</td><td>OK</td></tr>
<tr><td>9.</td><td>Monitoring Plan (CDM VVM EB 55 (para.122-124))</td><td>PDD B.7</td><td></td><td></td><td></td></tr>
<tr><td></td><td>(a) Compliance of the MP with the methodology</td><td></td><td></td><td></td><td></td></tr>
<tr><td>9.1</td><td>Are all necessary parameters required for the type of project by the methodology and applicable tools contained in the monitoring plan?</td><td>DR 1</td><td>Yes, the monitoring plan provides for collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period, however some exceptions were found as item 9.2 below.
All the parameters have to be stated in the same basis (dry or wet basis).
Calibration procedures are required to be stated to all monitoring procedures.
Consistency on the description was to be followed.
The value of the parameters should be indicated.</td><td>CL 26</td><td>OK</td></tr>
<tr><td>9.2</td><td>For each parameter, is the:
a. Title in line with methodology?
b. Data unit correctly expressed?
c. Parameter appropriately described?
d. Source clearly referenced?
e. Correct value provided for the purpose of PDD estimations?
f. Has this value been verified?
g. Measurement methods correctly described and in line with the methodology/tools?
h. Correct reference to standards (i.e. for calibration and maintenance)?
i. Indication of accuracy provided?
j. QA/QC procedures described?
k. QA/QC procedures appropriate?</td><td>DR 1</td><td>See 9.1
LFGtotal,y, LFG flare,y;, PE flare,
<table>
<tr><td>a.</td><td>Yes</td></tr>
<tr><td>b.</td><td>Yes</td></tr>
<tr><td>c.</td><td>Yes, but improve consistency on the description is required</td></tr>
<tr><td>d.</td><td>Yes</td></tr>
<tr><td>e.</td><td>Yes</td></tr>
<tr><td>f.</td><td>Yes</td></tr>
<tr><td>g.</td><td>Yes</td></tr>
<tr><td>h.</td><td>Calibration procedures need to be stated.</td></tr>
<tr><td>i.</td><td>Yes</td></tr>
<tr><td>j.</td><td>Yes</td></tr>
<tr><td>k.</td><td>Yes</td></tr>
</table>
LFG electricity; $PE_{EC;}$</td><td>.CL 26</td><td>OK</td></tr>
</table>

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion

a.	Yes
b.	Yes
c.	Yes
d.	Yes
e.	No. No value was stated.
f.	Yes
g.	Yes
h.	Yes
i.	Yes
j.	Yes
k.	Yes

W_{CH4}, T, C, Operational hours,

a.	Yes
b.	Yes
c.	Yes, but improve description on wet or dry basis
d.	Yes
e.	Yes
f.	Yes
g.	Yes
h.	Yes
i.	Yes
j.	Yes
k.	Yes

EL_{FG}

a.	Yes
b.	Data unit stated in PDD is “MWh”, in the methodology is “TJ”
c.	Yes

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
			d. Yes e. Yes f. Yes g. Yes h. Yes i. Yes j. Yes k. Yes		
9.3	Do all means/ methods of monitoring described in the plan comply with the requirements of the methodology?	DR 1	Yes	OK	OK
	(b) Implementation of the MP				
9.4	Are the arrangements described in the plan feasible and practical within the project design? How has this been verified (review procedures, interviews, project plans, and physical inspection)?	DR 1	The Monitoring Plan Figure does not include power generation. It needs to be completed. The flare efficiency measurement must be reconciled with the Tool. It should be mentioned in Annex 4 that all monitoring information is available in section B.7.2.	CAR 12 CL 26 CL 29	OK
9.5	Is the operational and management structure clearly described and in compliance with the envisioned situation? Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	DR 1	No. The operational and management structure is not clearly described and responsibilities and institutional arrangements for data collection and archiving are not clearly stated. Compliance with the envisioned situation could not be checked.	CAR 13	OK
9.6	Is necessary monitoring equipment in place or readily available?	SV	No equipments were installed yet.	OK	OK
9.7	Does the monitoring plan represent current good monitoring practice?	DR 1 SV	Yes. The monitoring plan provides current good monitoring practice.	OK	OK
9.8	If applicable: Does annex 4 provide useful information enabling a better understanding of the envisioned monitoring provisions?	DR 1	Not applicable.	NA	NA
9.9	Are the means of implementation of the monitoring plan, including data management and QA/ QC procedures, sufficient to ensure that the emission reductions achieved can be reported ex-post and verified?	DR 1	Yes.	OK	OK
9.10	In the DOE's opinion, is the project participant able to implement the monitoring plan?	DR 1	The PDD should state a periodicity in the equipment calibration and maintance procedures. Specify manufacturer's recommended frequency of calibration.	CL 26	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
10.	**Sustainable Development** (CDM VVM EB 55 (para.125-127))				
10.1	Does the Letter of Approval from the Host Party confirm that the project activity contributes to the sustainable development of that country?	NA	Prior to the submission of the Project Design Document and the Validation Report to the CDM Executive Board, the Project will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the Project assists the country in achieving sustainable development.	CL 30	OK
11.	**Environmental Impacts** (CDM VVM EB 55 (para.131-133))	PDD D.			
11.1	Has an analysis of the environmental impacts of the project activity been undertaken? How is this evidenced?	DR 1 , DR 16	Yes, an analysis of the simplified environmental report was developed and the impact of the project activity has been undertaken. The analysis concludes that no unacceptable adverse environmental impacts will occur from the project activity. The project will not create any adverse environmental effects.	OK	OK
11.2	In accordance with the laws and regulations in the Host Country, does this project require an EIA? Has an EIA been conducted for this project? Is this EIA valid for the current project? Has this EIA been approved? How has this been verified?	DR 1	Yes. See Item 11.1 above. The environmental agency has not yet issued the project activity approval.	CL 17	OK
11.3	Does the environmental analysis undertaken and presented for the project activity include an analysis of transboundary impacts? Are any transboundary impacts likely?	DR 1	NA. The project's environmental impacts are localized and would not result in trans-boundary impacts. The PDD does not mention that the project activity does not imply any trans-boundary environmental impacts.	CAR 14	OK
11.4	Is the analysis in the PDD fully consistent with the findings of the EIF? Are all significant impacts and mitigation measures identified in the EIF mentioned in the PDD?	DR 1	The summary description of environmental impacts during the operation period as presented in PDD D.1 is generally consistent with the findings of the simplified EIA and the mitigation measures outlined in the simplified EIA. However, the environmental agency has not yet issued the project activity approval.	CL 17	OK
11.5	Does the analysis conclude that the project will create any unacceptable adverse environmental impacts?	DR 1	The environmental agency has not yet issued the project activity approval.	CL 17	OK
12.	**Local Stakeholder Consultation** (CDM VVM EB 55 (para.128-130))	PDD E.			
12.1	Have comments from relevant stakeholders been invited prior to the publication of the PDD on the UNFCCC website?	DR 1	Letters and the Executive Summary of the project were sent to the following local stakeholders: a. Prefeitura Municipal de Jaboatao dos Guararapes–PE	CL 18	OK

	Checklist Question	Reference	Comment	Draft Conclusion	Final Conclusion
	How has this been verified?		/ Municipal Administration of Jaboatao dos Guararapes–-PE. b. Secretaria Municipal de Meio Ambiente de Jaboatao dos Guararapes–-PE / Municipal Secretariat of Environment of Jaboatao dos Guararapes–-PE. c. Camara dos Vereadores de Jaboatao dos Guararapes–-PE / Municipal Legislation Chamber of Jaboatao dos Guararapes–-PE. d. CPRH - Agencia Estadual de Meio Ambiente e Recursos Hidricos do Pernambuco / Environmental State Agency of Pernambuco e. Ministerio Publico do Estado do Pernambuco / Public Ministry of Pernambuco State. f. Forum Brasileiro de ONGs (FBOMS) / Brazilian NGO Forum. g. ABES – Rio – Associacao Brasileira de Engenharia Sanitaria e Ambiental / Brazilian h. Association of Sanitary and Environment Engineering.		
12.2	Have all relevant local stakeholders been invited? How has this been assessed?: a. Have appropriate media been used to invite comments by local stakeholders? b. Have all stakeholder groups has access to information? c. Have all stakeholder groups had a reasonable chance to comment?	DR 1	No comment regarding local community was provided. No evidence was provided stating on whether there has been explicit effort to contact the poor communities located on the vicinity of the landfill, either for the landfill or landfill gas projects.	CL 19	OK
12.3	Is the summary of comments received as provided in the PDD complete? (what has been done to check this i.e. Document review etc)	DR 1	No comments have been received at this time.	OK	OK
12.4	Has due account been taken of any stakeholder comments received and is this adequately and clearly described in the PDD?	DR 1	No comments have been received at this time.	OK	OK
12.5	In the DOE's opinion, is the local stakeholder consultation process that has been conducted adequate?	DR 1	Yes.	OK	OK

Appendix C: REMEDIATION FORM

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

Corrective action requests	Reference to checklist question	Summary of project participants' response	Final conclusion
CAR 1 Name of the Organization, E-mail, address of the Host Party PP in PDD, DNA should be made consistent with the documentation presented during the site visit.	1.1, 5.1	Section A.3 of the PDD was adjusted to be consistent with Annex 1. First column of Section A.3 has been modified to include only the name of the party.	The PDD has been revised and the information presented in section A.3 and Annex 1 is now consistent. CAR Closed
CAR 2 The PDD does not contain the item "B.6. Emission reductions". The PDD section B.6 starts from sub item B.6.1	1.1	The title for section B.6 (i.e. Emission reductions) has been added.	ERM CVS confirms the insertion of the title for section B.6 in the PDD. CAR closed
CAR 3 The requirements for training and maintenance are not sufficiently clear. Revision to the PDD is required.	4.10	Requirements for employees training have been clarified as part of the Monitoring plan (section B.7.2 of the PDD). The training will be necessary at a later stage (see implementation plan) and therefore the procedures are described with all the necessary details for this stage in the PDD. The implementation plan "Cronograma CTR Candeias.pdf", including the training program is provided to the DOE.	ERM CVS has reviewed the implementation plan which clearly sets out the requirements for training and maintenance. The provisions are considered to be sufficient to ensure that emission reductions can be monitored ex-post. CAR Closed
CAR 4 Provide the schedule for project implementation plus evidences that demonstrate whether the project is following the forecasted activities	4.11	A project timeline has been presented in section B.5 of the PDD. Relevant evidences have been provided to ERM CVS.	A project timeline has been presented in section B.5 of the revised PDD. ERM CVS has checked the references provided [DR2, DR36, DR38, DR16] and can confirm that the information presented is correct. Further details on the validation of the project implementation timeline and starting date of the project activity can be found in the additionality section of the validation report, 3.5. CAR Closed
CAR 5 Clarify the status of the diesel generator and if necessary include the diesel generator as part of the baseline scenario, baseline option, baseline and project emissions.	6.3, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 9.1	The diesel generator is not part of the CDM project and will not operate during the crediting period. So it was not included in the revised PDD. The calculation of the baseline emissions was revised in the PDD and calculation of ERs.	As confirmed and explained in the PDD, the project will consume only electricity from the grid and not from the diesel generator. The diesel generator has been removed from the PDD and will not be part of the project

Corrective action requests	Reference to checklist question	Summary of project participants' response	Final conclusion
Justify the baseline emissions from decomposition of waste at the landfill site following ACM0001.			according to the project design presented in the PDD. The baseline emissions calculations were validated by ERM CVS by review of the spreadsheet [DR8] against the calculations and equations stated in the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" v05. The data used to estimate the methane generation was validated based on the technical supporting documents provided [DR 16, 24, 28, 29, 45]. CAR Closed.
CAR 6 Evidence of the starting date of the project activity shall be included in the PDD.	7.1, 7.3	A detailed project timeline was included in section B.5 of the PDD, with supporting evidences. The expected project starting date (purchase of the equipment) has not yet happened.	A project timeline has been presented in section B.5 of the revised PDD. ERM CVS has checked the references provided [DR2, , DR36, DR38, DR16] and can confirm that the information presented is correct. Further details on the validation of the project implementation timeline and starting date of the project activity can be found in the additionality section of the validation report, 3.5. CAR closed.
CAR 7 The identified alternative to the project activity is doing nothing (operating the landfill without gas recovery). Therefore investment comparison analysis is not appropriate according to the additionality tool.	7.8, 7.11, 7.12	Benchmark analysis has been undertaken to demonstrate the additionality. Please refer to the attached sheet + section B.5 of the PDD	The benchmark analysis was used to demonstrate additionality. This is considered appropriate for the project type and alternatives. Further details of the validation of the benchmark analysis are provided in the additionality section of the validation report. CAR closed.
CAR 8 The power generation installed capacity is stated incorrectly in table 1 in section B.5 of the PDD. Revision of the PDD is necessary.	7.11	Table 1 in the GSP PDD has been replaced by a clearer description of the technical parameters of the proposed project. Please refer to the updated PDD.	The description has been included and the installed capacity of the project is now stated clearly and consistently throughout the PDD. CAR closed.
CAR 9 Sensitivity Analysis, as required by the 'tool for the demonstration and assessment of additionality', is not included in the PDD. Revision	7.26	Sensitivity analysis has been undertaken. Please refer to: - section B.5 of the PDD for revised sensitivity analysis. - The IRR spreadsheet 'FA - CANDEIAS oct 2010.xls'	The results for the sensitivity analysis are clearly shown in the PDD. The sensitivity analysis was included in the spreadsheet provided. The PP has used a

Corrective action requests	Reference to checklist question	Summary of project participants' response	Final conclusion
of the PDD is required.		- Explanations have been included in the PDD concerning the probability of each scenario to reach the benchmark.	range of +/- 10%, and in addition the degree of variation of each parameter needed for the IRR to reach the benchmark has been presented. The results obtained in the spreadsheet are in accordance with the ones in the PDD. Therefore, it is possible to reproduce the sensitivity analysis. For further details on the validation of the sensitivity analysis please refer to the additionality section of the validation report, 3.5. CAR closed.
CAR 10 More recent data for the costs of the Biogas collection system and flare must be considered and new evidence shall be provided, since the technology/prices/conditions could have changed since the values provided in the GSP PDD were determined.	7.22	The investment analysis originally presented refers to the prices available at the time of planning the proposed project (2007). The financial analysis and spreadsheet have been revised, using 2010 data based on specific quotations for Candeias landfill. Please refer to : - section B.5 of the PDD for revised sensitivity analysis. - FA - CANDEIAS oct 2010.xls) - Supporting evidences.	The investment analysis has been revised to use values taken from quotations of costs for the project activity, which provide more accurate and up-to-date values. Please see the additionality section of the validation report (section 3.5), under 'investment analysis' for a detailed validation of the input values to the analysis. CAR closed.
CAR 11 The correct versions of IPCC Guidelines and the corresponding data to calculate project emissions are not used. Revision of the PDD is required.	8.3	All references to IPCC have been corrected.	IPCC Guidelines versions have been corrected. IPCC 2006 values are used. CAR closed.
CAR 12 The monitoring plan diagram does not include power generation. Revision of the PDD is required.	9.4	The diagram was corrected.	The Monitoring Plan Figure was corrected, and now includes the power generation. CAR closed.
CAR 13 The operational and management structure is not included in the monitoring plan. revision of the PDD is required.	9.5	The operational and management structure to be implemented for monitoring has been included in the revised PDD.	The revised PDD includes information on the operational and management structure for monitoring. A monitoring manager will be appointed with overall responsibility for the monitoring plan and supervision, and a monitoring team will be established. Only trained and skilled staff will work on the project. The operation and management structure set out in the PDD is considered sufficient to fulfil

Corrective action requests	Reference to checklist question	Summary of project participants' response	Final conclusion
			the requirements of the monitoring methodology and ensure that emissions reductions can be reported and verified ex-post. Further details on the validation of the monitoring plan are provided in section 3.4 of the validation report. CAR closed.
CAR 14 The PDD should include description of trans-boundary environmental impacts, if any.	11.3	The project will not result in any trans-boundary impacts. This was included in the PDD (see section D.1)	The project will not result in any trans-boundary impacts. This has been confirmed against the simplified environmental report [DR 16]. CAR closed.
CAR 15 The PDD does not use standard format for values. The glossary of all parameters used to the emission reduction calculation is not copied exactly as indicated in the methodology or tool applied. Section C.1.1 is not completed with the correct format: DD/MM/YYYY. Revision of the PDD is required.	1.2	The requested revisions to the PDD have been made.	Standard number formatting was used in the revised PDD. The parameters used in the emission reduction calculation have been written exactly as stated in the methodology and tools. The appropriate date format has been used in section C.1.1. CAR closed.
CAR 16 The PDD does not contain a clear description of the scenario existing prior to the start of the project activity and whether this is the same as the baseline scenario. Revision of the PDD is needed.	3.4	The statement "scenario existing prior to the start of the project activity is the same as the baseline scenario" was added in Section A.2 (3rd paragraph).	The PDD presents a clear description of the CTR Candeias Sanitary landfill, where the proposed project is located. A statement has been included clarifying that the description of the scenario existing prior to the project and the description of the baseline are the same. ERM CVS has validated the description by means of the validation site visit, which was carried out before the proposed CDM project activity had begun construction. The description of the existing situation was confirmed by means of a physical inspection of the site, review of the simplified environmental report [DR16] and interviews with the project developer. CAR closed.
CAR 17 Scope 1"Energy Industries (Renewable/non –	4.2	The Scope 1"Energy Industries (Renewable/non – renewable sources)" was included in section A.4.2.	The revised PDD makes reference to scope 1. This is consistent with the applied methodology and is appropriate for the

Corrective action requests	Reference to checklist question	Summary of project participants' response	Final conclusion
renewable sources)" is not included in the PDD description			project case. CAR closed.
CAR 18 The PDD does not include all tools referenced in the methodology, as well as the complete and correct name, version, and unit. revision of the PDD is required.	6.2	All tools utilised in the project are included in section B.1 of the revised PDD, including the version number. Furthermore, tools that are not utilised are listed in section B.2 with relevant explanations.	The PDD has been revised and the tools are correctly referenced. Further details of the validation of the appropriateness of the tools and methodology are provided in section 3.2 of the validation report. CAR closed.
CAR 19 Clarify the procedures to identify the most reasonable baseline scenario, as required by the methodology and applicable tools, stating all realistic and credible alternative scenarios. The baseline description, reasons for exclusion and explanations shall be included for all options. Investment analysis shall be presented in section B.5 according to the Guidelines for completing the PDD.	6.12, 6.13, 6.14, 6.21, 7.5	A sentence was added in the beginning of section B.4 to refer to the step by step approach for determining the baseline scenario as per the approved methodology. All options listed in the methodology have been included in the PDD with relevant justification. Investment analysis has been moved to B.5.	The PDD has been revised to clearly show the procedures applied to identify the most reasonable baseline scenario. All realistic and credible baseline alternatives are discussed, based on ERM CVS's local and sectoral knowledge. Adequate justification of exclusion of baseline scenarios has been provided in the revised PDD. The investment analysis is now presented in section B.5 of the PDD. For the detailed validation of the selection of baseline alternatives please refer to section 3.3 of the validation report concerning the baseline. CAR closed.
CAR 20 The benchmark used in the investment analysis is nominal and the free cash flow provided is in real terms.	7.12, 7.13	The IRR spreadsheet was modified.	Annual inflation rate of 4.5% over all the input values was considered in the calculations. The spreadsheet calculations are now in line with the benchmark. Further details on the validation of the benchmark, the inflation rate, and the spreadsheet calculations and input values are provided in section 3.5 of the validation report. CAR 20 is closed.
CAR 21 The electricity tariff is not adequately adjusted by inflation.		The IRR spreadsheet was modified.	Inflation was correctly applied to the electricity tariff value. The inflation rate is validated in section 3.5 of the validation report. CAR 21 is closed
CAR 22 The IRR calculated is not in accordance with the Benchmark provided concerning taxes.		The IRR spreadsheet was modified.	SELIC rate is a pre-tax nominal rate and therefore taxes on profit (IR and CSLL) were excluded from the revised IRR calculation.

Corrective action requests	Reference to checklist question	Summary of project participants' response	Final conclusion
			The financial analysis calculations are validated in further detail in section 3.5 of the validation report. CAR 22 is closed

Clarification requests	Reference to checklist question	Summary of project participants' response	Final conclusion
CL 1 Present evidence on the estimation of the quantity of waste disposed in the landfill, as stated in section A.2 and A.4.3. No reference was found for the claim that Candeias landfill receives solid waste from Cabo de São Agostinho and Paulista municipality. Relevant evidence shall be provided.	3.1, 3.2	From 2007 until 2009, the weight per year of waste disposed at the landfill is based on the weighted reports. From 2010 until closure (2022) the waste quantity disposed per year is based on the design capacity of the landfill (2,100 tpd). For historical waste landfilled, please refer to the files: "Controle de residuos 2007 e 2008.xls" and "Controle de resíduos CTRC 2009.xls". From 2010 until closure (2022), please refer to the file "CTR candeias Proj Executivo pag 60-61.pdf".	ERM CVS has reviewed the evidence provided on the quantity of waste deposited at the landfill site historically [DR 17] and the estimated quantity in the future [DR 28], and can confirm that the references are consistent with the numbers stated in the PDD. The description of the project activity has been revised to remove the claim that the Candeias landfill currently receives solid waste from Cabo de São Agostinho and Paulista municipality. CL closed.
CL 2 Present evidence and describe age and lifetime of the baseline facility in the PDD in section A.2 and A.4.3.	3.5, 4.3, 4.6	Age: the site started receiving waste in 2007, as evidenced by the EXCEL document "controle de residues 2007e 2008". Lifetime: 15 years, as evidenced by the document: "Projeto Executivo do Aterro Sanitario de Muribeca" (Project decription). Report No: 832-SAP-PEM-RT-E100 July 2006.	The age and lifetime of the baseline facility (CTR Candeias Sanitary landfill) was described in section A.4.3 and has been validated against the documentary evidences [DR 17] and [DR 28]. CL closed.
CL 3 Provide additional quantitative information regarding the project technology in section A.4.3 including expected amount of methane generated (baseline), the fraction captured by the project, fraction flared, and fraction generating electricity during the crediting period.	3.5, 4.3, 4.5	Section A.4.3 of the PDD was updated. The quantity of methane expected to be generated by the landfill, the expected amount collected, sent to flare and sent to electricity generation is presented in the PDD. Quantity of flares and capacity; 1 flare of total capacity of 5.000 Nm^3/h is selected. **Electricity generators:** Electricity generation is expected to begin in 2012 and	Section A.4.3 of the PDD was revised to provide the required information. Quantity of methane generated, quantity captured, and quantity sent to flare/electricity generation: this information has been checked against the documentation specifying the technical parameters of the project, namely the record of historical residues control for the Candeias landfill [DR 17], the technical specifications of the flare

Clarification requests	Reference to checklist question	Summary of project participants' response	Final conclusion
		last until 2026 (i.e., the expected date when the gas extracted will be too low to justify the electricity generation). Based on the volume of gas extracted, the number of modular unit selected for this landfill is 1 X 3 engines (each having a capacity of 1.415 MW, combined total capacity of 4.245 MW) from 2012-2016, 2X3 engines units from 2017-2023, and 1X3 engines from 2023-2026. **Electricity Transformer** 2 electricity transformers will be installed with a Input/output voltage ratio of 380 V / 13.8 KV and a capacity of 12,500 KVA **Medium voltage panel** The Panel will follow standard NBR IEC 62271-200, and will operate at 13,8 kV, 60 Hz	system [DR 24], a document concerning the technical specifications of the landfill written by Engecorps [DR 28], an email from the equipment supplier GE Energy concerning the lifetime and operating hours of the equipment [DR 29] and the gravimetric characterisation of the residues at CTR Candeias [DR 46]. The information presented on the electricity generation equipment has been checked against an email from the equipment supplier GE Energy concerning the lifetime and operating hours of the equipment [DR29], the technical specifications of the gas engines provided by the manufacturer Jenbacher [DR 37], and an estimate of engine overhaul provided by the equipment suppliers GE Energy [DR 41]. CL closed.
CL 4 Technical specification of the project and equipment should be provided in section A.4.3 of the PDD in line with the 'guidelines for the development of the project design document'.	4.5	Energy and mass flow are provided in the PDD for the first crediting period (section A.4.3). All information is also incorporated in the excel sheet: *LC.Brazil.Novagerar.Candeias.ERCal (30sept 2010).xls*. **Flare specifications:** • total capacity: 5.000 Nm^3/h (ref: CTR Candeias LANDTEC.pdf) • Lifetime: 15-20 years. (Ref: Flare specifications ZTOF - JZ.pdf) • Efficiency: greater than 99% of total organic compounds and greater than 98% of total non-methane organic compounds (Ref: Flare specifications ZTOF - JZ.pdf) **Generators specifications:** • Capacity of 1 unit is 1.415kW (ref: Motor JMS 420 GS-B.L.pdf), However, Haztec will purchase system including 3 units/system (refer to: GE ENERGY JENBACHER - HAZTEC -	Information of main equipments and installations, including equipment to adjust the electricity generated to the grid, was included in the PDD and the supporting evidence was validated by ERM CVS, namely the commercial proposal for the gas engines from GE Energy Jenbacher [DR 3], the budget costs for the site works from Landtec [DR 7], the technical specifications of the flare system [DR 24], and the technical specifications of the gas engines provided by the manufacturer Jenbacher [DR 37]. CL closed.

Clarification requests	Reference to checklist question	Summary of project participants' response	Final conclusion
		Proposta Comercial.pdf) • 3 electricity generating engines will be used to electricity generated starting in 2012. Based on available LFG, these 3 units will used from 2012-2016. Capacity will be increased by 3 additional units in 2017. • Lifetime: the engines will need to go through an overall after 60,000 hrs (ref: Overhaull Motores JMS 420.pdf). Overhaul will be required for the first 3 units (refer to the financial analysis) • Efficiency:, Thermal efficiency : 42.4% (ref: Motor JMS 420 GS-B.L.pdf) LFG consumption per engine : 675 Nm^3/hr (ref: Motor JMS 420 GS-B.L.pdf) • Equipment to adjust the electricity generated to grid conditions is now described in the PDD	
CL 5 Provide evidence that the SER was delivered to the Environmental agency	4.8	Please refer to the document "proof request env permit.pdf"	The evidence document was reviewed by ERM CVS, and it is confirmed that the SER was submitted to the Environmental Agency [DR16]. CL closed.
CL 6 (a) Further evidence shall be provided to substantiate the input values to the investment analysis. (b) Justification should be provided for the choice of the benchmark (c) Evidence for the period of assessment must be provided (lifetime of equipments, for example). (d) Justification shall be provided for the depreciation rate and residual value. (e) The IRR analysis shall be presented in the same currency as the currency used in the determination of the benchmark (Brazilian Reais)	7.1, 7.11, 7.12, 7.20, 7.26, 7.27, 7.28, 7.29, 7.30, 7.31, 7.32, 7.34	(a) Quotations are provided to ERM CVS to support the input values to the investment analysis Specially: - Administrative costs Please see "Estimativa de Custos Administrativos" - Inflation rate Please see "Inflation and Exchange Rate" - Exchange rate Please see "Inflation and Exchange Rate" **Insurance costs:** The evidence provided was the insurance policy that the company has for all its assets, therefore, it is highly representative for the costs, for as soon as they invest in the new assets, they will include them in the very same insurance policy. The insurance costs have been	**(a)** Further evidence was provided to support the input values to the investment analysis. these parameters are validated in detail in section 3.5 of the validation report. **(b) Benchmark:** The benchmark rate was changed to 10.25% to reflect the correct time of investment decision. ERM CVS confirmed the benchmark against the official central bank source [DR53]. **(c) Period of assessment** The period of analysis in the spreadsheet is from 2010 to 2030. Electricity generation continues until 2026 at which point there is insufficient landfill gas to generate power,

Clarification requests	Reference to checklist question	Summary of project participants' response	Final conclusion
		corrected to deduct those assets not in operation after 2026. **(b) Benchmark:** The SELIC rate provided in the revised financial analysis uses the latest information available i.e., the target SELIC rate published by the government on June 6, 2010: 10.25%. **(c) Period of assessment** Although the landfill stops receiving waste at the end of 2022, the project activity (LFG collection and use) does not end until 2030, therefore the period of analysis should go until 2030. Similarly, due to the "bell shape" of LFG generation, electricity generation has to be adapted to that evolution, so that you do not have idle equipment. This is why a module of three generators operates for 15 years, with a major overhaul in the middle, and another module of three generators only operates for 7.5 years. This is consistent with the lifetime of the project activity defined by the flare, which can be used for 20 years. The period of analysis is in accordance with the PDD and evidence has been provided for the lifetime of the various equipment (electricity generators and flare) to support it. **(d) Depreciation rate and Residual value:** The fair value of the engines has been considered based on the standard depreciation rate for electrical equipments in Brazil (10%). The PDD included an explanation of how the residual value was calculated, following the depreciation rate for the electricity equipment (7 years *10%/year). **(e) Currency:** The analysis is done in constant values and thus the results (IRR) do not depend on the currency (the IRR will be the same whichever currency is used). Nevertheless in order to be consistent with financial theory the investment analysis calculations in the spreadsheet were	and flaring only continues from 2027 to 2030. The period of assessment has been cross checked against the lifetime of the equipment, as described in section 3.2 of the validation report 'Timeline and operational status of the project'. **(d) Depreciation rate and residual value:** ERM CVS has confirmed that the depreciation rate is appropriate by reviewing the Brazilian federal standard for depreciation rate of electrical equipment [DR 25]. The first set of engines reaches the end of its technical lifetime after 15 years of operation and hence has no residual value remaining at the end of the assessment period. The second set of engines remains in working order at the end of the assessment period, and therefore a residual value is calculated as the remaining value of the second set of engines after the annual equipment depreciation (10% per year over 7 years) is subtracted. This calculation is in line with standard accounting practice in Brazil. No residual value for other items such as the flare and pipelines is included, since this equipment has reached the end of its technical lifetime by the end of the assessment period. ERM CVS can therefore confirm that the residual value of the project is appropriate and correctly calculated. (e) Currency The spreadsheet investment analysis calculations were converted into Reais. This is consistent with the currency used in the determination of the benchmark and is therefore consistent with financial theory. the change doe not impact the IRR result of the calculations. the revised IRR spreadsheet is correctly calculated and presented. CL Closed.

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		converted to Reais.	
CL 7 Subject to confirmation of the start date, the PP should clarify whether a CDM notification document is to be sent to the Brazilian DNA.	7.3	No notification was sent, not required.	The start date of the project was defined in the GSP PDD as October 2009, therefore demanding the CDM Notification to the DNA. Since the starting date has been delayed and changed to April 1, 2011; in the revised PDD, a CDM notification document to the Brazilian DNA is not required. CL Closed.
CL 8 Explanations are required on why alternatives P1, P4 and P5 were considered "not economically conceivable".	7.8	This section was revised (B.4)	The explanations were included in the PDD section B.4. The validation of the exclusion of baseline alternatives is provided in section 3.5 of the validation report. CL Closed.
CL 9 Documentation of the value of "Other equipments (Pipes, Conections, Valves, Pumps)" in DR 2 for the "Biogas collection system and flare shall be provided.	7.24	The financial analysis was reviewed and all evidences/quotations from 2010 and specific to Candeias landfill are provided. **Pipelines, wellheads and Drill:** The technical report (Relatorio - Biogas - Complementar – Candeias.pdf) contains details of how the pipeline system is going to be deployed between 2010 and 2022. Including the technical details of the new pipelines and wells for every year and the maps showing the exact location of these investments. **Flare and Blower System:** Evidence is provided including a copy of the email sent by Haztec to Landtec requesting a quote of the system for Candeias (LANDTEC Email.pdf).	New evidence on CAPEX was provided and verified. **Investment in drill & pipelines year 1-12** Evidence "Relatorio - Biogas - Complementar – Candeias.pdf" [DR 45] clarifies the Investment in drill & pipelines year 1-12 with the quotes from suppliers of pipes, drilling and welding services **Flare and Blower System:** Evidence "CTR - Candeias Budget June 2010.pdf" was sent by email form LANDTEC [DR 6]. It represents a quote for all costs related to the flare and blower system. CL Closed.
CL 10 Further justification for the Electricity tariff (170 BRL/MWh) must be provided.	7.20	The electricity tariff is based on the latest quotation from public auctions for renewable energy sources in Brazil. Refer to FA - CANDEIAS oct 2010.xls where all references to public documents are provided (the information was also updated in the PDD). Electricity generated from LFG in Brazil is sold under bilateral private contracts, and there is no public	The electricity tariff used in the investment analysis is based on the highest value registered in the latest Alternative Energy Auction in Brazil dated as of August 26, 2010, which involves starting supply in 2013 [DR49; DR 59]. The tariff was adjusted correctly by inflation in the FCF provided. The lack of database information to estimate the electricity tariff for landfill gas projects

Clarification requests	Reference to checklist question	Summary of project participants' response	Final conclusion
		electricity price for LFG facilities. In Brazil there is not enough electricity generated from this source to set up an auction as has been done for other renewable energy sources (Wind, Biomass). Nevertheless, the maximum electricity price as a result of the only auction for renewable energy sources at the time of the elaboration of the PDD has been conservatively selected. The few landfill gas projects that generate electricity in Brazil selected a commercial tariff on a bilateral basis. Following the same approach as other registered PDDs in Brazil, as a conservative approach the latest available Renewable Energy Auction in Brazil at the time of PDD preparation (2007) was chosen in the GSP PDD in order to determine the tariff. During the course of the validation, Brazil had a second RE auction (August 2010). The price remains relatively stable (the average price increased by 1.76% and the highest price was 6.66% higher than the highest price in the previous RE auction. The highest price from the 2010 auction was used in order to be conservative.	was verified based on ERM CVS's local and sectoral knowledge, and consequently the use of the 2010 tariff level was considered conservative. CL Closed.
CL 11 If a Feasibility Study Report exists, it shall be provided.	7.17	Data used in the investment analysis are specific to Candeias based on 2010 quotations and technical design. A simplified environmental report has been developed for the project, and this has been provided to ERM CVS.	The technical feasibility report provided [DR45] does not include relevant investment data to be considered in the investment analysis. The input values to the investment analysis are validated based on quotations and other documentary evidence – please refer to section 3.5 of the validation report. CL closed.
CL 12 The definition of 'similar' projects shall be presented in the PDD. Provide the source of the information that there are no Landfills with power generation in Brazil other than CDM Projects.	7.57	References to existing landfills are provided in section B.5 Information has been added in section B.5 of the PDD in relation to common practice.	The similar projects were defined in PDD, as other landfill gas flaring or utilization projects in the state of Pernambuco. References were reviewed by ERM CVS including [DR 31, 32, 33, 47]. Further details of how the common practice was validated are provided in section 3.5 of the validation report, common practice analysis section. CL closed.
CL 13	8.2, 8.12, 8.17	In reference to the tools, all steps and selected options have been included in the PDD.	The project emissions related to grid

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Provide evidence for the estimation of project emissions related to electricity consumption. And please clarify whether a diesel generator is included as part of the project.		A diesel engine is used for landfill operation related activities (i.e. truck weight meters) for emergency situations when there is an electricity shortage from the grid. This is not related with the CDM project. This diesel engine is no longer considered. In fact, the project will strictly use electricity generated from the landfill gas and, in case the system is stopped, electricity from the grid will be consumed. As a simplification, ex-ante project emissions are calculated using the assumption that all electricity consumption for the project activity is imported from the grid. The electricity imported from the grid for project consumption will be monitored ex-post.	electricity consumption were revised in PDD, according to ACM0001. The PPs clarified that no fossil fuel will be consumed in the project activity except for the pilot flame of the flare (LPG) and therefore, no reference is made in the PDD to the diesel generator. The existing (during the site visit) diesel generator is not related to the CDM project activity and is excluded from the project. The pilot flame for the flare is properly accounted for and data are appropriately referenced [DR54]. This CL is closed
CL 14 Provide a reference for the waste composition used in the ex-ante calculations.	8.4, 8.5, 8.15, 8.17	The waste composition specific to Candeias landfill has now been used in the revised emission reduction calculations and the ER calculation sheet and the references in the PDD have been changed accordingly. All materials have been included in the PDD.	The waste composition reference was provided [DR 46] including real data – waste gravimetric composition – from the Candeias Landfill. The document was prepared by Haztec based on samples taken from the landfill. CL closed.
CL 15 Provide evidence of the Emission factor of the grid.	8.4, 8.5 8.12, 8.15, 8.17	Please refer to the grid emissions factor calculated by the DNA of Brazil (annex 3 of the PDD)	Annex 3 with detailed information of the grid emission factor of electricity displaced in the grid was submitted. The source is considered reliable since it represents the official data published by the DNA of Brazil [DR34], and no other reliable data sources are publicly available. The grid emissions factor in the PDD is an ex-ante estimation, and this factor will be monitored annually and updated ex-post throughout the crediting period. CL closed.
CL 16 Evidence for biogas consumption per MWh shall be provided.	8.15	Please refer to the ER calculations sheet.	The ER calculation was revised considering the capacity and biogas consumption per engine, which has been validated against the technical specifications of the engines provided by the manufacturer, Jenbacher [DR 37]. CL closed.
CL 17	11.2, 11.4, 11.5	Please refer to the documentary evidence provided ('LI	The approval was reviewed by ERM CVS for

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The approval issued by the environmental agency for the landfill shall be provided.		CPRH Ecopesa Biogás.pdf')	the Candeias project [DR 35] and it is confirmed as valid. CL closed.
CL 18 Evidence that the stakeholders were consulted was not provided.	12.1	Copies of the letters sent to the stakeholders are provided to ERMCVS with this response. The PDD has been modified to indicate that the Ministerio Público Federal (Federal public Ministry, MPF) has been consulted, as well as to include the website where the PDD was available for consultation http://www.haztec.com.br Please also refer to the document 'MPF - PE.pdf' (the confirmation of reception of the letter by the Ministerio Publico Federal).	The stakeholder consultation description in the PDD has been verified against copies of the letters sent to stakeholders [DR 21] and ERM CVS can confirm that the description in the PDD is correct and that the stakeholder consultation was in line with CDM and host country requirements. CL closed.
CL 19 Evidence that the local stakeholders were consulted was not provided.	12.2	Please see "Consulta ao CEDECOM – ONG" The NGO contacted during the stakeholder consultation, Centro de estudos e apoio ao desenvolvimento de comunidades (CEDECOM) is an NGO that works with poor communities in Brazil. In particular they have projects related with waste pickers. http://www.cedecom.org.br/index.php	The letter sent to CEDECOM [DR 21] proves that relevant and local stakeholders were consulted. CL closed.
CL 20 Describe the baseline, project and existing scenarios clearly in sections A.2 and A.4.3. Information regarding the owner of the landfill is required to be included.	3.1, 3.2	Baseline, project and existing scenarios have been clarified in section A.2 and A.4.3. The name of the company that owns the landfill is ECOPESA AMBIENTAL LTDA, for the Evidence, please see the Environmental licences of the Landfill and Biogas system. ECOPESA AMBIENTAL LTDA is a company with two shareholders: HAZTEC (50%) and EMPESA (50%). Please see "5ª Alteração Contratual Ecopesa incluindo Haztec 09122009.pdf "	The description of the baseline, project and existing scenarios was added in PDD. Moreover information regarding the owner of the landfill was provided and has been validated against the documentary evidence provided [DR 22], [DR 35]. CL closed.
CL 21 The PDD does not state whether the selected baseline scenario is the same as the situation existing prior to the start of the implementation of the project activity.	4.4	This was clarified in section A.2 (3rd paragraph)	This has been clarified in the revised PDD. The baseline scenario is the same as the scenario existing prior to the development of the project, which was validated during the site visit. CL closed.
CL 22 Clarify if technology transfer from Annex-I-countries to Brazil occurs in section A.4.3 of the PDD.	4.7	Technology transfer from annex 1 country is involved; please see the file "Main Suppliers"	The main suppliers from Annex 1 countries that have possibility to be contracted by the project were informed and this information has been validated against the relevant

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			documentary evidence [DR 48]. CL closed.
CL 23 Clarify if the project participants are private or public entities in section A.3. Clarify in section B.8 if the entity is also a project participant.	5.1	Section B.8 was updated with information regarding participants. We included that Haztec is a private entity and leave it open for IBRD (international organization) acting as a trustee for the fund as we normally do.	PDD was updated regarding project participants. CL closed.
CL 24 The PDD should clearly state which option from the applicabiloity criteria of the methodology is selected. Justify why the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" was excluded. The PDD has to indicate clearly if thermal energy is considered.	6.4	The PDD has been revised to indicate that option (b) of ACM0001 is applicable to the project activity. The PDD has been revised to include calculation of the project emissions from LPG consumption for the pilot light for the flare, following the 'tool to calculate project or leakage CO_2 emissions from fossil fuel combustion'. Section b.4 indicates that heat (thermal energy) does not apply "Since thermal energy (heat) generation is not contemplated as part of the proposed project activity, cogeneration plant is not considered as baseline alternatives; therefore P2 and P3 are discarded."	The PDD has been revised and correctly states that option (b) of the methodology ACM0001 ("The captured gas is used to produce energy (e.g. electricity/thermal energy)" is applied in the case of the project activity. The revised PDD includes estimation of the project emissions from LPG consumption. ERM CVS has checked the calculations and can confirm that they are in line with the tool. the calculations and input values to the calculations are validated in further detail in section 3.6 of the validation report. The revised PDD clarifies that thermal energy is not included in the scope of the project activity. ERM CVS confirmed this against the technical design of the project using references [DR 16, 24, 28, 29, 45]. CL closed.
CL 25 Present all formulae and parameters required for the determination of baseline emissions correctly as required by methodology and tools	8.5	All formulas have been reviewed to ensure consistency with tool and methodology.	ERM CVS confirms that all formula and parameters are presented according to the applied methodology and tools. This is validated in more detail in section 3.6 of the validation report. CL closed.
CL 26 a) All parameters listed in the monitoring plan are required to be included in accordance with the methodology and tools. b) Reference to the use of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" is not provided. c) All data/parameters that will be monitored	8.15	a) All data monitored are included in section B.7.1. b) The "tool to calculate project or leakage CO2 emissions from fossil fuel combustion" is utilised. Justification has been provided in section B.2. c) Consistency with the methodology has been reviewed. d) The format of tables in section B.7.1 has been revised to be the one recommended in the PDD	a) All required parameters are now included in section B.7.1. The validation of the parameters is provided in further detail in section 3.4 of the validation report. b) The "tool to calculate project or leakage CO2 emissions from fossil fuel combustion" is utilised. Reference is made to the tool in the revised PDD.

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shall be included in section B.7.1 according to the Guidelines for the completion of the PDD. d) Section B.7.1 table format is not in line with the guidelines. e) The data/parameter, data unit and description cells are not completed exactly as in the methodology. f) The value applied for the operation of the energy plant is not consistent in the PDD sections. g) Justification of the choice of data and comments are not completed in accordance with the tools and the methodology applied. h) Data and parameters to be monitored in the "Tool to determine project emissions from flaring gases containing methane" are not included in section B.7.1. i) Parameters f and z are not included in section B.6.1 j) The values for MAT and MAP shall be further justified. k) The sources of values applied for the efficiency of the degassing system (55%), as well as, the flare efficiency (90%) shall be provided Revision of the PDD is needed.		Form. e) The appropriate information required by the methodology has been included in the tables. f) The value applied for energy has been reviewed and corrected. g) Justification of methodological choices is provided. h) Data and parameters to be monitored in the "Tool to determine project emissions from flaring gases containing methane" have been included in section B.7.1. i) f and z were included in section b.6.1 j) MAT and MAP are justified using data provided in annex 3 of the PDD. k) Degassing system: The feasibility study (Relatório Ambiental - Biogás - CANDEIAS - Rv 03) provided to the DOE in September 2010 refers to 40% for the collection efficiency in p.20. Flare efficiency: 90% using the tool for flaring (explanation was added in section A.4.3 of the PDD).	c) All the data and parameters to be monitored, including the parameters in the "Tool to determine project emissions from flaring gases containing methane" are now included in section B.7.1. d) Section B.7.1 table format was revised (parameters EFgrid and CM,y). e) The tables are now completed as per the methodology requirements. f) The value applied for the operation of the energy plant has been made consistent throughout the PDD. g) Justification for the choice of data and comments have been provided in line with the methodology and tools applied. h) Data and parameters to be monitored in the "Tool to determine project emissions from flaring gases containing methane" are now included in section B.7.1. i) The parameter *z* and *f* are now included in section B.7.1. The parameters pn,j,x and Wx are now properly included in section B.7.1 instead of B.6.2 as they were before.. j) The MAT and MAP applied for the project are now justified. k) The sources of values applied for the efficiency of the degassing system, as well as, the flare efficiency are now indicated in the PDD. Further details on the validation of the parameters to be monitored is provided in section 3.4 of the validation report. CL closed.
CL 27 Section B.6.3 shall be revised, in accordance with section B.6.1 and B.6.2. The emission reduction spreadsheet shall correctly present the emission reduction calculations as per the methodology and tools.	8.21	Section B.6.3 of the PDD has been modified to include the whole formula and to refer adequately to the methodology instead of just the Tool. Evidence for the calculation of the electricity consumed for the project has been provided to ERM CVS and the value has been corrected. This information has also been	Section B.6.3 of the PDD has been revised to be in line with the calculations and equations required by the methodology and tools, and is now consistent with section B.6.1 and B.6.2. The ER calculation was revised in PDD and

Clarification requests	Reference to checklist question	Summary of project participants' response	Final conclusion
		included in the ER calculation spreadsheet. The ER excel spreadsheet for project emissions has been revised to follow the appropriate formula. Calculations were revised and the PDD updated accordingly.	ERM CVS has reviewed the spreadsheet [DR 8] to confirm that the calculations are correctly presented in line with the methodology and tools. Further details of the validation of the emission reduction calculations are presented in section 3.6 of the validation report. CL closed.
CL 28 The starting date of the crediting period and the explanation of the choice shall be clarified.	8.23	The crediting period start date has been updated in the revised PDD.	The PDD was revised, in line with the date that the project may be registered. CL closed.
CL 29 Annex 4 should state that all monitoring information is available in section B.7.2.	9.4	The relevant reference was added in Annex 4 of the PDD.	PDD was revised accordingly. CL closed.
CL 30 The letters of approval of the host Party and Annex 1 Party shall be provided	3.1	To be provided	To be confirmed

MINOR ISSUES	Reference to checklist question	Summary of project participants' response	Final conclusion
No minor issues raised			

Forward Action Requests	Reference to checklist question	Summary of project participants' response	Final conclusion
No FARs raised.			